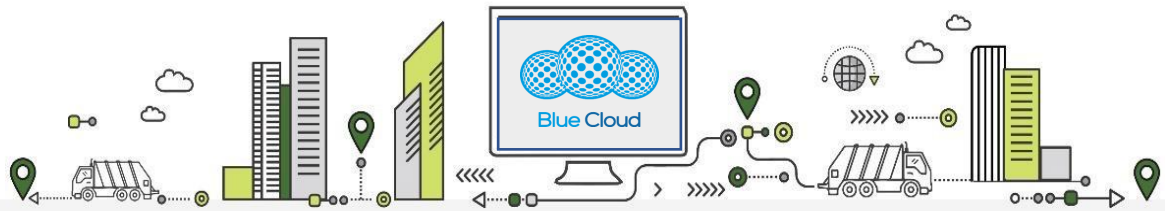
BlueCloud, Digital company, AI & Smart City

Optimizing waste collection through integrated smart bins with real-time monitoring of waste level in containers, end-to-end statistical data analysis to create efficiencies, cut the cost of waste collection and incentivize recycling.

Blue Cloud

Corporate presentation

Paris, February 2021



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BlueCloud Company

BlueCloud is a French company, based in Paris, in innovative interconnected and software solutions for the development of the city and urban infrastructure.

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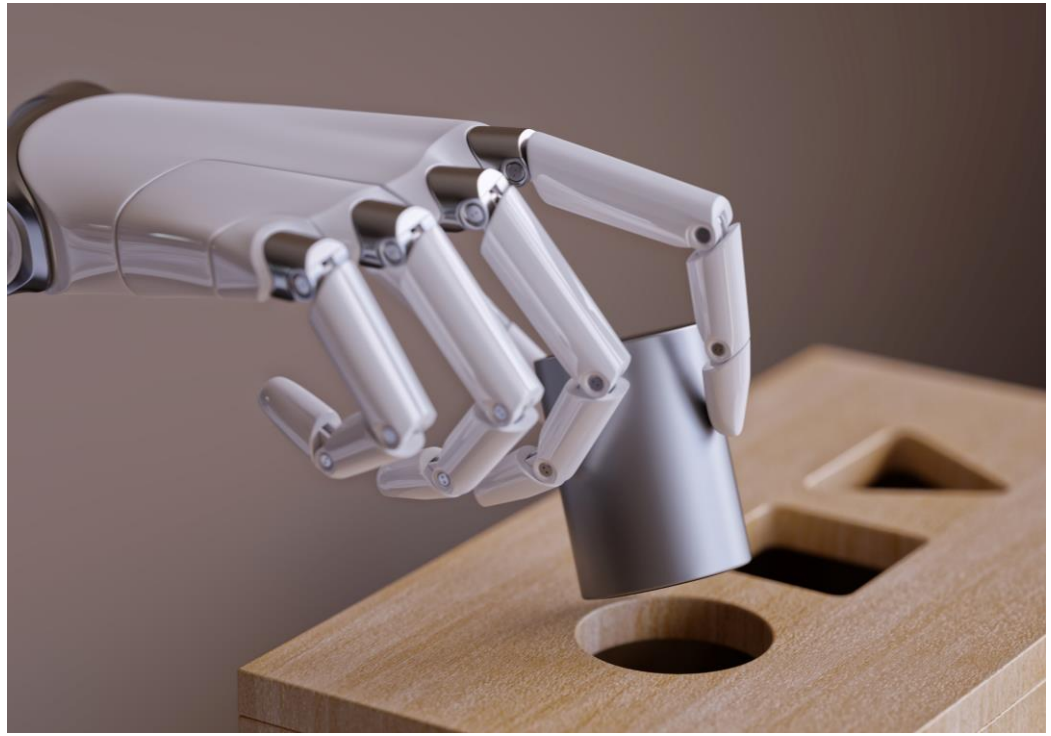
“Blue-Trash” : Add Value for cities and citizens

- Our first objective is to meet the expectations of cities, including its citizens, elected officials and economic stakeholders with innovative solutions for operational efficiency, new revenue opportunities and citizen satisfaction.

- Smart City solution’s with advanced analytics software capabilities to expand our approach to unite and leapfrog the digital transformation of public sectors to build new revenue streams and create a culture of more fully engaged, satisfied citizens.



