Green up!

ECUBE Labs Co., Ltd.

T +82.2.2109.0293
F +82.2.2109.0294
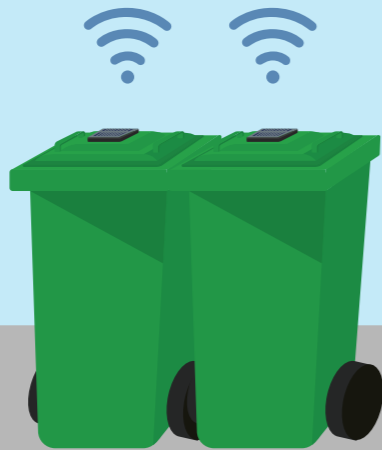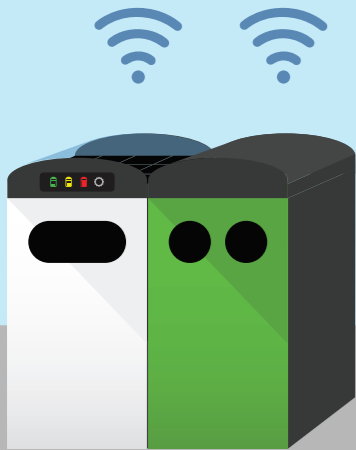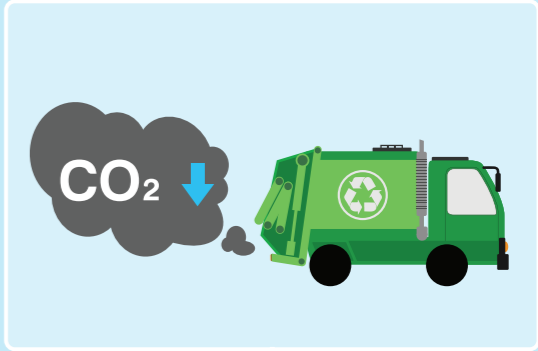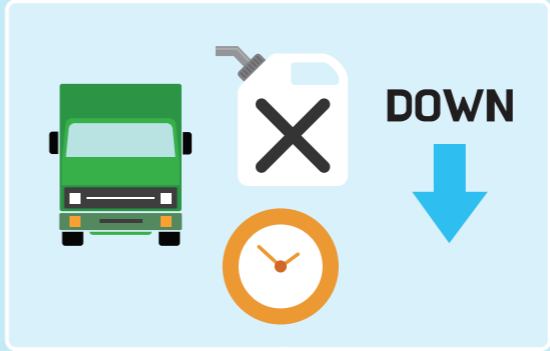E market@ecubelabs.com
A #406 Acetechnotower 5th Bldg,
    Guro 3-dong, Guro-gu, Seoul

www.ecubelabs.com

ECUBE CUBE Labs

Integrated Waste Management Solution

Intelligent Waste Collection Solution
Dramatically reduces waste collection costs by up to 80%

DOWN

CO_2
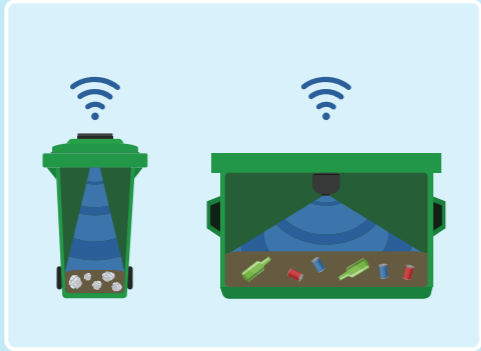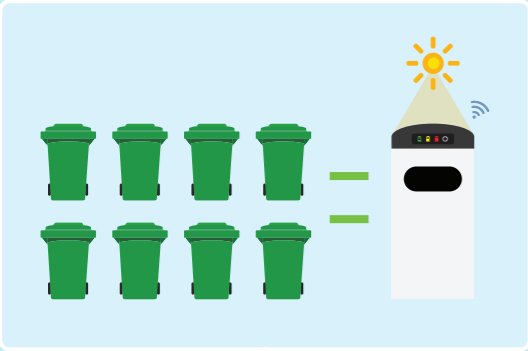
1
Clean Cube
Solar-powered waste compacting bin. Senses bin fill-level and sends real-time data to Clean City Networks.

