



# Environmental Governance- the application of Environmental IoT



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行政院環境保護署  
Environmental Protection Administration  
Executive Yuan, R.O.C. (Taiwan)

# The international work of Taiwan EPA

- **Sharing Taiwan's environmental experiences and technologies**
  - Working with the USEPA to promote **the International Environmental Partnership (IEP)** to assist in regional environmental capacity building
  - Over 40 countries have participated in environmental education, city clean air, atmospheric mercury monitoring, climate change adaptation

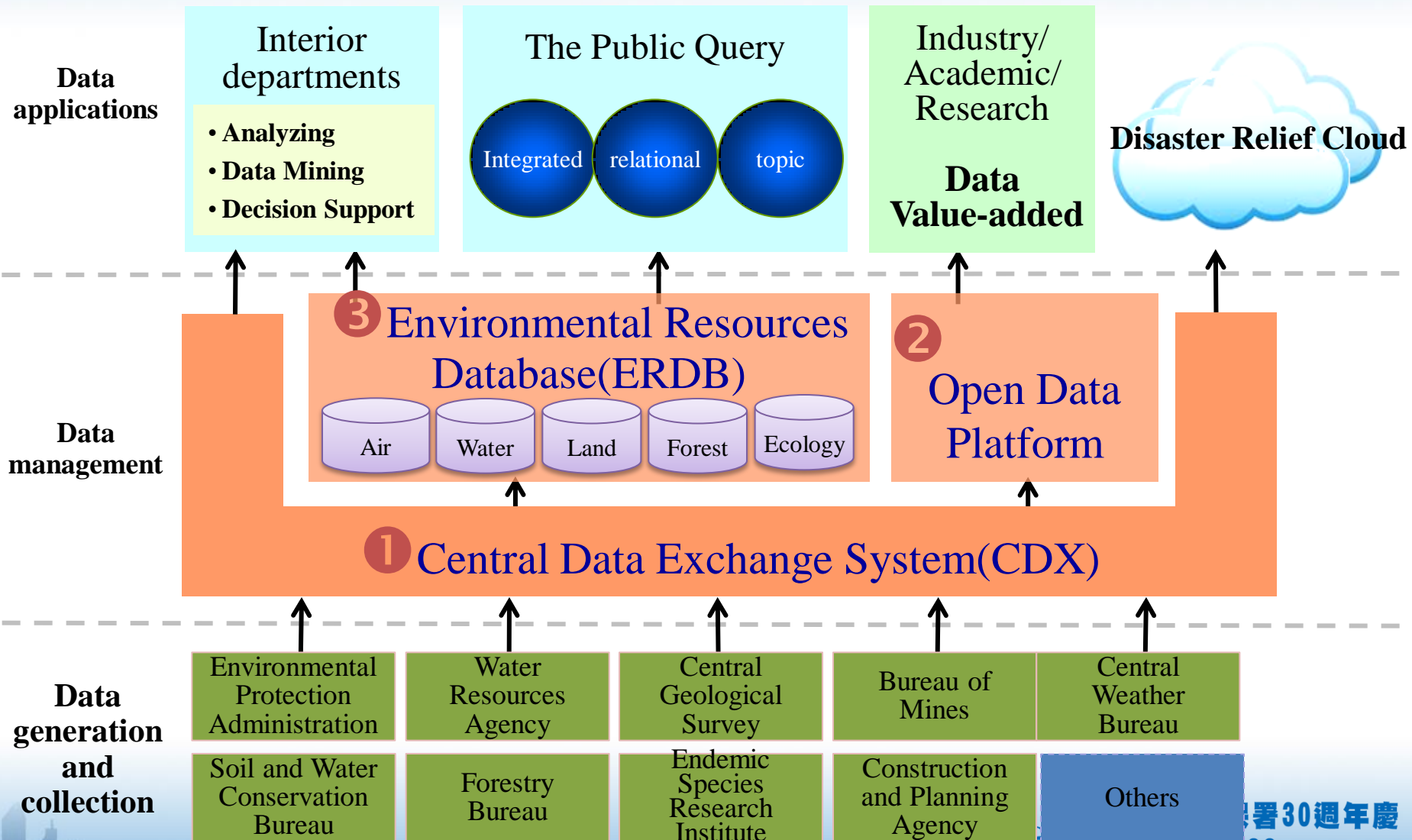


More than 40 nations have participated in the IEP



# What did we do in 2015?

## The Architecture of EnviroCloud





# What did we do in 2016?

## Enhancing Open data quality and more

### application

Environmental Open Data Cloud Services

Rank	Top5 Visiting Rate of Open Data
1	Hourly PSI
2	Real-time UV index data
3	10-minute rainfall data
4	Air quality forecast data
5	Basic information of UV monitoring station

