Korea Air Quality monitoring Networks

CleanSYS & AirKorea

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INTRODUCTION

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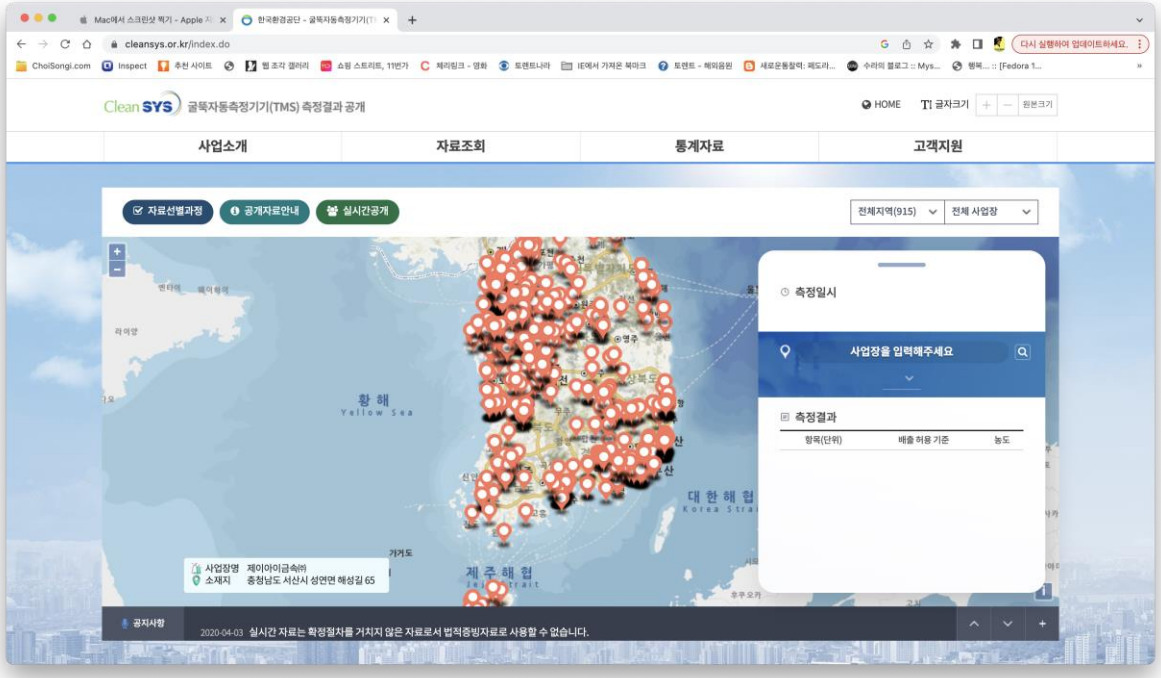
Clean SYS

www.cleansys.or.kr



(Stack Emission monitoring system)

Air korea

www.airkorea.or.kr

(Air Quality monitoring system)

Stack Source

Nature

Vehicle(Mobile)

Air Pollutant (Point Source)
Management Method

- Fuel Control
- **Stack Emission control**
- **Air pollutants Total Emission Cap**
- Self Emission Measure

Over View

Air Pollutants Emission On-line Monitoring System from Stack sources in Real-Time [CEMS]

BEFORE CleanSYS

- Manual Spot Sampling & Analysis
- Inefficient & Ineffective
- Frequent Emission accident

ET + ICT

advanced air quality management

AFTER CleanSYS

- Real-Time & On-line measure
- Watching Emission Limit exceed in real-time
- Prevent Air Pollution Accident

1990s : Start Pilot project

1997~2002 : Nationwide Center(4 Regions)