2
Clean Cap
Wireless bin fill-level sensor. Senses bin fill-level and sends real-time data to Clean City Networks.

3
Clean City Networks
Real-time monitoring and data management platform. Provides optimization of collection routes.

4
Smart Collection Planning
Collections require less trucks, fuel, and time, reducing operational costs by up to 80%.

5
Greener Environment
Eliminates overflowing bins and reduces harmful gas emissions, resulting in cleaner cities.

Clean Cube
Smart solar-powered waste compacting bin

100% powered by solar energy, the Clean Cube compacts waste, allowing it to hold up to eight times more waste than traditional bins.

Clean Cap
Wireless bin fill-level sensor

The Clean Cap measures the bin fill-level in real-time. It can be attached to any type of bin to monitor any type of waste.

2x
4x
8x

Clean Cap B

(Battery Model)

Clean Cap S

(Solar Model)

Product Dimensions

Model	Size (H*W*L)	Net Weight
• 100L	116 * 50 * 61 cm	140kg
• 120L	144.9 * 61.3 * 77.5 cm	155kg
• 240L	157.4 * 72 * 86.1 cm	190kg

Safety Features

- CE approved
- Hand detection safety sensor
- Fire detection temperature sensor
- Independent locking mechanism for all access points

Technical Features

- RoHS compliant
- Galvanized steel sheet construction
- TGIC-free polyester powder coating finish for optimal durability and weatherability
- Compaction Force: Up to 720kg of force
- System Voltage: 12 Volts DC
- Power Consumption: 15Wh/day
- Battery: Spill-proof, sealed lead-acid storage
- Polycarbonate protective cover for PV panels
- Control System: Microcontroller-based automation

Basic Specifications

	Clean Cap B	Clean Cap S
• Power	Battery-powered	Solar-powered
• Size	95*Ø96mm(H*W)	57*76*106mm(H*W*L)
• Net Weight	470g	720g
• Battery life	Up to 10yrs	Over 10yrs

Technical Features

- Measuring technology: Ultrasonic
- Measuring range: 30~400cm
- Polycarbonate molded body
- Battery: High performance lithium battery (Clean Cap B), rechargeable lithium battery (Clean Cap S)

100% powered by solar energy

- Can be installed anywhere with sufficient sunlight
- Crystalline silicon solar module up to 60W
- No exterior wiring needed

Powerful waste compaction

- Compacts waste with up to 720kg of force
- Increases bin capacity by up to eight times
- Prevents waste overflow

Easy-to-install

- Attachable to any type of bin or container
- Flexible bracket options
- Available in both solar and battery-powered models

Robust fill-level sensing

- Accurate sensing with ultrasonic technology
- Effective monitoring of both solid materials and liquids
- Sensor settings can be configured remotely

SMART communication system

- Wireless transmission of bin fill-level and bin status information in real-time to Clean City Networks
- Telecommunication through WCDMA and GSM networks
- Locational information provided by GPS module

Unique features

- Compatible with standard wheelie bins
- Embedded LED backlight advertisement panels
- Patented X-frame compaction module
- Customizable design options

Complementary to Clean Cube

- Covers areas not feasible for Clean Cube installations
- Data from the Clean Cap can be viewed on the same software solution that displays data from the Clean Cube

SMART communication system

- Wireless transmission of bin fill-level and bin status information in real-time to Clean City Networks
- Telecommunication through WCDMA and GSM networks
- Locational information provided by GPS module

Clean City Networks (CCN)
## Real-time monitoring and data management platform

CCN receives real-time data from Clean Cubes and Clean Caps to improve waste collection efficiency by informing users when collections are required, which bins require collection, and the optimized routes for each individual collection.
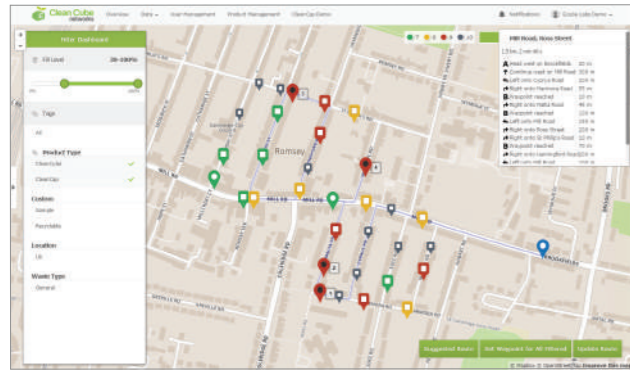
Robust monitoring function