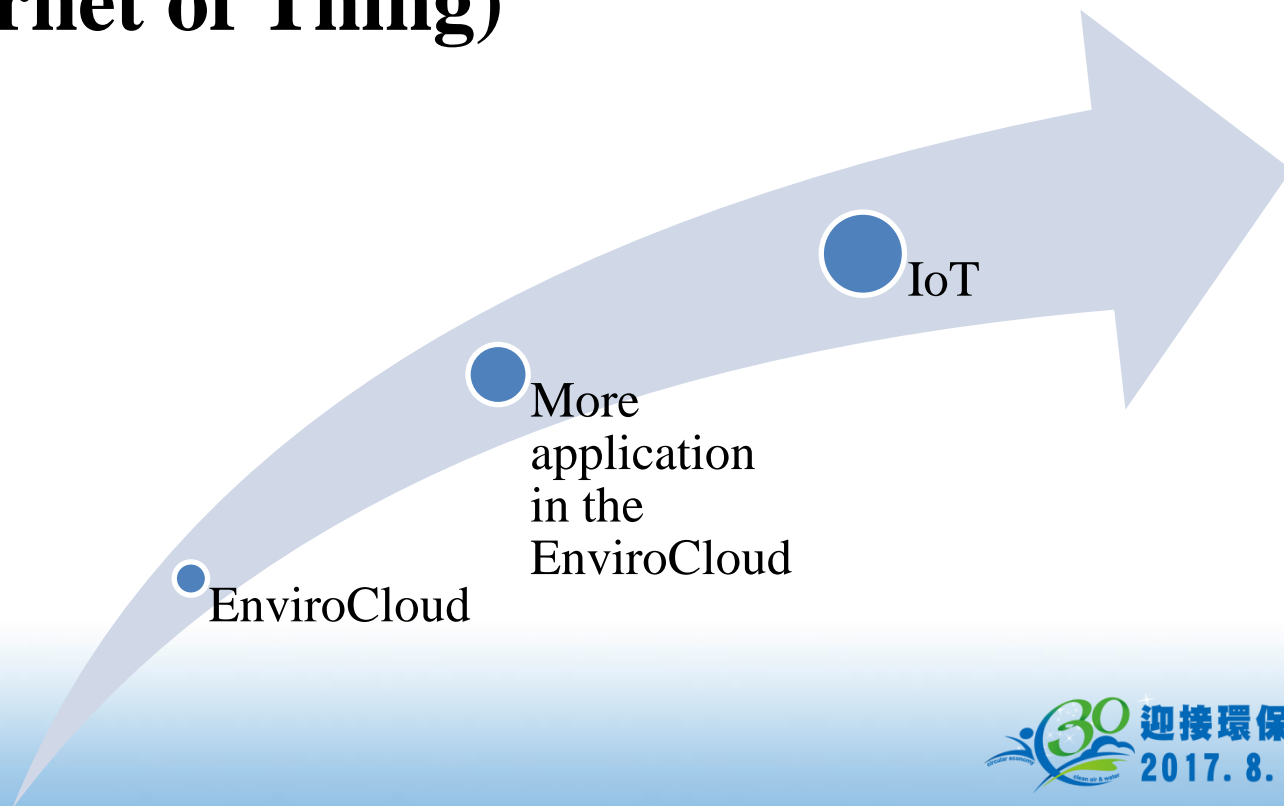


### Application Case

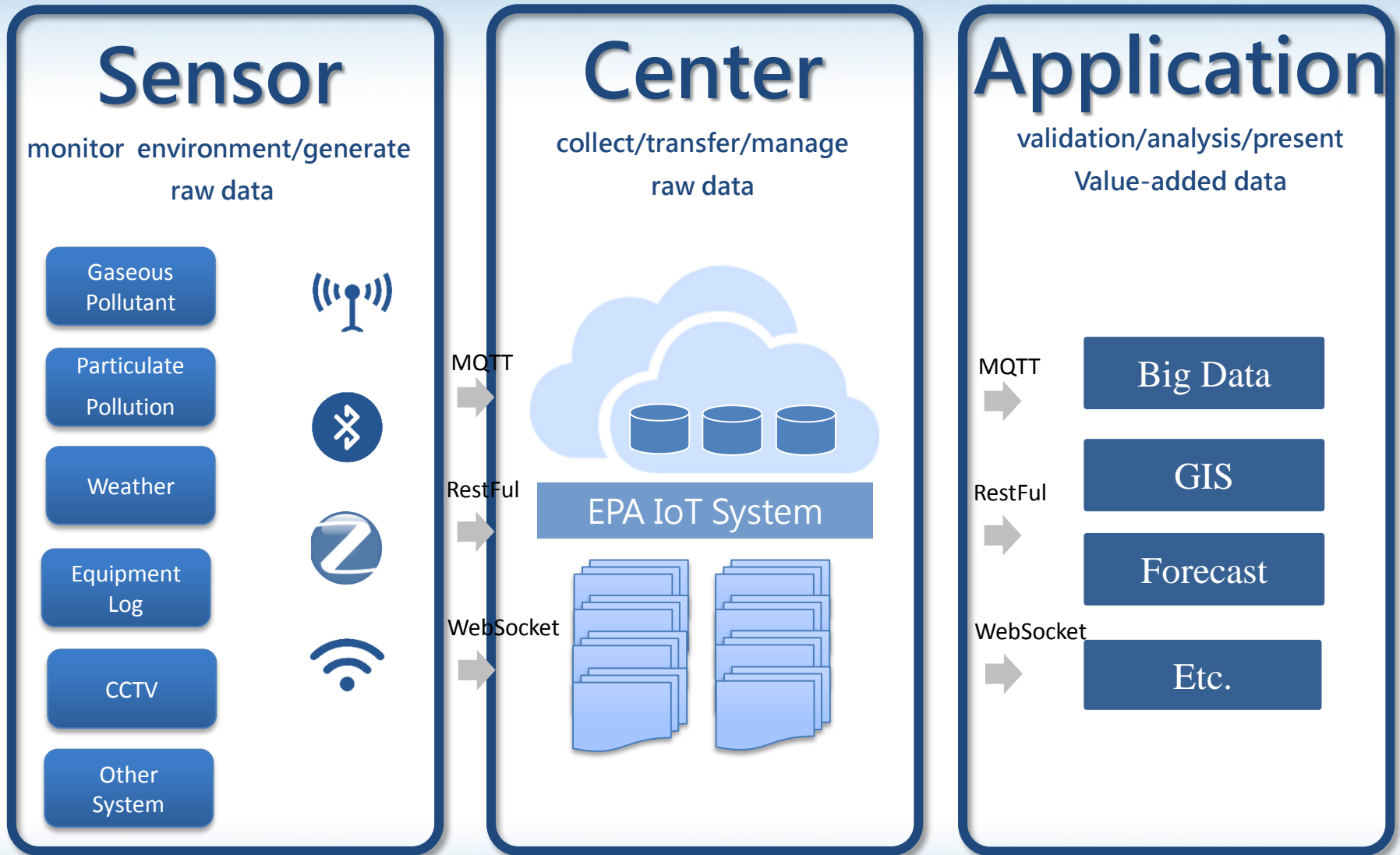


# What did we do in 2017?

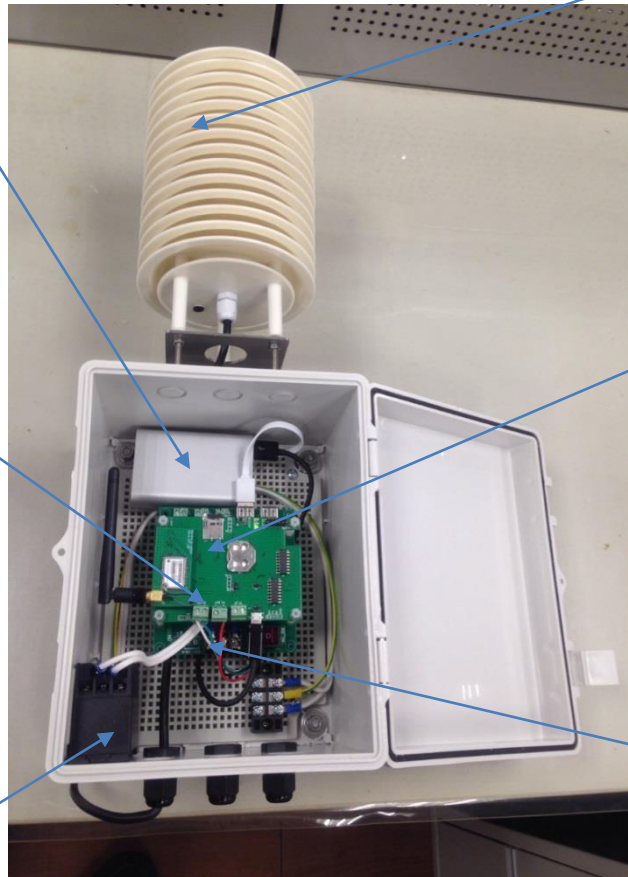
- We promote the  
**Environmental IoT**  
(Internet of Thing)



# The data flow of Environmental IoT



# Why we promote IoT?



Battery

Connection module



LoRa    LTE Cat-1

Support LoRa, Wifi,  
BLE, Zigbee, 4G LTE,  
NBloT

lightning protector

Sensor module



PM2.5, VOC,  
temperature etc.