2002.2 : Legal administrative data use

2020. : Open real time data to the public

Main Status

Target Facilities

- Air Pollutant Emission Amount Over 10 tons/year

  * Exist some Exemption Condition or Grace Term

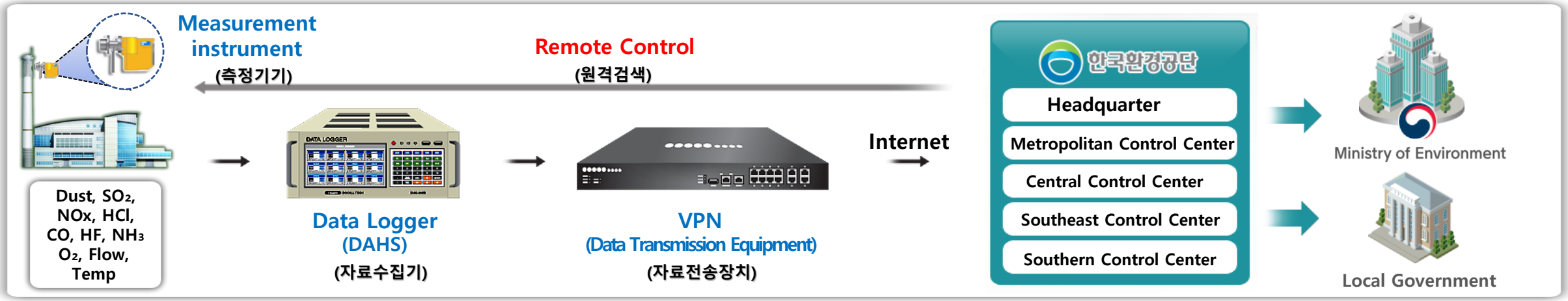
Monitoring Matter

- Pollutants(7) : Dust, SOx, NOx, HCl, HF, NH_3, CO
- Others(3) : O_2, Flow, Temp

Monitoring status

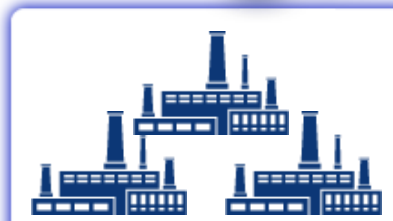
- 2022. : 887 Facilities, 2,988 Stacks

SYETEM CONFIGRATION & DATA USEAGE

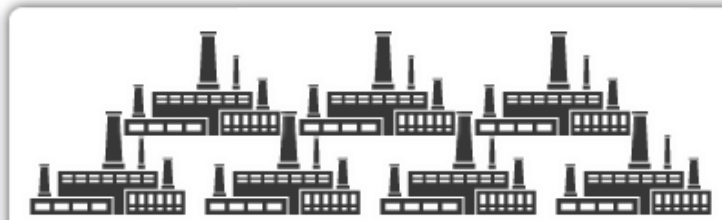


Major Achievements

3.4% facilities with CleanSYS discharge 65.7% air pollutants of Korea.



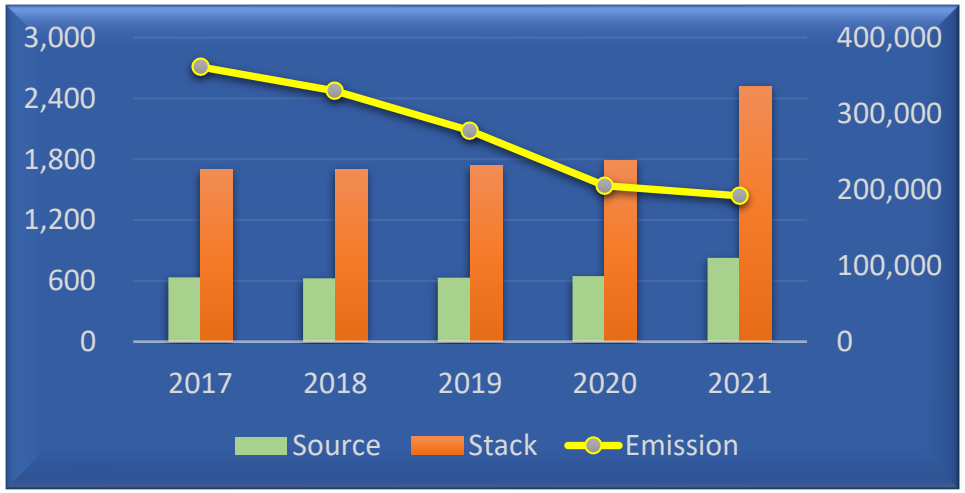
CleanSYS : 3.4 %



Non-CleanSYS : 96.6%

Large Factory(Emission over 10 ton/year)