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Needs, Market, …

The target market of Smart City, Waste Management System

BlueCloud solution “Blue-Trash” enables waste management and recycling companies to optimize their collection operations and maximize the use of valuable resources. We do this by deploying BlueCloud wireless ultrasonic sensors (fill-level and weight) to a wide range of containers, and using the data intelligence to drive operational efficiencies including optimized routes, asset tracking and cost analysis. BlueCloud sensors leverage the latest in IoT and cellular network technologies.

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Needs, Market, …

Our targeting Countries – Europe, India, North-America and Africa

Waste management market comprises of four segments, Municipal Waste, Industrial Waste, Bio-Medical Waste and Electronic Waste.

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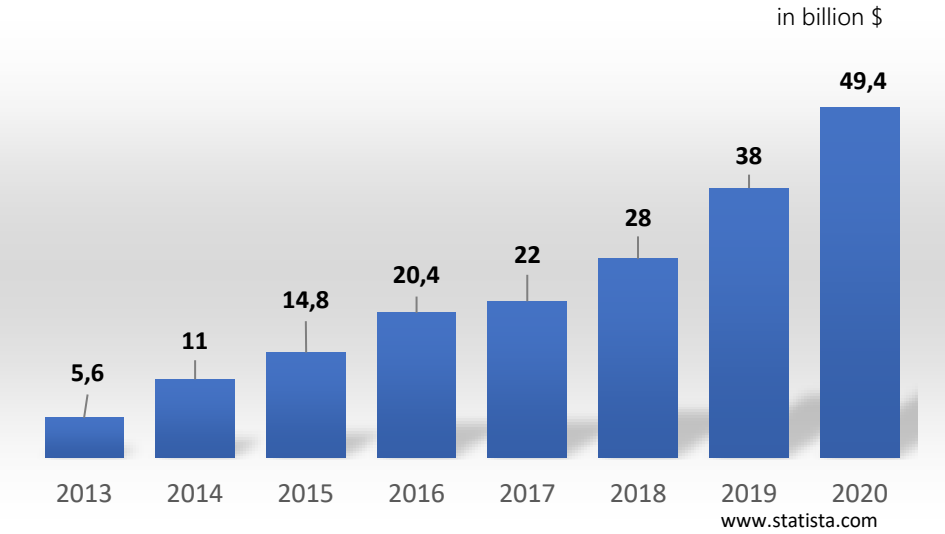
Needs, Market, …