Control module



raw data in SD

power supply  
module



AC 110V  
AC 220V  
DC 5V  
DC 12~48V

- Small
- Light
- Cheap
- Variation of modules

# The EPA Environmental IoT Center



行政院環保署智慧物聯網

應用 ▾ 開發者中心 感測資料儀表版 感測分析 I-Environment 登入

儀表版

專案

裝置

感測器

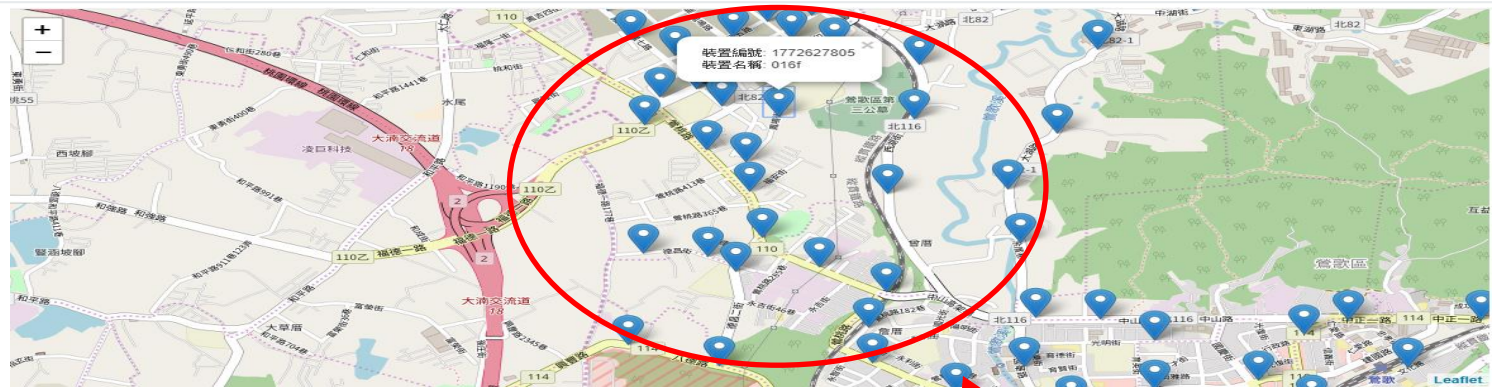
位置

感測數據

裝置屬性

感測器屬性

感測數據屬性



PM2\_5

