



PARIS CIRCULAR ECONOMY PLAN

ADOPTED AT THE PARIS CITY COUNCIL
OF 3, 4 AND 5 JULY 2017

2017-2020



The circular economy is a practical response to the main challenges of our time. As a true societal project, it carries an ambition: to develop an economy that enables individuals to joyfully reclaim their forgotten ability to create the riches they need through initiatives. In a world in which endemic unemployment and alienated work continue to grow, it offers the promise of activities that are compatible both with human dignity and respect for the environment.

As a low-environmental-impact economy, it promotes new forms of production and consumption, as well as sociability, while opening up avenues for the creation of jobs that are sustainable and cannot be offshored. We are initiating this major change in the way our society works as a whole by substituting the idea of reuse for that of replacement, to create a world free of waste.

The City of Paris, a pioneer in this area, is committed to spreading the circular economy that many actors are already driving forward in their local areas. In close collaboration with twenty or so local authorities in Greater Paris, the City of Paris held the États généraux de l'économie circulaire (General Assembly on the Circular Economy) in September 2015, during which the White Paper on the Circular Economy was presented. It identifies practical proposals for action and innovative solutions throughout the metropolitan territory, so we can at last effectively combat climate disruption, put an end to the large-scale erosion of biodiversity and reduce the impact of our lifestyles on the health of our fellow citizens.

With its first Circular Economy plan, Paris is equipping itself with a truly operational roadmap. From the path to zero waste to the fight against food wastage and the development of urban agriculture, it now mobilises all municipal personnel in the service of a city that respects the environment.

By promoting a virtuous economy, which places competition and innovation at its core, we are providing a better living environment for Parisians and designing the city of the twenty-first century: fairer, more inclusive and more sustainable.

Anne HIDALGO
Mayor of Paris



We can all take action to improve everybody's living conditions while preserving the planet. Each local action that we undertake is another building block in the construction of sustainable responses to global challenges. Elected representatives, citizens, entrepreneurs, bankers and non-profit actors: we have the power to act.

This is the impetus that we created two years ago, with the launch of the Greater Paris General Assembly on the Circular Economy, which led to the creation of a White Paper, a Pact of Greater Paris Local Authorities, a Charter of Commitments for Student Life Actors and a Call to World Cities. This impetus is given by local actors who have together decided to take action to reduce our environmental footprint and create jobs.

A year later, we are very proud to present Paris' first action plan for the circular economy, a roadmap that is built on previous work and includes the city's actions and commitments.

These commitments are varied: to pursue a path of zero waste, to invent new jobs in the areas of repair and crafts, to meet the major challenge of building-site waste, to combat wastage in all its forms, and food wastage in particular, to find the right tools to leverage public procurement...

Numerous projects have been launched. The circular approach is expanding into all work undertaken by the City of Paris, while we are working on new projects aimed at spreading innovation and creating the conditions for the scaling up of circular initiatives.

The people of Paris are receptive and initiatives are growing in number.

The economy is changing, becoming more digital and bringing about profound changes in both our daily lives and our social protection system.

It is up to us to make sure that this new economy matches our values of equality and environmental protection, and that it turns its back on predation and profit in favour of cooperation and public goods.

Antoinette GUHL

Deputy Mayor of Paris responsible for the social and solidarity economy, social innovation and the circular economy

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A CONDUCTIVE ENVIRONMENT

The linear economic model «extract—manufacture—consume—discard» that our growth has been based on since the beginnings of industrialisation has shown its limits, with scarcity of resources and energy, large-scale waste production and negative impacts on the environment. The circular economy, on the other hand, is emerging as an answer to the complex equation that makes it possible to reconcile jobs for all, preservation of climate, natural resources and social and industrial innovation.

The European Union has understood this and adopted a series of ambitious targets, which member states should reach between 2020 and 2030, including:

- Material recovery of more than 70 % of construction and demolition waste by 2020, a target of the 2008 Waste Framework Directive;
- Reduction of landfill to a maximum of 10 % of all waste and a ban on landfilling of separately collected waste by 2030 (target of the Circular Economy Package^{1/}).

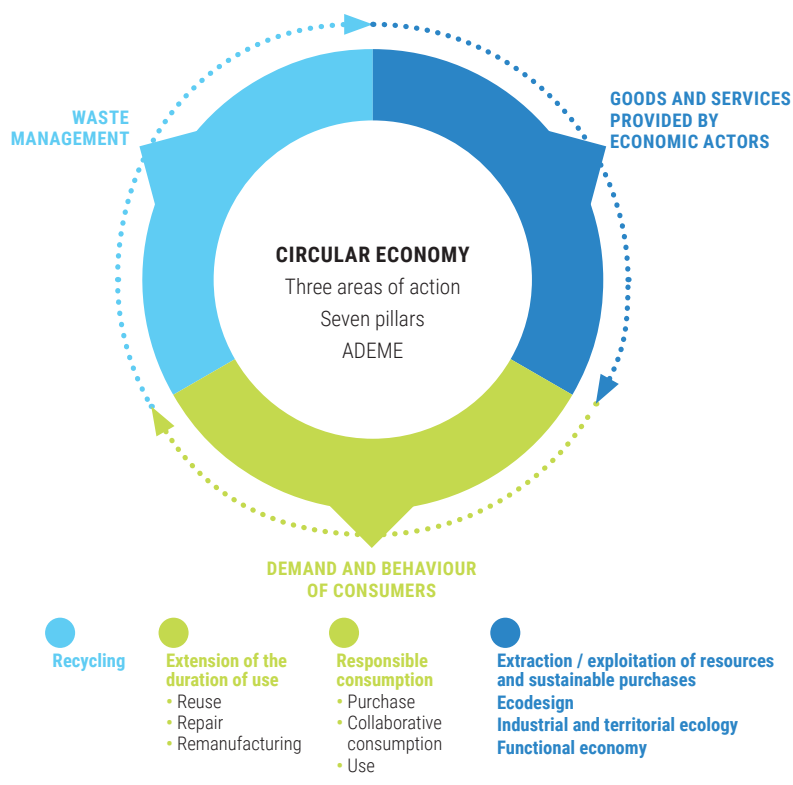
It is therefore necessary to improve sorting to better recover and recycle waste, but above all to develop as many strategies as possible to avoid creating waste in the first place. There are many options to leverage to this end: ecodesign of products, responsible purchasing, synergies and pooling between economic actors («industrial and territorial ecology»), shared and collaborative consumption, selling/purchasing of services rather than products («functional economy»), and of course repair and reuse. In France, the French environment and energy management agency (ADEME) has systematised these principles using the idea of «pillars» of the circular economy, which are presented below.

Cities have a major role to play in meeting these sustainability challenges, which are particularly intensified in dense urban environments, as was

shown by the Paris urban metabolism study^{2/}. According to Arab Hoballah of the United Nations Environment Programme: “By 2040-2050 cities will represent ¾ of the world’s population, ¾ of income, ¾ of resources used and ¾ of CO₂ emissions.” It is therefore in these urban agglomerations that solutions must be explored, tested and deployed on a large-scale.