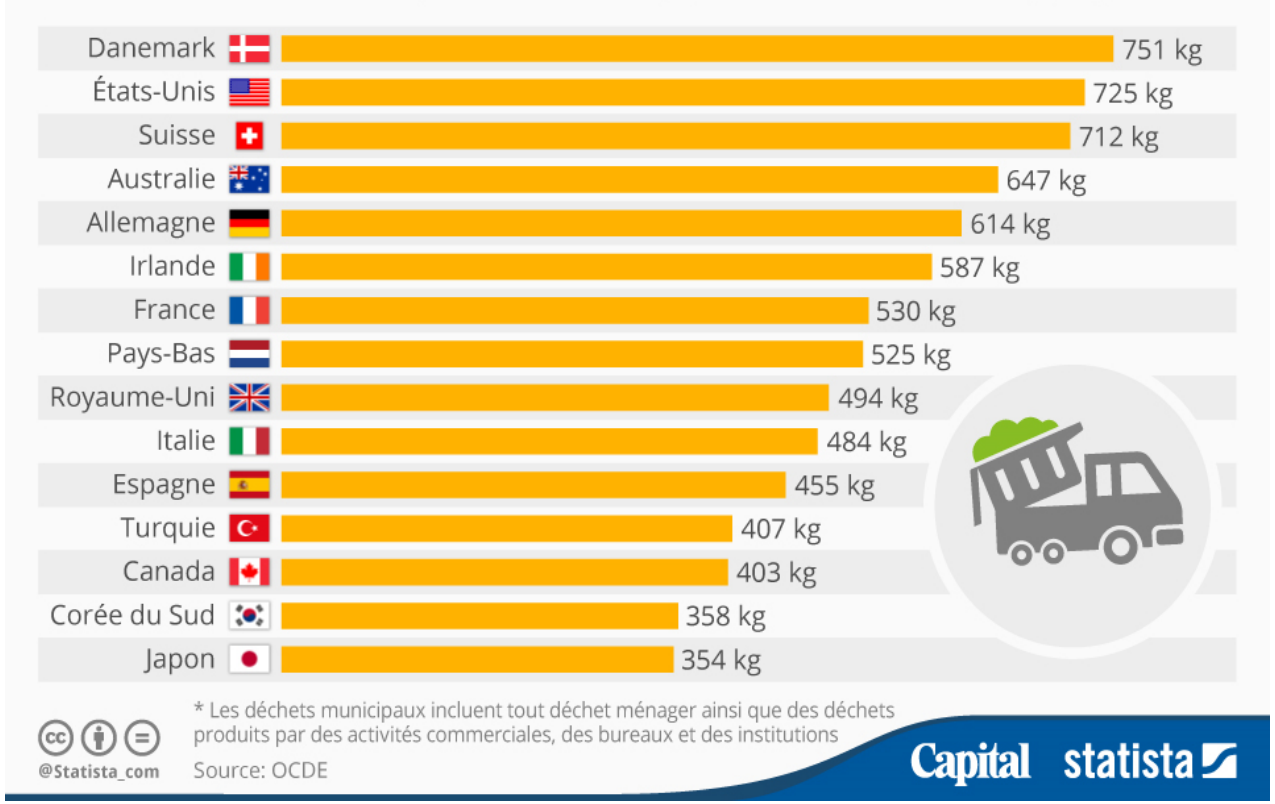
Market Size & Growth

Smart waste collection technology market is expected to grow from $28 billion in 2018 to $49,4 billion in 2020.

GLOBAL, SEGMENTATION AND FORECAST : 2013-2020



THE CONTRIES THAT GENERATE THE MOST MUNICIPAL WASTE IN 2013 (IN KG PER PERSON)



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BlueCloud Smart Garbage Management System :“Blue-Trash”

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“Blue-Trash” Key Features

- Determining the shortest path, thereby reducing the travelling overhead.
- Finding nearest dustbin within the selected area and vicinity radius
- GPS tracking, monitoring & scheduling of all the garbage fleets/vehicles
- Determining if it has been already addressed (Collected)
- Know the fill-level and/or the Weight of your containers at all times
- Cut your service costs by up to 50%
- Notification to accept/reject to visit nearest bin instead of previously chosen bin.
- Obtaining details using RFID/NFC technology
- Sharing details between two nodes.
- Determining the level of the garbage in the bin, which helps the collector to decide on whether to collect the waste or not
- Charging households a metered price for the waste they generate, based on Weight or Volume Waste Fee (VBWF)
- Provide a world class service
- Reduce your company’s carbon footprint

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Digital transformation offers new ways to improve today's waste management operations

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Internet of Things

Sensors and instrumented devices generate vast amounts of time series data

Weight Sensor :
Used to measure the trash load inside the bin or container

Level Sensor :
Used to detect the level of trash inside the bin or container

Wireless technologies revolution

Sigfox, Xbee, LoRa, WiFi, NbIoT, GPRS

Smart Waste Management System

VBWF (volume-based waste fee) program :
Residents drops off waste to a large container bin

Cloud enablement

Power of analytics

"Pay as you throw"

Intelligent Waste Management Platform

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BlueCloud Smart Garbage Management System : “Blue-Trash”

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Waste disposal is a significant function of the smart city infrastructure.

Soaring population growth and rapid urbanization are driving cities in to finding smart solutions to the waste problem.

Experience has thought us that smart waste management is saving money for the municipality and bringing positive actual change in to every day life of haulers and city residents.

As waste management operations all over the world attempt to become cleaner and greener.

BlueCloud is leading the way with complete end-to-end automation and monitoring of waste collection and management.

BlueCloud is using cutting edge technologies like Sigfox, GPS, GSM, LoRa, RFID, IoT Sensors along with innovative Mobile and Intelligent Monitoring application to improve and smoothen ground-level mechanisms for waste collection and efficient processing and charging households a metered price for the waste they generate **“Pay as you throw”**.

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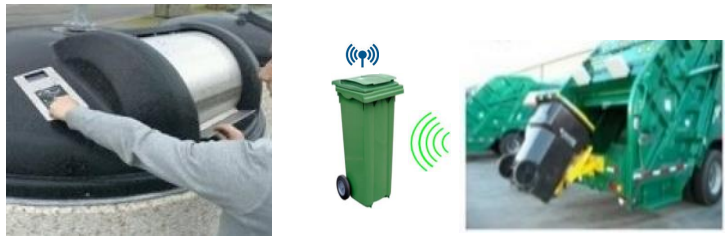
The Challenges…and BlueCloud Solution!

