Development and Application of Decision Support System in Taiwan

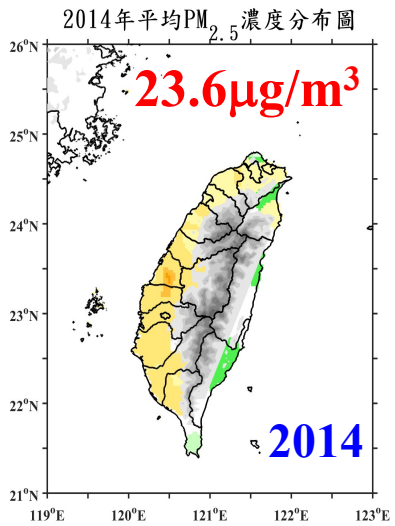
Lai, Hsin-Chih

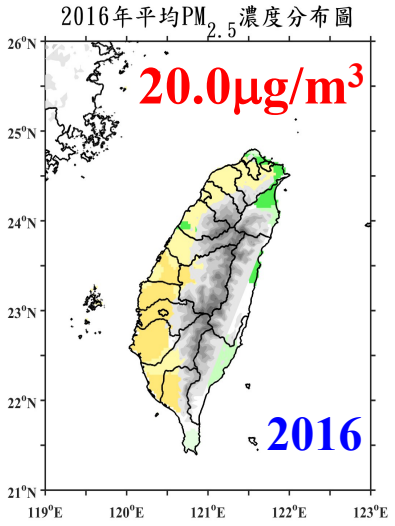
Director , Office of R&D

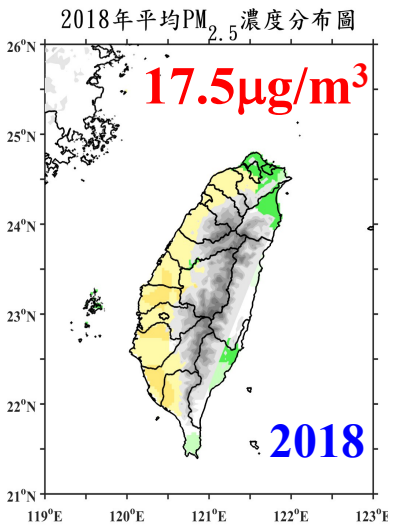
Chang Jung Christian University

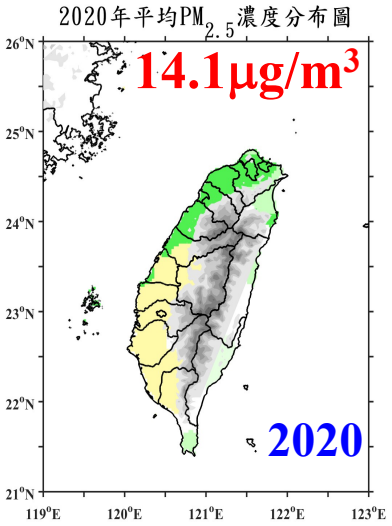
2025/02/24

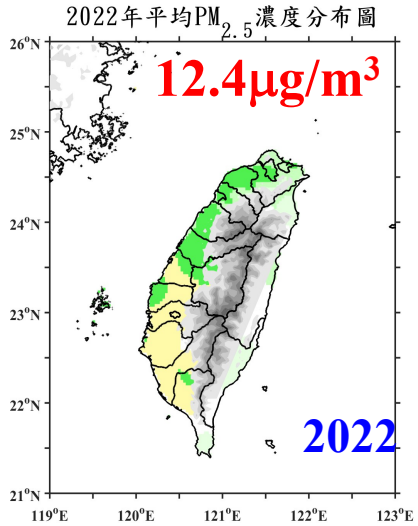
Air quality has been improved in Taiwan

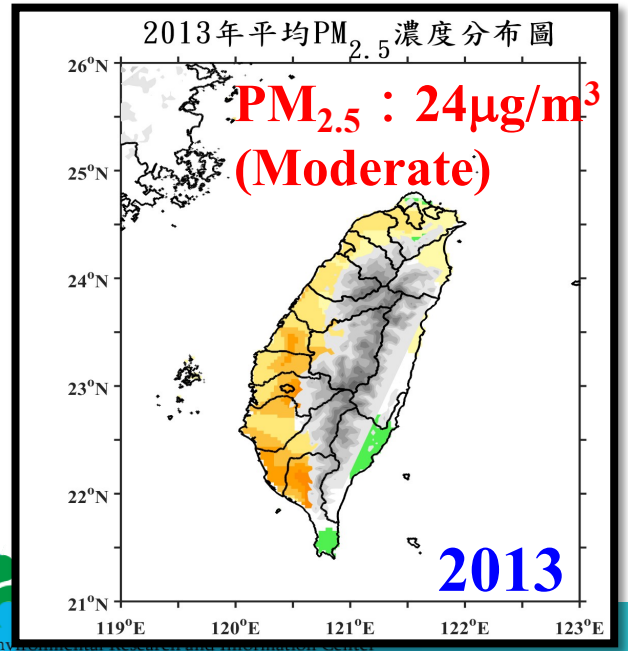






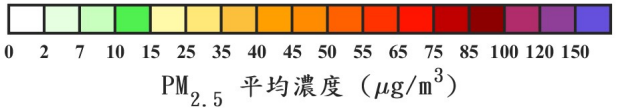


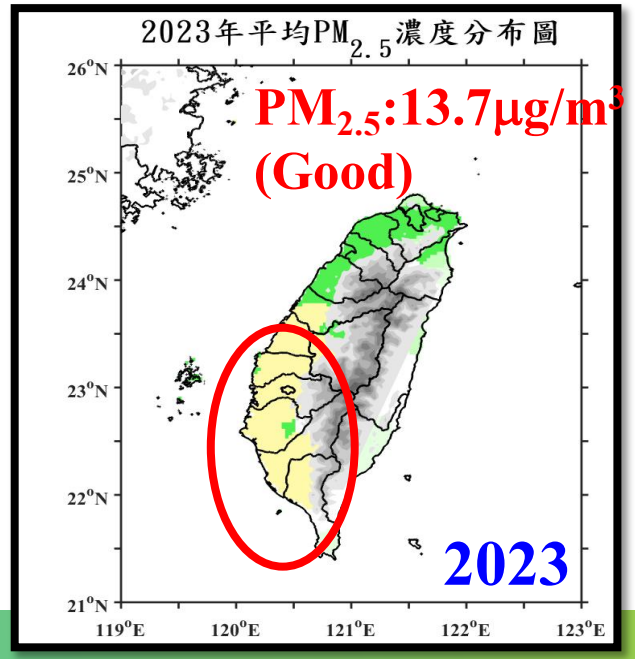




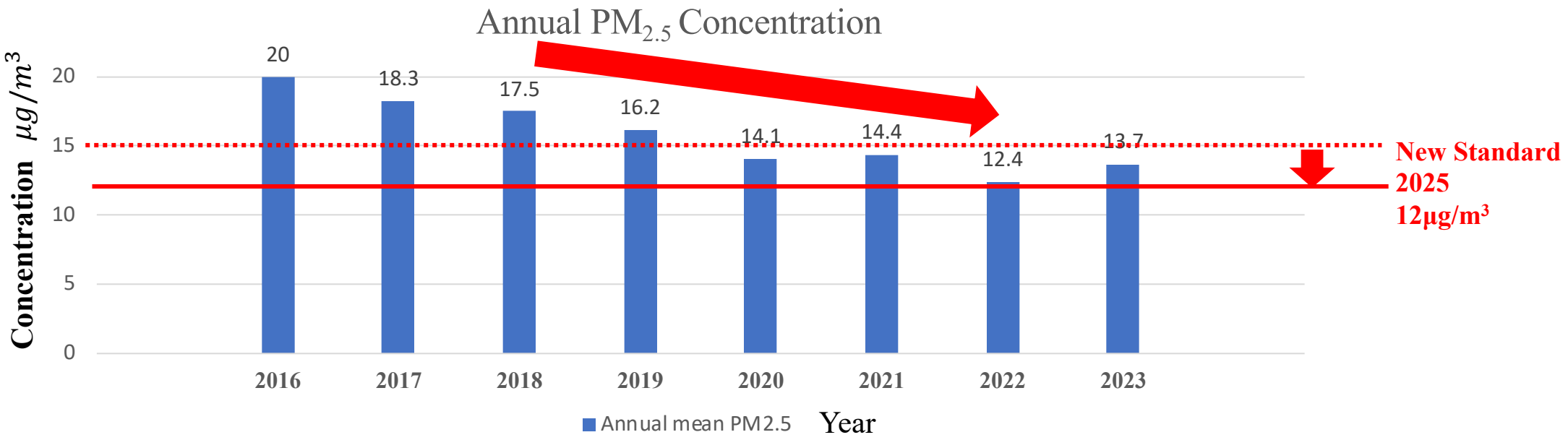
$PM_{2.5}$ Concentration less than 15ug/m³

Decrease by 42.9%



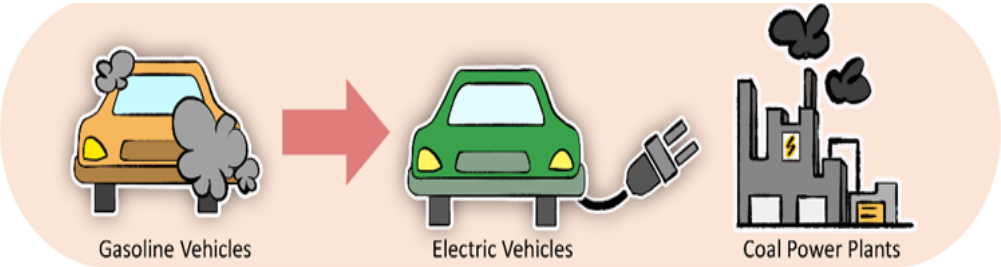


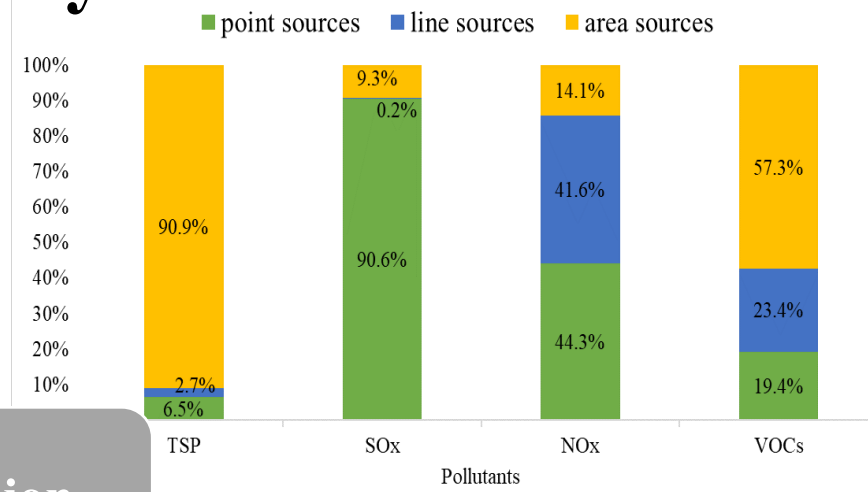
New air quality standard set to 12 μg/m³ in replace of 15 μg/m³ in 2025



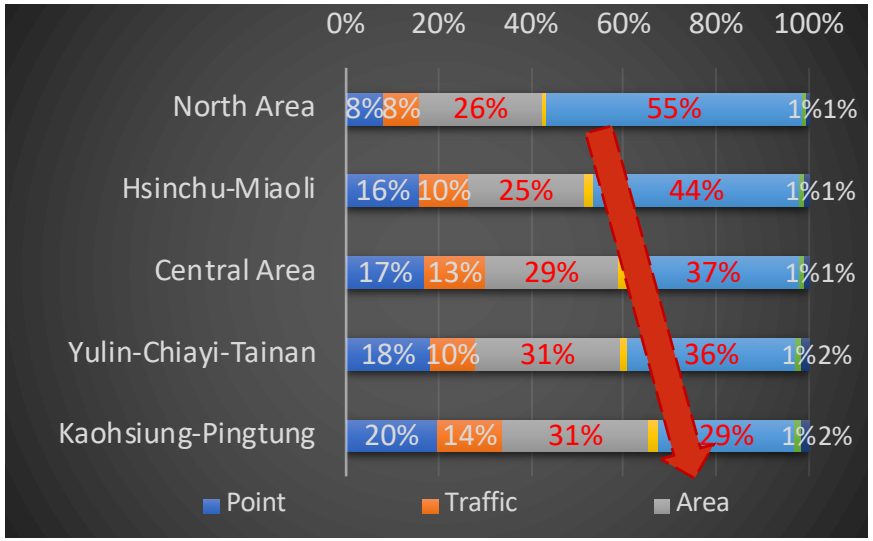
What's the next? And how to make it?