Certain European cities, like Paris, are already taking action. For example, having built a circular economy plan based on the “Cradle to Cradle” concept, and focussing on specific flows (food, phosphate, waste, water, electricity and heat), the City of Amsterdam is calling for the creation of a Silicon Valley of the circular economy: a new district that will become a huge testing ground. 3500 homes and 200,000 m² of working spaces that are energy self-sufficient and built using recycled materials will be located here, as well as an exhibition area to showcase innovation.

The City of Glasgow, Scotland’s main economic hub, has also positioned itself as a pioneer of the



^{1/} On 2 December 2015, the European Commission published a communication entitled «Closing the loop - An EU action plan for the Circular Economy» reflecting its desire to support the transition to a circular economy. This plan included a set of measures aimed at reforming six Directives on the end of life of vehicles, batteries and accumulators, and electric and electronic equipment waste, as well as the landfill of packaging waste.

^{2/} Measuring the ecological performance of cities and regions: The metabolism of Paris and Île-de-France», Laboratoire Théorie des Mutations Urbaines, research report for the City of Paris, January 2007. Research work directed by Sabine Barles, professor at Pantheon-Sorbonne University, funded by the City of Paris.

^{3/} Mr Hoballah is head of the Sustainable Production and Consumption Department, Technology, Industry and Economy Division, United Nations Environment Programme.

circular economy by including the ambitious target of diverting 80 % of waste from landfills by 2020 in its Waste Strategy and Action Plan^{4/} and by drafting the Circle City Scan of Glasgow^{5/} in 2016 with the Glasgow Chamber of Commerce, in partnership with the organisation Zero Waste Scotland. This plan involves the city's three main economic activities: education, industry and health.

Further abroad, in Korea, the Seoul Innovation Bureau has introduced the "Sharing City" initiative to share goods and services, develop the functional and sharing economy in both the public and private sector, and optimise the budget.

Such initiatives taken in a number of cities demonstrate the efficiency of this geographic scale in order to carry out public policies that promote the circular economy. Cities bring together dense and connected working populations, dynamic and diversified economies, as well as research and teaching activities, and therefore benefit from "economies of agglomeration", i.e. effects produced by proximity between individuals and organisations (such as pooling of costs, diversity of opportunities and circulation of information).

In France, the government also provides strong institutional support for the circular economy. France's "Energy Transition for Green Growth" law, which was adopted on the 17th of August 2015, reasserts the ministry's ambitions, such as the generalisation of organic waste sorting at source for all producers before 2025, the extension of sorting instructions to all plastic packaging by 2022, materials recovery of 70 % of construction waste by 2020, the use of landfill for final waste only, and the development of industrial and territorial ecology. And for good reason: the circular economy already employs nearly 600,000 people in France and there is an estimated potential for 200,000 to 400,000 additional jobs (including 50,000 for the Île-de-France region alone)^{6/}. Energy transition may represent the largest jobs pool, but by 2030 the sorting, collection and recycling of packaging could generate more than 10,000

jobs, and industrial ecology around 4000 jobs. The United Kingdom estimates that 47,500 jobs alone could be created by doing away with landfill for waste produced by the wood, plastic, textiles, food and electronic device industries. In Germany, generalisation of the deposit system to all drinks containers could create 27,000 jobs.

More locally, a study assessing the environmental impact of six circular economy projects being tested in Paris has shown that the circular economy not only makes it possible to create "reshored" jobs, but also to promote the emergence of new business opportunities for existing actors, through the exchange of services or flows at local level.

Lastly, at individual level, the habits of consumers and attitudes are evolving towards shared use (rental, reuse, swapping, donation) and repairing. A survey performed by the BVA and Institut de l'Économie Circulaire in June 2015 showed that 9 French people out of 10 are in favour of using second-hand parts to repair their vehicle. While they remain marginal, these new uses extend the lifecycle of products and open the way toward a more virtuous and circular economy.

A STRONG POLITICAL COMMITMENT FROM THE CITY OF PARIS

A NEW AND UNPRECEDENTED POLITICAL ORGANISATION

Political commitment is reflected not only in the Mayor's term-of-office objectives, which demonstrate her will to engage in actions that encourage growth of the circular economy, but also in the structuring of her municipal team. The task of steering the circular economy strategy has been assigned to the Deputy Mayor of Paris, who is also responsible for issues related to the social and solidarity economy and social innovation. The Mayor's Councillor is also involved. As the circular economy is by nature a highly cross-cutting area,

^{4/} Waste Strategy and Action Plan, Glasgow City Council, 2015

^{5/} Circular Glasgow, drafted in collaboration with Circle Economy, Glasgow Chamber of Commerce, Zero Waste Scotland, Glasgow City Council, June 2016

^{6/} Study performed in June 2015 by the Institut de l'Économie Circulaire. In order to specify this potential, the Institute catalogued all works that have been carried out on the relationship between job creation and the circular economy.

several of Paris' other elected representatives are directly concerned by and involved in this dynamic.

AMBITIOUS THEMATIC STRATEGIES

The Municipality is engaged in many areas to develop a sustainable, cohesive, responsible and resilient city. This vision forms part of the term-of-office commitments. The circular economy is a reflection of this vision. It involves adopting a territorial strategy for sustainable economic development aimed at both producers and consumers, and public and private actors.

This commitment first led to the adoption of a unanimous pledge at the Paris City Council in June 2014 to set the city on a "zero-waste path". Following in the footsteps of the Local Waste Prevention Programme (PLPD) 2011-2015, which enabled a 7 % reduction in household waste tonnage, this policy aims to continue to reduce waste and improve recycling by promoting landfill-free management, limitation of energy recovery to only non-recyclable or non-reusable waste, and collection of organic waste at the source. The aim is to put an end to disposable objects and bring about a paradigm shift by considering waste as a resource and not scrap.

In 2015, the City of Paris won a national call for projects issued by the French environment and energy management agency (ADEME): "Territoire zéro gaspillage, zéro déchet" (Zero Waste Territory). As part of the project, it committed to reducing household and similar waste by 10 % between 2010 and 2020. This commitment will be carried forward as part of the review of the PLPD.

In keeping with this commitment, on the 16th of February 2016 at the Paris City Council, the Mayor of Paris presented a communication on improving cleanliness and the zero waste strategy, which mainly aims to provide impetus for sorting activities by endowing collection systems with more visibility, simplicity and proximity. The Compost Plan adopted in January 2017 reflects the City's

will to implement sorting at source and door-to-door collection of household food waste. Two arrondissements of Paris are now engaged in this project.

The City would also like to encourage the reduction of food waste and change habits that generate it. With this aim, a strategic plan for combating food wastage was voted for in December 2015. This document provides a global, coordinated vision, with 13 practical actions that involve contract catering, shops, food markets and citizens. It also extends and amplifies the PLPD, actions of the Sustainable Food Plan, as well as initiatives from Paris' student community engaged in the circular economy. This strategic plan therefore contains a range of actions led by the City, which are the result of consultation with dozens of local and public actors, and which aim to reduce food waste by half between now and 2025.