In most parts of Western countries or cities (Europe, North-America, etc..) residents dispose their waste via curbside Municipal solid waste (MSW) collection. These collection and disposal services are traditionally funded by property taxes, where the costs are hidden, or from a per-household fee unrelated to the actual amount of MSW generated.

Neither of these funding methods provides an economic incentive for residents to reduce waste or improve recycling.

A volume-based or weight-based waste fee (VBWF) policy changes this model by charging households a metered price for the waste they generate.

BlueCloud provide, with "**Blue-Trash**," a Smart Garbage Management System Solution that offers a true "**pay as you throw**" approach, charging residents only when a waste bin is collected from their property or when they brought their trash bags to the collective bin (container) with their RFID card associated with the resident's account.



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What ’s in it for the end user

- Cutting edge technology mounted on existing infrastructure
- Real time monitoring of waste and trucks, viewable from any device.
- Fast ROI , in just one year
- Contract revision and fleet optimization based on big data analysis
- Reduce emissions in residential areas and the city center
- Meet a requirement of cleanliness of streets still more to preserve the quality of life of residents and enhance their attractiveness
- Charging households a metered price for the waste they generate **“Pay as you throw”**.

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Features and Benefits of “Blue-Trash”

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Features and Benefits of “Blue-Trash” in Smart Waste Management

- **Monitoring of the vehicle in Real Time** to improve per vehicle productivity & reduce non-compliance.
- **Usage and route planning** optimization of garbage trucks to reduce fuel consumption by over speed tracking, measurement of engine idling, route improvement, dispatching and proper periodic maintenance.
- **Rapid management** of vehicle breakdown and maintenance.
- **Centralized command control center** for waste collection and transportation.
- **Efficient monitoring and management** of waste bins.
- **Availability of MIS** for effective planning of resources, schedule & unforeseen events.
- **Automated monitoring** of transfer stations, processing centres for daily garbage inward, outward using weigh bridge automation.
- **Effective Management** of citizen complaints.
- **Creating healthy competition** between wards by generating Cleanliness Score based on timely pickups, coverage & customer feedback
- **Greater transparency** in the civic administration.
- **Eliminate the human factor** from entire cycle of SWM process starting from collection to bill disposal.

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Features and Benefits of “Blue-Trash”

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Features and Benefits of “Blue-Trash” in Smart Waste Management

- Intelligent monitoring solution “**Blue-Trash**”
- Enables waste management and recycling companies to optimize their collection operations and maximize the use of valuable resources
- Wireless Ultrasonic Level Sensors for containers
- Optimized routes, asset tracking and cost analysis
- Logs continuous data from sensor, provides a war room view of operations and generates optimized routes
- By collecting and analyzing data from containers across the city, BlueCloud is able to create efficiencies and cut the cost of waste collection and incentivize recycling
- Alerts on container level, Handling of containers
- Smart root prediction for collection, Collection time notifications

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“BlueTrash” Add Value for cities and citizens

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Case Study

A city of Paris (19eme District) - 120,000 residents implements BlueCloud’s solution during PoC and reduces costs and emissions by over 50%.

- 53% Disel Consumption
- 53% GHG Emissions
- 30% Driving Distance
- 33% Over all Working time

Benefits

- ✓ Opex Reduction by up to 50%
- ✓ Cutting edge technology mounted on existing infrastructure
- ✓ Real-time monitoring of waste and trucks, viewable from any device
- ✓ 12-Months ROI
- ✓ Contract revision based on big data analysis
- ✓ Fleet optimization based on big data analysis