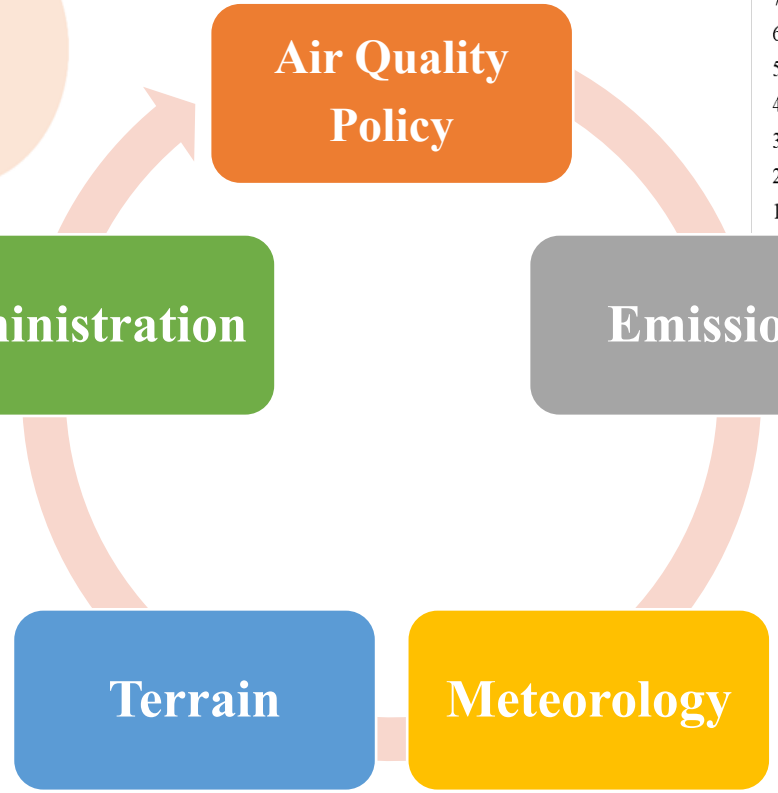
Major factors for air quality

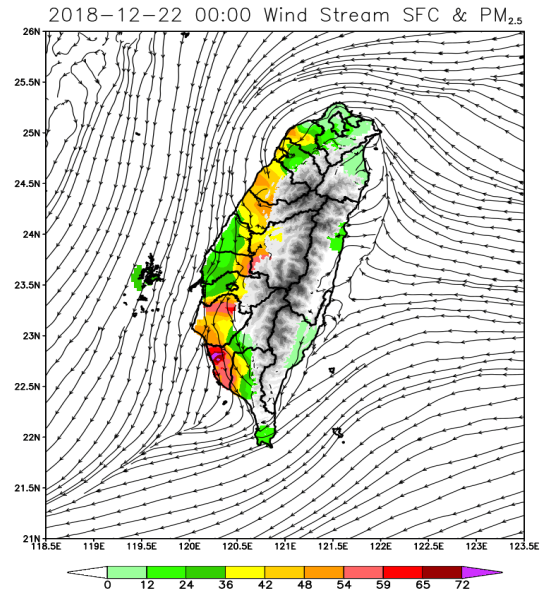




Source: Taiwan MOENV







Electric vehicle promotion policy vs power emission

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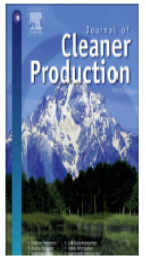

Analysis of air quality and health co-benefits regarding electric vehicle promotion coupled with power plant emissions

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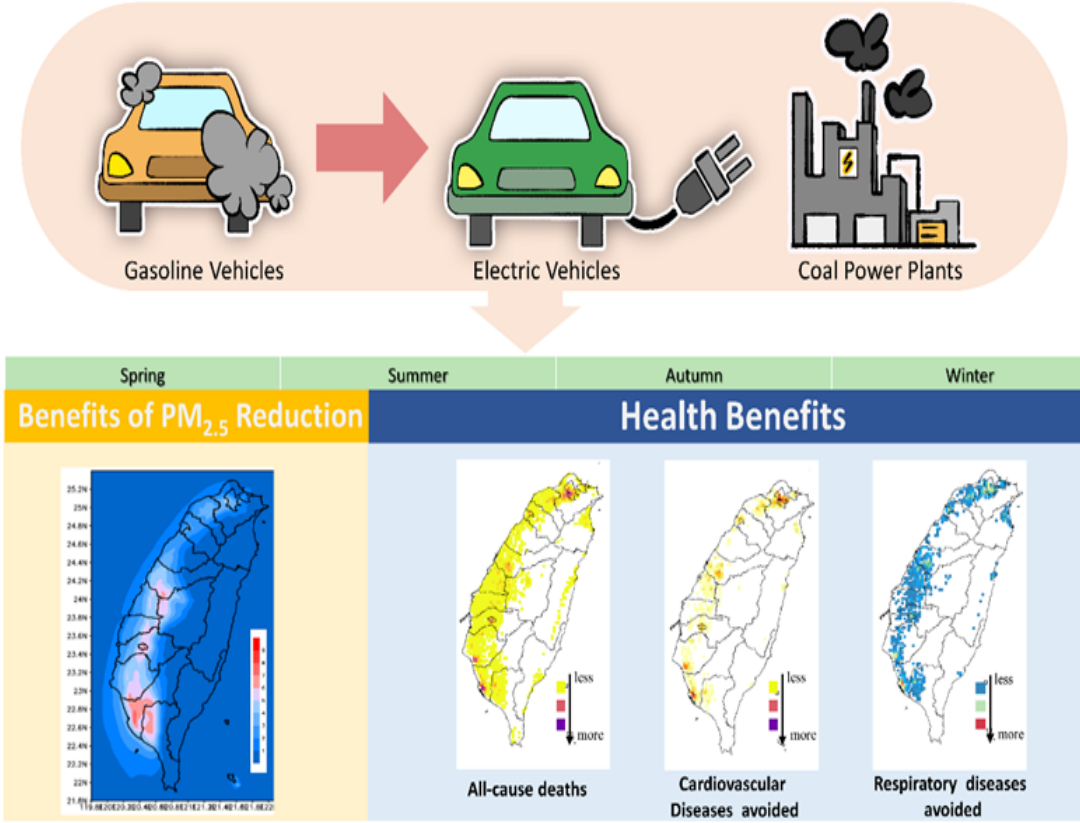
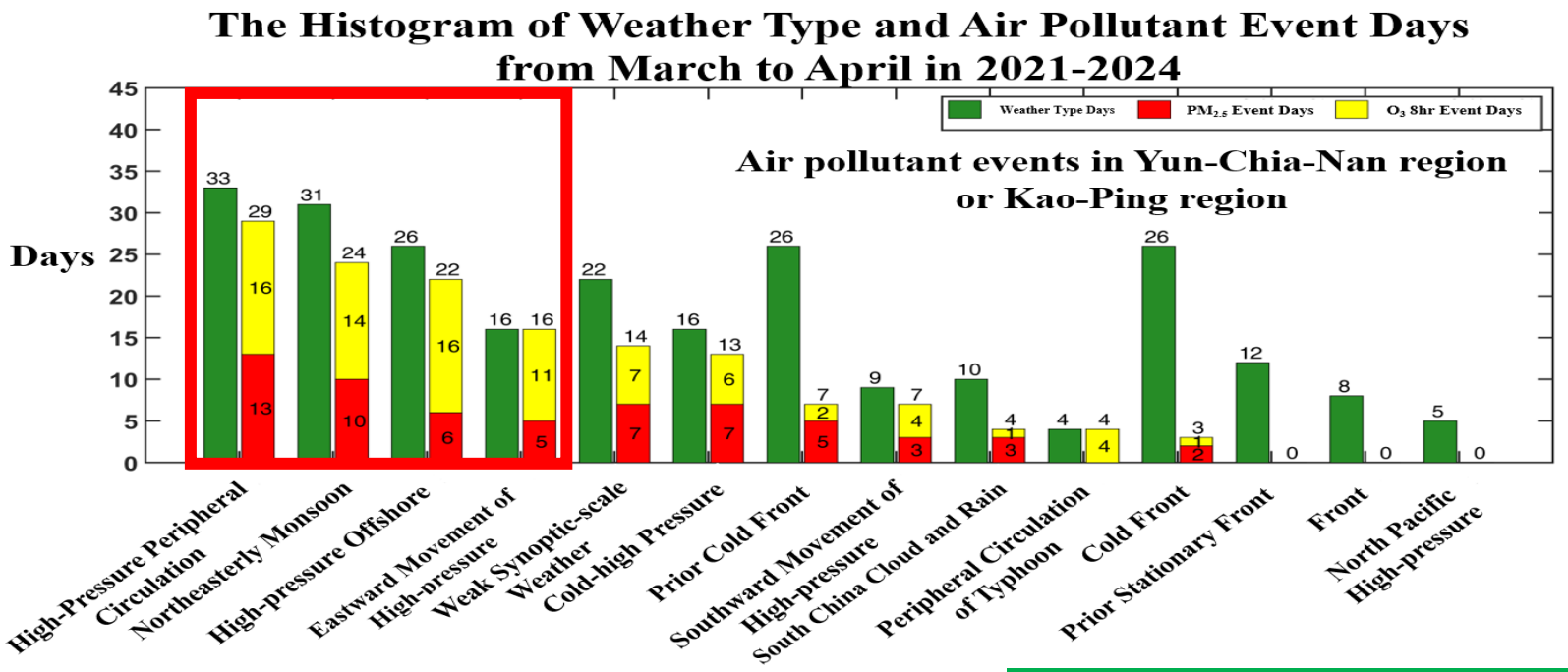
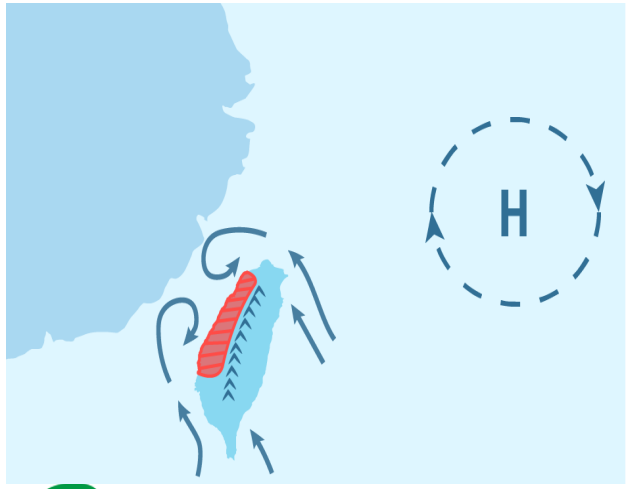
[c] Department of Civil and Environmental Engineering, University of Tennessee, Knoxville, TN, USA
[d] Environmental Research and Information Center, Chang Jung Christian University, Tainan, Taiwan



- In particular, meteorological and terrain effects in Taiwan are quite complex rather than the other areas. Pollution Events usually happened under specific weather patterns.