Changes by Year (2017 ~ 2021)



The number of	facilities	Stack	2021, Air Pollutant Emission Amount(ton/year)			
			Total	Dust	NOx	SOx
Total(Large Factory)	3,925	75,257	287,677	14,673	198,069	74,935
CleanSYS	826	2,524	189,029	4,735	137,092	47,202
Ratio of CleanSYS	21.0%	3.4%	65.7%	32.3%	63.0%	69.2%

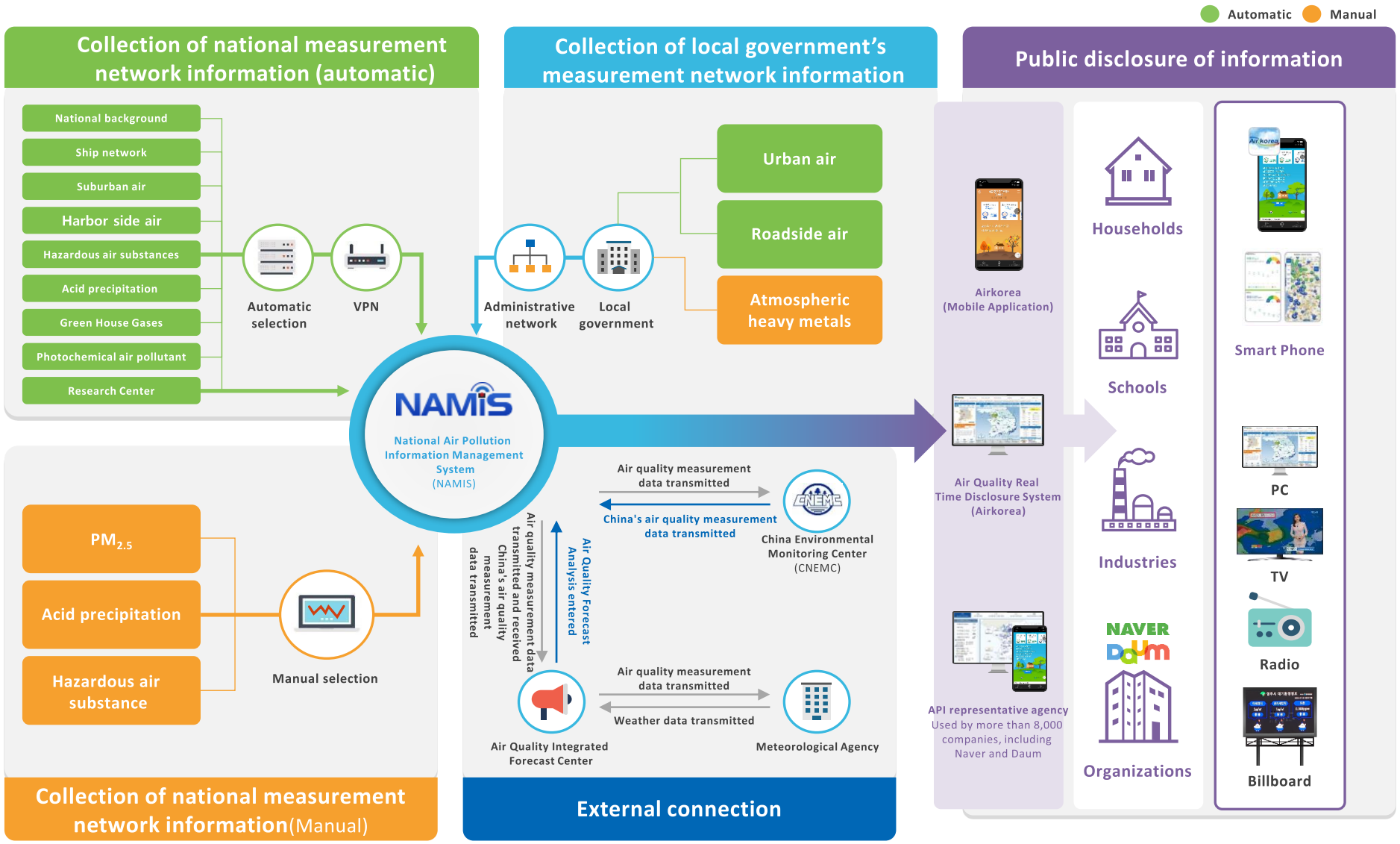
Real-time **nationwide air quality and integrated air environment index**