Real time raw data

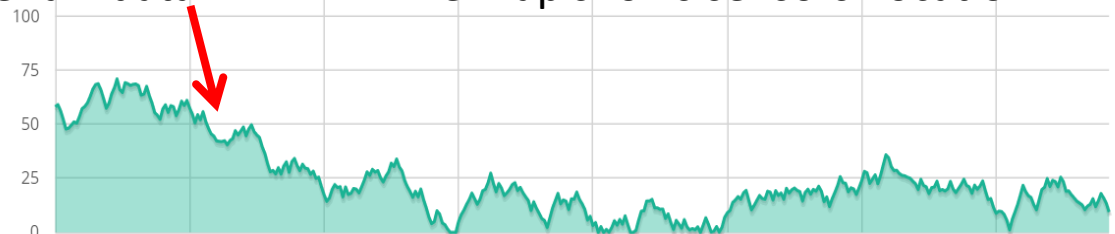
The map shows sensors' location

PM10

CO

CO2

PM1



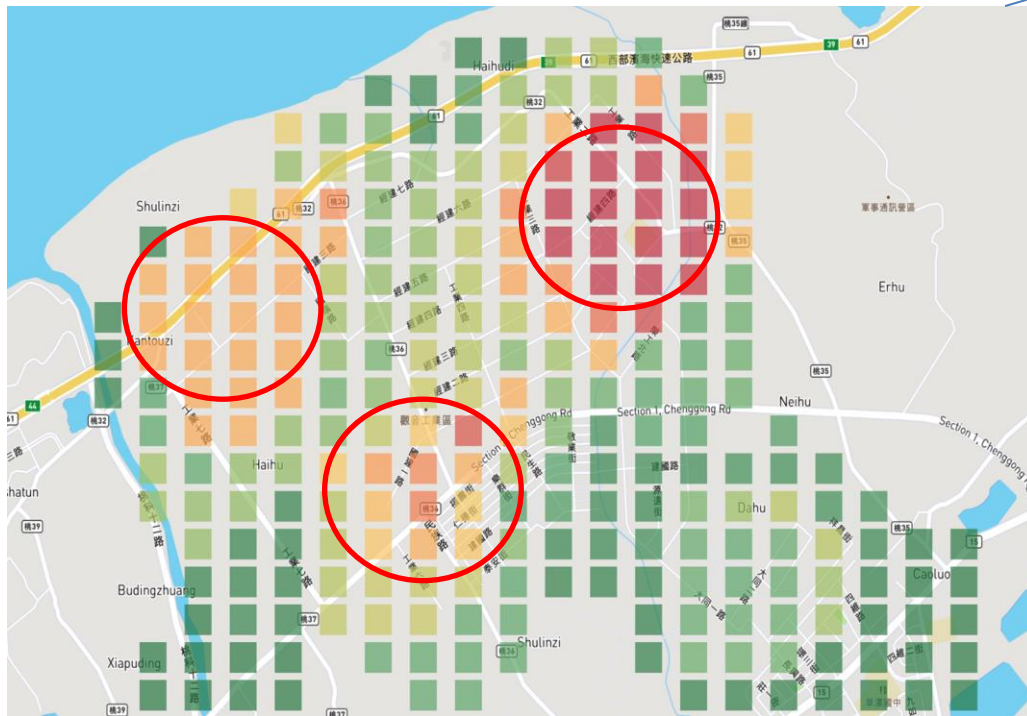


# The first implement area - Guanyin Industrial Zone



# The top 3 potential pollution area

In this case, we develop a method to figure out the top 3 potential pollution area.