The issue of responsible public procurement has also been identified as a development challenge for the circular economy. Paris is the world's fourth-ranked city in terms of economic power and attractiveness. Public procurement by the City of Paris alone is worth 1.6 billion euros. This therefore represents a powerful means of leverage for the ecological transition of the economy and creation of sustainable local jobs. At the end of 2015, the City of Paris had already initiated a transnational procurement group with several other European cities. This is unprecedented for a French local authority: Paris was the first to have approved the introduction of a responsible public procurement scheme at the Paris City Council in February 2016. The circular economy forms a very important part of this. With this scheme, the City of Paris commits to defining new criteria related to resource efficiency (both material and human) for its future public procurements, as well as to reassessing its needs prior to procurement. This term of office is also marked by the seal of COP21 (UN Climate Change Conference Paris 2015). In addition, the Paris Climate and Energy Action Plan contains many key areas related to

the circular economy and targets that go beyond national and European energy transition strategies: 25% reduction in the territory's energy consumption and 25% of consumption from renewable sources by 2020.

Another area addressed by the City through the lens of the circular economy is the re-industrialisation of the capital. For a number of years, the City has introduced public policies to encourage the development of local production that is better adjusted to local needs and consumes less materials and energy. It is creating many networks that bring together economic actors (such as the "*Paris Esprit d'Entreprise*", the business and employment centres, and the *Groupement Jeunes Créateurs Parisiens*), has launched two projects for logistics centres on the doorstep of Paris, and encourages innovation by supporting business and research projects with financial assistance, technical support and property mobilisation.

More recently, the Information and Assessment Mission tasked with identifying promising industries and opportunities for them to locate in Paris^{7/} has explicitly associated the capital's re-industrialisation strategy with the principles of the circular economy, for example by recommending the development of river and rail transport, the growth of innovation hubs, product ecodesign, the promotion of repair, energy-efficient building renovation, the creation of recovery platforms, and for priority to be given to short supply chains.

By organising the event "Paris, City of Makers" at the City Hall and announcing its desire to double the number of production spaces in the capital (fab labs, makerspaces, etc.), the City of Paris has put itself on the global map of city makers.

A COMMITMENT TO THE CIRCULAR ECONOMY THAT IS TAKING SHAPE

Throughout 2015, the City of Paris carried out major work, in collaboration with twenty or so local authorities in Greater Paris, to organise the General Assembly on the Circular Economy. This event brought together and mobilised many of

the city's actors, with more than 120 organisations from the non-profit, industrial, economic, institutional and academic sectors. It resulted in the publication of a White Paper on the Circular Economy in September 2015, which presents a set of 65 action proposals and as many forms of leverage to be used to promote the growth of the circular economy. The Pact of Greater Paris local authorities for the circular economy, the Call of cities for circular economy (as part of preparations for COP 21 – Conference of the Parties on Climate Change) and the Charter of commitment for the development of the circular economy in the student world were also adopted. A report of this participative work was given on the closing days of the General Assembly, organised from the 14th to the 16th of September 2015 at City Hall, during which more than 2000 participants visited conferences, debates, project presentations and non-profit stands.

^{7/} Report of the Information and Assessment Mission: « *Fabriquer à Paris pour relever les défis sociaux et environnementaux : quelles filières industrielles d'avenir ?* » (Manufacturing in Paris to meet social and environmental challenges: which industrial sectors for the future?) presented at the Paris City Council in September 2015

VARIOUS TERRITORIAL LEVELS

Paris is a unique territory. As a national capital and European metropolis, it is a hub for very many tangible and intangible flows (tourism, logistics, finance, national and international travel, etc.). As a world city, Paris is also part of international networks such as the 100 Resilient Cities initiative established by the Rockefeller foundation, the European network ACR+ and the Ellen MacArthur Foundation for the promotion of the circular economy, as well as networks that bring together cities engaged in the fight against climate disturbance, such as the C40, Energy Cities and Covenant of Mayors.

The City of Paris is now part of a new territorial and administrative entity: the Métropole du Grand Paris (Metropolis of Greater Paris)⁸. As a municipality, département and metropolitan territory, it can act at various levels, in keeping with actions launched and the influence it has exerted on the metropolis' construction. As the municipality has always had important relations with its neighbours in the inner and outer suburbs, it is pursuing the many partnerships established within the Île-de-France region, in particular through the circular economy.

The Metropolis of Greater Paris therefore brings together more than half of the region's inhabitants and is competent in four main areas: spatial planning, local housing policy, economic, social and cultural planning and development, and lastly environmental and air protection. It is also responsible for coordinating electricity, gas, heat and refrigeration distribution systems. With its planning powers and operational competencies, the Metropolis has many means at its disposal to promote the circular economy on a large scale, even though the "Water, sanitation and waste management" competency is the responsibility of public territorial establishments (formerly "agglomeration communities").

PARIS' URBAN METABOLISM

In order to function, a territory, and to an even greater extent a city, imports large quantities of materials, finished products and energy to meet the daily needs of its residents and users, including food, electricity, heat, refrigeration, fuel and consumer goods. A territory also generates a lot of waste, which needs to be collected and removed. These incoming and outgoing flows have major economic and environmental impacts: extraction of materials, transport, loss of economic value of waste leaving the territory without being recovered, and atmospheric emissions. This is what is known as the urban metabolism. A better understanding of these incoming, outgoing and stored flows should enable better management of resources. Instead of being exported or discarded in nature, these flows could be redirected toward the territory's economy, by promoting pooling between actors, energy recovery, reuse and recycling. In short, the circular economy! In 2007, the City of Paris funded research work directed by Sabine Barles, professor at Pantheon-Sorbonne University, which involved keeping accounts of materials flows for Paris, the dense urban area and the entire Île-de-France region⁹. In order to illustrate this accounting and all flows of materials, water and energy entering and leaving the territory, as well as the impacts of projects developed, at the end of 2014, the City of Paris' Urban Ecology Agency created a data visualisation, available online (<http://metabolisme.paris.fr/>), which provides a better understanding of interactions between the city and its environment.

These analyses have revealed that materials flows are highly contrasted between Paris, Greater Paris and the Region¹⁰.

- The large amounts of resources taken from outside its territory make Paris a city that is highly dependent on its immediate and wider environment. In order to function, Paris imports the equivalent of 8.8 tons of materials per resident, including 20 % fossil fuels.
- People consume more food in Paris. Due to the

⁸/ The Métropole du Grand Paris (Metropolis of Greater Paris) was created on the 1st of January 2016. It was created by the law of 27 January 2014 on the Modernisation of Territorial Policy and the Cities (MAPTAM), reinforced by the law of 7 August 2015 on the New Territorial Organisation of the Republic (NOTRe). It brings together Paris, the 123 municipalities of the three départements Hauts-de-Seine, Seine-Saint-Denis and Val-de-Marne, and seven municipalities of the neighbouring départements Essonne and Val d'Oise, covering a total of nearly 7.5 million inhabitants. The metropolis does not work alone but along with public territorial establishments (EPT) of more than 300,000 inhabitants each. As a public inter-municipality cooperation establishment (EPCI) with a separate status and tax system, the Metropolis of Greater Paris forms the strategic level of public policy formulation. Among other things, public territorial establishments form the level at which public policies are implemented and managed.