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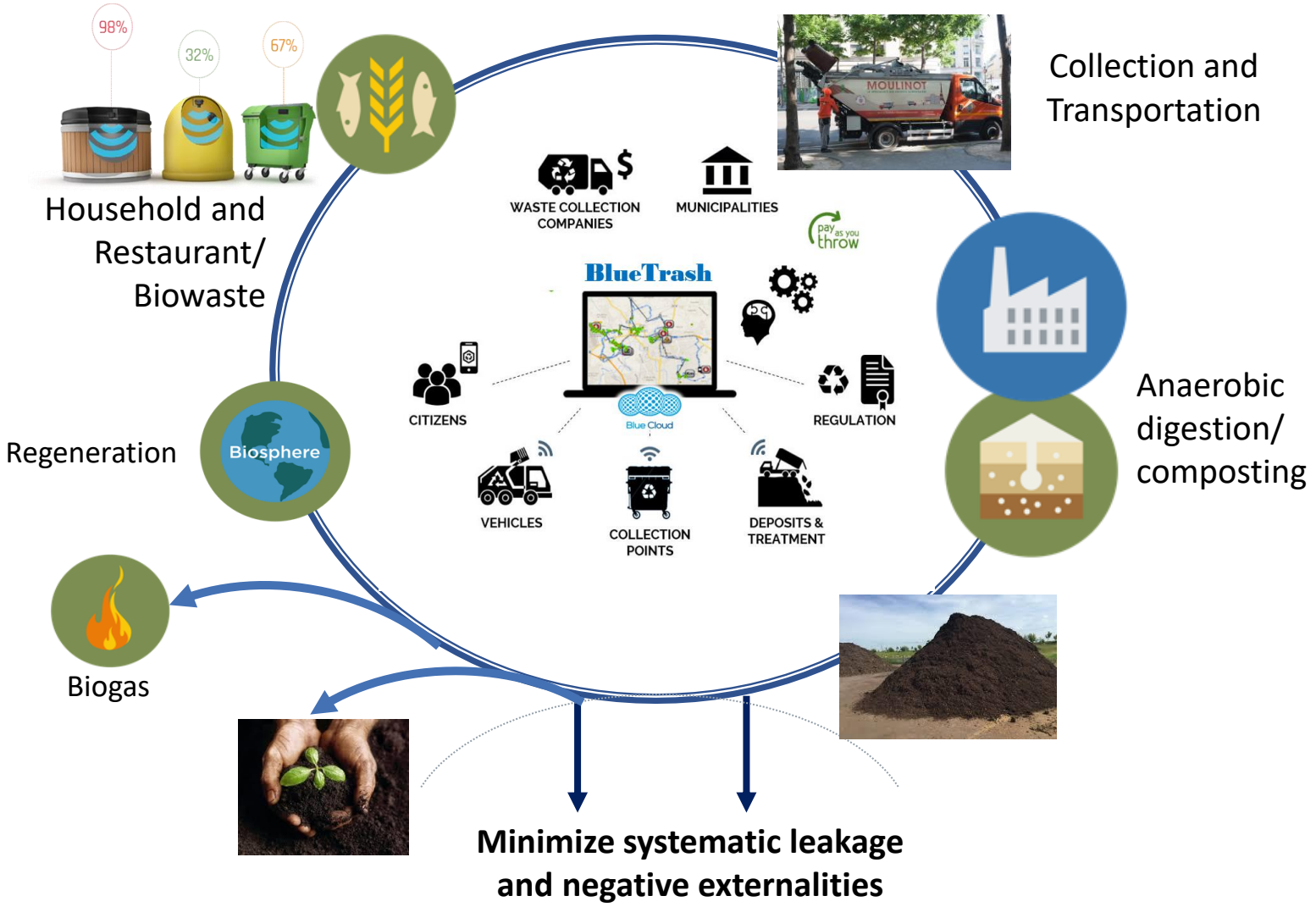
BlueCloud Circular strategy and model

BlueCloud and the company **Moulinot Compost & Biogas** are currently in talks for a partnership in the management of organic waste and implicitly in the development of the circular economy.

BlueCloud will manage real-time data collection on the waste containers and Optimized routes for trucks.

The company **Moulinot** will manage transport and transformation of bio-waste into compost and Biogas.

http://www.moulinot.fr/



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BlueCloud Smart Garbage Management System :“Blue-Trash”

Technical Details

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Data flow diagram of “Blue-Trash” solution