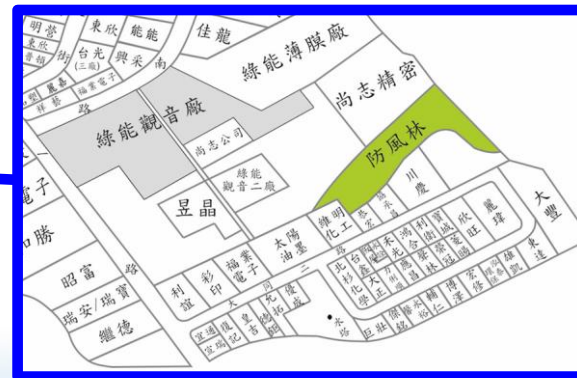
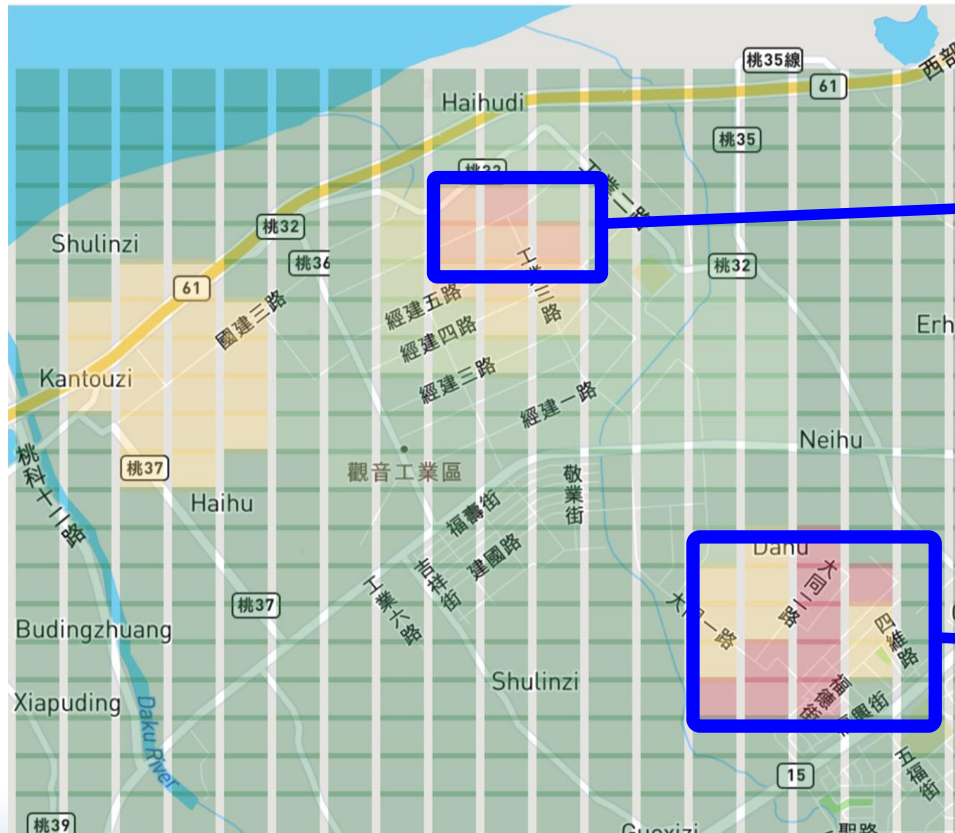


# Combine other domain data

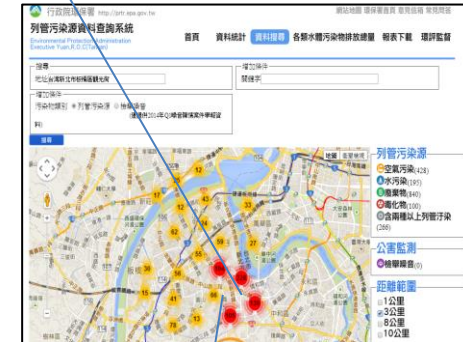
compare the locations of these factories in PRTR system with the top 3 potential pollution areas.

The location of industries in Guanyin Industrial Zone which recorded in PRTR.

潛勢分析



PRTR





# Land the crime

The factory was making air pollution

Sensor



The news about EPA intelligent audit

Google 環保署 觀音工業區

全部 新聞 地圖 圖片 影片 更多 設定 工具

約有 62,200 項結果 (搜尋時間: 0.46 秒)

**啟動空氣品質物聯網智慧稽查打擊非法 - 環保新聞專區 - 環保署**  
enews.epa.gov.tw/enews/fact\_Newsdetail.asp?InputTime=1060807112731  
2017年8月7日 - 環保署完成觀音工業區空氣品質感測物聯網設置, 布達100個感測點, 藉由密集感測、數據匯流解析、污染熱區標定與時點鎖定, 啟動智慧稽查, 已...