⁹/ Measuring the ecological performance of cities and regions: The metabolism of Paris and Île-de-France», *Laboratoire Théorie des Mutations Urbaines* (Urban Changes Theory Laboratory), research report for the City of Paris, January 2007.

¹⁰/ Source : <http://metabolisme.paris.fr>

high level of catering activity (with large numbers of business and leisure tourists visiting the territory), the quantity of incoming food per resident is greater in the capital than in the rest of the metropolis and other French towns and cities. Volumes of organic waste therefore represent a major challenge for improving the metabolism. Parisians discard three times as much food still in its packaging than the average level for French people¹¹.

- A dynamic metropolis and region. The metropolitan territory and Île-de-France region are marked by their economic dynamism. This means that significant volumes of merchandise and manufactured products are imported and exported. The region imports the equivalent of 12 tons of materials per resident and exports 5.2 tons per resident per year.
- A rapidly developing region. Due to the many housing and urban renewal construction sites, there are major flows of imported construction materials and building site waste, which represent significant challenges for improvement of the region's metabolism.
- Lastly, a downward trend for merchandise imports and exports can be observed between 2003 and 2010 for Paris and the region (with a decline of around 20%). Volumes of land-filled waste from construction sites and economic activities are on the rise, however, while

volumes of household waste and atmospheric emissions are declining.

Among other things, this graph highlights the fact that waste, which is overwhelmingly produced by construction and public works, represents 45% of exported materials and that only 30% of this waste is recycled¹².

These volumes of waste form the main asset for the implementation of a circular economy, as it becomes possible to scale-up flows and make waste recovery activities profitable. In addition, this dynamic positions the Île-de-France region as a potential producer of many secondary raw materials, some of which are already "rare" and essential for the development of future industrial sectors. According to estimations of the Paris Region Planning and Development Agency (IAU Île-de-France), if all waste produced in the territory was recovered, 9% of ongoing needs for raw materials within Île-de-France could theoretically be covered. Île-de-France has many assets to make changes in the territory. It has a vast network of companies in key areas for the circular economy, including mature recycling schemes (for metals, paper, etc.), and developmental actors in the chemicals, energy and design industries. In the area of construction waste, the regional plan for the prevention and management of building-site

FLOWS OF MATERIALS ENTERING AND LEAVING PARIS

(Paris urban metabolism graph)



^{11/} Approximately 20% of food waste discarded in the rubbish bin is still in its packaging, which is three times more than the French average. 2015 annual report on the price and quality of Paris' public waste removal service.

^{12/} The «To Nature» cycle represents atmospheric and diffuse emissions

waste (PREDEC) has been accompanied by the formulation of a regional strategy for the circular economy and construction waste.

In March 2015, the Paris Urban Planning Agency (APUR) released a study that provides an initial description of emerging forms of economy, including the circular economy, social and solidarity economy and collaborative economy, which are becoming established in the economic fabric of Paris and the Metropolis. It should be noted that the ideas of "circular", "social", "solidarity" and "collaborative" interact and overlap, and cannot be interconnected into a single concept. As a whole, these economies produce new, alternative and diverse services, whose endpoints are the user and resident.

An interactive map of services provided by these "new forms of economy" is available on the APUR's website¹³. It can be seen on the map that the many services belonging to the circular economy are present throughout Paris, but that the territorial fabric is more closely knit to the west of a diagonal line that crosses "Batignolles-Porte de Charenton". Beyond this line, the structure is looser. These services, which are sometimes made possible by digital technologies, require physical locations, as they are based on sharing and social links. For this reason, the density of the city seems to be favourable for them. Observation of their geographical location also shows that they can eventually become a positive marker of territorial economic growth: they are mainly located in the central eastern part of the metropolis.

To summarise, the most pressing circular economy challenges for Paris are:

- Control of the food chain;
- Recovery of sources of organic matter (amendment and energy);
- The fight against food wastage;
- Visibility of the goods supply chain (origin and logistical organisation) ;
- Impacts of the construction industry;
- Support for innovation and new economies;
- Solutions facilitating access to and sharing of premises and property;
- Priority to short production and distribution chains.

^{13/} <http://www.apur.org/etude/regards-economie-paris-nouvelles-formes-economie-circulaire-sociale-solidaire-collaborative>

AN INTEGRATED STRATEGY FOR THE CIRCULAR ECONOMY

INTERACTION WITH MUNICIPAL PLANS

Numerous public policies have been introduced in order to provide conditions for sustainable and resilient growth in the territory. Seeking these

interactions will make it possible to focus the circular economy plan for Paris on complementary actions, and even integrate a circular economy dimension in other municipal policies, when the opportunity arises, for example during policy reviews.

	SUSTAINABLE DEVELOPMENT CHALLENGES				
	Combat climate change and adapt the city to the changing climate	Improve environmental quality and contribute to the personal growth of all	Promote biodiversity in Paris	Strengthen social cohesion and solidarity between territories and generations	Promote transition toward the circular economy
Climate and Energy Plan	●	○			●
City of Paris staff travel plan	●	●			○
Bike plan	●	●			○
Local urban planning scheme (PLU)	●	○	○	○	○
Plan to combat air pollution	●	●			○
Noise prevention plan		●			○
Environmental health plan		●			○
Charter for sustainable urban logistics	●	●			●
Biodiversity plan	○	○	●		○
Blueprint for the ecological restoration of waterways	○		●		○
Paris rain plan	○		●		○
Blueprint for the recovery and development of non-potable water	○		●		●
Urban agriculture development strategy	○	○	●	○	●
Sustainable Paris Actors Network	●	○	○	○	●
Paris pact against exclusion				●	○
Local housing programme	●			●	○
Scheme to promote socially and environmentally responsible purchases	●				●
Sustainable food plan (City of Paris municipal canteens)	●			○	●
Plan for urban agriculture and sustainable food	●			○	●
Local waste prevention programme / zero-waste strategy	●	○			●
Compost plan	○	○		○	●
Plan to combat food wastage	○			○	●
Innovation arc				○	○

Policy **in bold** → mandatory document

● → challenge strongly taken into account or pillar strongly impacted in (by) public policy actions

○ → challenge or pillar indirectly impacted by public policy actions

The diagram below illustrates how these various commitments (plans, strategies and charters), which are mostly voluntary, partly respond to the issues and challenges of the circular economy.