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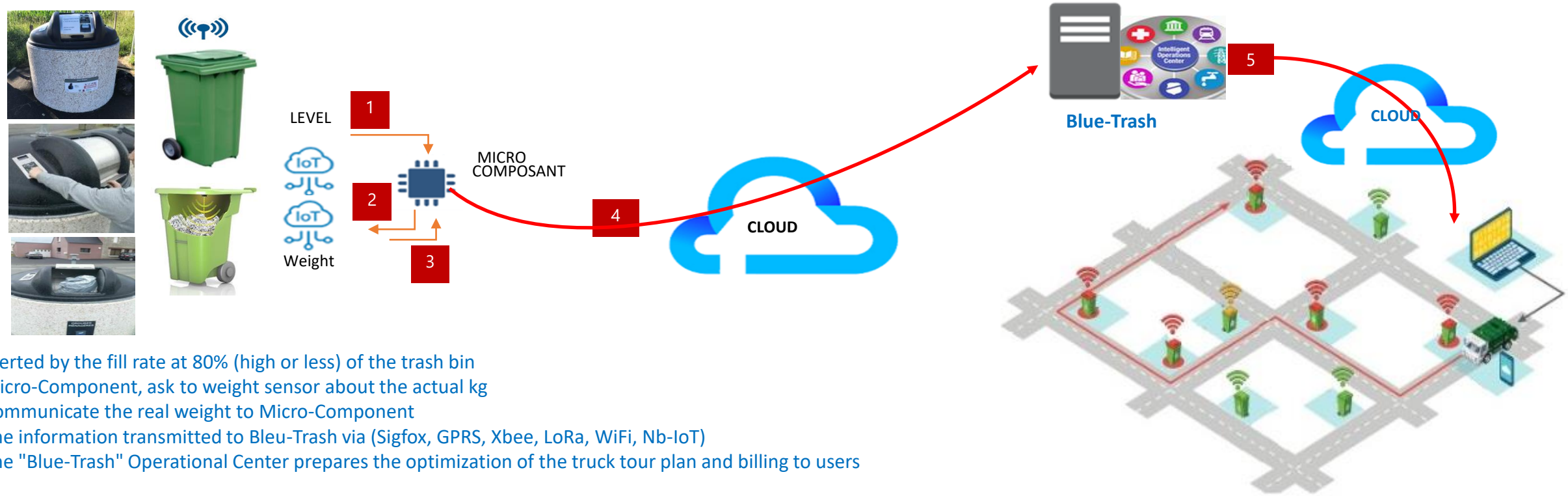
Connected in real time to a control center, **Blue-Trash** optimizes the quality of collection and improves interaction with local authorities as well as with users.



(1) Alerted by the fill rate at 80% (high or less) of the trash bin
(2) Micro-Component, ask to weight sensor about the actual kg
(3) Communicate the real weight to Micro-Component
(4) The information transmitted to Bleu-Trash via (Sigfox, GPRS, Xbee, LoRa, WiFi, Nb-IoT)
(5) The "Blue-Trash" Operational Center prepares the optimization of the truck tour plan and billing to users

Billing Process :

- ❖ All information collected can track the amount of waste produced per household and enable communities to individualize billing per user
- ❖ Extractions are possible in CSV, Excel or PdF
- ❖ To avoid errors, there are gateways with the most frequently used billing software: (French Software Solutions : STYX, ATPMG) or Others used locally ...

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Data flow diagram of “Blue-Trash” solution with Route Optimization