Air quality forecast and warnings

Air quality statistics, etc., provided

- Real-time air pollution data provided in various forms, including indicators, figures, graphs, etc.
  - Information including air quality forecast and warning (fine dust and ozone), final confirmation, and air pollution integrated map forwarded to prevent public damage by air pollution
- Items : SO2, NO2, CO, O3, PM10, PM2.5

Overview



1973 Install 4 sites, MOE

2002 HAPs(16sites) install
PAMS(15sites) install

2003 NAMIS open

2005 Airkorea open

2011 PM-2.5 Network install

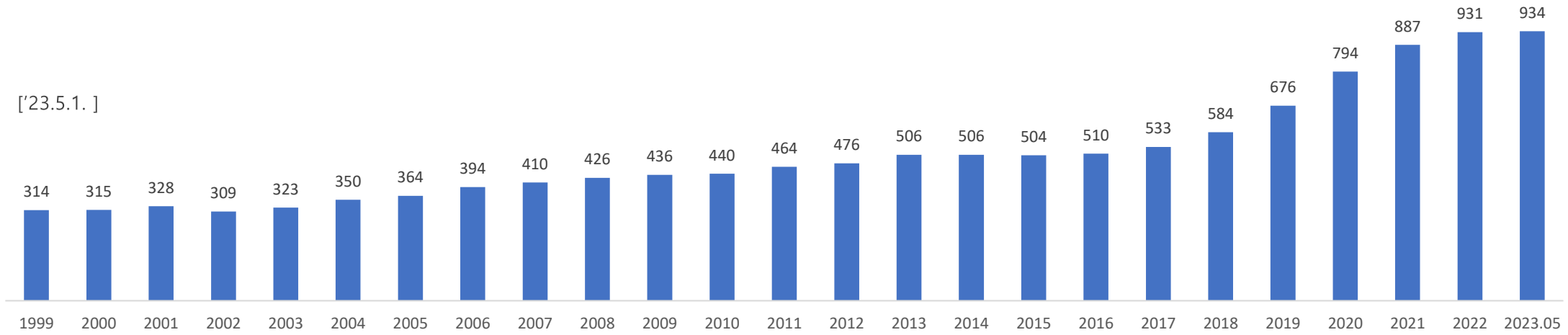
2014 Air Quality Forecast start

2017 Emergency control for hi level PM-2.5 in Metropolitan areas

2020 -2022

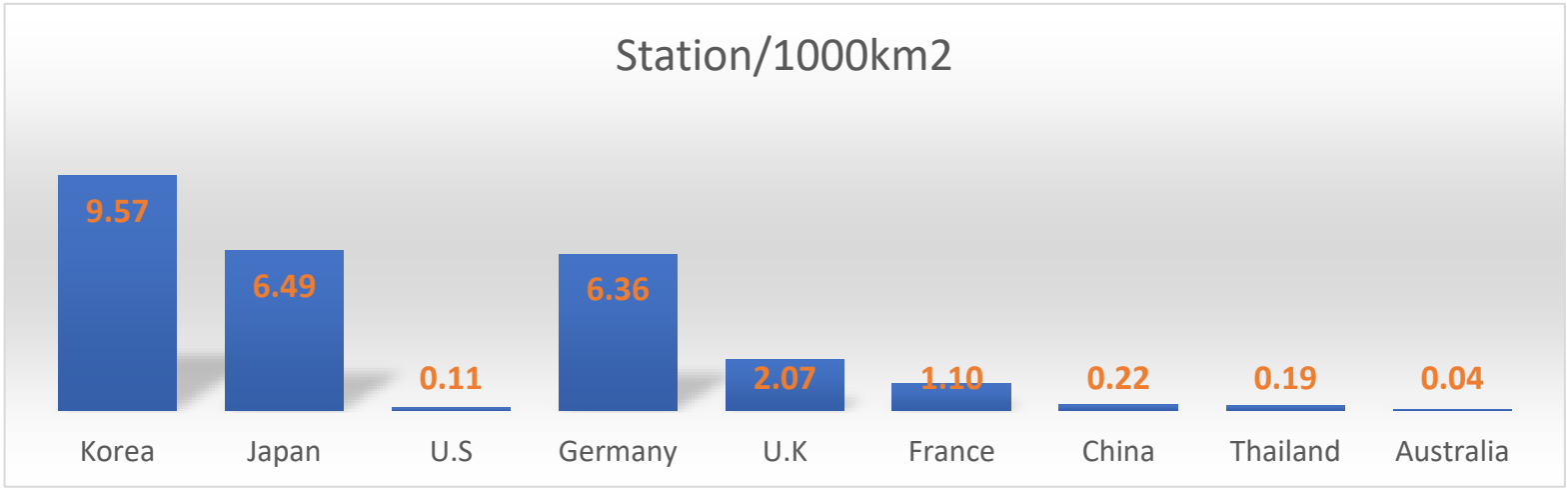