PILLARS OF THE CIRCULAR ECONOMY						
Sustainable supplies	Ecodesign	Industrial and territorial ecology	Functional economy	Responsible consumption (collaborative in particular)	Extension of the duration of use (reuse and repair)	Recycling
●	○				●	○
				○		
				○		
				○		
	○		○			
	○		○			
					○	
●		○	○	○		
○	○					
○						
	○					○
○	○	●				
○		○		○		○
○	○	○	○	○	○	○
				○	○	
	○					○
●	●	○	●	●	●	○
●				●		
●				●		
○	●	●	○	○	●	○
○				○		○
○				●		
		○	○	○		

TERRITORIAL INNOVATION: NEW LEVERAGE TO DEVELOP THE CIRCULAR ECONOMY IN PARIS

THE CIRCULAR ECONOMY IS CONSISTENT WITH THE AIMS OF TERRITORIAL INNOVATION AND BASED ON THE DEPLOYMENT OF NEW MODES OF ACTION

The circular economy is a new approach that requires the development of numerous innovations and disruption of the behaviours and organisational methods of actors. Among the key innovations that need to be developed to strengthen the circular economy in the territory of Paris are:

- Development of new technologies (energy recovery and storage, green chemistry, bio-based materials, new recycling processes, integration of digital technology to optimise logistics chains, etc.);
- New modes of organisation between the actors of one or several sectors (pooling of goods and spaces, intermediation platforms, exchanges of flows, etc.);
- Social innovations (participative democracy, recycling centres, etc.);
- Service innovations based on new economic models (short supply chains, functional economy, collaborative economy, etc.).

In broader terms, the circular economy is part of a "territorial innovation" approach, defined as "a new solution (or a solution transferred to a new environment) for a problem and/or need that has been collectively identified in a territory, in order to improve well-being and promote sustainable local development¹⁴." The idea of territorial innovation is also based on other key characteristics that are totally consistent with the approaches of the circular economy: close adaptation to a given territorial environment, mobilisation of local assets and resources, construction of a sustainable economic model and capacity to mobilise local actors, in particular citizens, with the aim of joint-construction and joint-production¹⁵.

But as with any innovative approach, by nature, the circular economy's role is to call into question modes of operation, habits and established positions. In order to become firmly established in a territory and grow, it therefore needs to be accompanied by effective change management, both in terms of culture and attitudes, on the one hand, and in terms of organisations, governance systems, the legal framework, means of assistance, etc., on the other. This is what this plan is all about: rather than simply being a collection of initiatives, it aims to activate and coordinate forms of leverage that will bring about deep-seated change within the system.

TEN FORMS OF LEVERAGE TO SUCCESSFULLY APPLY A TERRITORIAL INNOVATION APPROACH SUCH AS THE DEVELOPMENT OF THE CIRCULAR ECONOMY WITHIN PARIS

1. Define a direction and objectives. There is no point in innovation for innovation's sake. It is important that the circular economy approach is attached to a solid territorial plan. Furthermore, targets and objectives must be specific, designed so as to be complementary and consistent with other municipal policies, and clear for all of the plan's stakeholders. Indicators must be set up for each action and regularly assessed.

2. Establish open and partnership-based systems of governance. The circular economy requires increased cooperation between actors from various sectors, as well as between public-sector, private-sector and non-profit actors. Partnership-based systems of governance must be built to steer the approach as a whole, but also at the level of individual actions, in order to get actors from different fields working together.

3. Deploy cross-cutting organisations. The circular economy requires that changes are made to organisations and operational processes in order to remedy current divides between professions and management systems (for waste, water

^{14/} Source: Report by Akim Oural, *L'innovation au pouvoir, pour une action publique réinventée au service des territoires* (Innovation needed! For redesigned public action at the service of the regions), 2015, page 7.

^{15/} Ibid.

and energy supply, transport, property, etc.) These new cross-cutting organisations must make it possible to adopt more integrated and systemic territory management approaches, to plan for exchanges of flows and synergies between various types of activity, and to think in terms of project lifecycles (rather than in terms of professions).

4. Find the right tools to manage complexity.

An effective circular economy approach requires an integrated vision of urban systems and consolidated knowledge of material flows. In addition to the “Paris urban metabolism” web platform, the City of Paris and its partners must continue to find the right tools to handle the complexity inherent in circular economy projects.

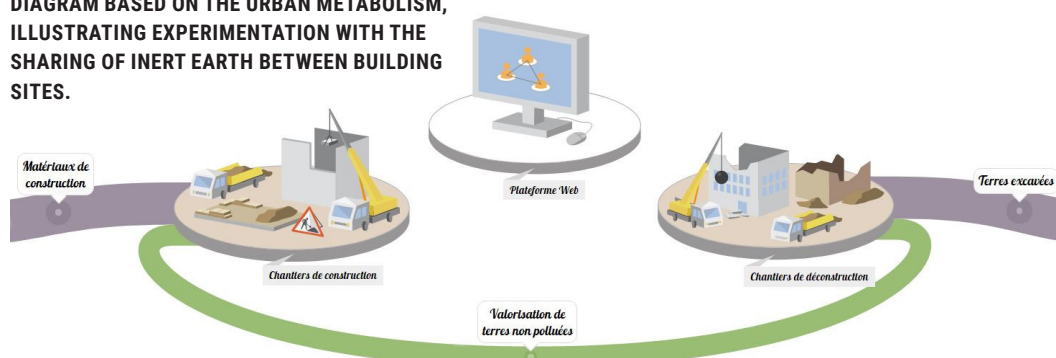
One of the plan's actions is aimed at developing an internal reference system for the Paris City Hall in order to define sustainable construction criteria that take into account circular economy principles, and to establish target standards and integrate them in specifications to guide project design.

5. Design in collaboration with users. Service innovations can no longer be considered without taking into account the user point of view and potentially jointly creating with users. Citizens can also lead innovative micro-projects. New innovation management methods via public design or usages need to be mobilised.

6. Experiment with new concepts, by mobilising the urban space and setting up demonstrators to test out innovations, their technical operation, their acceptability and their cost. An experimental approach requires tolerance of errors, a suitable legal framework (availability of the public domain, conditions of R&D partnerships between public and private organisations, etc.), and effective risk management.

7. Rely on a suitable legal framework, in order to promote and secure public-private cooperation and remove obstacles to the development of innovations in the area of the circular economy.

DIAGRAM BASED ON THE URBAN METABOLISM, ILLUSTRATING EXPERIMENTATION WITH THE SHARING OF INERT EARTH BETWEEN BUILDING SITES.



The «Improvement of the Urban Metabolism» call for experimental projects has given rise to innovative projects in the area of the circular economy: reuse of property, materials or excavated earth, development of the concept of glass bottle deposits in micro-breweries, collection of organic waste, and raising awareness of wastage. These various types of innovation make it possible to explore the obstacles to be removed (in terms of the legal framework, economic model, networking of actors, etc.) This action will be followed by the setting up of a circular economy innovation platform by Paris&Co.

8. Establish incentive-based funding and develop sustainable economic models.

Funding provides powerful leverage to encourage actors to engage in an innovative approach, which is «risky» by nature. While seeking sustainable economic models, incentive-based funding makes it possible to scale up innovative initiatives in the area of the circular economy.

One of the plan's actions aims to encourage the location of circular economy actors in Paris by organising the sharing of premises. Sharing and optimisation of the occupancy of premises can provide a solution to the high rent and property pressure in Paris for organisations with limited financial means (in particular non-profit actors in the circular economy), as well as for those launching a business with an innovative concept. However, this practice is not currently widespread and difficult to implement for public authorities.

9. Assess and organise the scaling up of innovations.

Assessment of the impact of initiatives is key to popularising circular economy innovations, as well as to generating real change in terms of the behaviour of actors or modes of operation used.