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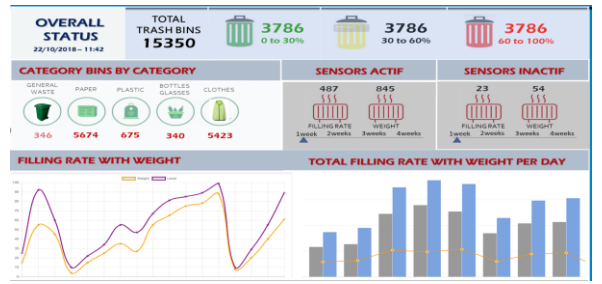
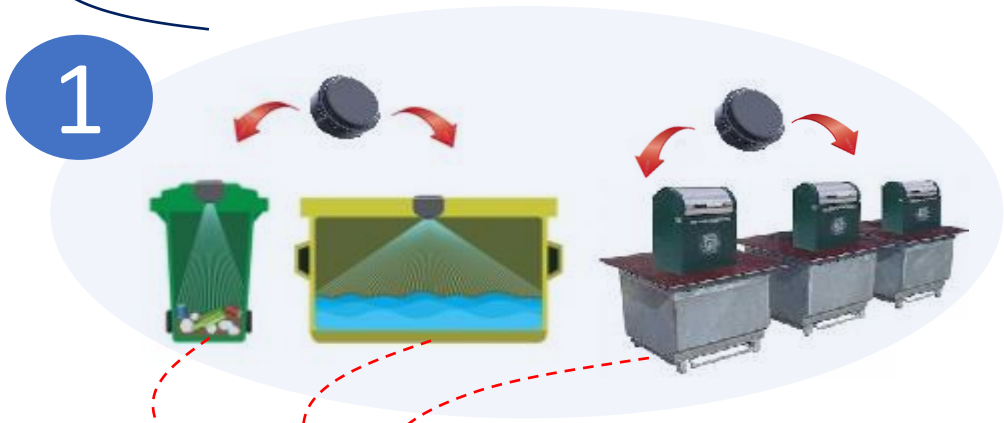
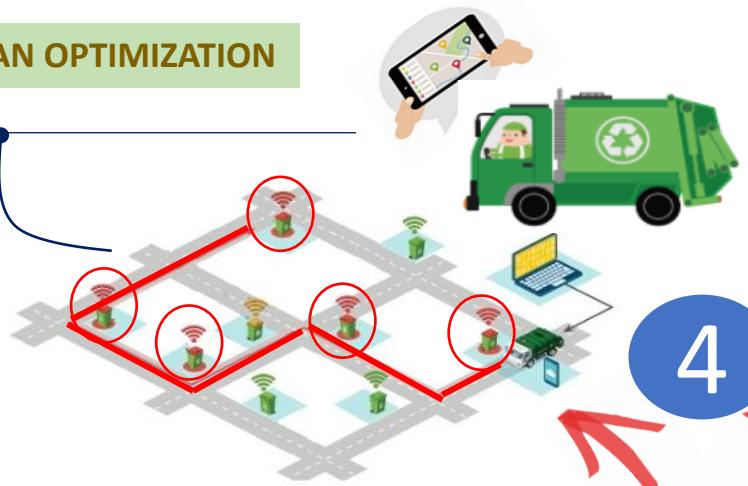
IoT

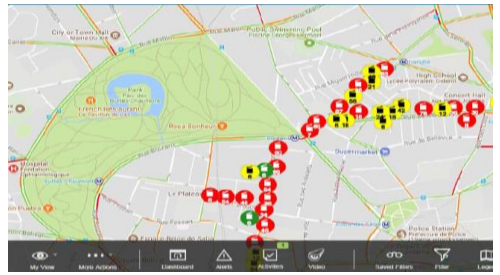
1) Level sensors
2) Weight sensors

ROUTE PLAN OPTIMIZATION









1

2

3

4

MICRO-CONTROLLER

Data sent by Network : Sigfox, LoRa, NB-IoT

Network
Sigfox/LoRa/NB-IoT

Real Time Data Monitoring

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Blue-Trash functionalities

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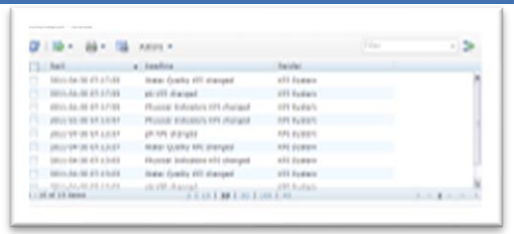
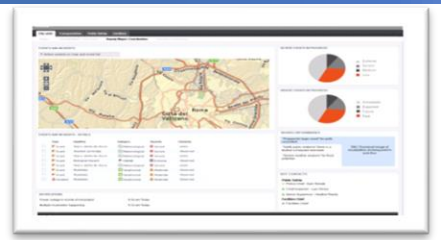
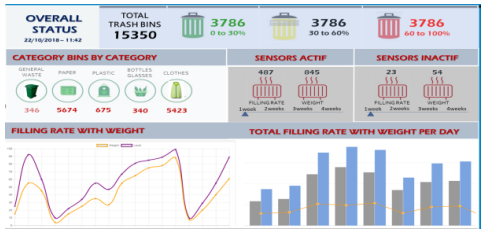
Workflow and escalation process