Harbor side network 29
Ships (PM-2.5) network 35

Main Status



TOT	Suburban	Back Ground		Harbor	Hazardous	Acid rain	PAMs	Green house	PM-2.5 compound	Research center	Urban	Road side	Heavy metal
		(Island)	(Ship)										
934	27	11	35	29	62	42	20	1	42	10	523	57	75

Country	Station/1000km^2
Korea	9.57
Japan	6.49
U.S	0.11
Germany	6.36
U.K	2.07
France	1.10
China	0.22
Thailand	0.19
Australia	0.04



DATA USEAGE

Air pollution information such as fine dust provided via OpenAPI

OpenAPI : a service which opens and shares information to enable information users to develop their own application programs rather than merely viewing information via a website

Disclosed items

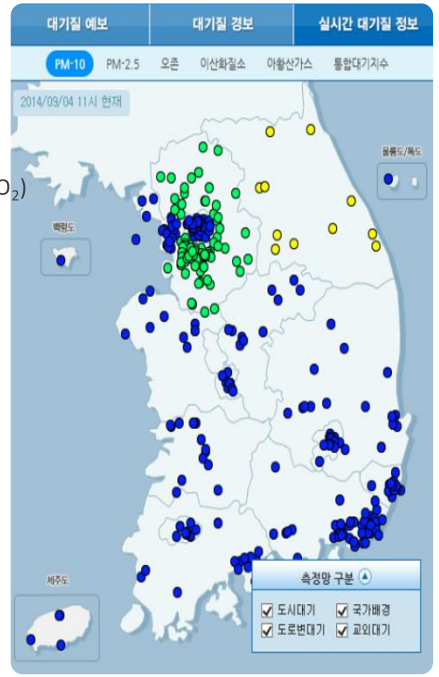
Sulphurous acid gas(SO_2)