Real-time monitoring of bin fill level and bin status

• Notifies collection staff when waste collection is required
• Route optimization for each collection
• High customizability of monitoring options
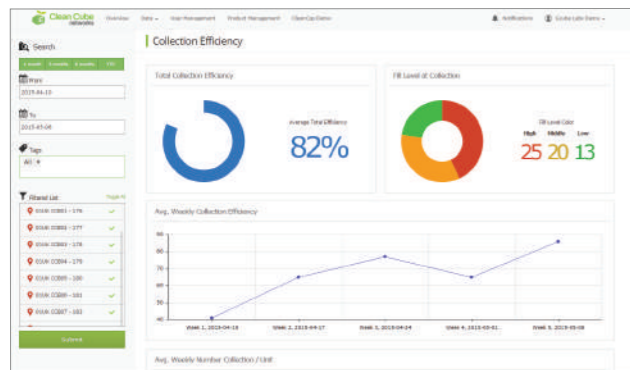
Intelligent data analytics

Smart data for smart waste collection planning

• Comprehensive collection of historical data
• Data analytics reports to improve efficiency
• Generates schedules using predictive algorithms

User-friendly user interface

Easily accessed anywhere, anytime

• Mobile application (Android/iOS, cellular phone/tablet supported)
• Web-based solution without any required installations

Product Benefits
Economic, environmental, and social benefits

Ecube Labs' solutions optimize collection planning, resulting in direct cost savings, a greener environment, and cleaner cities.

$ Economic benefits

• Reduces collection frequency by effectively increasing bin capacity by 6-8 times

• Smart waste collection planning using real-time data to optimize resource allocation

• Lowers operational costs by 80%

Environmental benefits

• Eliminates overflowing bins

• Reduces CO_2 emissions and traffic congestion

• Utilizes renewable energy

Social benefits

• Improves public cleanliness

• Contributes to vitalising the green technology industry and the use of the renewable energy products

• Increases recycling diversion rates

Possible Installation Sites

The Clean Cube and Clean Cap are complementary products. The Clean Cube's strength lies in the compaction of waste generated in crowded areas such as city, centers, malls, parks, and stations, where waste is required to be collected frequently. Conversely, the Clean Cap complements the Clean Cube by covering areas that may not be collected as frequently, making the remote fill-level monitoring of bins very useful. Examples include residential areas and industrial applcations where users wish to keep their existing bins.
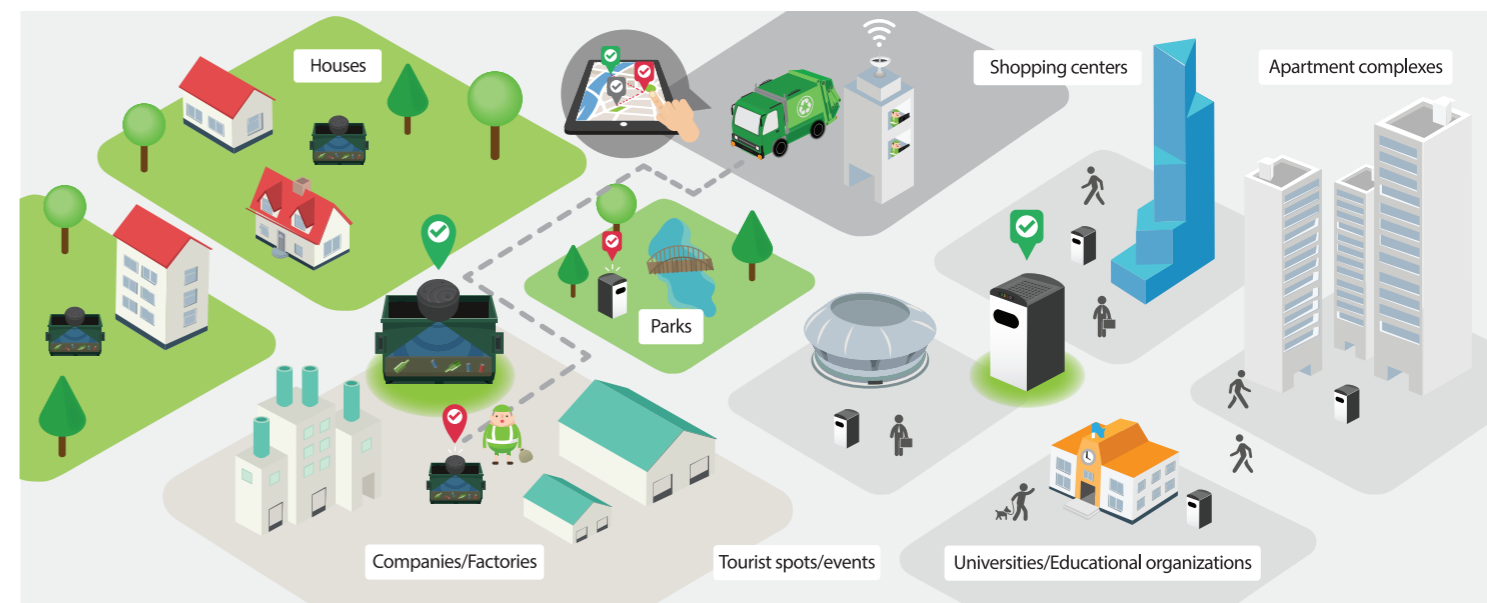
Case Study
Smart waste collection at Korean universities