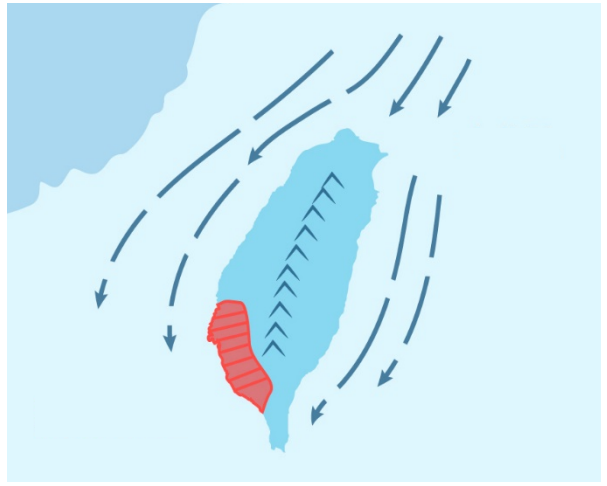


High-Pressure Peripheral Circulation



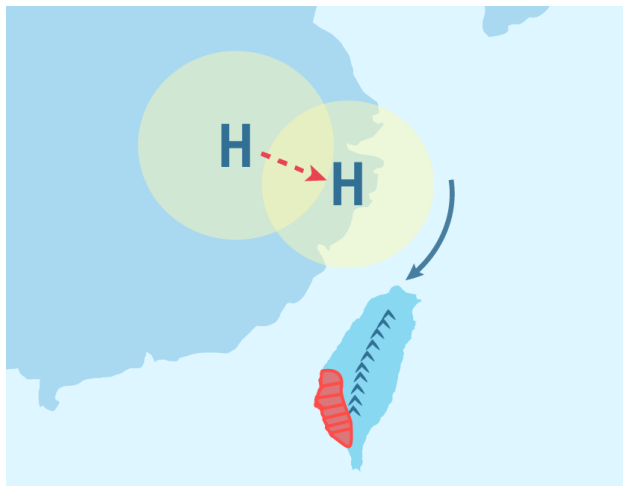
Air pollution incidence rate：88 %

Northeasterly Monsoon



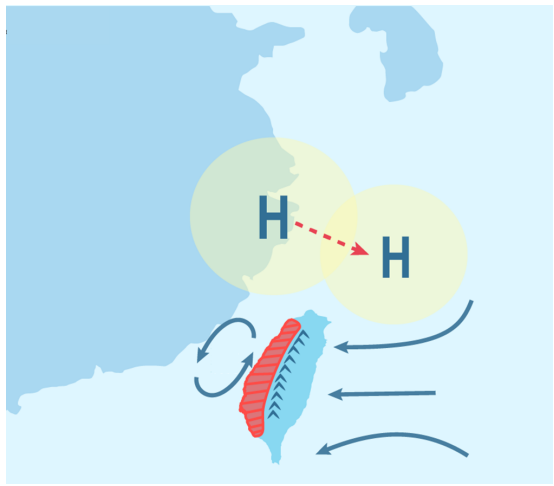
Air pollution incidence rate：75~85 %

High-Pressure Offshore



Air pollution incidence rate：85 %

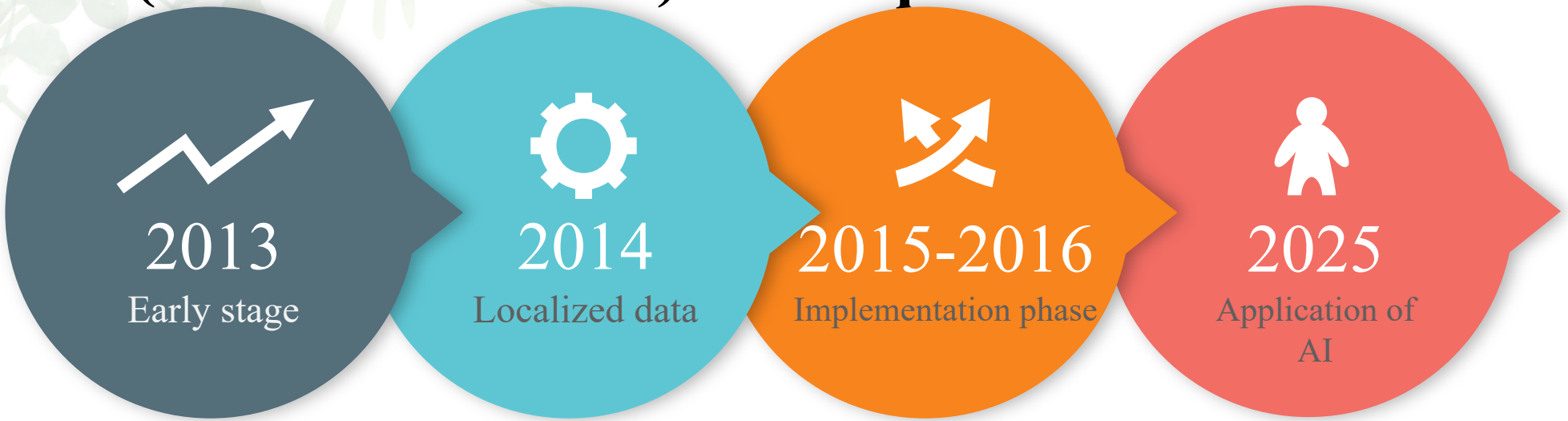
Eastward Movement of High-Pressure



Air pollution incidence rate：85~88 %

Introduction of ABaCAS-Taiwan

Air Benefit and Control and Attainment Assessment System-Taiwan (ABaCAS-Taiwan) Development and Evolution



- Training Program in Taiwan
- Creating an SOP for **ABaCAS-Taiwan**
- Building Taiwan Emission Cost Analysis System (**TECAS**)

- Response Surface Model
- BenMAP
- Training sessions for EPA and EPB faculties
- Join international ABaCAS conference

- **ABaCAS-Taiwan**
- TECAS database being updated, BenMAP created a health assessment according to age.
- ABaCAS-Taiwan Standalone version

- ABaCAS-Taiwan Web version
- **ABaCAS-Taiwan with AI**
- Air Quality Event Days

Effective policy instruments are needed to support decision-makers

ABaCAS-Taiwan

民眾健康

空氣污染議題

排放源及減量評估

控制技術規劃

污染物減量

- 控制成本 ？
- 減量情境 ？
- 健康效益 ？

空氣品質減量效益

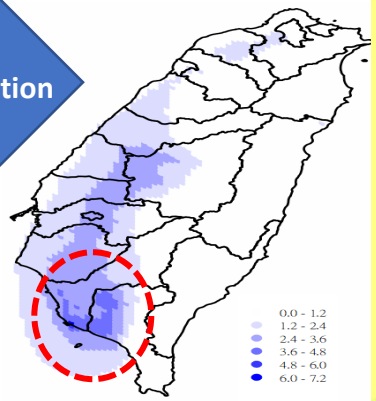
發展臺灣空氣品質決策支援系統

Taiwan Air Benefit and Control Assessment System (ABaCAS-Taiwan)

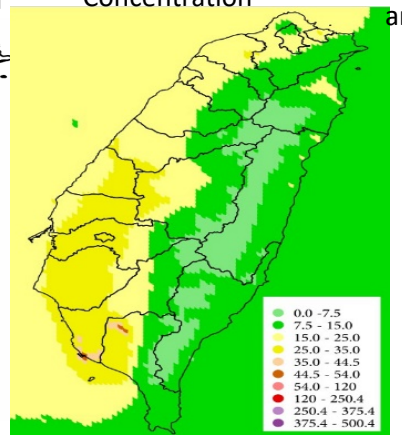
Evaluation of Air Pollution Control Action Plans

Reduction of air pollutants

Distribution of $PM_{2.5}$ Concentration Delta



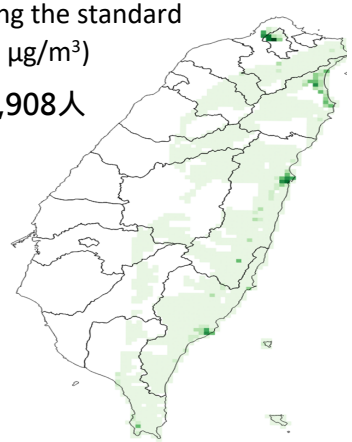
Distribution of PM2.5 Concentration



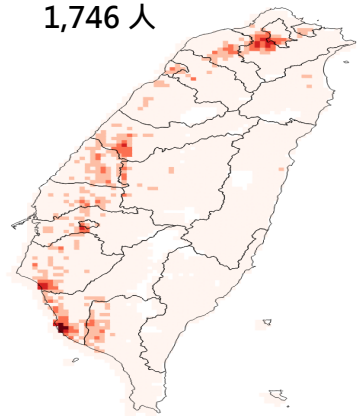
Health Benefit

Population distribution in areas meeting the standard (<15 μg/m³)

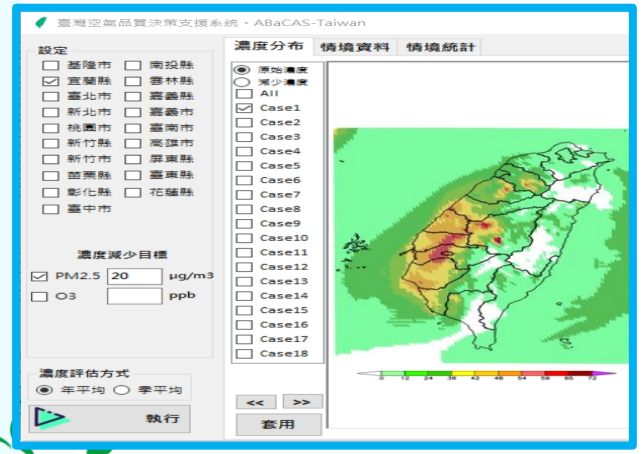
1,392,908人



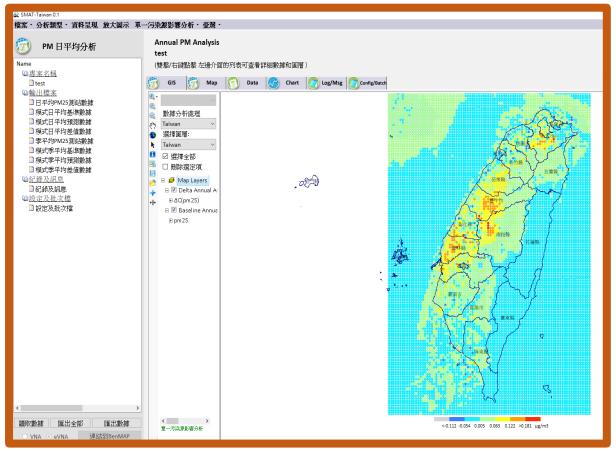
Avoid Death 1,746 人



RSM

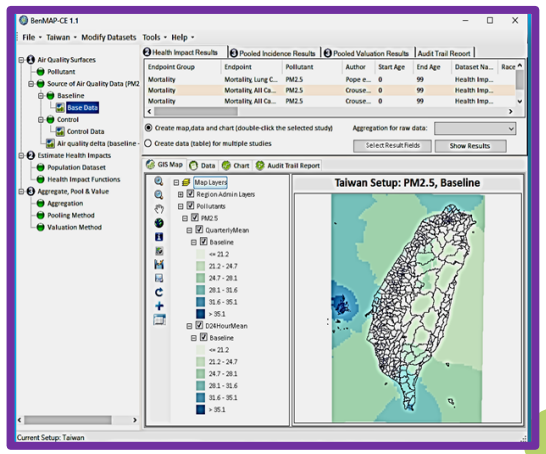


SMAT

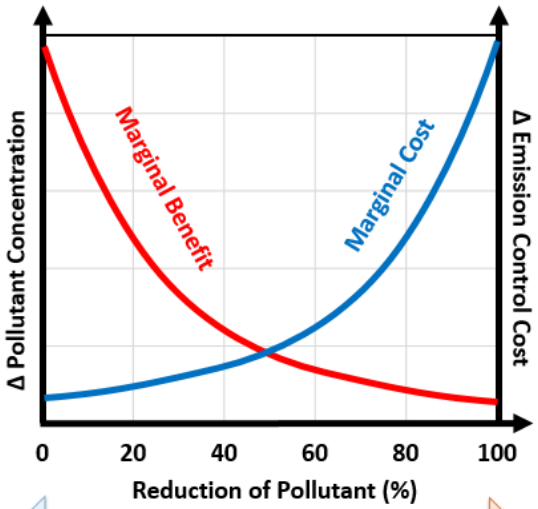


TECAS

BenMAP



Taiwan Emission Control Cost Analysis System(TECAS)



Localization survey data

Collected Control Measures Cost

Site survey

Checking Control Measures Cost

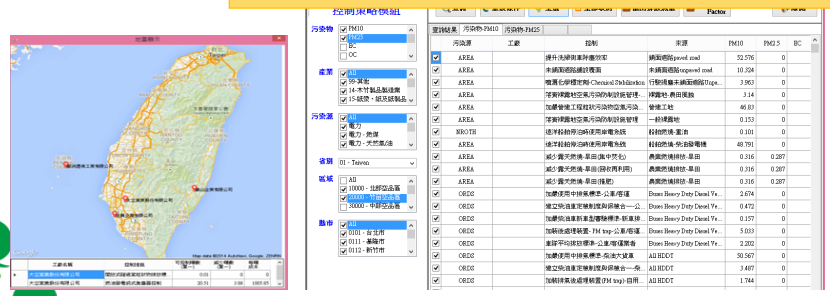
Establish Localization Data

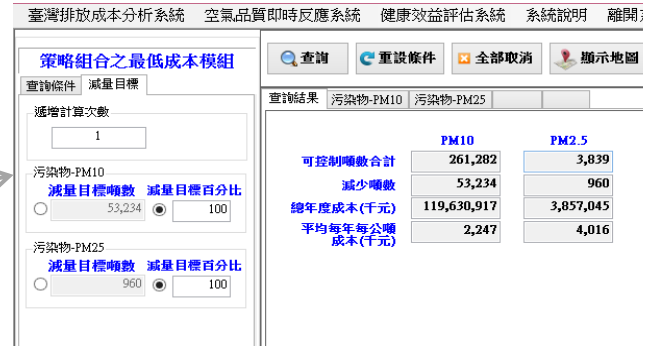
Import Data

Cement Industry, Steel Industry, Power Plant, Petrochemical Industry

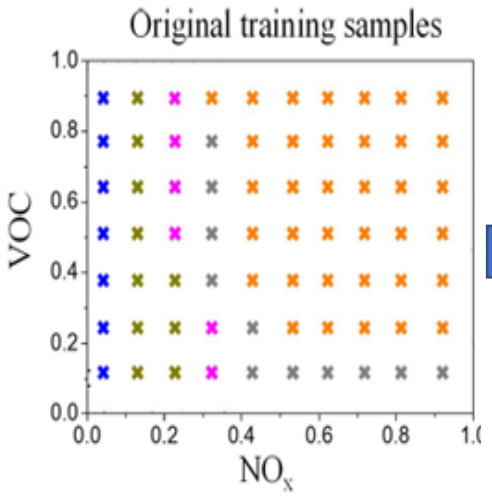
Calculating emissions reductions and associated costs.