Nitrogen dioxide(NO_2)

Carbon monoxide(CO)

Ozone (O_3)

Fine dust (PM_{10}, $PM_{2.5}$)

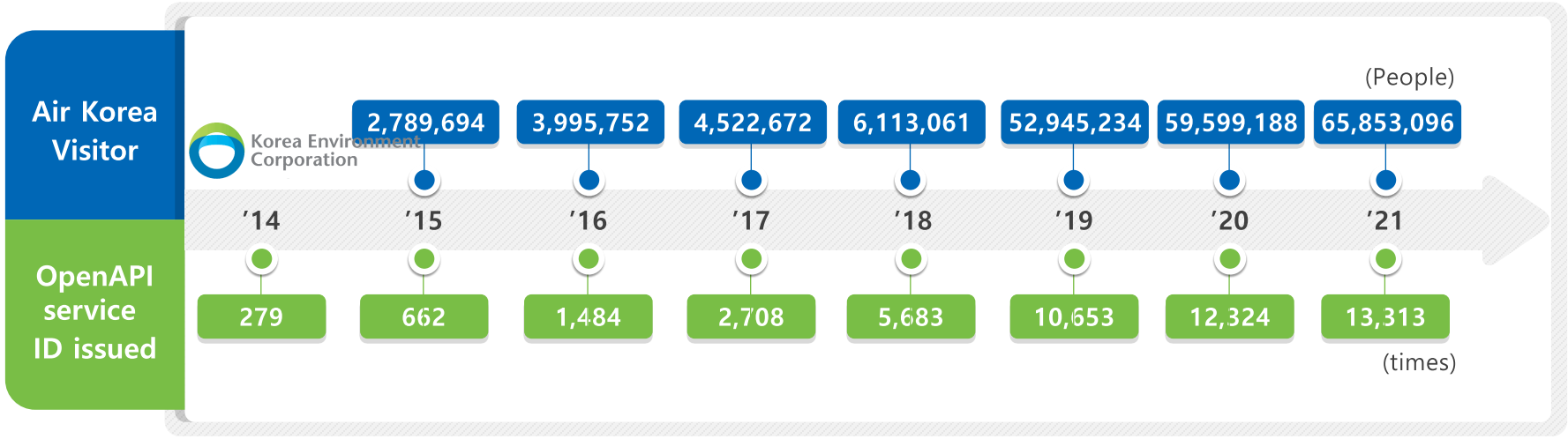


Public open

Major Achievements

Air Korea Web
Visitors increased 10 times over 3 years
with growing interest of ultra fine dust issues

Air Korea(www.airkorea.or.kr) serves real-time air monitoring data & air quality forecast information



1st winner
Of
Mobile Award Korea 2022
In Public Service Applications

미세먼지 실시간 예보 '에어코리아'

공공서비스 한국환경공단

한국환경공단은 사용자 위치정보 기반으로 대기환경정보를 종합적으로 제공하는 '에어코리아(Airkorea)' 앱을 2014년에 구축, 현재까지 운영하고 있다. 에어코리아는 전국 614개소 대기환경측정소의 실시간 측정자료를 중심으로 미세먼지, 오존 등 실시간 대기현황, 미세먼지 예보 및 경보발령 알림 서비스를 제공하고 있으며, 2월 누적 다운로드 115만 건을 돌파했다.

미세먼지 계절관리제 실시에 맞춰 지난 2021년 11월 앱 디자인을 개선하고 주요 기능을 전면에 배치해 사용자 접근성과 편의성을 강화했다. 미세먼지 상황을 평시·고농도로 구분하고 미세먼지 민감군을 영유아·어린이·노인·질환자로 구분, 대상별 행동요령을 사용자 맞춤형으로 제공했다.