With its responsible public procurement scheme, the City of Paris is committed to defining new resource efficiency criteria for future procurement contracts. In concrete terms, this will give rise to the implementation of an environmental footprint indicator for the City's procurements. The ability to reliably measure the environmental footprint of public procurements will make it possible to better assess the quality of projects and generalise the most resource-efficient solutions throughout the territory of Paris. Putting together an assessment reference, including targets and indicators, is one of the leading actions of the action plan.

10. Communicate.

The evolution of attitudes requires effective and educational communication on circular economy actions.

To summarise, the cross-cutting keys to success for a transition to the circular economy:

- are largely based on human factors: the need for training and new skills, as well as changes regarding expectations and, therefore, demands and behaviours; new methods of organising and cooperating, essential for the effective implementation of a collaborative approach, reuse and sharing;
- must systematically take into account the question of economic models and project funding (while the capital itself can be seen as a resource to be circulated in a more direct and local manner);
- are based on effective use of digital technology and open data, to promote better use of public goods and inclusive service and goods offerings.

A MUNICIPALITY AT WORK

The City of Paris' teams use their specific skills to implement actions based on the circular economy concept on a daily basis. Here is an overview of the municipal's flagship actions, which gives a vision of what has been set into motion and prospects for deployment.

	Recovery of green waste	<ul style="list-style-type: none"> ● Recycling of wood waste from green spaces ● Recovery of Christmas trees
	Recovery of materials (from construction and public works)	<ul style="list-style-type: none"> ● Recycling of products of funerary monument dismantling ● Recycling of road materials ● Recovery of materials during large-scale renewal works ● Digital inter-departmental exchange platform
	Ecodesign of venues and events	<ul style="list-style-type: none"> ● Green space ecodesign reference ● Charter of eco-responsible events
	Sustainable and responsible supplies	<ul style="list-style-type: none"> ● Supply of organic and sustainable products in canteens ● Socially and environmentally responsible public procurement scheme ● Development of urban agriculture
	Energy: recovery and reuse of heat and cold	<ul style="list-style-type: none"> ● Recovery of heat from wastewater to heat public buildings ● Recovery of heat from data centres ● Cooling of public buildings
	Water management	<ul style="list-style-type: none"> ● Development of the non-potable water network and uses ● Rational water management in green spaces
	Mobility and goods transport	<ul style="list-style-type: none"> ● Development of urban logistics spaces ● Shared municipal fleet (cars and bicycles)
	Organic waste: separate collection for recovery	<ul style="list-style-type: none"> ● Collection of organic waste (municipal restaurants and markets) ● Launch of separate collection of household food waste ● Support and assistance for collective composting
	Consumer goods: facilitating extension of the lifecycle	<ul style="list-style-type: none"> ● Recovery of IT and telephony equipment ● Reuse of furniture ● Experimentation with sharing kiosks ● Support for reuse actors (recycling centres, repair cafés, etc.)
	Zero waste path: facilitating sorting	<ul style="list-style-type: none"> ● Deployment of Emmaüs Eco-Systems solidarity collections ● Improving the proximity of bulky waste collection points
	Fight against food wastage	<ul style="list-style-type: none"> ● Fight against food wastage in municipal canteens ● Recovery of unsold items on food markets ● Support to non-profit organisations to collect unsold food items

Recovery of green waste

Recycling of wood waste from green spaces

Since 2012, the grinding of pruned branches has produced 5000 m³ of groundwood per year, which is used as mulch on flowerbeds in Parisian gardens in order to prevent the growth of weeds, as a substitute for banned plant protection products, and to limit watering.

Logs from trees in Paris have been recovered to make facilities and furniture for four play areas. Other projects are being studied.

Recovery of Christmas trees

69,500 Christmas trees were collected at the beginning of 2016 at voluntary drop-off points located in the gardens of Paris (54,000 in 2014). They were transformed into 1120 m³ of groundwood for use as mulch on flowerbeds or to cover footpaths.

Recovery of materials (from construction and public works)

Recycling of products of funerary monument dismantling

Materials left over from funerary monuments taken down following the transfer of a lot are gathered in storage and crushing areas in the cemeteries of Pantin and Thiais. Each site produces an average of between 2400 and 3500 tons of gravel per year, which is used to create pedestrian paths and roads.

Recycling of road materials

Paris' road regulations require that materials from road works are taken to a City of Paris materials recycling centre to be reworked or recycled. Out of the 15,000 tons of granite laid every year, 50% is sourced from recycled granite. In order to ensure optimal use of recycled materials, the City of Paris sells part of its stocks. This unprecedented initiative will bolster exchanges between municipalities in the metropolis.

Recovery of materials during large-scale renewal works

Integration of the principle of selective dismantling and reuse of building materials from structural and finishing works for renewal schemes at sites such as Alembert (Département of Paris), Caserne de Reuilly (Paris Habitat) and Les Canaux (City of Paris). These tests can serve as points of reference for the integration of such specifications in future schemes.

Digital inter-departmental exchange platform

A digital platform for the exchange of materials, objects and furniture was created in 2015 by the green spaces departments. Following numerous proposals put forward by staff members, a working group was formed to open it up to all City of Paris departments and develop it to include functions that are directly linked to other business applications.

Ecodesign of venues and events

Green space ecodesign reference

An analysis grid can be used to review all environmental and public reception targets when designing or redeveloping gardens and green spaces. Along with the sustainable green space design guide (GADEV), these tools facilitate communication between various actors and the achievement of targets specified in the reference document.

Charter of eco-responsible events

For events and demonstrations organised in public areas in Paris, the City of Paris has established an eco-responsible events charter that promotes ecodesign. It is systematically sent to event organisers and applies at each stage of the event, from design to dismantling.

Sustainable and responsible supplies

Supply of organic and sustainable products in canteens

Since 2009, the City of Paris has been committed to its Sustainable Food Plan – an ambitious action plan for its canteens (30 million meals per year in 1200 canteens), which made it possible to achieve a level of 32.9% sustainable food in 2015 (51.2% in crèches). The aim is to reach a level of 50% sustainable food by 2020.

Socially and environmentally responsible public procurement scheme

Adopted at the Paris City Council in February 2016, Paris' responsible public procurement scheme meets regulatory requirements and engages the City in an innovative approach, with the creation of an environmental footprint indicator for its purchases, new resource-efficiency criteria for future procurement contracts, as well as prior consideration of needs.

Development of urban agriculture

The City of Paris launched the "Parisculteurs" call for projects with support from signatories of the "Objectif 100 hectares" (Objective 100 hectares) charter. Out of the 33 projects selected by the Paris City Hall and its partners, 28 are devoted to urban agriculture projects, representing more than 5.3 hectares.

Energy: recovery and reuse of heat and cold

Recovery of heat from wastewater to heat public buildings

In addition to operational sites (Wattignies school, Aspirant Dunand swimming pool and the City Hall), 13 sites with energy recovery potential have been identified on the wastewater and non-potable water network. This system will make it possible to save up to 250 tons of CO₂ each year.