● Yonsei University

● Seoul National University

● Korea University

● Dongguk University

Problem

- High weekly collection frequency
- Overflowing waste bins in public areas
- Waste bins placed across large campuses
- 12% recycling diversion rate

Solution

- Installation of 144 Clean Cubes across four university campuses
- Real-time monitoring with Clean City Networks (CCN)
- Route optimization for waste collections

Results

- Weekly waste collections reduced from 12 to less than 2
- Less litter and cleaner public areas
- Increased recycling diversion rate to 54%
- 82% reduction in operational costs

"Ecube Labs' solutions have been a great success. Significant cost reductions, cleaner public spaces, and it also increased our recycling diversion rates by over 300%."

Bureau of Facilities Managment
Seoul National University

Patents and Certifications

Patents

- "Module Apparatus for Refuse Collection and Method"
- "Apparatus for Refuse Collection"
- "Rubbish Can and Method for Manufacturing Same"
- "Abfalleimer und Verfahren zur Herstellung desselben"
- "M2M topology based on parameters"
- "Device determination method for device to device communications"
- "Storing Apparatus for Compressing Waste"

Certifications

- CE Markings (LVD, EMC)
- Green Certification
- RoHS Certification
- ISO 9001 Certification
- ISO 14001 Certification
- IP Rating Certificate
- KC (Korea Certification) Mark
- K (Korea Testing Laboratory) Mark

| CE Marking 20 November 2014 | RoHS Certification 10 July 2014 | Green Certification 16 May 2014 | ISO 9001 Certification 04 June 2013 | ISO 14001 Certification 04 June 2013 |

Partners

As a smart green company, Ecube Labs' vision is to promote environmental sustainability by providing smart integrated solutions that increase operational efficiency of waste management systems. Our complete integration of solar-powered waste compaction bins and bin fill-level sensors under a single efficiency-optimizing software platform allows us to provide an innovative solution for the waste management industry that significantly reduces operational costs and lowers greenhouse gas emissions.

2011
Establishment of Ecube Labs

07   Established Ecube Labs' headquarters in Seoul, Korea
07   Awarded the grand prize in 'Europe-Korea Business Plan Competition' held by European Union Chamber of Commerce

2012
Product Development and Pilot Projects

05   Registered first generation of patents
09   Partnered with Hanwha Chemical to complete first major installation case across four Korean universities
12   Registered second generation of patents

2013
Expansion of Global Presence

04   Collaborated on joint R&D project with Australian waste management company
06   Registered for ISO 9001/14001 certification
06   Selected for 'Korean-Government's International Cooperation Program for Environmental Technologies'
08   Formed global strategic partnership with Vodafone
12   Nominated for Pollutec 2013 'Innovation Award'
12   Awarded grand prize in '2013 Korea Creative Economy Awards' held by Korean Ministry of Science, ICT, and Future Planning

2014
Active Global Market Expansion

05   Obtained 'Green Certification' from Korea Environmental Industry & Technology Institute
06   Received '2014 Korea Green Business Award' from Korea Ministry of Trade, Industry, and Energy
06   Received Frost & Sullivan's 'Technology Innovation of the Year Award'
07   Obtained CE markings (LVD, EMC) and RoHS certification
10   Selected as finalists for AWRE 2014 'Innovation Award'
10   Registered third generation of patents

2015
Domestic and Global Pilot Projects and Partnerships

02   Began a pilot project of Clean Cubes for City of Seoul
04   Signed exclusive agreement with ESE B.V.
05   Selected for K-Global's 'Prospective ICT R&D Program'
      Signed exclusive agreement with OTTO Group
      Signed exclusive agreement with Mohammed Tayyeb Khyoory & Sons
07   Began a pilot project of Clean Cubes at Changi Airport
10   Began a pilot project of Clean Cubes at Singapore Sports Hub
10   Began a pilot project of Clean Caps for City of Seoul

Contact our
Global Business Development Team
for any inquiries

Phone
+82-2-2109-0293

E-mail
market@ecubelabs.com

Website
www.ecubelabs.com

ECUBE Labs