또한 여러 기관과의 협업을 통해 환경위성영상(국립환경과학원 환경위성센터), 대기오염신고(행정안전부 안전신문고), 도로먼지지도(한국환경공단 도로재비산먼지관리시스템) 등과 연계, 일원화된 대기환경정보를 편리하게 이용할 수 있다. 아울러 기존 에어코리아 누리집에서 제공하는 황사 정보 및 미세먼지 세부 측정정보 등 상세정보를 모바일 앱에서도 함께 제공할 수 있게 됐다.

디지틀조선일보 강동현 기자

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Result and Conclusion

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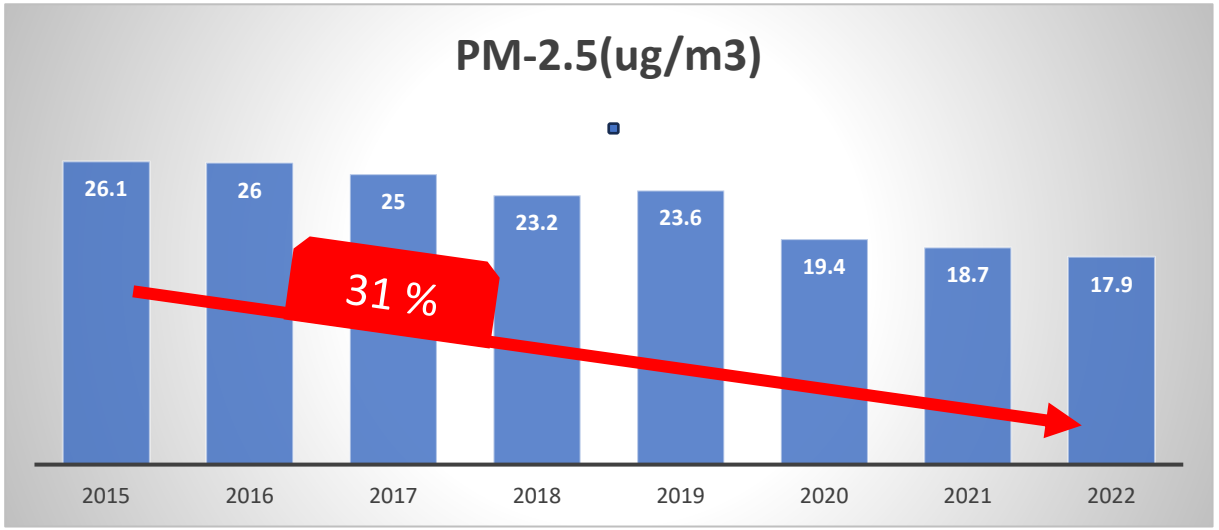