Recovery of heat from data centres

The City of Paris is committed to the recovery of energy from data centres, with an initial test

that aims to heat the Butte-aux-Cailles swimming pool in the 13th arrondissement. IT servers will be installed on the swimming pool's premises by the successful tenderer, which will be able to sell the computing power to third-party clients.

Cooling of public buildings

Numerous applications are being studied to promote recovered energy and supply Paris' air conditioning network, such as the heat exchanger system connected to non-potable water piping that extracts energy from water to cool the City Hall (44% energy savings).

Water management

Development of the non-potable water network and uses

The blueprint for the non-potable water network and uses, which was approved by the Paris City Council in October 2015, plans to optimise and modernise the network by upgrading production and developing new uses to cool the city, adapt to climate disturbance and devise projects that combine water and energy.

Rational water management in green spaces

The installation of sub-meters, remote monitoring of consumption and renovation of sealing systems for fountains contribute to optimising consumption: improved responsiveness in the event of leaks, improved knowledge of consumption per usage, and control of water volumes actually used for plants.

Mobility and goods transport

Development of urban logistics spaces

The rationalisation of goods transport by pooling spaces and vehicles, as well as by linking up the territory, is essential for the growth of the circular economy. 15 "urban logistics spaces" (*Espaces Logistiques Urbains* – ELU) are currently distributed throughout the territory of Paris. The local urban planning scheme aims to preserve existing logistics

facilities and reserve spaces dedicated to this usage when urban projects and/or lots are transferred.

Shared municipal fleet (cars and bicycles)

Between 2014 and 2016, car and electric bicycle sharing services were deployed. More than 700 registered users can benefit from the use of 58 shared vehicles for their work-related journeys. These shared-vehicle services will be provided on new planned administrative sites. In addition to these services, tests continue to be performed for the use of Autolib' for work-related journeys.

Organic waste: separate collection for recovery

Collection of organic waste (municipal restaurants and markets)

Since 2014, the Paris City Hall has been deploying solutions to generalise the collection of organic waste produced by municipal canteens, schools and food markets. It has introduced sorting at source and separate collection of organic waste in four municipal canteens, including that of the City Hall, as well as in 22 school canteens in the 2nd, 9th and 18th arrondissements. Following successful tests, prerogatives have been integrated into new public service contracts in order to spread these practices throughout all of Paris' food markets.

Launch of separate collection of household food waste

Since May 2017, as part of the multi-year plan to improve cleanliness in Paris, a third sorting bin (brown bin) designed to collect all kitchen and table waste has been installed in buildings in the 2nd and 12th arrondissements. This test comes ahead of the generalisation of food waste collection throughout the territory of Paris.

Support and assistance for collective composting

The City of Paris encourages collective composting in all its forms. In July 2016, 422 household

composting sites at the foot of buildings (including 222 in collective housing and 200 on public sites), as well as 6 neighbourhood compost bins, were counted. Local composting in Paris still has significant growth potential. The Paris Compost Plan, which was adopted in February 2017, sets a target of 500 household composting sites in collective housing (twice the current number) and 400 sites in public facilities (twice as many as in 2016), to be met by 2020.

Consumer goods: facilitating extension of the lifecycle

Recovery of IT and telephony equipment

While the prospects in terms of volumes are not significant given the policy of optimising the duration of use of IT and telephony equipment, the reconditioning and recycling of such equipment, which was reformed by the City and Département of Paris, have been assigned to an external service provider (currently ESAT). Computers, screens and mobile phones that can be reused are distributed to members of the City's personnel with a low income and non-profit organisations in Paris, as part of the "Un Ordi pour mon Asso" (A computer for my association) campaign: 62.1% are recycled and 37.9% are reused.

Reuse of furniture

Reuse of furniture in the City's departments has become a priority in order to extend its useful life and reduce purchasing volumes. Conditions for such reuse have required a new organisational system in order to sort furniture before each move, find temporary storage on available premises and classify stored furniture. Since July 2015, 20 recovery campaigns have been conducted, 380 items have been recovered and 232 items have been reused. Reused furniture will be placed in the new administrative building in the Joseph Bédier, Porte d'Ivry sector.

Experimentation with sharing kiosks

The idea is to provide light furniture in public

spaces where citizens are invited to share objects such as books. Two concrete projects are currently being set up (in the 10th and 12th arrondissements) to try out the idea before extending it into other areas of Paris.

Support for actors engaged in reuse

The City of Paris grants subsidies to recycling centres and helps with finding premises. In 2016, there were 10 recycling centres (7 general and 3 specialised) in Paris. These organisations collected nearly 3000 tons of objects in 2015. In 2017, four new organisations will open their doors, with the aim of achieving a target of 20 recycling centres in Paris in 2020. Paris City Hall also supports other non-profit projects devoted to reuse and repair, such as "Bricothèques" (to loan and borrow tools) and "Repair Cafés".

Zero waste path: facilitating sorting

Deployment of solidarity collections

Initiated in 2013 in the 11th arrondissement by Eco-Systèmes and Emmaüs, local solidarity collections of waste electrical and electronic equipment have been organised in 14 other arrondissements in Paris. In 2015, these campaigns mobilised 16,500 visitors and 141 tons of WEEE were collected.

Improving the proximity of bulky waste collection points

In order to improve the proximity and simplicity of collection facilities, the City of Paris has equipped itself with new means, such as five "trimobiles" (mobile waste sorting stations), which provide an average of 70 monthly services, and the Trilib' stations tested by Eco-Emballages in four arrondissements since December 2016. This innovative sorting system in public spaces will be gradually deployed throughout the territory and 10 new sorting spaces will be opened by 2020.

A boost for sorting

In response to a call for proposals issued by

Eco-Emballages, the City of Paris has set up an action plan that promotes simplicity, proximity and visibility in order to fully equip the capital with sorting tools, from buildings to public spaces, and support actions with an ambitious awareness-raising campaign.

Fight against food wastage

Fight against food wastage in municipal canteens

The City Hall municipal staff canteen was the first to be equipped with an organic waste sorting system. This system has since been extended to include other municipal canteens in order to reduce waste and recover energy from collected organic waste. In a similar vein, collection of organic waste in schools in the 2nd and 9th arrondissements has provided an opportunity to raise awareness among children and canteen staff about food wastage.

Recovery of unsold items on food markets

As part of new public service contracts for the management of Paris' food markets (2015-2019), contractors are required to develop partnerships with local non-profit organisations in order to organise the redistribution of unsold edible fruit and vegetables. 10 markets are now covered by various non-profit organisations.

Support to non-profit organisations to collect unsold food items

Identified as a structural action for the plan to fight against food wastage, the City of Paris has launched a call for projects to support collection and distribution systems for unsold food. The 19 selected non-profit organisations will receive a subsidy of 500,000 euros to equip themselves with logistical means or kitchen equipment in order to recover unsold food from supermarkets and prepare meals for those most in need.