To achieve a stated pollutant-specific emission reduction target (in tons or percentage) with the least total annual cost

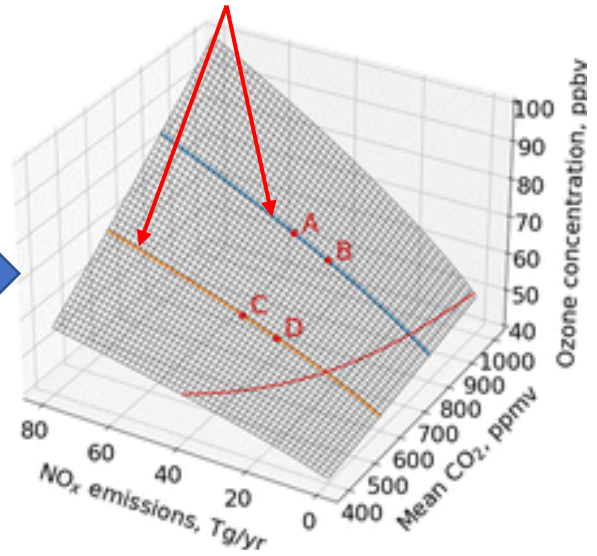




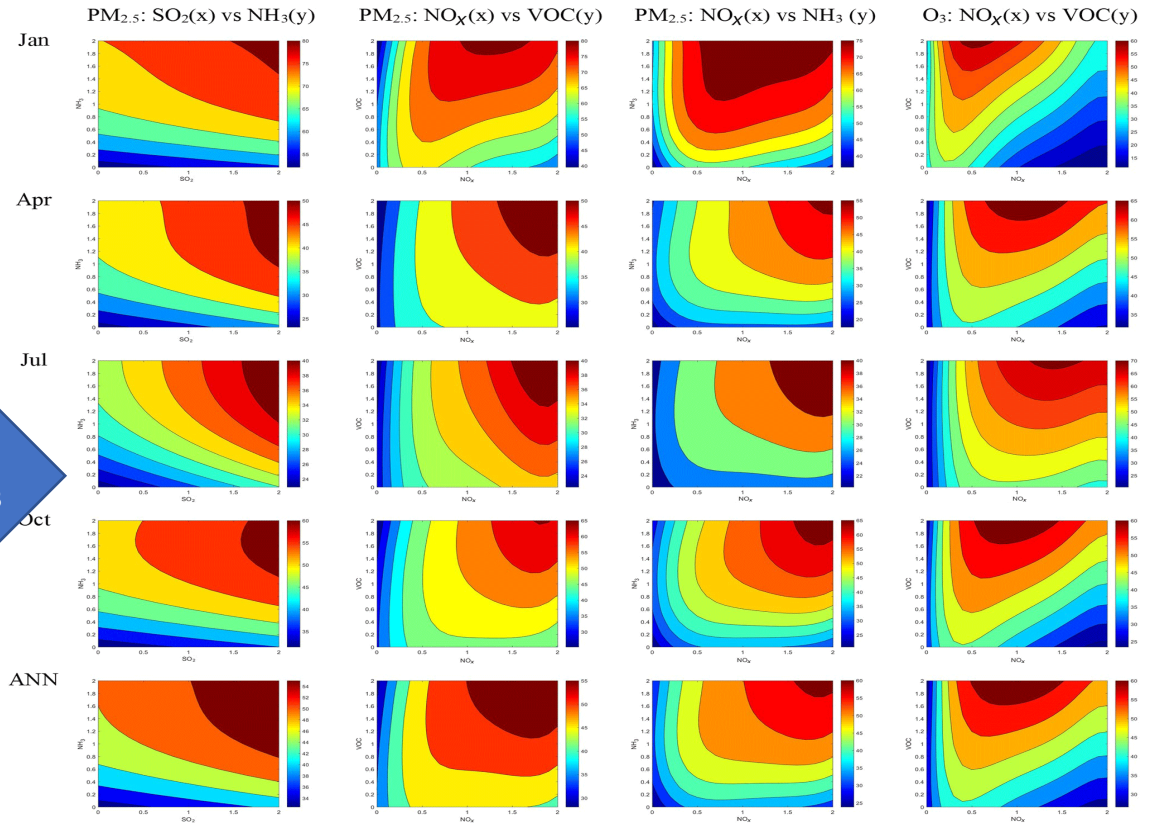
Response Surface Model (RSM)



Multidimensional

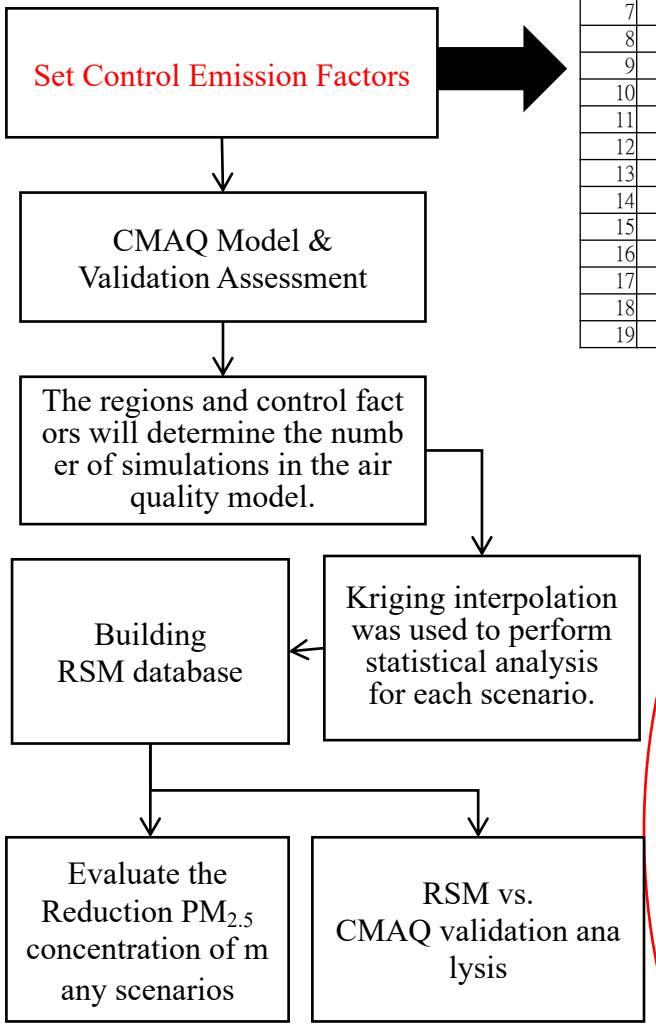


Multiple Pollutants



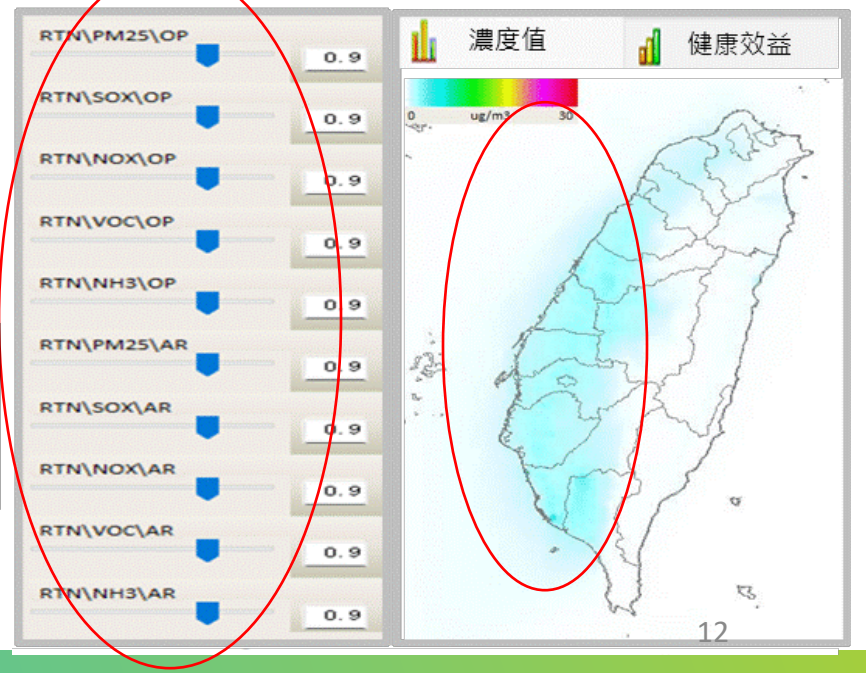
Runs and output of RSM

源別	行業別	$PM_{2.5}$	SO_x	NO_x	VOC
固定源	鋼鐵製造業				
	電力及燃氣供應業				
	化學材料及肥料製造業				
	電子零組件製造業				
	水泥及其製品製造業				
	塑膠製品製造業				
	金屬製品製造業				
	紡織業				
	石油及煤製品製造業				
	其他化學製品製造業				
	用水供應及污染整治業				
	紙漿、紙及紙製品製造業				
	其他非金屬礦物製品製造業				
	其他點源				



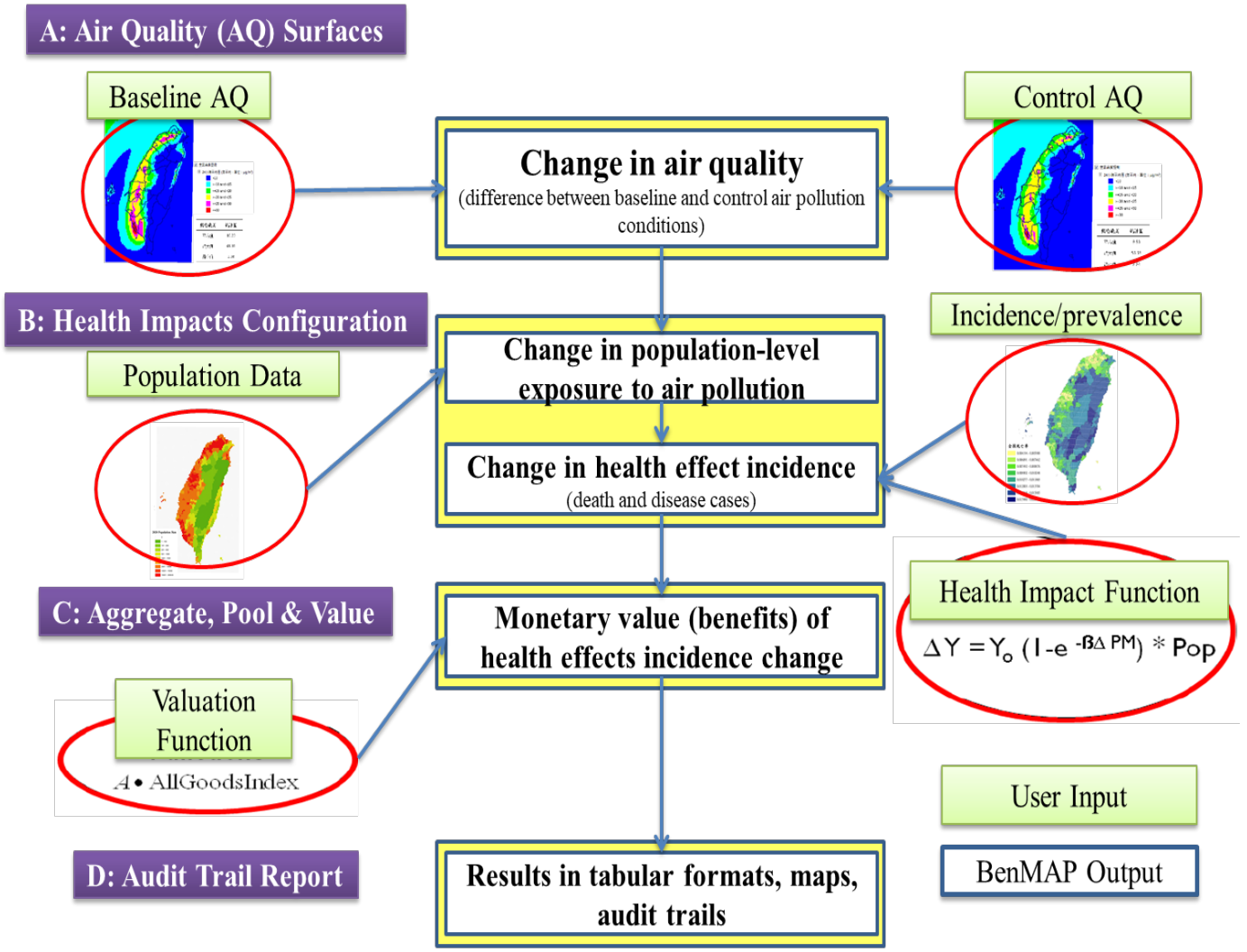
Run	PM25_HHO	SOX_HHO	NOX_HHO	VOC_HHO	PM25_LKC	SOX_LKC	NOX_LKC	VOC_LKC	PM25_CSG	SOX_CSG	NOX_CSG	VOC_CSG	PM25_KKG	SOX_KKG	NOX_KKG	VOC_KKG
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	3.53	0.54	2.34	2.34	0.45	2.85	1.18	1.18	1.32	0.51	0.66	3.85	2.34	1.19	3.48	0.51
3	0.86	1.01	0.52	0.52	1.88	2.26	0.23	0.23	1.76	2.92	3.44	1.28	3.81	3.07	3.73	2.92
4	3.31	2.31	0.71	0.71	0.85	0.71	2.70	2.70	3.60	1.31	0.70	1.16	2.92	2.11	0.40	1.31
5	3.63	0.07	1.57	1.57	0.07	1.41	2.20	2.20	3.18	1.68	1.82	2.85	1.46	0.74	2.39	1.68
6	2.32	1.60	3.35	3.35	3.49	0.42	3.69	3.69	3.20	2.75	0.53	3.44	2.45	2.20	0.54	2.75
7	2.84	3.25	0.94	0.94	3.81	3.31	3.86	3.86	0.62	3.40	0.28	1.34	2.06	0.82	1.55	3.40
8	1.36	3.89	1.70	1.70	2.37	1.30	1.78	1.78	0.45	3.57	0.20	0.53	3.04	1.67	2.96	3.57
9	3.02	3.48	0.60	0.60	3.66	3.90	3.22	3.22	2.03	0.39	3.90	0.21	0.06	1.36	2.47	0.39
10	2.60	3.84	1.17	1.17	3.43	0.66	3.40	3.40	1.12	2.07	1.02	2.40	2.76	2.45	0.38	2.07
11	0.75	1.35	2.19	2.19	1.17	2.45	0.80	0.80	2.30	0.10	3.65	2.45	0.87	1.99	2.14	0.10
12	0.33	3.69	0.18	0.18	3.04	1.67	1.42	1.42	3.45	0.92	0.04	0.60	0.30	2.60	0.95	0.92
13	0.50	0.30	3.52	3.52	1.51	1.93	0.46	0.46	0.82	0.76	1.15	3.69	3.67	1.74	3.22	0.76
14	1.14	3.34	3.07	3.07	2.25	3.40	1.95	1.95	0.31	0.21	2.75	3.57	1.87	3.99	2.62	0.21
15	0.61	2.89	0.87	0.87	0.33	3.80	2.99	2.99	2.45	0.62	1.99	1.85	1.11	3.70	2.93	0.62
16	0.05	2.73	3.82	3.82	2.62	0.83	0.36	0.36	3.06	3.62	2.26	1.61	2.57	1.53	1.17	3.62
17	1.03	0.52	3.10	3.10	1.34	1.14	3.47	3.47	0.08	2.60	1.21	2.03	3.94	0.15	1.91	2.60
18	2.44	0.71	0.10	0.10	2.73	2.66	2.11	2.11	0.76	3.08	1.69	1.04	0.14	0.99	1.64	3.08
19	2.68	2.50	3.33	3.33	0.62	0.94	3.10	3.10	3.88	3.86	1.38	2.65	3.27	3.38	0.76	3.86

Database of RSM



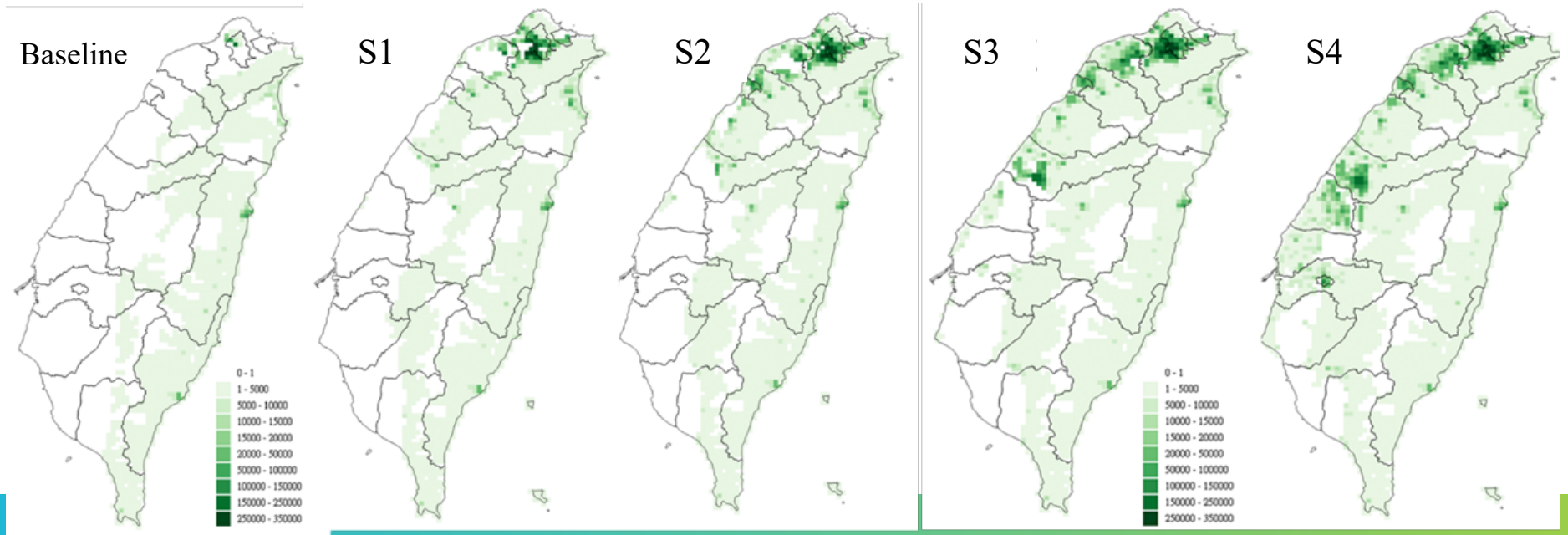
Environmental Benefits Mapping and Analysis Program (BenMAP)

Database	
Air pollutants	$PM_{2.5}$ MAX_8HOUR_MEAN、MAX_1HOUR_MEAN、MAX_8HOUR_MEDIAN、 MAX_1HOUR_MEDIAN、D24HOUR_MEAN。
Data on incidence, prevalence, and mortality rate	Taiwan's National Health Insurance Research Database (NHIRD)
Population	Population data of the smallest statistical areas from 2019 to 2024
Health Impact	$PM_{2.5}$ and O_3
Inflation data	2019~2024
Income growth adjustment data	2019~2024



Item		$PM_{2.5}$ ($\mu g/m^3$)	Avoid Death (95% CI)	Health Benefit (95% CI) unit：100 million (TWD)	Population in Attainment area
Scenarios	**Base Concentration (2013)**	**23.7**	-	-	**1,249,105**
S1	Taiwan's emissions have decreased by 20%.	16.3	7,489 (2,789~17,301)	8,525.46 (3,174.76~19,695.73)	7,200,214
S2	Taiwan's emissions have decreased by 30%.	14.8	8,901 (3,323~20,334)	10,132.73 (3,783.41~23,147.97)	10,741,980
S3	Taiwan's emissions have decreased by 40%	13.4	10,346 (3,873~23,361)	11,777.52 (4,408.52~26,594.08)	14,170,671
S4	Taiwan's emissions have decreased by 50%	11.9	11,786 (4,423~26,305)	13,416.78 (5,035.17~29,945.42)	17,218,776

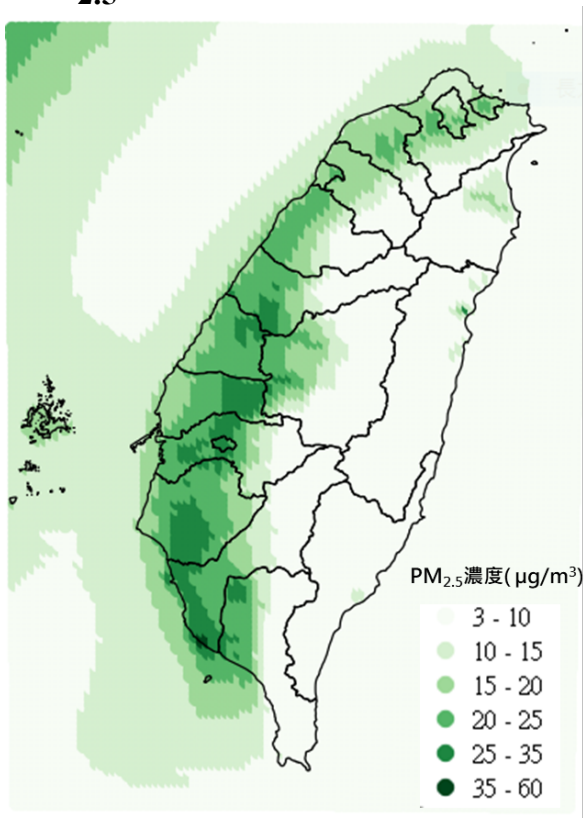
Output of BenMAP



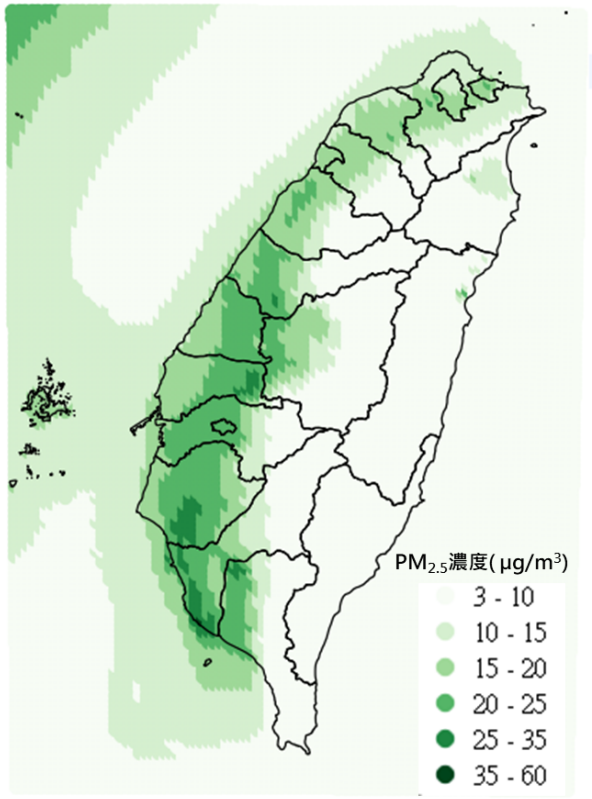
Applied examples of ABaCAS-Taiwan

Evaluation of Air Quality Improvement of Air Pollution Control Program 2016 → 2019

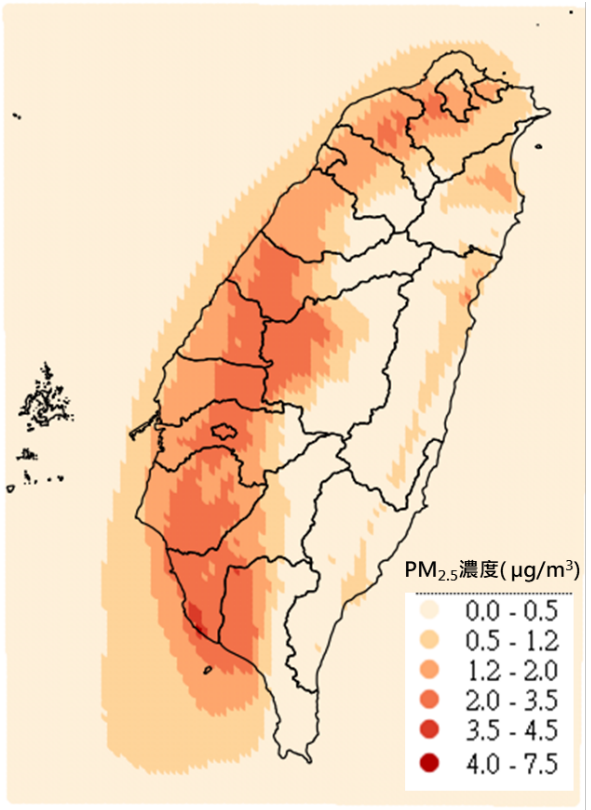
$PM_{2.5}$ Concentration



Baseline Year (2016)



After Implementation of the Air Pollution Control Program

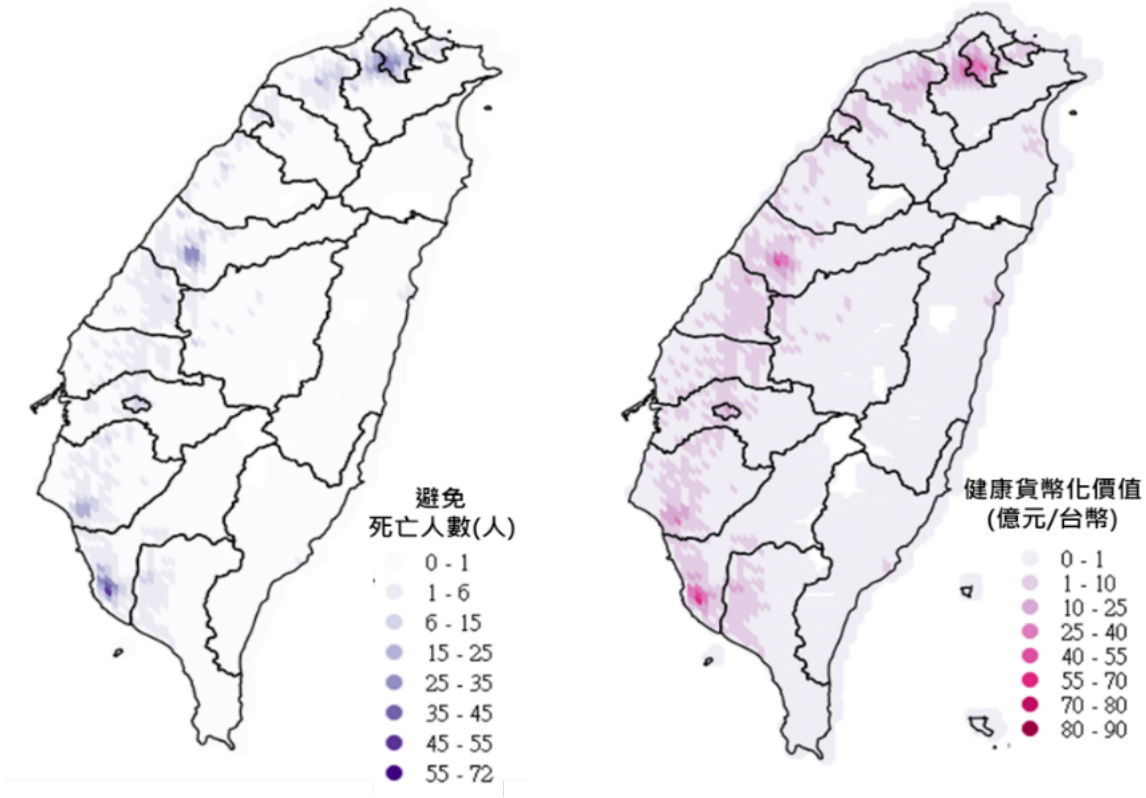


Improvement

Evaluation of the health benefit of Air Pollution Control Program 2016 → 2019

After implementing this program, the reduction in $PM_{2.5}$ concentrations could prevent 2,778 premature deaths due to exposure to air pollution (95% Confidence Interval (CI) = 767 to 5,545 deaths). The estimated monetized health benefits amount to approximately NT$342.8 billion (95% Confidence Interval (CI) = NT$94.6 billion to NT$684.4 billion).

The distribution map of health benefits (avoided deaths and monetized health value) after the implementation



Evaluation of the meteorological and background effects on air quality

Goal of Air Quality

$PM_{2.5}$ < 18μg/m³ — **Short-term** (2019-2020) → **$PM_{2.5}$ < 15μg/m³** — **medium-term** (2021-2025) → **$PM_{2.5}$ < 12μg/m³** — **long-term** (2025-2032)

Air quality area	2016	Air Pollution Control Program		2020		Reduction increased by an additional 20%		Reduction increased by an additional 57%	
	$PM_{2.5}$ observed concentration (μg/m³)	$PM_{2.5}$ concentration	Ratio	$PM_{2.5}$ observed concentration (μg/m³)	Ratio	$PM_{2.5}$ concentration	Ratio	$PM_{2.5}$ concentration	Ratio
North	19.8	17.9	10%	12.7	36%	15.1	24%	12.0	40%
Chu-Miao	20.1	18.5	8%	13	35%	16.1	20%	13.5	33%
Central	23.8	21.4	10%	16.3	32%	17.8	25%	14.0	41%
Yun-Chia-Nan	25.3	23.1	9%	18.4	27%	19.8	22%	16.3	36%
Kao-ping	22.9	20.4	11%	18.8	18%	16.7	27%	12.7	44%
Yilan	13	11.8	10%	9.4	28%	10.0	23%	8.0	28%
Hua-Tung	9.8	9.1	7%	7.6	22%	8.2	17%	7.2	27%
19 counties and cities average	19.2	17.5	9%	14.1	27%	14.8 (17.5~12.1)	22%	12.0 (14.2~9.8)	38%

Meteorological conditions and the impact of overseas reductions accounted for about 18%

Evaluation of 14+N Control Action Plan after executed

Table 4. Health benefit of each pollution control measure under the 14 air pollution control strategies (TAPCAP).

	Air Pollution Control Measure	Health Benefit [1] (100 Million NTD)	Percentage of Total Benefit (%)	Technical Cost (100 Million NTD)	Benefit/Cost Ratio
	1. Technical Measures				
T1	Retire 80,000 Stage 1 and Stage 2 diesel trucks	14,019	54.5	1863	7.5
T2	Strengthen air pollution controls in port areas (ship speed reductions, regulations on ship fuel usage, promoting the use of shore power)	3623	14.1	11	332.4
T3	Power facility regulations (stricter power sector regulations and standards)	3014	11.7	21	144.9
T4	Improve control of smoke from 7000 restaurants	751	2.9	4	183.1
T5	Eliminate 1 million 2-stroke motorcycles	616	2.4	193	3.2
T6	Improve control of smoke from agricultural waste-burning (reduce the area of open-air burning by 90%)	448	1.7	3	179.3
T7	Regulate boilers (accelerate the retirement of 5000 industrial boilers and 1000 commercial boilers)	416	1.6	540	0.8
T8	Install exhaust filters in 38,000 Stage 3 diesel trucks	317	1.2	41	7.8
T9	Install pollution control devices in state-owned businesses (e.g., Dragon Steel, China Steel Corporation, CPC Corporation)	299	1.2	268	1.1
T10	Change fuel-burning customs and traditions (increase centralized burning to 22,000 metric tons)	98	0.4	10	9.8
	Subtotal	23,601	91.7	2954	86.9
	2. Administrative Measures [1]				
M1	Tighten emission standards for automobiles that are 10 years or older, and set up air quality maintenance zones, where the entry of highly polluting vehicles is restricted or forbidden	758	2.9	-	-
M2	Control fugitive dust from riverbeds	685	2.7	-	-
M3	Regulations for fugitive dust from construction sites and stockpiles of dust-generating materials, increase conformance to 90%	642	2.5	-	-
M4	Promotion of electric vehicles (up to 2100 vehicles) for the transportation of fresh produce	18	0.1	-	-
	Subtotal	2103	8.2	-	-

[1] As the administrative measure does not involve the purchase and use of pollution control devices, they do not have an easily identifiable cost, which makes it impossible to calculate their B/C ratio.

Open Access Article

Using Costs and Health Benefits to Estimate the Priority of Air Pollution Control Action Plan: A Case Study in Taiwan

by Hsin-Chih Lai [1], Min-Chuan Hsiao [2,*], Je-Liang Liou [3], Li-Wei Lai [4], Pei-Chih Wu [1] and Joshua S. Fu [5]

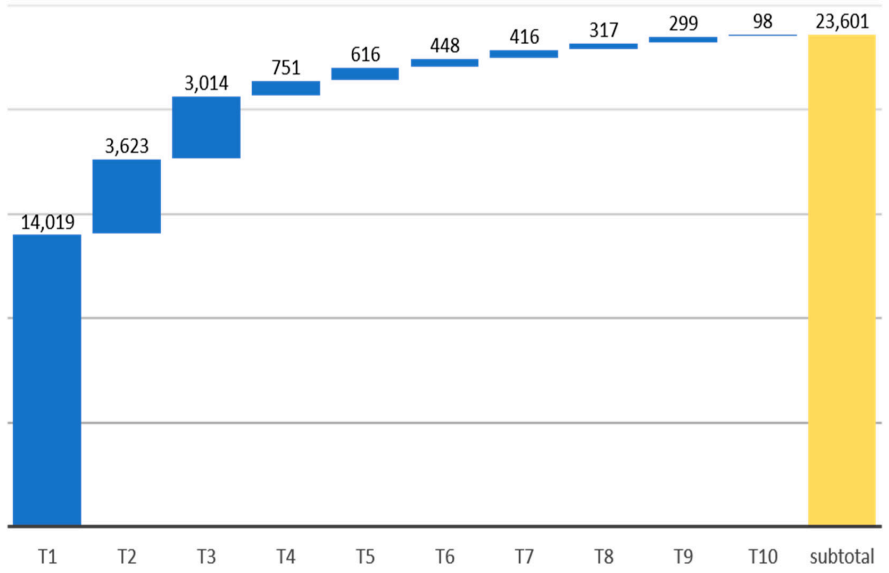
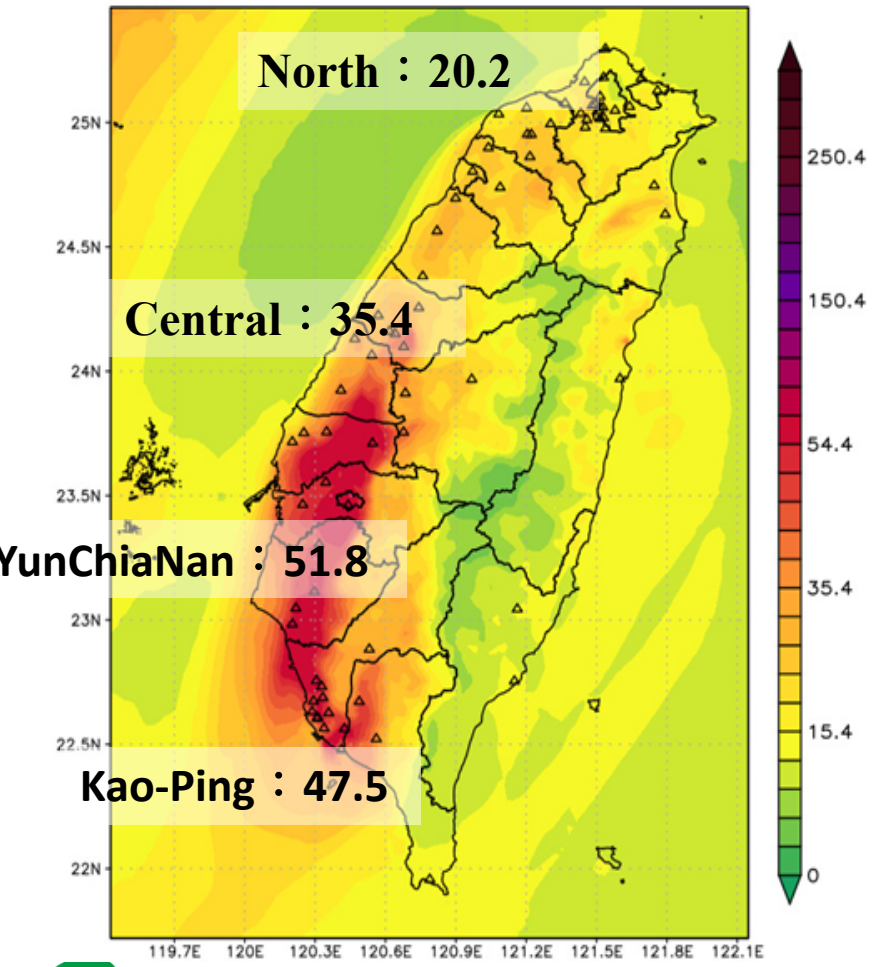


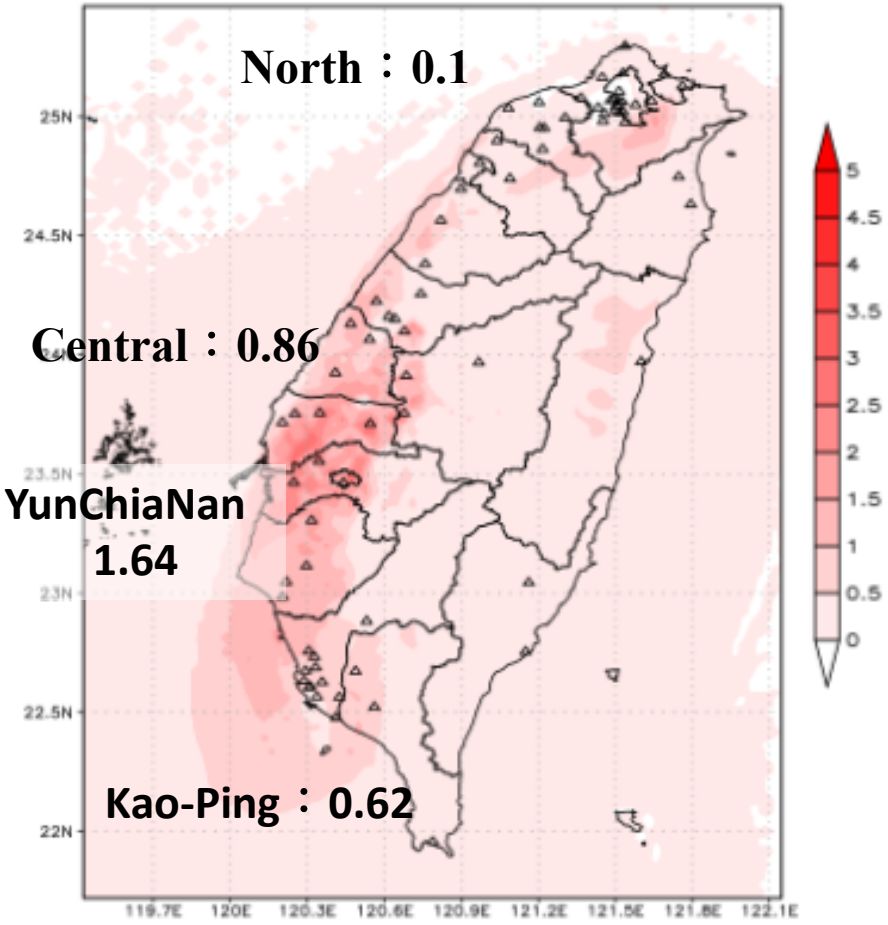
Figure 5. Health benefits of technical pollution control measures (billions of new Taiwan dollars (NTD)).

Evaluation of Multi-reduction Strategy – Power Plants

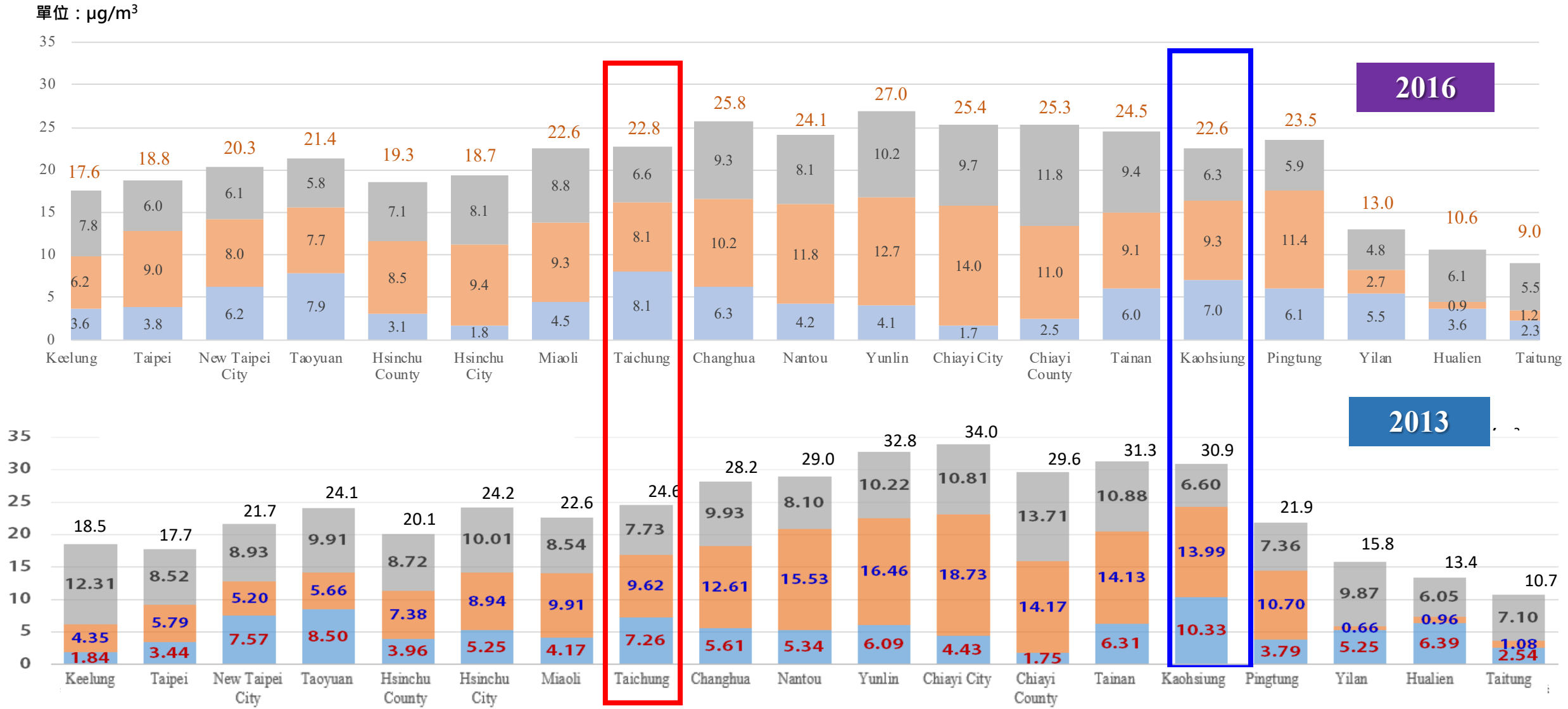


Coal Power Plant	Capacity (MW)	Reduction Ratio
Hsieh Ho	1,000	55%
Linkou	2,400	25%
Taichung	5,500	30%
Mailiao	1,800	55%
Hsinta	1,800	80%

Difference of $PM_{2.5}$ Concentration



Evaluate the effect of transboundary to support regulation setting



Note: Other emission include long-range transport and offshore ships

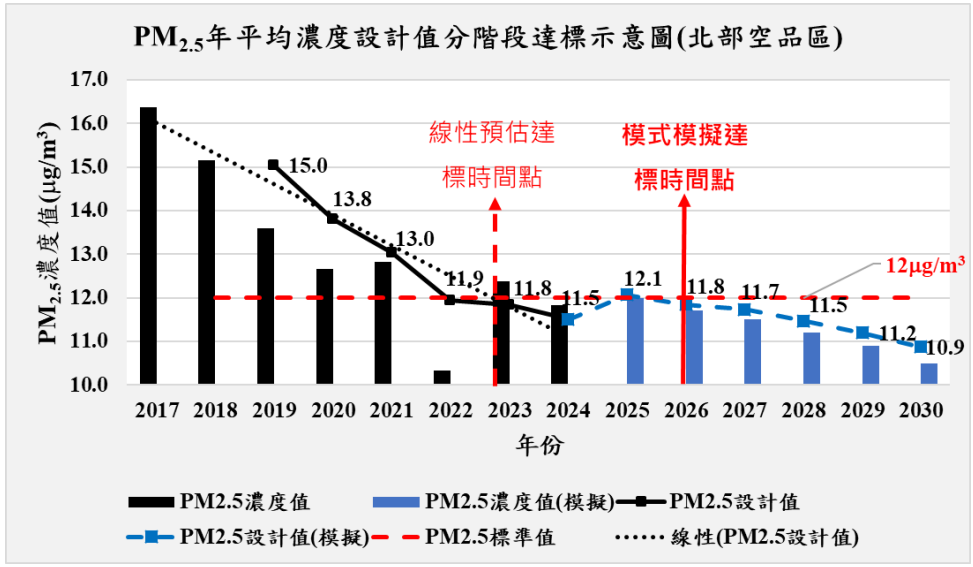
縣市	Keelung	Taipei	New Taipei City	Taoyuan	Hsinchu County	Hsinchu City	Miaoli	Taichung	Changhua	Nantou	Yunlin	Chiayi City	Chiayi County	Tainan	Kaohsiung	Pingtung	Yilan	Hualien	Taitung
$PM_{2.5}$ Concentration in 2013	18.5	17.7	21.7	24.1	20.1	24.2	22.6	24.6	28.2	29.0	32.8	34.0	29.6	31.3	30.9	21.9	15.8	13.4	10.7
long-range transport	66.5%	48.0%	41.1%	41.2%	43.5%	41.4%	37.7%	31.4%	35.3%	28.0%	31.2%	31.8%	46.3%	34.7%	21.3%	33.7%	62.6%	45.2%	66.2%
Sources from other cities	23.5%	32.6%	24.0%	23.5%	36.8%	37.0%	43.8%	39.1%	44.8%	53.6%	50.2%	55.1%	47.8%	45.1%	45.2%	49.0%	4.2%	7.1%	10.0%
Keelung	9.9%	1.3%	4.6%	0.0%	0.0%	0.0%	0.3%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.3%	0.2%	0.5%	0.3%	0.1%
Taipei	2.1%	19.4%	7.1%	2.5%	1.1%	0.0%	0.9%	1.0%	1.1%	0.8%	0.9%	0.9%	1.1%	1.1%	0.8%	0.6%	0.5%	0.2%	0.1%
New Taipei City	9.5%	14.9%	34.9%	11.1%	5.2%	3.6%	3.6%	2.4%	2.7%	2.1%	2.3%	2.3%	2.5%	2.5%	1.8%	1.4%	1.4%	0.4%	0.2%
Taoyuan	2.4%	5.1%	4.9%	35.3%	9.2%	10.2%	5.4%	3.3%	4.0%	2.6%	2.9%	2.9%	3.5%	3.4%	2.6%	2.0%	0.5%	0.2%	0.1%
Hsinchu County	0.4%	0.4%	0.1%	1.4%	19.8%	10.2%	4.0%	2.4%	2.1%	1.6%	1.5%	1.4%	1.5%	1.5%	1.1%	0.8%	0.2%	0.1%	0.1%
Hsinchu City	0.1%	0.9%	0.0%	0.0%	1.9%	21.7%	2.1%	1.0%	1.1%	0.6%	0.7%	0.8%	0.9%	0.9%	0.6%	0.4%	0.2%	0.1%	0.1%
Miaoli	0.6%	0.9%	0.2%	0.9%	4.2%	2.5%	18.5%	5.3%	3.9%	3.1%	2.7%	2.4%	2.2%	2.2%	1.7%	1.3%	0.2%	0.1%	0.1%
Taichung	1.5%	2.1%	1.9%	2.9%	4.0%	5.0%	10.0%	29.5%	16.6%	14.7%	10.9%	7.1%	11.3%	6.8%	4.3%	3.4%	0.2%	0.0%	0.2%
Changhua	0.8%	1.1%	0.8%	1.1%	1.8%	1.6%	3.2%	5.5%	19.9%	8.1%	11.5%	7.3%	6.1%	5.6%	4.5%	3.7%	0.4%	0.8%	0.3%
Nantou	0.2%	0.2%	0.1%	0.4%	0.5%	0.6%	1.5%	2.2%	1.4%	18.4%	2.7%	1.4%	0.7%	1.5%	0.9%	0.7%	0.0%	0.0%	0.1%
Yunlin	0.9%	1.2%	0.9%	1.2%	2.2%	1.5%	2.8%	3.7%	3.7%	5.0%	18.6%	8.4%	9.1%	6.4%	5.2%	4.2%	0.4%	1.1%	0.4%
Chiayi City	0.2%	0.2%	0.2%	0.2%	0.6%	0.2%	0.6%	0.6%	0.3%	0.6%	0.8%	13.1%	0.5%	0.7%	1.0%	1.0%	0.2%	0.7%	0.2%
Chiayi County	0.3%	0.4%	0.3%	0.3%	0.7%	0.4%	1.1%	1.5%	1.6%	2.0%	3.3%	8.5%	5.9%	5.0%	3.7%	3.3%	0.2%	0.5%	0.2%
Tainan	0.9%	0.8%	0.6%	0.1%	1.5%	0.2%	2.5%	3.3%	2.2%	4.2%	3.5%	5.7%	4.1%	20.2%	11.2%	7.7%	0.0%	0.0%	0.3%
Kaohsiung	0.8%	0.4%	0.0%	0.0%	1.1%	0.0%	2.7%	3.8%	1.8%	4.9%	3.6%	3.1%	2.1%	5.5%	33.4%	17.6%	0.2%	0.2%	1.6%
Pingtung	1.3%	1.7%	1.6%	2.0%	2.4%	2.0%	2.8%	2.4%	1.4%	2.9%	2.2%	2.3%	1.6%	1.4%	5.3%	17.4%	0.0%	0.0%	0.5%
Yilan	1.1%	0.8%	1.0%	0.5%	0.5%	0.4%	0.3%	0.2%	0.3%	0.2%	0.2%	0.1%	0.2%	0.2%	0.1%	0.1%	33.3%	1.4%	0.3%
Hualien	0.5%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	47.7%	5.2%
Taitung	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.4%	0.0%	1.3%	23.7%

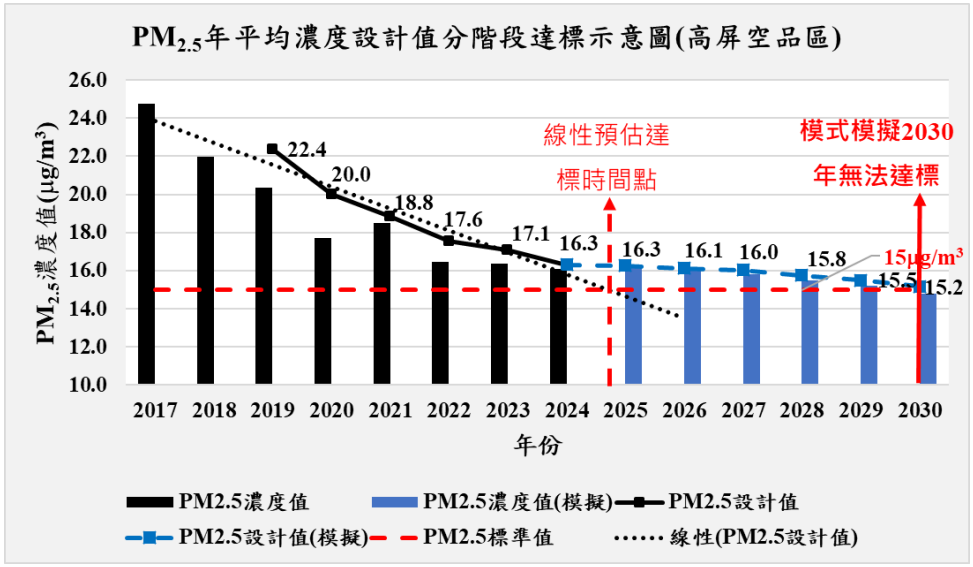
Future Application of ABaCAS-Taiwan

Application of Design Value(DV) on setting attainment strategy

Simulated Control Scenarios → **Calculate future Design value** → **Accomplish Goal** → **Adjust control strategies**

Phase III Plan + Energy Transition Scenarios





Determine and Run ← Achieving the standard → **Strengthen and Reset**

Yes / No

Co-Benefit of Air Quality & Net Zero

2025 New Air Quality Standards

Air Quality Index (AQI)

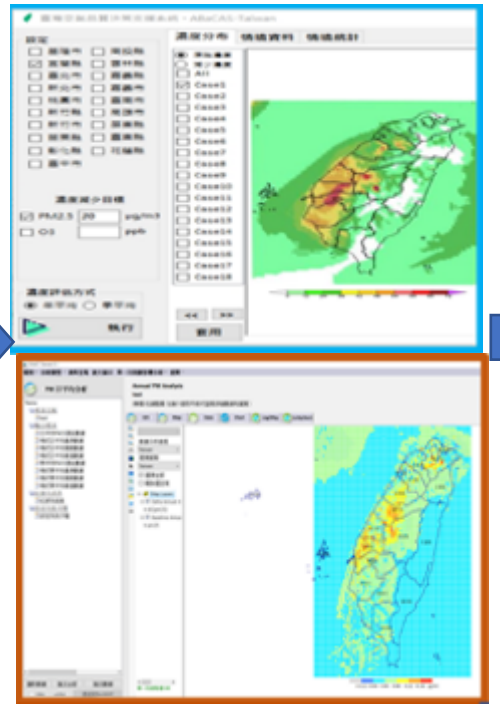
AQI	O_3 (ppm) 8h	O_3 (ppm) 1-h[1]	$PM_{2.5}$ (μg/m³) 24-h	PM_{10} (μg/m³) 24-h	CO (ppm) 8-h	SO_2 (ppb) 1-h	NO_2 (ppb) 1-h
Good 0 ~ 50	0.000 - 0.054	-	0.0 -12.4	0 -30	0 - 4.4	0 -8	0 -21
Moderate 51 ~ 100	0.055 - 0.070	-	12.5 – 30.4	31 – 75	4.5 - 9.4	9 – 65	22- 100
Unhealthy for Sensitive Groups 101 ~ 150	0.071 - 0.085	0.101 – 0.134	30.5 – 50.4	76 – 190	9.5 - 12.4	66 – 160	101-360
Unhealthy 151 ~ 200	0.086 - 0.105	0.135- 0.204	50.5 – 125.4	191 – 354	12.5 - 15.4	161- 304[3]	361-649
Very Unhealthy 201 ~ 300	0.106 - 0.200	0.205 - 0.404	125.5 – 225.4	355-424	15.5 - 30.4	305-604[3]	650-1249
Hazardous 301 ~ 400	(2)	0.405 - 0.504	225.5 – 325.4	425 - 504	30.5 - 40.4	605-804[3]	1250-1649
Hazardous 401 ~ 500	(2)	0.505 - 0.604	325.5- 500.4	505-604	40.5 - 50.4	805-1004[3]	1650-2049

New Targets for Greenhouse Gas Reduction

Compliance Policy Scenario Planning

- **Air Pollution Control Plans**
- **Energy Scenarios**
- **Climate Scenarios**

ABaCAS-Taiwan



Feasibility and Effectiveness Assessment

- **Feasibility of Air Quality Policies**
- **Co-benefits of Air Quality and Net Zero Co-benefits**

Control strategies and feedback adjustments based on scientific data and co-benefit feasibility assessments

Utilizing AI technology to reduce the time of model simulations

Kriging

Utilizing AI technology to reduce the number of simulations

Model Runs

>1000runs

>100runs

>20runs

1 run

Air pollutant

Single scenario (brute-force)

Emissions

AQM

Air pollutant

Instant AQ responses to emissions change

Emissions Change

RSM

Region A

Region B

- Chemistry
- Transport
- Indirect

Instant AQ responses to multi-region sources

Region A

Region B

Region C

E-RSM

Pollutant A (PM)

Pollutant B (O_3)

RSM w/ Temporal Polynomial Functions

Multi-pollutant responses based on polynomial functions

$$\Delta Conc = \sum_{i=1}^{n} X_i \cdot (E_{NO_x})^{a_i} \cdot (E_{SO_2})^{b_i} \cdot (E_{NH_3})^{c_i} \cdot (E_{VOCs})^{d_i} \cdot (E_{PO}$$

NO_x NH_3 POA SO_2 VOC

pf-RSM

CMAQ Input

Emission
Meteorology
Boundary
Land-use

生成網路

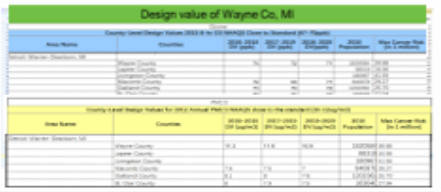
Deep RSM

ABaCAS-Taiwan with AI - Web Version

"Nexus" aims at providing a common platform for multi-pollutant analysis over a selected area (nation/State/local/community) to support AQ planning

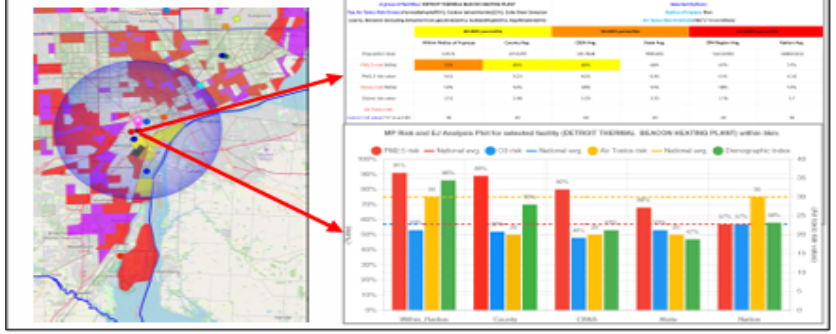
1. AQ Nature

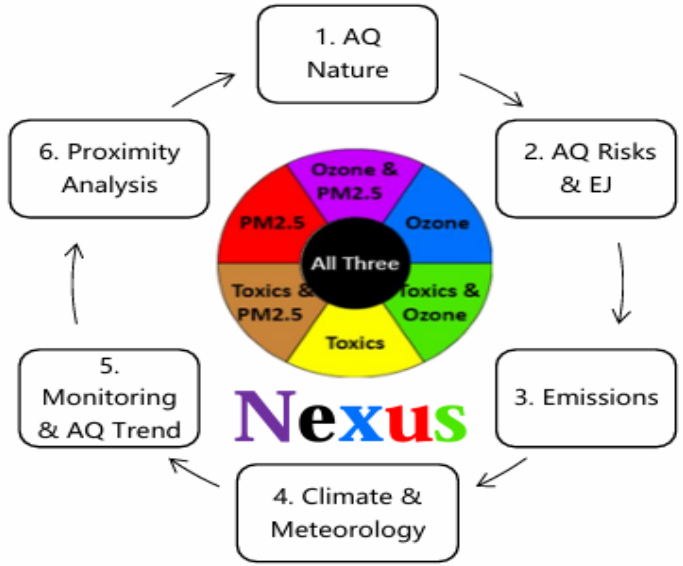
- Pollutants of concern and AQ levels in the area
- Attainment/nonattainment status of the area



6. Proximity Analysis

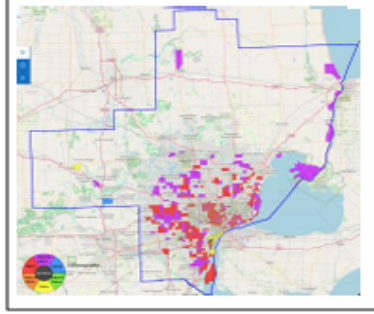
- Identify MP risks in close proximity to facility, monitor and/or community of interest

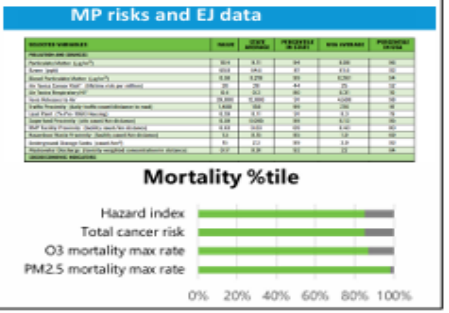




2. AQ Risks & EJ

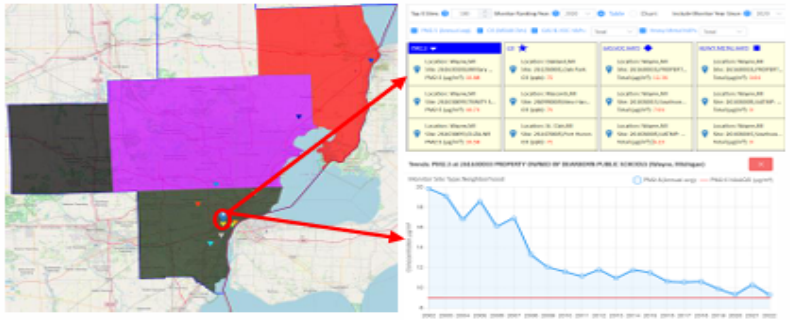
- Identify MP risks and EJ issues of concern over national, regional, State, local and community levels





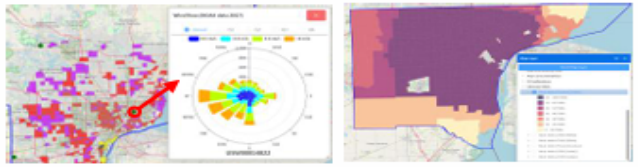
5. Monitoring & AQ Trend

- Ambient AQ data and historical AQ trend
- Identify areas in NAAQS violation



4. Climate & Meteorology

- Identify climate concerns/risks
- Identify favorable meteorological conditions leading to poor air quality



3. Emissions

- Identify key emission sources, categories, sectors and emitted pollutants and GHGs

Thank You