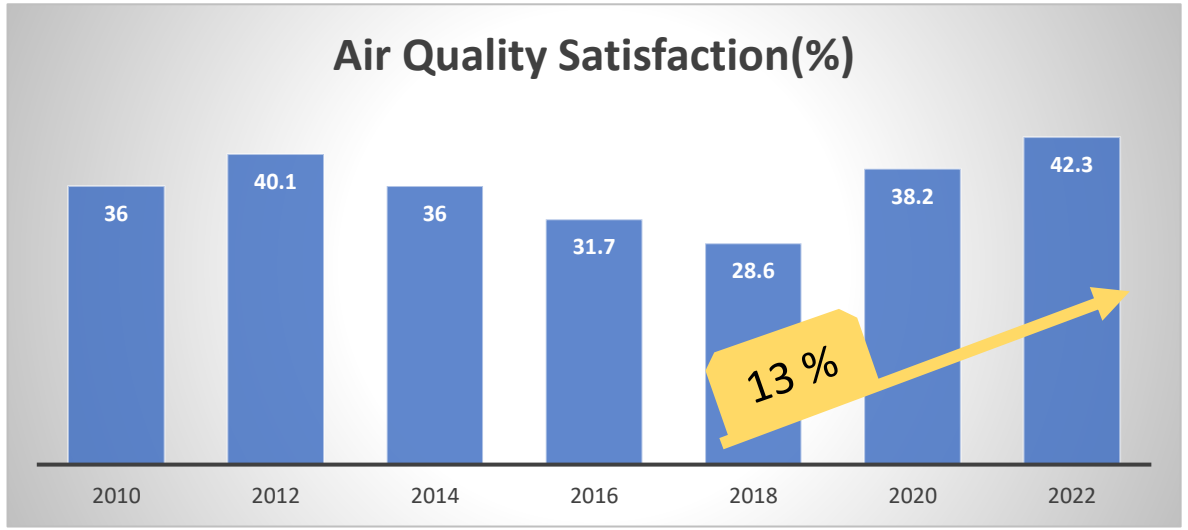

2015 ~ 2022 /Air Quality with

PM-2.5 concentration decrease 31 %

2018 ~ 2022 / Public Air Quality

Satisfaction improved 13 %

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International Case #1
Colombia - Air monitoring system

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Project Overview

Target Area
Colombia (Santa Marta, Barranquilla, Boyacá, Bogotá)

Goal
Installation of Air quality monitoring stations and National air quality information system

Total Cost
USD 2 million
(Total 5 million (KOICA))

Period
2014. 6. 11 - 2017. 6. 30.
(36 months)

Strengthening Security Systems for air quality and Technical and Facility Capacities for the Complete Management of air Quality in Colombia

Colombia

Due to the ambient air pollution generated by automobiles, increase of industrial facilities, mining industries and traditional industries of each region following the industrialization, **Colombia suffers economic and social damage of US$3 billion per year.**
K-eco Implemented an air quality Policy and systematic air pollution control by carrying out **innovation of the scientific technology** responding to the environmental and climate change **in Colombia.**

Details of Construction Work Scope

- Installation of national ambient air monitoring information system : 1 control center, NAMIS Colombia, Aircolombia
- Strengthening the capacity to train the air quality monitoring technicians
- Installation of ambient air monitoring stations: 9 (3 mobile stations and 6 monitoring stations)
- Support the establishment of policies and frameworks for monitoring air quality: ambient air roadmap

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International Case #2
Mongolia - Air Quality Monitoring

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Project Overview

Target Area
Ulaanbaatar, Mongolia

Goal
Improving air quality management through the establishment of air quality monitoring system

Total Cost
USD. 8,910,000

Period
2023 - 2026

Establishment of ICT-based Integrated Air Quality Monitoring System in Ulaanbaatar, Mongolia


Mongolia

Improving Mongolia's air quality management through the establishment of an air quality management system and capacity building within Ulaanbaatar city.

Details of Work Scope

- Establishment of Air quality monitoring station nationwide
- Improvement of Air Quality Monitoring System
- Capacity enhancement
- Establishment of Measurement data Quality control system
- Technical Advisory and Expert Deployment

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Future Collaboration

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Collaboration with WB and Clients countries with K-eco for using KGGTF

- K-eco's good practices such as Tele-Monitoring System for monitoring water or air quality can be applied to partner countries.
- K-eco has been collaborating with WB team to improve the environment in Jordan. (waiting for the selection)

Using Korea's Green ODA fund or Knowledge Sharing Program

- Korean Government has been trying to share Korea's experience and good practices with partner countries since 2004.
- One of KSP programs is to collaborate with MDBs including WB.
- WB & K-eco collaborated to carry out the feasibility study for constructing a sanitary landfill at Atyrau in Kazakhstan in 2016.
- Based on the KSP-WB collaboration result. , we can develop a Green ODA project in environment area

Sharing K-eco's experience with Partner countries

- Many partner countries have visited K-eco to improve and conserve the environment during last 30 years.
- K-eco has been sharing with WB teams and partner countries K-eco's experiences and practices.
- K-eco is always welcome to visit K-eco to learn Korea's good practices.!!!

Thank you for listening.

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