Detection and correlation events



Alert and Incident Management



EXECUTIVE

OPERATOR

Roles and permissions

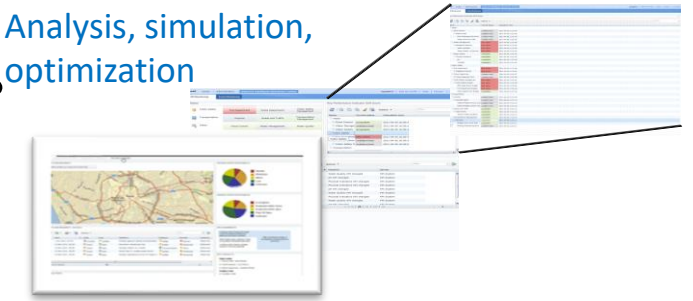
Automatic sending of emails and SMS, Instant Messaging

SYSTEM MONITORING

OPERATIONS CENTER

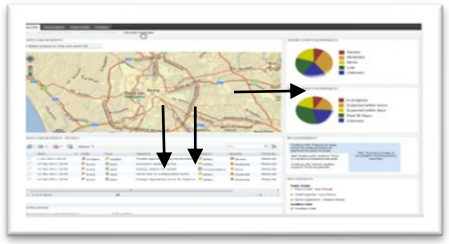
Geospatial analysis

Analysis, simulation, optimization

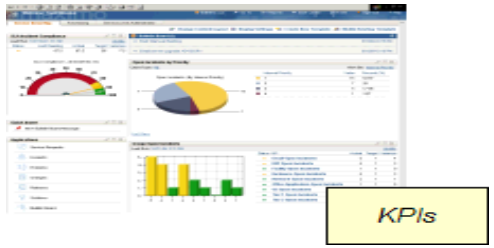


System Tracking & Control
Route Optimization Plan

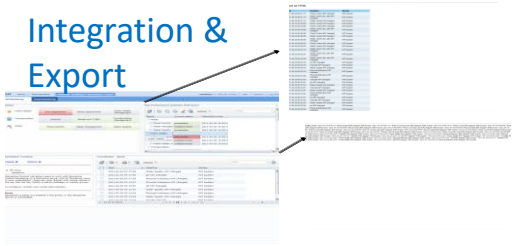
"Click to Action"



ANALITICS & REPORTING



Data Integration & Export



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Net Effects of Volume-Based Waste Fee (VBWF) Program implementation in France

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Net Effects of VBWF Program implementation in France

Due to the wide-ranging nature of VBWF (Volume-Based Waste Fee (VBWF) programs as implemented across France country, it is challenging to isolate a single policy or societal variable and determine the extent to which it contributes to reduction in MSW (Municipal Solid Waste) landfilled and the corresponding increased diversion to recycling or composting.

Several studies have examined the topic, and while all agree that VBWF programs are beneficial, the magnitude of the benefit can vary, depending on how the question is approached..

Today, the results of setting up incentive fees or VBWF, are available on the experiments carried out with individual bins equipped with IoT in areas generally having a residential rate in vertical habitat of less than 5% (except voluntary approach in some cities in France : Besançon and Belfort (global bill for vertical habitat from a per-household fee unrelated to the actual amount).

The results are very encouraging:

- Decrease of the amount of residual household waste by 30 to 40%
- Increased sorting quantities from 15 to 30%

In vertical habitat, the bins are not identifiable by different people who sort more or less. Efforts are cancelled by the negligence of others.

The points of the voluntary participation with username and volumetric units offer the ability to implement the incentive fee in communities in general, whether the type of habitat included in the community or habitat rate vertical habitat greater than 5%.

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Labels, Awards and Partenership

Awards:

- Labeling "BlueTrash", "Digital City Solution" by the **Systematic Paris-Region** cluster in October 2018
- BlueCloud is Winner 2019 "**Sustainable City - Circular Economy**" of **UrbanLab & Paris@Co**
- BlueCloud is finalist 2019 "**Circular Challenge** " of **CITEO**
- BlueCloud is Winner 2020 " **Coup de Cœur 2020 »** de l'Enjeu Territoires IDF (Ile de France)

Partership:

BlueCloud has brought together a number of technological and industrial partners, convinced by the solidity of our project and our innovative solutions in intelligent waste management; namely :

- IBM: For infrastructures and the Cloud (Europe, India and Africa),
- SigFox : For Connected Objects telecommunications (France and Europe)
- VODAFONE: For Connected Object Telecommunications (India and Africa)

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BlueCloud, Digital company, AI & Smart City

BlueCloud is proud to have set the standard for smart intelligent IoT waste management, and it's our passion to make every city smarter, more efficient, cleaner and greener!

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