**Home 工業區土壤及地下水品質管理分級燈號預警管理系統**  
sgw.epa.gov.tw, 工業區燈號預警管理系統, 工業區現況查詢  
觀音工業區服務中心 地理位置 桃園市觀音區 聯絡電話: (03)4830400#6507 傳真電話: (03)4839927 聯絡地址: 桃園市觀音區工業五路三號. 一、工業區基本資料. 1.

**觀音飄惡臭環響大雨夜遠不肖業者 | 法律前線 | 社會 | 聯合新聞網**  
https://udn.com/news/story/7321/2538199  
2017年8月21日 - 環保署表示, 桃園市觀音工業區屢有民眾陳情有惡臭異味飄散, 環保署與桃園市政府環境保護局成立專案小組, 研析監測資料, 鎖定空氣污染排放熱...

**環保局夜間主動出擊十路埋伏強力稽查工業區 - 桃園市政府環境保護局**  
https://www.tydep.gov.tw/tydep/Message/Detail/312  
環保局稽查人員於11日夜間兵分十路針對大園工業區、觀音工業區、龜山工業區、... 並追究環保專責人員的業務責任, 不排除報請行政院環保署廢止專責證書, 一旦被...

**觀音工業區廢氣刺鼻微型感測器查空汙 - 客家電視台**  
www.hakkatv.org.tw/news/158101  
2017年8月7日 - 桃園觀音工業區常遭民眾檢舉有工廠排放刺鼻廢氣, 環保署今年5月投入100個微型感測器, 稽查到樂工南路、工業四路和經建四路間建有4間工廠...

**工業區廣設感測器抓污染事半功倍 | 即時新聞 | 20170807 | 蘋果日報**  
www.appledaily.com.tw/realtimenews/article/new/20170807/1177067/  
2017年8月7日 - 環保署廣設感測器成了抓違反排放空汙的利器, 環保署今年3月在桃園觀音工業區, 完成第一個工業區的感測器佈設, 全面普設100個感測點, 透過其...

**【影】觀音工業區汙水排入海中慘變陰陽海影片曝光遭網轟: 環保署廢掉...**  
bepo.ctitv.com.tw, 必聽奇聞  
2017年8月30日 - 導演賈柏林在2013年拍攝《看見台灣》紀錄片, 片中拍到台灣多處的環境問題, 其中桃園市觀音工業區汙染附近河川。有網友便在臉書不公開社團曝光...

**觀音工業區設置空品盒子即時監控空氣污染 | 台灣好新聞TaiwanHot.net**  
www.taiwanhot.net/?p=482954  
2017年8月8日 - 桃園市環保局與行政院環保署合作, 在觀音工業區設置了100個PM2.5的空品盒子, 因布設的密度高, 如果有工廠偷排廢氣, 空品盒子可立即發現濃度...

**觀音飄惡臭環響大雨夜遠不肖業者 | 社會 | 中央社即時新聞CNA NEWS**



# Future Issues -During 2017~2020



We're going to implement up to

**10,200** sensors in

Taiwan.

Particularly in the area, like

- industrial park**
- heavy traffic area**
- community**
- non urban**

# 4. APEC-VC Road Map (' 18~' 22)

## (Draft, Inputs needed)



### Enhancing Regional Science and Technology Connectivity through the Utilization of APEC-VC Gateway

Exchange of Information on Environmental Technology and Industry through the **APEC-VC Gateway**

#### Technology Transfer

Technology transfer through **information exchange** on environmental technology and industry in order to **overcome the technology gap** among the APEC economies

- Database on technology reports, policy trends, product and company information shared by each economy
- **Share some specific application of technology , like environmental IoT**

#### Create Trade and Investment Opportunities

Sharing information on

- Trade regulations and policies
- Supply and demand of environmental technology
- Events and exhibitions of **seller-buyer interactions**

#### Policy and Knowledge Sharing

Sharing knowledge on environmental policy developments and execution of each economy

#### Outcome

- ① Provide solutions to environmental problems in the APEC Region by sharing technology and policy information
- ② Overcome the Technology Gap
- ③ Create trade and investment opportunities for SMEs

Enhance Science and Technology Network



**Thank you for your  
attention**



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