Some examples of successes already achieved within Paris, thanks to the innovations of the City of Paris, companies and citizens:

- More than **6000 m³ of groundwood** are produced per year by green spaces in Paris;
 - Reuse of **3000 tons of gravel** per year, on average, produced by the recycling of funerary monuments;
 - **7000 to 8000 tons of granite** are reused in order to be laid on Paris' roads each year;
 - **32.9% sustainable food** served in Paris' municipal canteens in 2015, including 29.12% organic food (**51.2% in crèches**); This makes Paris the number one French public buyer of organic products;
 - **28 new projects** devoted to urban agriculture projects, covering more than **5.3 hectares**;
 - **Electricity consumption savings of 44% for the production of cooling at City Hall** by using non-potable water;
 - **Target of reducing energy consumption by 20% in swimming pools** through heat recovery;
 - **40% reduction in saloon and city cars** in the municipal motor vehicle fleet;
 - **2 rentals per second** for the Vélib' bicycle hire scheme: 286,000 registered users;
 - **875 Autolib' stations**: 67,500 registered users;
 - Creation of **15 urban logistics spaces (ELU)**;
 - **116 tons of organic waste collected in 2015** for food markets and municipal canteens;
 - Approximately **300 tons of waste avoided** in 2015 thanks to **collective composting** on **422 collective composting sites** and **six neighbourhood compost bins**;
 - **3000 tons of objects collected** in 2015 by Paris' recycling centres;
 - **141 tons of objects were collected** in 2015 through «solidarity collections»;
 - Carbon assessment: **9.2% reduction in greenhouse gas emissions between 2004 and 2014**;
 - **13% reduction of waste-related emission in 10 years**;
 - **7% reduction in the tonnage of household waste** from 2011 to 2015;
 - **Significant reduction in private road transport emissions of 23%**.
-

ACTIONS OF THE PARIS CIRCULAR ECONOMY PLAN – A MULTI-YEAR PROGRAMME UNTIL 2020

In order to handle the huge amount of work involved in implementing the numerous proposals of the White Paper on the Circular Economy and launch an action plan, performed set of priorities are established annually in order to focus on 10 to 15 actions.

Following a diagnosis and operational definition phase for these actions, conducted in conjunction with the metropolis' many actors, action sheets are produced that lay out the best development paths, points that require attention and keys for their implementation. These steps, which are carried out annually, form a global roadmap, with a reasonable number of concrete actions, which are likely to be carried out to fruition.

The roadmap is therefore established in an iterative manner, and on the basis of proposals from the White Paper on the Circular Economy, or while taking into account changes within the territory (new synergies, new markets, new actors, etc.). A total of at least thirty or so actions will be engaged over the term of office, in order to support and spread the circular economy throughout the territory. The diagram hereafter summarises this organisation.

PARIS CIRCULAR ECONOMY PLAN 2017 – 2020

Vision for its territory + municipal policies

2015: GREATER PARIS GENERAL ASSEMBLY ON THE CIRCULAR ECONOMY

2015: GREATER PARIS WHITE PAPER ON THE CIRCULAR ECONOMY

2015-2019: CONCERTATION BETWEEN THE CITY OF PARIS' DEPARTMENTS AND DECISION-MAKING BY ELECTED REPRESENTATIVES

ROADMAPS

2016: DIAGNOSTIC STUDIES
AND FEASIBILITY OF ACTIONS

2017: FIRST ROADMAP
15 concrete actions

2017 TO 2019: DIAGNOSTIC STUDIES
AND FEASIBILITY OF ACTIONS

ASSESSMENT AND
REPORT OF ACTIONS

2018-2019: SECOND ROADMAP
10 to 15 concrete actions

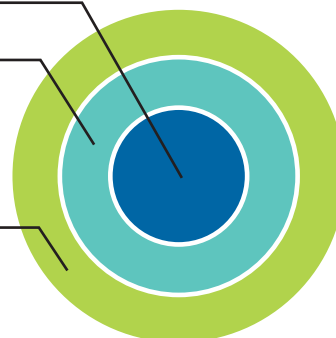
A distinction is made between three territorial levels for action implementation:

- **Projects carried out internally**, by the City's departments and personnel (being exemplary). For example: public procurement, management of municipal assets and consumption choices (buildings: construction and renovation; school canteens, purchases, etc.);
- **Territorial actions** that come under the exercise of the City of Paris' powers. For example: support for recycling centres, responsible events, relations with food markets, waste management, etc.;
- **Metropolis-wide actions**, which require specific forms of governance, for example regarding issues related to logistics flows, or new approaches to land and economic policies.

CITY SERVICES /
ADMINISTRATION

TERRITORY
OF PARIS:
EXERCISE
OF POWERS,
PUBLIC POLICIES

METROPOLIS OF
GREATER PARIS
(PARTNERSHIPS)



Each annual programme, or «Roadmap», of the Paris Circular Economy Plan 2017-2020 is approved by the Paris City Council.

GROWTH TARGETS FOR THE CIRCULAR ECONOMY IN PARIS

At national level, a certain number of targets are set by the Energy Transition Law for Green Growth (TECV) and provide a framework for action. On the basis of national targets and deadlines, targets specific to the territory of Paris are provided in the table below to set the direction for municipal policy that promotes growth of the circular economy in Paris.

In addition to these targets, specific indicators will make it possible to measure the impact of the implementation policy. Certain indicators that can already be used may be measured in the short term, while others will require research and tooling work before they can be measured.

In order to monitor their development, the following data will be collected and analysed:

- Tonnage of waste diverted via repair, reuse, recovery and upcycling activities (recycling centres, artisans, second-hand goods stores, fab labs, etc.);

- Turnover and workforce of organisations working in the circular economy (including all sectors and types).

The following indicators may be measured in the short term:

- Tons of waste avoided;
- Percentage reduction of incoming / outgoing flows in Paris (urban metabolism);
- Percentage increase in materials recovery (t) and organic recovery (t) in Paris.

The following indicators will be measured as of 2020:

- Number of jobs created;
- Value creation (€) thanks to the growth of circular economy models.

Lastly, performance and impact indicators are defined for each of the actions of the plan described in the roadmaps.

Energy Transition Law for Green Growth	National targets and deadlines of the Energy Transition Law for Green Growth (year of reference: 2010)			Targets for Paris
	2017	2020	2025	
Reduce quantities of household waste		-10 %		Zero waste path
Generalise the sorting of organic waste at source for all producers			Generalisation	Collection of household food waste in the 2nd and 12th arrondissements starting in 2017, throughout Paris by 2020, and production of compost
Sort all plastic packaging		before 2022		2019 deadline
Recover waste from construction and public works in the form of materials		70 %		Zero-waste building sites for operations run by the City of Paris
End to provision of disposable plastic cups, glasses and plates, except for those that can be composted in household compost and made entirely or in part from bio-based materials.		on the 1 st of January 2020		2017 deadline for the municipality
Proportion of recycled paper in public purchases (the rest must be sourced from sustainably managed forests)	25 %	40 %		100 %

In order to ensure joint-development and regular monitoring of the implementation of circular economy actions for the territory, specific governance is being put in place. The idea is to define which bodies come together and how often, in order to look at the progress of actions underway, and the

relevance and feasibility of new avenues under consideration. The expertise of various engaged actors will therefore be regularly mobilised.

The diagram below illustrates how it will work:

