



Environmental Protection Administration, Executive Yuan, ROC (Taiwan)
Soil and Groundwater Pollution Remediation Fund Management Board

Introduction to Soil and Groundwater Pollution Remediation Act (SGPRA) in Taiwan

2016.03.28

Outline

1 SGPRA Main Structure

2 Determination of Soil & Groundwater Contamination and Responsible Parties

3 Contaminated Site Management

4 Pollution Remediation Fees Disbursement

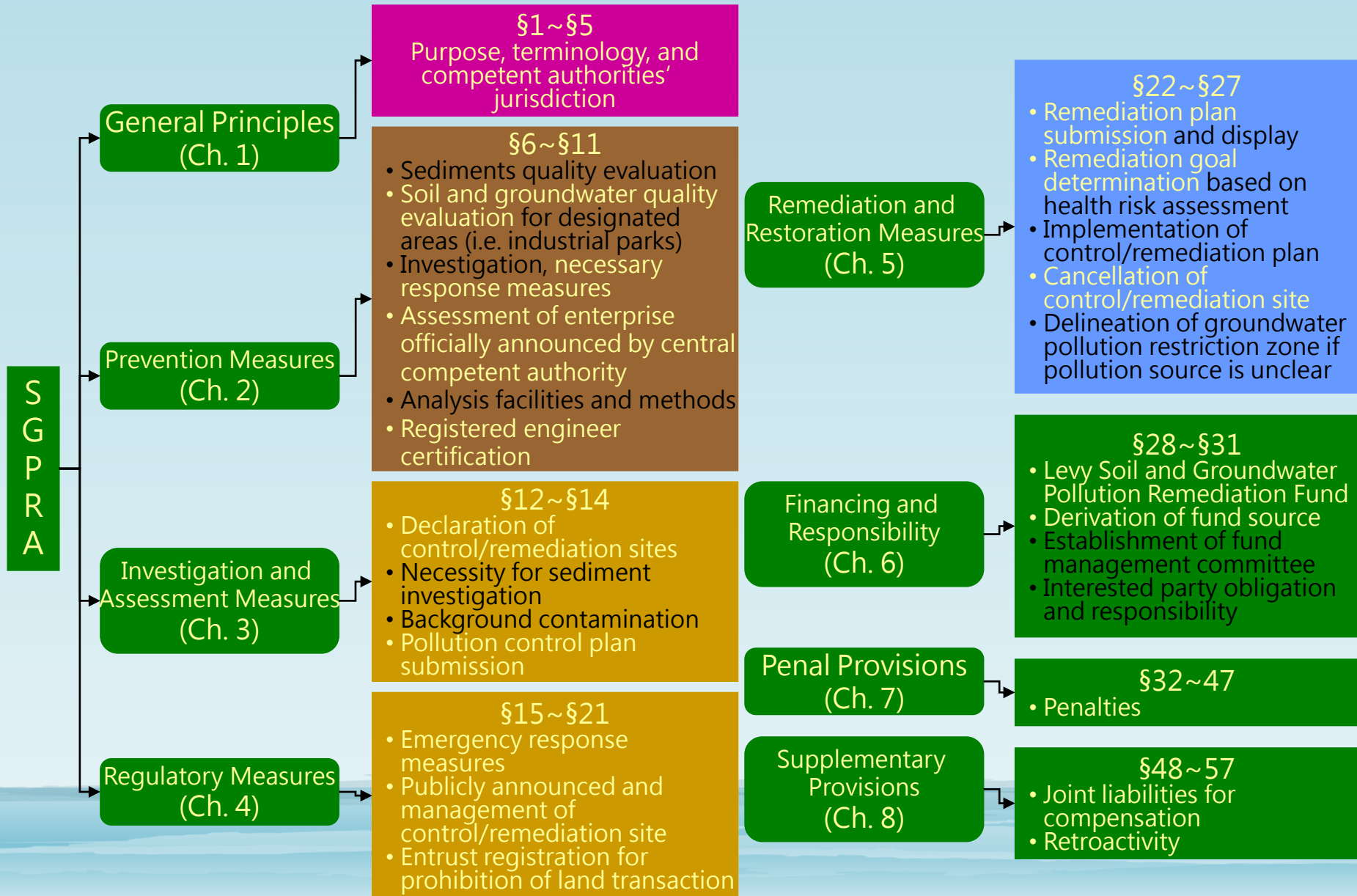
5 Sediment Monitoring and Management

6 Enterprise Officially Announced by Central Competent Authority

7 Brownfield Development

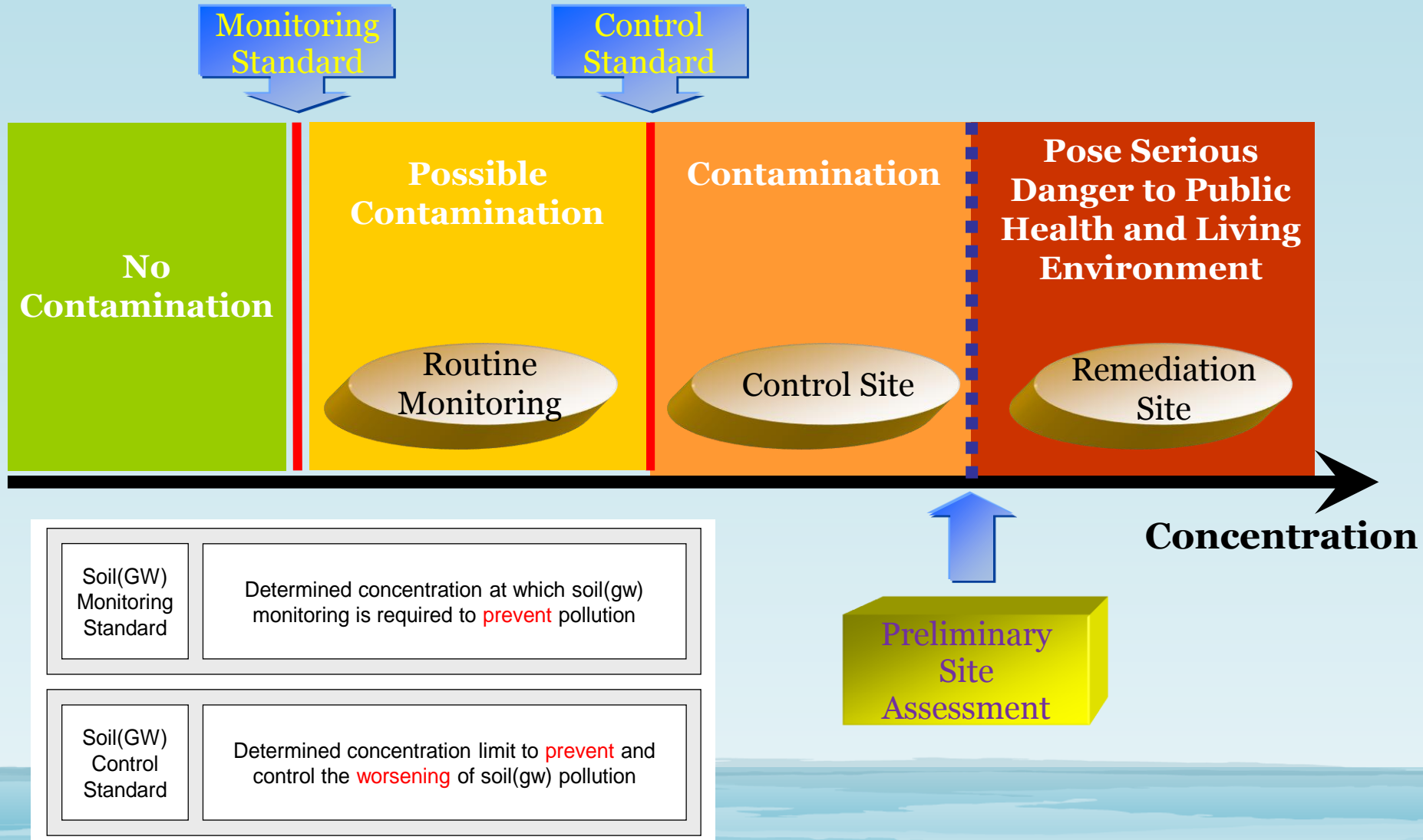
SGPRA Main Structure

SGPRA Main Structure



Determination of Soil & Groundwater Contamination and Responsible Parties

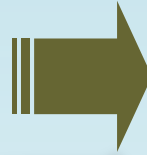
Determination of Soil & Groundwater Contamination



Definition of Contaminated Site

Pollution Control Site

A place where the source of soil or groundwater pollution has been clearly identified and the pollutants therein do not naturally exist in the environment but have occurred through scouring by rainwater, dispersal, deposition, or irrigation resulting in soil or groundwater pollution that meets the standards for control



Pollution Remediation Site

A pollution control site which has been reviewed and declared by the central competent authority as a Pollution Remediation Site based on its preliminary assessment that the site is likely to seriously endanger public health and the living environment



Definition of Polluter

Polluter

A person causing soil pollution or groundwater pollution through any of the following acts:

- leaking or discarding of pollutants;
- illegally discharging or injecting pollutants;
- brokering or allowing the leaking, discarding, illegal discharge or injection of pollutants;
- failing to dispose of pollutants pursuant to applicable laws or regulations

Potential Polluter

A person who causes pollution to accumulate in the soil or groundwater resulting in soil or groundwater pollution due to the following actions:

- discharging, injecting, spreading of pollutants;
- permitting or agreeing to the discharge of wastewater into irrigation and drainage systems or irrigation and water catchment areas



Responsibility -

- Control Site -
 - Investigation, preparing and executing pollution control plan
- Remediation Site -
 - Preparing and executing contamination investigation and assessment plan
 - Preparing and executing pollution remediation plan
- Conducting emergency response measures

Definition of Polluter

Interested Party of the Polluted Land

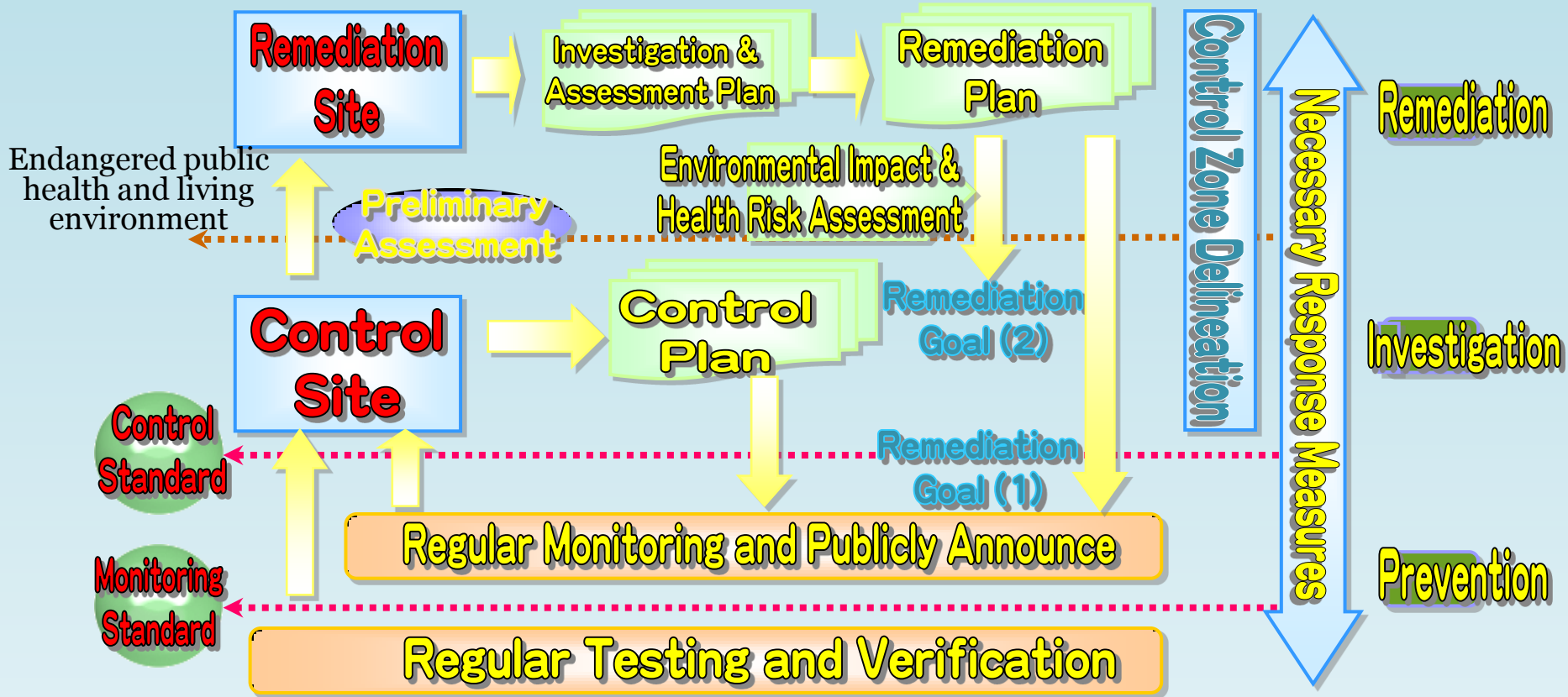
A person who is not a polluter of the land but is a user, administrator, or owner of the land when the land is declared a pollution remediation site



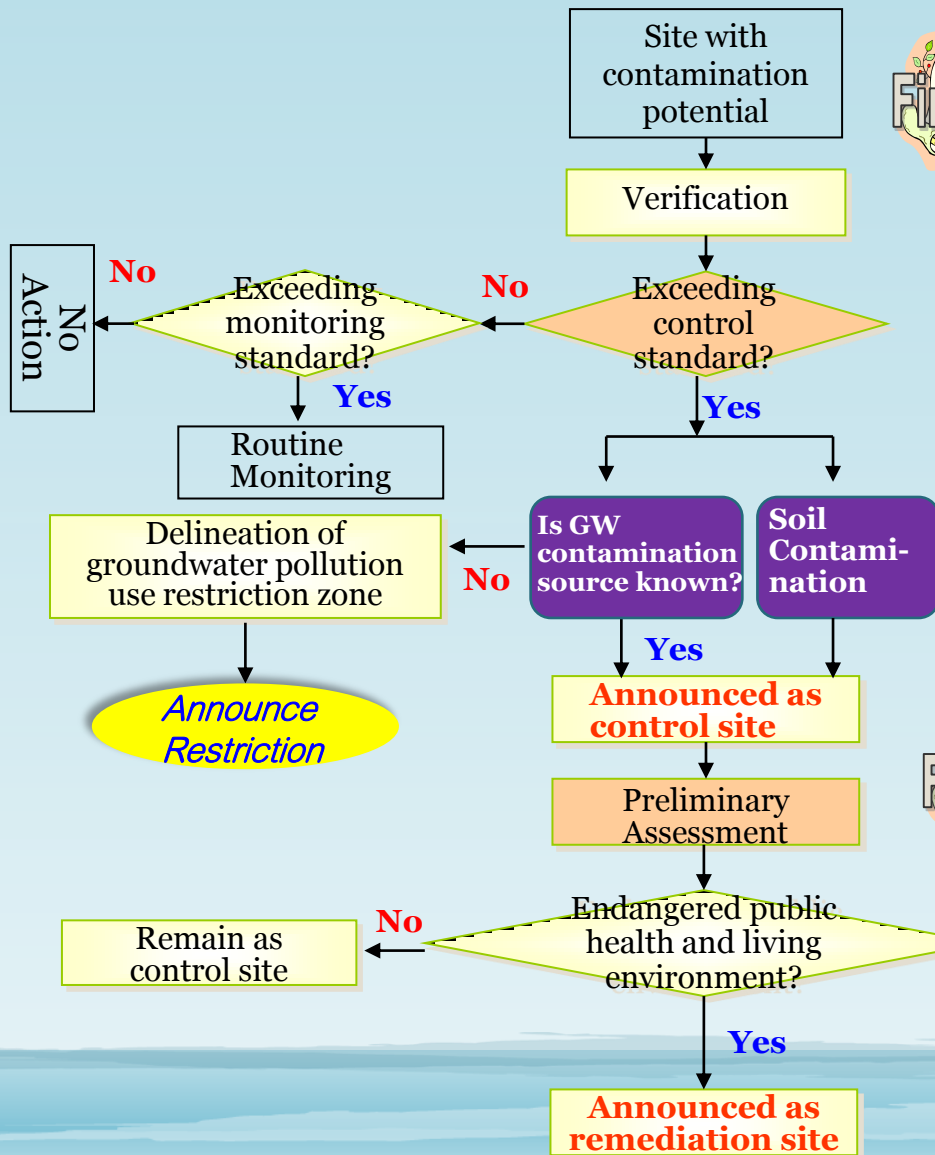
- Failure to demonstrate due diligence as a good manager:
 - Shall bear joint payment responsibility with polluter and potential polluter
 - Shall be fined when cause land to be publicly declared as control or remediation site

Contaminated Site Management

Determination of Contaminated Site



Publicly Announcing Procedures and Related Fines



Polluter

- Fine \$100K~\$500K if announced as **control site**; \$150K~\$750K as **remediation site**
- Announce personal or polluter name and shall order to receive 4-hr lesson concerning relevant laws and regulation
- If fail to attend, fine \$50K~\$250K per violation until attending



Interested Party of the Polluted Land

Failure to demonstrate due diligence as a good manager :

- Fine \$50K~\$250K if announced as **control site**; \$100K~\$500K as **remediation site**

Land Registration and Prohibition of Land Disposal

Register Information

● Control Site

- Enter in land register

● Remediation Site

- Enter in land register
- Prohibit land disposal

When compulsory auction procedures have been implemented for the land, such procedures may be cancelled

➤ Land Register:

- ⊕ Name, personal identification document number, address of the landowner
- ⊕ Land markings
- ⊕ Date of announcement as a control or remediation site and document number

➤ Prohibit land disposal:

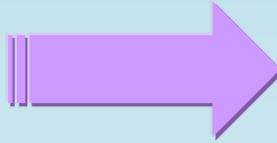
- ⊕ Scope of right
- ⊕ Legal basis for prohibition of disposal and background
- ⊕ Prohibition of land disposal via transfer, subdivision, or establishment of encumbrance



Delineation of Pollution Control Zone and Other Restrictions

Competent authority shall delineate and publicly announce soil and groundwater pollution control zones based on the situation or scope of the soil and groundwater pollution of the control or remediation sites

With the exception of control, remediation or other pollution improvement plans



Unless receive approval from central competent authority

Prohibited Actions

- Putting pollutants into soil
- Injecting wastewater and sewage into a groundwater body
- Discharging wastewater and sewage into soil
- Other control activities officially announced by the competent authority

Prohibited Land Use Activities

- Development actions prescribed in the Environmental Impact Assessment Act
- New construction, extension, alteration, renovation, or demolition of buildings or facilities not required in a control, remediation or other pollution improvement plans
- Other land use activities that have been designated by the central competent authority as affecting the health and living environment of residents

Delineation of Pollution Control Area and Other Restrictions



Other Prohibited Actions

- When necessary, competent authority may **prohibit the growing of edible crops, the raising of poultry or livestock, or the cultivating or harvesting of marine animals and plants**
- **Drinking or use of groundwater, or utilization as a drinking water source** may be prohibited, within groundwater pollution control zone



- Polluter, potential polluter, interested party of the polluted land: \$150K~\$750K
- Others:\$100K~\$500K
- In severe circumstances, orders may be issued for the suspension of activities, work, or business. When necessary, orders may also be issued for the termination of business



Work Approval Application

When engaging in **excavation, backfill, temporary storage, and transport of soil or groundwater extraction** within pollution control zone shall submit **cleanup or pollution prevention plan** to the competent authority, and may implement work only after approval.



- \$100K~\$500K, shall be notified to make corrections within a time period; those failed to make corrections by the deadline shall be fined per violation

Necessary Response Measures

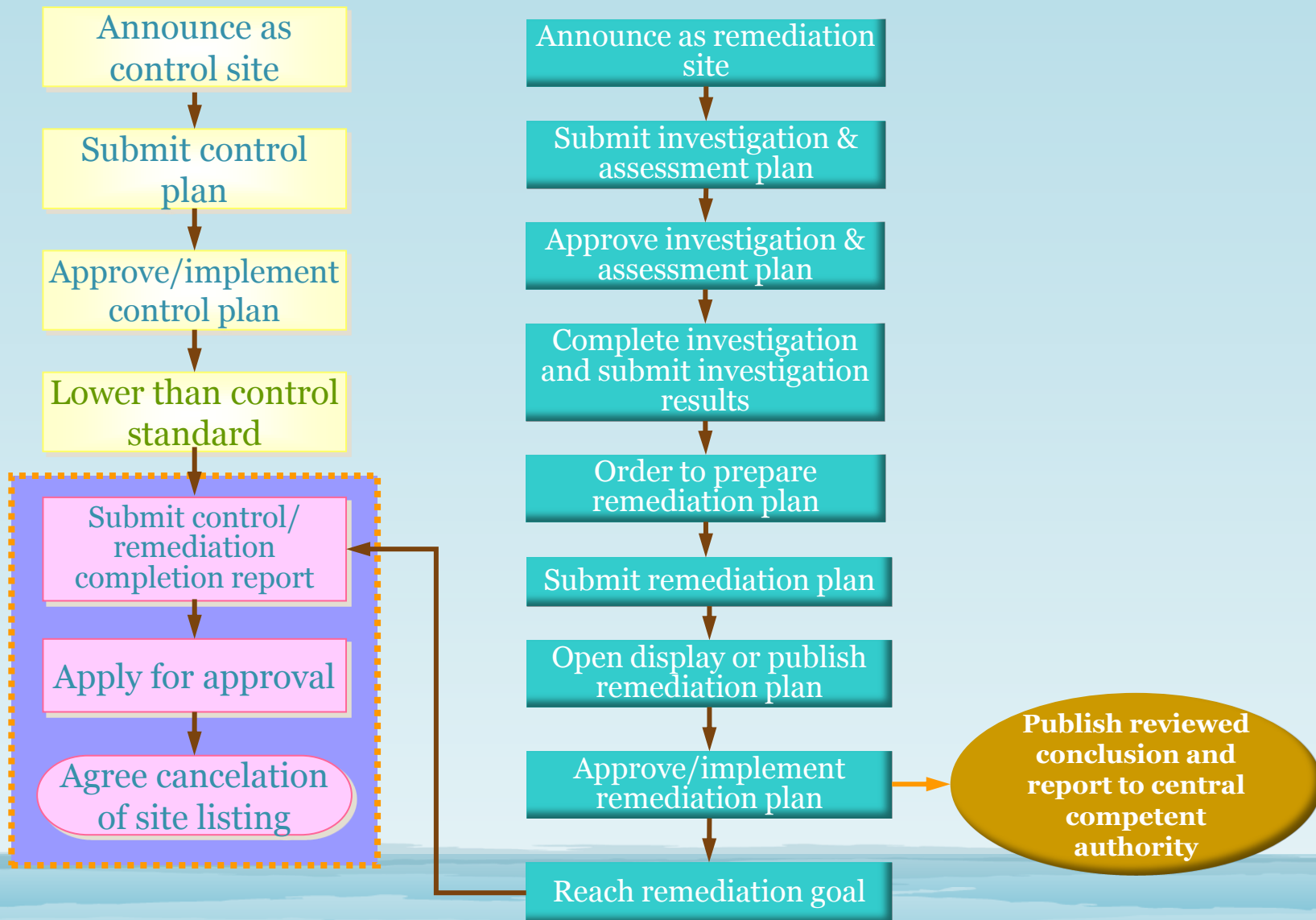
- Order polluters to cease activities, suspend business or partially or completely suspend work
- Investigate groundwater pollution and search liable persons for such pollution; inform residents to stop using groundwater and restrict drilling of wells for groundwater
- Supply drinking water or notify tap water authorities to provide access to tap water supply as top priority
- Erect notification signs or fences
- Testing contaminated or suspecting contaminated agricultural or aquaculture products; when necessary, control or destroy such products and provide appropriate compensation or restrict cultivation of specific crops
- Evacuate residents or limit people's activities
- Remove or dispose pollutants
- Other response measures as necessary

May order polluter, potential polluter, interested party of the polluted land, or commission a third party to implement



- Not adopting necessary response measures or fail to comply with orders given by competent authority:
 - Causing human death, receive life imprisonment or minimum 7 years imprisonment and may be fined maximum of \$5 M
 - Causing severe injury, receive 3 to 10 years imprisonment and may be fined maximum of \$3 M
- Fail to comply competent authorities' order to execute necessary response measures, shall be fined \$200K~\$1M per violation

Execution of Control and Remediation Plan



Registered Engineer Certification

Certified Documents:

- Pollution Control Plan
- Pollution Remediation Plan
- Assessment Investigation Data
- Pollution Investigation and Assessment Plan

Certified Engineer:

Environmental engineer,
applied geological engineer
or other relevant
professional engineer

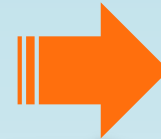
Control Site – submit pollution control plan

Polluter or Potential Polluter

- Shall responsible to complete investigation work within 6 months and draft pollution control plan, which shall be implemented after being submitted to and receiving the approval from competent authority

Interested Party of Polluted Land

- May draft pollution control plan before competent authority takes appropriate improvement measures, and the plan may be implemented after receiving the approval from competent authority



Failing to submit shall be fined \$1 M~\$5 M and shall be notified to make corrections within a limited period; those still failed to make corrections by deadline shall be fined per violation

Remediation Site - submit investigation & assessment plan

Polluter or Potential Polluter

Must submit a soil and groundwater pollution investigation & assessment plan within 3 months of notification, and must implement the plan after approval by the competent authority



Failing to submit or implement, shall be fined \$200K~\$1 M and shall be notified to make corrections within a limited period; those still failed to make corrections by deadline shall be fined per violation

Remediation Site - submit remediation plan

Polluter or Potential Polluter

In pursuant to the investigation and assessment results, soil and groundwater pollution remediation plan shall be submitted within 6 months after notification by the competent authority, and shall be implemented after receiving approval



Failing to submit shall be fined \$1 M~\$5 M and shall be notified to make corrections within a limited period; those still failed to make corrections by deadline shall be fined per violation

Remediation Site - remediation plan change

- Implementer may apply for remediation plan change
- The special municipality, county, or city competent authority may also change the remediation plan on its own, or order the plan implementer to do so, in view of the facts



Enforcement Rule

Items need to be reviewed

- Information concerning plan submitter
- Pollutants, scope of pollution and severity of pollution
- Remediation goal
- Remediation method
- Land use after remediation
- Self-verification method and sampling and testing plan after remediation
- Remediation timeframe

Items only need to be reported

- Information concerning plan writer, and implementer
- Plan outline
- Basic site information
- Current site and pollution status
- Pollution monitoring methods
- Clean-up or pollution control
- Site health and safety management
- Estimated funding

Remediation Site - develop remediation goal

Remediation Goal:

- Pollution concentration less than soil and groundwater pollution control standard
- If factors, such as geological conditions, pollutant characteristics, or pollution remediation technologies preclude remediation until pollutant concentrations are less than soil and groundwater pollution control standards, soil and groundwater pollution remediation goals based on **environmental impact and health risk assessment results** may be submitted after requesting and obtaining the central competent authority's approval

- Competent authorities must hold public hearings before approving remediation plans containing goals that are not less than control standards

Plan Submittal, Implementation Deadline and Extension

Control Plan

- Special municipality, county, or city competent authority shall order the polluter or potential polluter to complete investigation work **within 6 months** and draft a pollution control plan
- May apply for **extension**; only **1 extension** may be granted

Investigation & Assessment Plan

- Polluter or potential polluter must submit soil and groundwater pollution investigation & assessment plan **within 3 months** of notification by the special municipality, county, or city competent authority
- May apply for **extension**; only **1 extension** may be granted

Remediation Plan

- Polluter or potential polluter shall submit a soil and groundwater pollution remediation plan **within 6 months** after notification by the special municipality, county, or city competent authority
- **Apply for extension**
 - 1st time : apply to special municipality, county, or city competent authority 30~60 days before deadline
 - 2nd time : apply to central competent authority 30~60 days before deadline

Fines

- \$1M~\$5M for failing to submit control/remediation plan
- \$200K~\$1M for failing to submit or implement investigation & assessment plan
- If fail to complete correction of control/remediation plan by deadline after being notified in writing 3 times, shall be fined \$200K~1M per violation

Cancellation of Regulatory Listing

Timing

If the concentrations are less than the control standards due to adoption of appropriate measures or implementation of control/remediation plan, the appropriate measures adopter or plan implementer shall request the special municipality, county, or city competent authority, or central competent authority, to grant approval

Information submitted by plan implementer

- The pollution source, scope, and severity
- Objective of control or remediation
- Implementation of appropriate measures or pollution control or remediation plan, and results
- Self-verification and results
- Funding disbursements
- Other matters specified by the competent authority

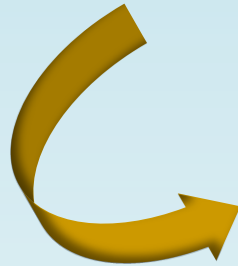
Competent Authority Responsibility

- Publicly announce the cancellation of the control or regulatory listing of the control/remediation site, and cancellation of reading
- Officially announce the removal or modification of the soil or groundwater pollution control area
- Request the land registration agency with local jurisdiction to revoke the control/remediation site registration

Natural Background Concentration Exceeding Control Standards

Timing

If the processes of scouring, dispersion, deposition, or irrigation cause the on-site concentrations of pollutants existing in the natural environment to reach the pollution control standards



Management

- The special municipality, county, or city competent authority shall notify the relevant industry competent authority of the **test results**, and shall **hold a consultation conference** and perform relevant matters. When needed, **necessary response measures** of Article 15, Paragraph 1 may be applied
- The special municipality, county, or city competent authority **may** perform an assessment on the basis of **environmental impact, health risk, technology, and economic benefits**. When felt remediation is necessary and feasible, a remediation plan shall be implemented after approval from the central competent authority

Pollution Remediation Fees Disbursement

Pollution Remediation Fee Disbursement

- Expenditures made by competent authorities at all levels for verification, adoption of necessary response measures, supervision, and plan determination, review, investigation, assessment, implementation, and modification
- Claims for compensation and legal expenses
- Personnel and administrative management expenses, personnel expenses incurred by soil and groundwater pollution prevention and remediation work
- Expense of soil and groundwater pollution control work performed by competent authorities at all levels
- Expense of audit of soil and groundwater pollution verification and implementation effectiveness
- Expense of international environmental protection work involving soil and groundwater pollution
- Expense of audits of soil and groundwater quality monitoring and implementation effectiveness
- Expense of levying soil and groundwater pollution remediation fees
- Expense of soil and groundwater pollution health risk assessment and management
- Expense of researching, promoting, developing, and creating incentives for soil and groundwater pollution remediation technology.
- Matters concerning subsidies for soil and groundwater pollution prevention work.
- Other costs in connection with soil and groundwater pollution remediation approved by the central competent authority.

Site Cleanup Priority Ranking

- If polluter, potential polluter, interested party of the polluted land **fail to implement soil and groundwater investigation and assessment plan**, the special municipality, county or city competent authority shall investigate the extent of soil and groundwater pollution at the remediation site, assess the environmental impact, and report the investigation and assessment results to the central competent authority for determination of the cleanup priority ranking
- The following shall be reported to central competent authority before can be disbursed from Soil and Groundwater Pollution Remediation Fund:
 - **Article 12, Paragraphs 5 through 10 (sediments and pollution caused by natural background)**
 - **Article 13, Paragraph 2 (appropriate measures for control site)**
 - **Article 15, Paragraph 1, Subparagraphs 7 and 8 (contaminant removal or cleanup and other response measures)**

Sediment Monitoring and Management

Sediment - Regular Monitoring

- **The industry competent authorities** in charge of the following water bodies shall regularly test sediment quality, and **submit** the data to the central competent authority for future reference after performing a comparative assessment of **sediment quality indicators**, and publicly announce the sediment quality

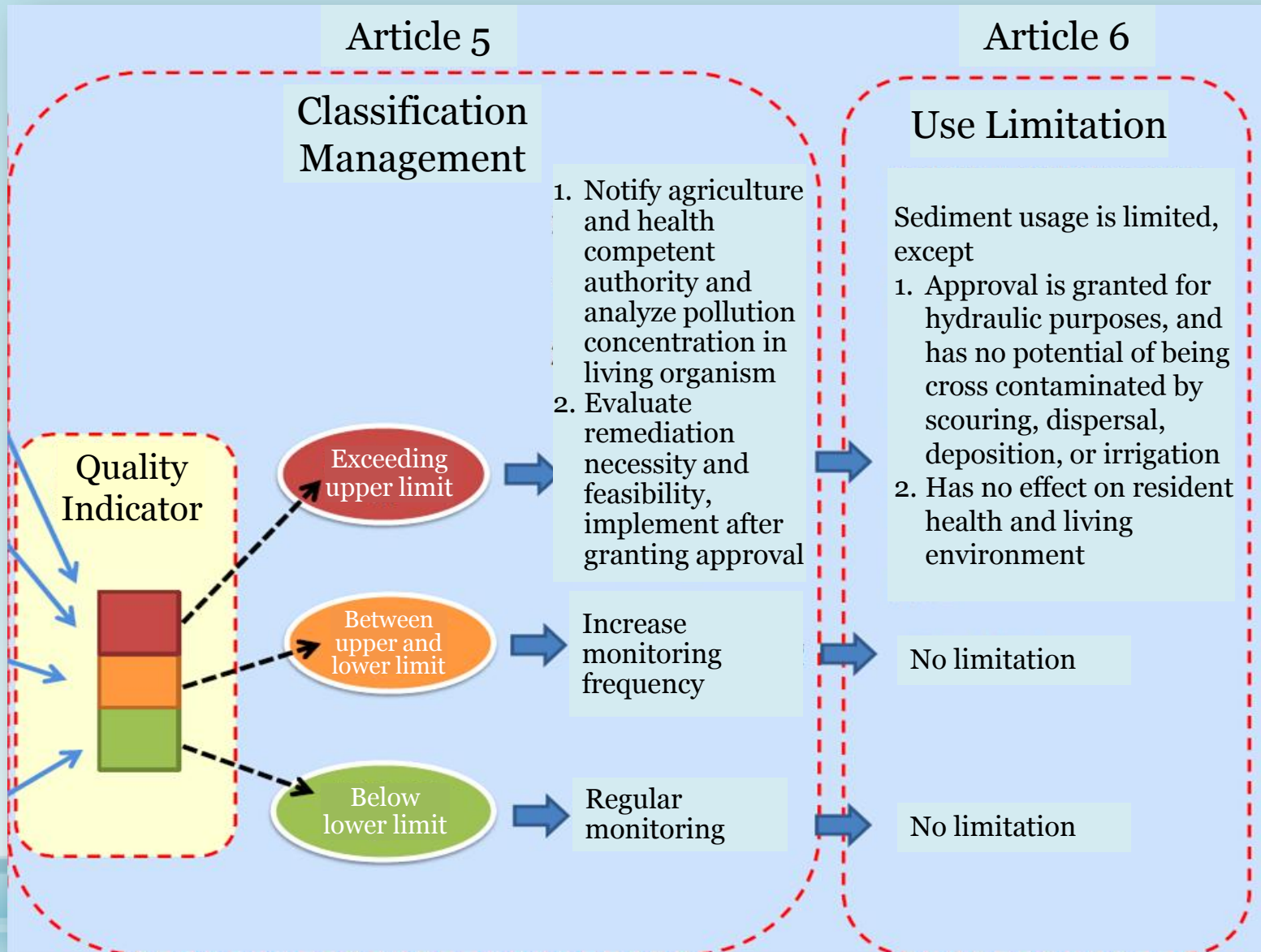
Regular Monitoring

- Rivers
- Irrigation canals
- Lakes
- Reservoirs
- Other specially designated surface water bodies announced by central competent authority



The central competent authority shall determine classified management and use restrictions of the sediment quality indicators

Sediment - Classification Management and Use Limitation Regulation of Sediment Quality Indicator



Sediment - Management

If agriculture or health competent authority discovers concentrations of pollutants in living organisms in surface water body is high

Notify special municipality, county, or city competent authority

Applicable

Sediment within the scope of the control area of control/remediation site is suspected of being polluted

- Shall test sediment, and may order the manager of the surface water body to perform an assessment on the basis of **environmental impact, health risk, technology, and economic benefits**
- When, after reviewing the assessment results, the central competent authority feels that remediation is **necessary and feasible**, a remediation plan must be drafted and submitted for approval before remediation may be implemented. When necessary, the regulations of Article 15, Paragraph 1 may be applied



Sediment remediation should be included in control or remediation plan



**Enterprise Officially Announced by
Central Competent Authority**

Regulation

Article 8

- If land used by an enterprise officially announced by the central competent authority is transferred, the **assignor** shall provide soil pollution assessment investigation and test data, which shall be **reported** to the special municipality, county, or city competent authority for future reference
- If a land assignor fails to provide relevant data and the land is officially announced as a control or remediation site, the assignor will have the **same responsibility as an interested party of the polluted land** fails to demonstrate due diligence as a good manager and shall bear joint payment responsibility

Article 9

When any one of the following situations applies, an enterprise officially announced by the central competent authority shall submit soil pollution investigation and assessment data, and shall request the special municipality, county, or city competent authority, or an agency commissioned by the central competent authority, to **review**:

- Enterprise establishment, registration, or application for a business license
- Change of business operator
- Change of industry category. However, enterprises whose industry category before and after the change is one which has been officially announced by the central competent authority shall be exempt
- Change of scope of operating site.
- Termination of business, cancellation of operating permit or business license, termination of operation, facility closure, or discontinuation of production, manufacturing, or processing

Brownfield Development

Brownfield Development



Remediation Goal

- Central competent authority may approve remediation goals in consultation with relevant agencies. Land development of the remediation site may not be changed after approval of the remediation goals.
- Any changes in development may be implemented only after obtaining approval from central competent authority in consultation with relevant agencies



Land Development Plan

- When land development plan involves with polluted land, it may be submitted concurrently with remediation plan, and shall reviewed in accordance with relevant laws and regulations
- Implementation of the land development plan only can proceed after the cancellation of regulatory listing of the remediation site

Fee

- Before cancellation of regulatory listing and implementation of land development plan, land developer shall pay 30% of the present value of the polluted area into the Soil and Groundwater Pollution Remediation Fund
- However, if the land developer had already submitted and completed a remediation plan prior to the day the special municipality, county, or city competent authority submitted a remediation plan, the case shall not be subject to this restriction

Thank You!



Collection Policy of Soil and Groundwater Pollution Remediation Fund in Taiwan

Yu-Ting Chen

**Environmental Protection Administration
of Taiwan**

March 2016



Hello, I am ...

❖ Chen, Yu-Ting (Eddie)

❖ Officer of EPA Taiwan.(2015-today)

- Assistant Officer of EPA Taiwan.(2006-2015)

❖ Responsible for :

- Remediation Fee Collecting.
- Groundwater monitoring well management
- Policy Planning

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Outline

- I. Origin**
- II. Foreign Policies**
- III. Collection Policy**
- IV. QA/QC**
- V. Conclusion**





 **Origin of the Soil and
Groundwater Pollution
Remediation Fund**



Need for Designated Fund

- ❖ The lack of environmental awareness has resulted the deterioration of our environment.
- ❖ The cost of remediation is heavy and time consuming; a sound financial support is necessary.

1981 Cadmium Rice Incident

Farmland

1994 RCA Incident and CPC
Anshen Factory Incident

Factory

2000 Taoyuan Shixiang Gas
Station Spill

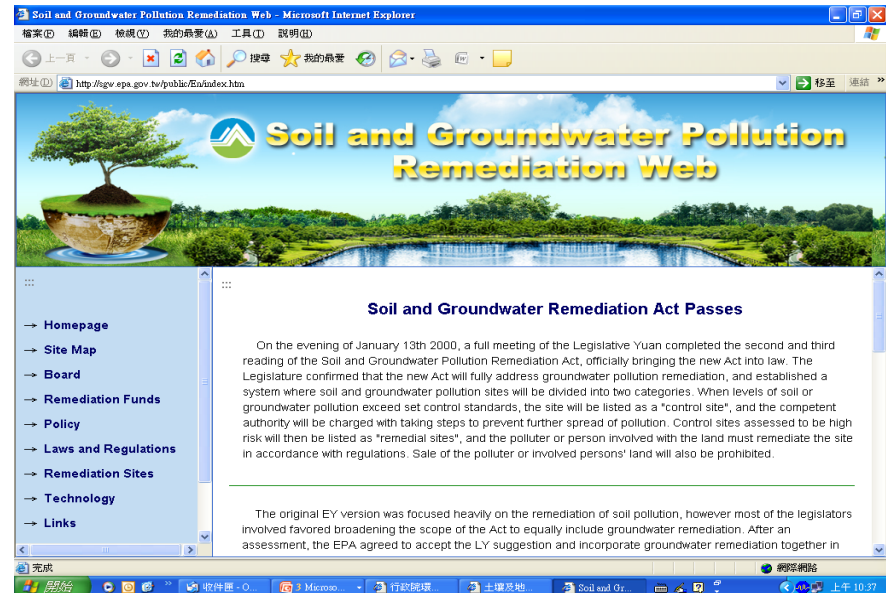
Gas Station



The Establishment of Remediation Agency

❖ “Soil and Groundwater Pollution Remediation Act” was passed in 2000

❖ In November, 2001, the “Soil and Groundwater Pollution Remediation Fund Management Board” was officially established.





Illegal Dumping Sites

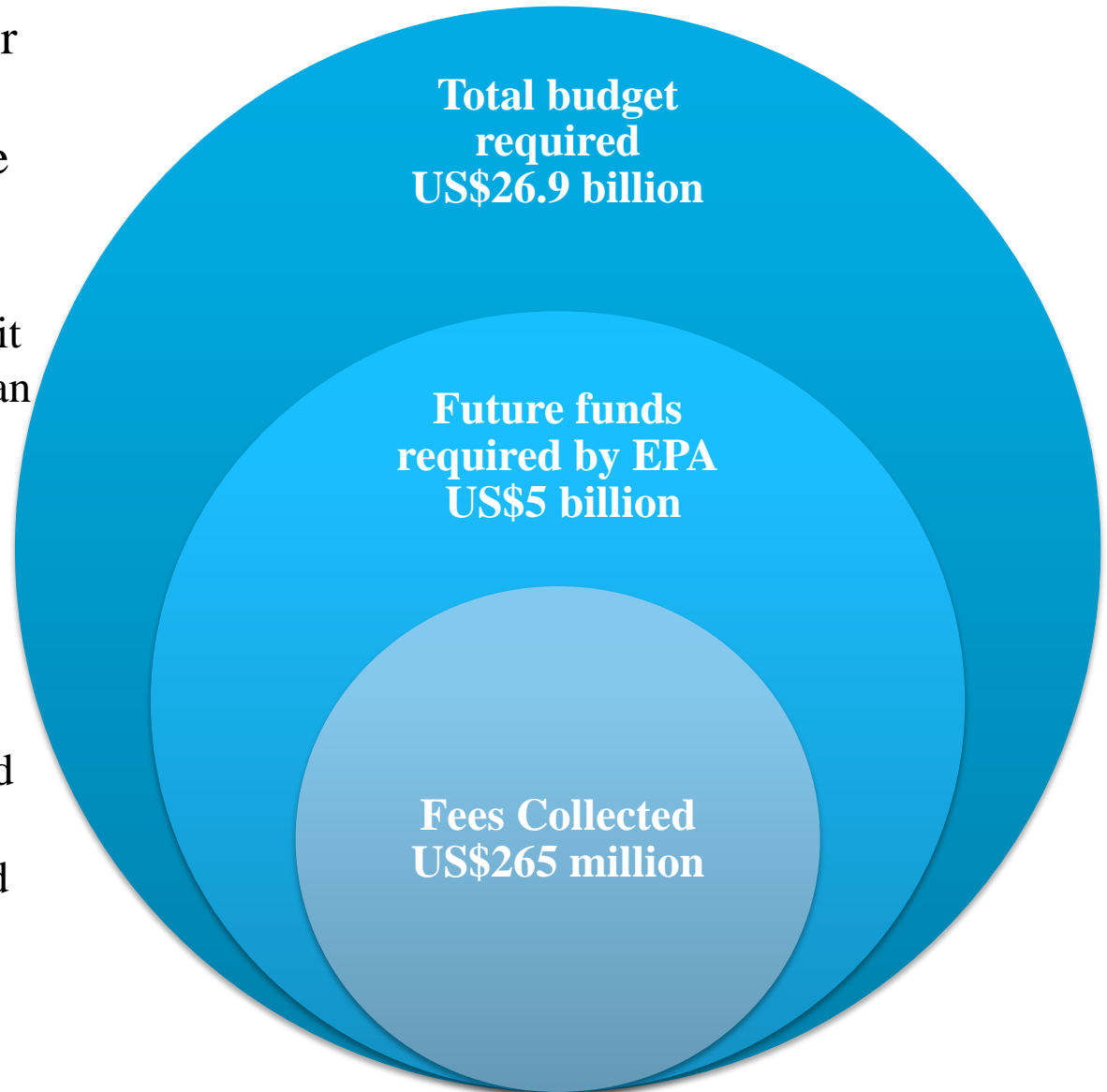
- ❖ Primary uses of remediation fund \Rightarrow investigation of polluted sites, emergency response, and pollution remediation of orphan sites.
- ❖ Most polluted sites in Taiwan are related to illegal waste disposal.





Demand of Funding

- ❖ Total budget required for soil and groundwater remediation in the future is US\$26.9 billion.
 - With existing data and treatment technology, it is estimated that Taiwan government requires about US\$5 billion in the next 25 years.
 - Fund demand is determined based on site investigations, treatment methods, and regulation of pollutant limits. Review of fund demand must be held regularly.





 **How other countries fund their remediation projects?**



Introduction

❖ Global Top 12 Leading Countries in Regulatory Framework

❖ North America

- USA
- Canada

❖ Western Europe

- Netherland
- UK
- Germany
- France
- Switzerland

❖ Asia

- Japan
- **Taiwan**

❖ Australia and New Zealand

❖ Global Top 12 Leading Firms in International Market

- URS Corporation
- CH2M Hill
- Arcadis
- Golder Associates
- ERM
- MWH Global
- RPS Group
- AECOM
- Parsons Brinkerhoff
- ENVIRON
- WSP Environment & Energy
- WorleyParsons



Comparison of Funding Policies

- ❖ The sources of Taiwan Remediation Fund are more diversified than other nations. Currently Taiwan is the only nation conducting collection on chemical substances (Superfund has stopped the collection on 1995).
- ❖ In most countries, remediation funds are largely budgeted by the government

Type of Fund Source	Taiwan	U.S.	Japan	England	Netherland	Korea
1.Government Budget	V	V	V	V	V	V
2.Special Fees and Taxes for Chemical Substances	V	(V)				
3.Corporate Environmental Tax		(V)				
4.Commission Cost for Implementation Plan & Survey Agency			V			
5.Earthwork Delivery Management Fee			V			
6. Fines and Cost Recovery	V	V				
7. Local Government Bid				V		
8.Developer Investment in Remediation	V	V		V	V	
9. Corporate Voluntary Funding			V			
10.Fund Interest Income	V	V	V		V	

(V): Stopped collection currently.



United States

US Superfund → Main reference of Taiwan Remediation Fund

❖ 17.0 Billion was collected between 1980 and 1995

Collection Target	Collection Rate	Percentage(%)
Petroleum Tax	\$0.097/Barrel (1980~1986) \$9.7Barrel (1986~1995)	40% - 46%
Chemical Taxes	\$0.22 - \$4.88/ton	20% - 24%
Environmental Income Tax	If revenue an enterprise is more than US\$2 million, 0.12% of overall revenue of the enterprise shall be taxed.	31% - 38%

Stopped in
1995

Congress

Fund was enough for future operation

Business

Not Compatible with Polluters-Pay Principle

By 2003 the superfund was empty, now relying on federal Funding



Netherland

Netherlands

Concept of Risk Management

- ❖ Soil Protection Act in 1987
 - Set up a designated fund but funding rely on government appropriation.

- ❖ Control the expenditure by applying the concept of risk management in soil quality standards
 - Before 1987: soil quality restore to unpolluted level
 - After 1987: soil quality fit for future land use

- ❖ Encourage development of brownfield through urban planning



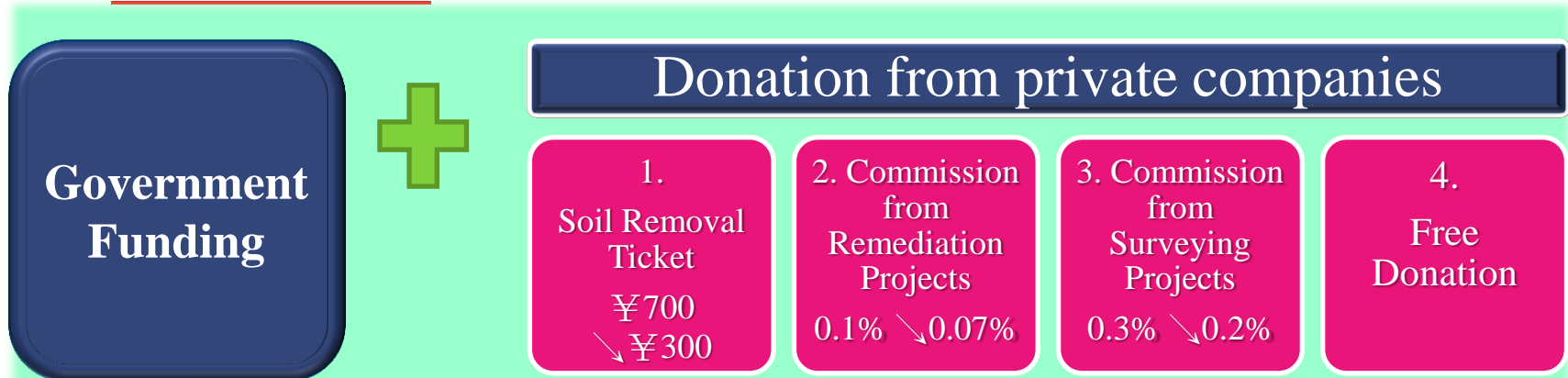
United Kingdom

- ❖ No designated fund, rely on government funding
- ❖ Strict polluter-pays principle
- ❖ Brownfields with unknown polluter manage through urban planning and neighborhood redevelopment
 - Central: Department for Communities and Local Government; Homes and Communities Agency
 - Local: London Land Commission
- ❖ Developers are given tax incentives



Japan

- 「 Soil Contamination Countermeasures Act 」 of 2002
 - Remediation Responsibility lie on land owner if polluter is unknown
 - Designated fund for soil remediation
 - **Land owner can apply for funding**
 - Both government and enterprises contribute
 - Percentage of corporate funding decreases in 2008
 - JPY 1.718 billion as been saved ➢ **Solely Used for Remediation**





Korea

Korea

Lacks Designated Fund; Rely on Government Budget

❖ 1995 Soil Environment Conservation Act

- 「Worrisome Level」 and 「Countermeasure Standards」, similar to Taiwan 「Monitoring Standards」 and 「Control Standard」
- Goal to establish Remediation Fund in 2010~2019
- Government budget decreases, expecting Remediation Fund to kick in.

年份	2014	2015	2016	2017	2018	2019
Total Soil and Groundwater Remediation Budget	128,392	116,957	113,030	<u>61,203</u>	<u>38,336</u>	<u>44,754</u>
1.Public Health Protection and Prevention Measure	86,325	67,512	67,215	13,123	13,636	13,654
2.Constructing Reasonable soil Management Policy	12,900	12,100	13,000	11,000	10,800	11,300
3.Developing Soil and Groundwater Technology and Personnel Training	22,267	24,445	25,215	23,780	5,600	5,700
4.Traning Soil Remediation Environmental Industry	4,800	10,800	5,000	10,500	5,500	11,000
5.Promoting International Cooperation	2,100	2,100	2,600	2,800	2,800	31,000

Unit: Million KRW · 1 USD = 120 KRW

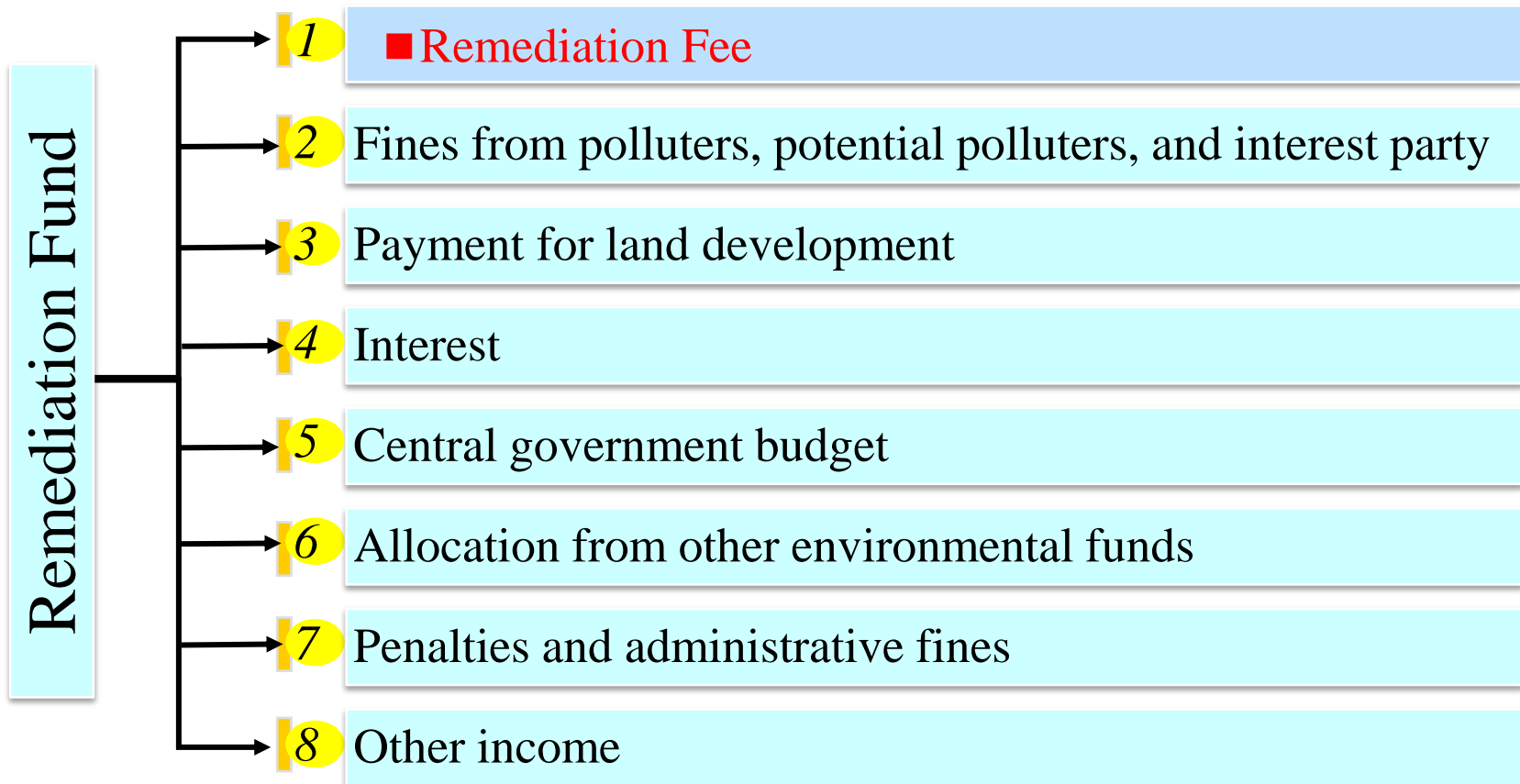


 **Collection Policy of Soil and
Groundwater Pollution
Remediation Fund**



Financing and Responsibility

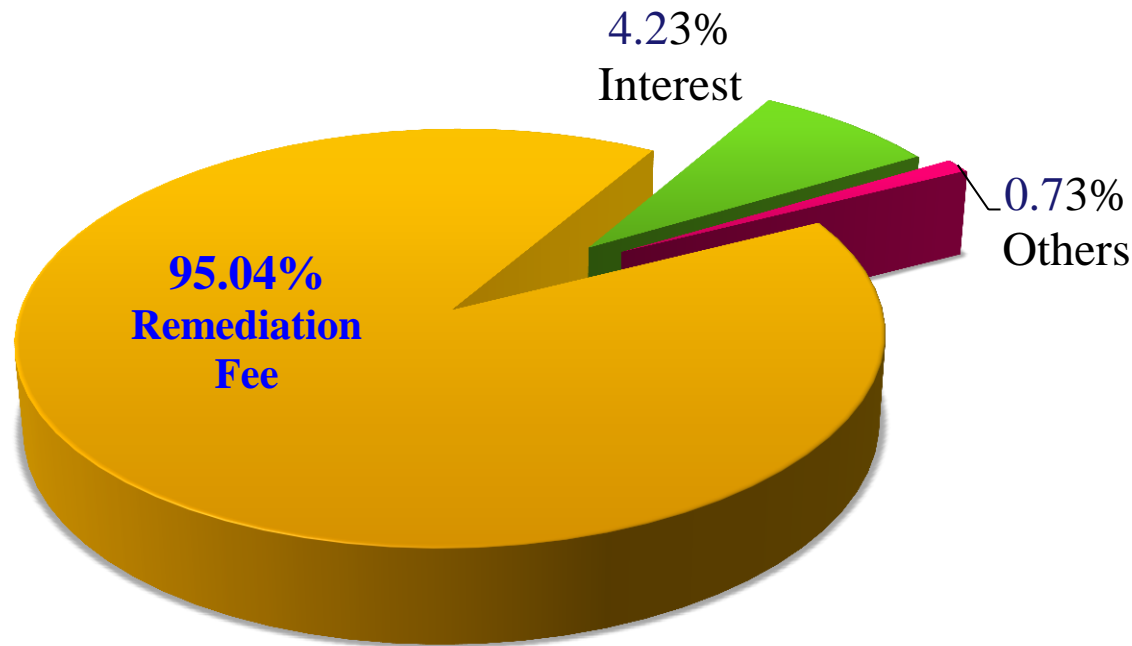
- ❖ Diverse source of Remediation Fund
- ❖ US\$290 million was collected to help with the remediation





Remediation Fund Provisions

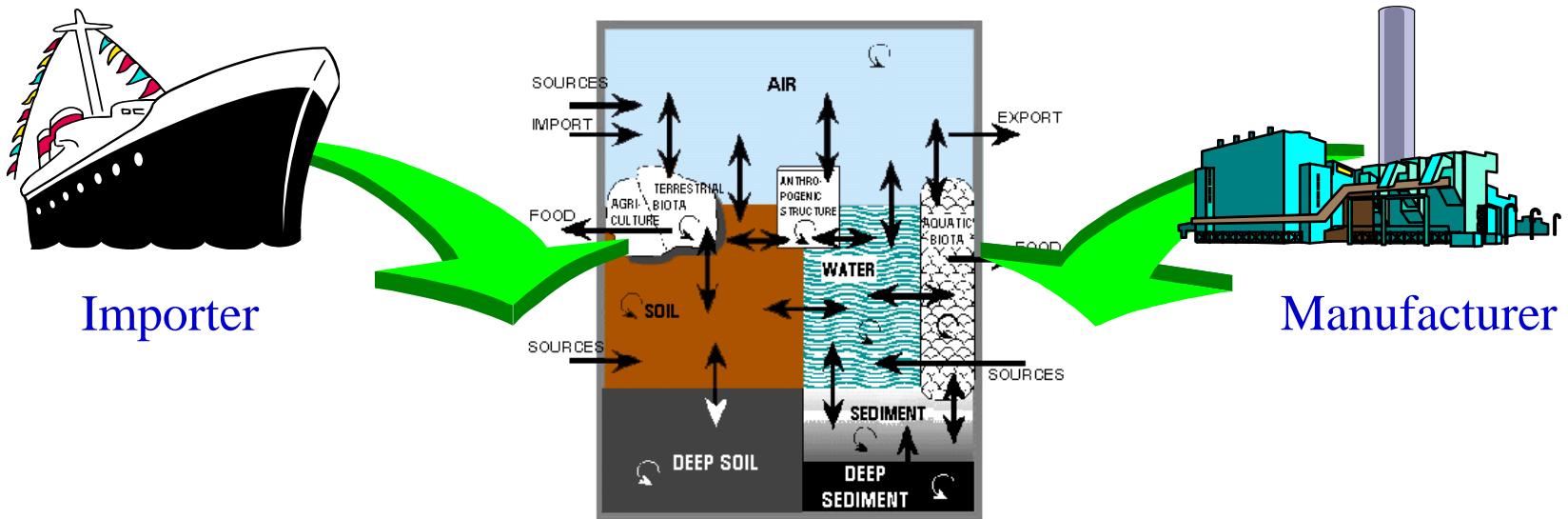
- ❖ The Soil and Groundwater Remediation Fee is the most important source of the Remediation Fund.
- ❖ Therefore, the Soil and Groundwater Remediation Fee becomes the key to a sound pollution remediation program.





Remediation Fund Provisions

- ❖ Collection of remediation fee is authorized in accordance with Article 28 of Soil and Groundwater Pollution Remediation Act:
 - Soil and groundwater pollution remediation fees are levied from manufacturers and importers of certain chemical substances in accordance to the amount manufactured and imported by such enterprises”
 - Complete Act can be viewed from the following website.
<http://law.moj.gov.tw/Eng/LawClass/LawContent.aspx?PCODE=O0110001>





Remediation Fund Provisions

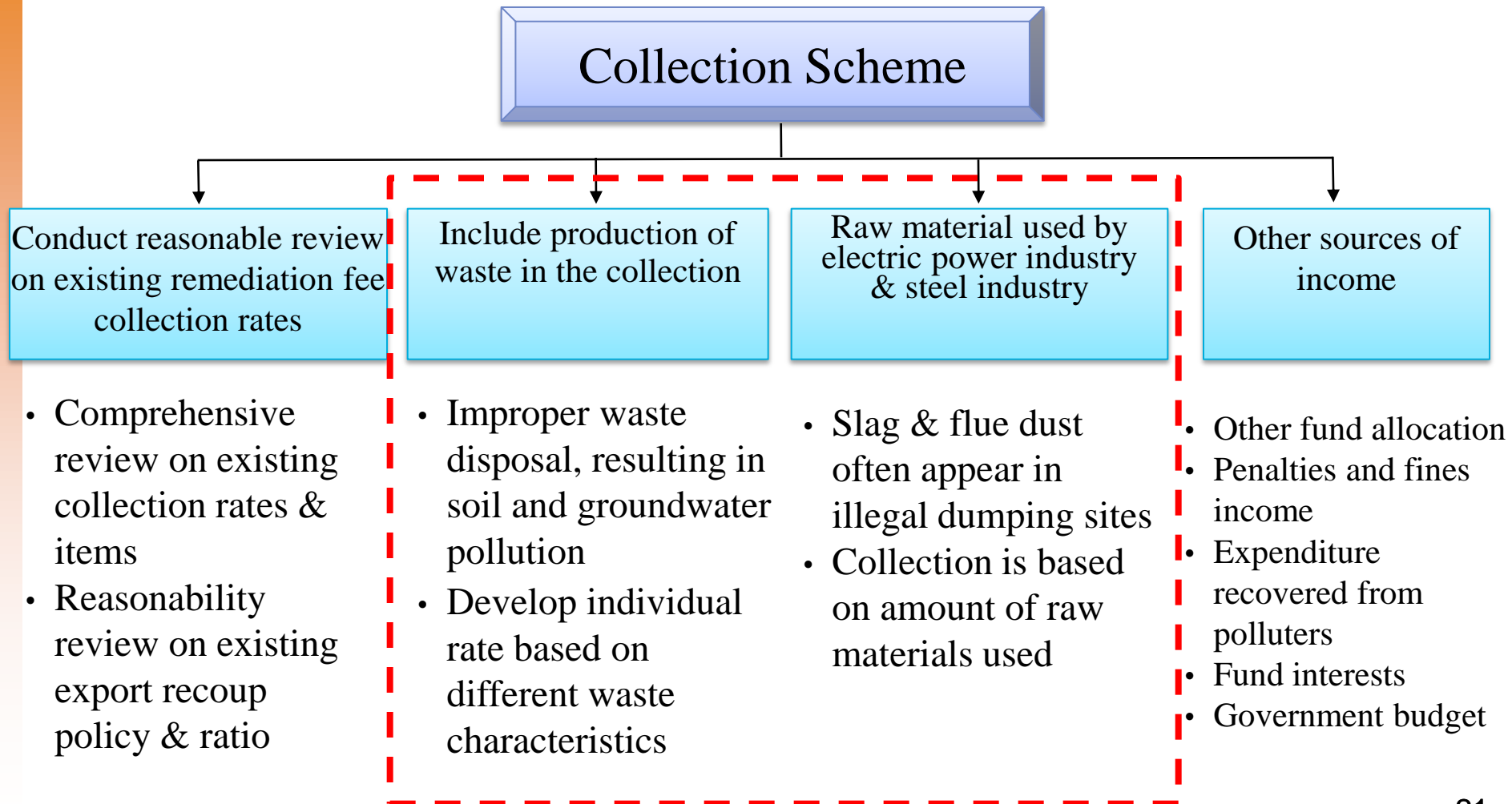
- ❖ Original Six categories including 125 chemical substances.

Category		Original Collection Rate (US\$/Metric ton)
Original Chemical Substance	1. Organic petroleum derivatives	0 ~ 1.22
	2. Chlorinated hydrocarbons	0.44 ~ 3.08
	3. Non-petroleum based organic chemicals	0.47 ~ 1.42
	4. Heavy metal and heavy metal compounds	1.05 ~ 3.56
	5. Pesticides	1.42 ~ 2.64
	6. Others (Sodium cyanide, potassium cyanide)	3.19



Remediation Fund Provisions

- ❖ Comprehensive evaluation of the fee collection policy was made in 2011.





Collection Rate and Scale

- ❖ Price of original chemical substance is cut by 20%
- ❖ Added copper, nickel, steel billet, coal, and industrial waste from 13 industries

Category		Revised Rate (US\$/Metric ton)	Original Rate (US\$/Metric ton)
Original Chemical Substances	1. Organic petroleum derivatives	0 ~ 0.98	0 ~ 1.22
	2. Chlorinated hydrocarbons	0.34 ~ 73	0.44 ~ 3.08
	3. Non-petroleum based organic chemicals	0.47 ~ 1.15	0.58 ~ 1.42
	4. Heavy metal and heavy metal compounds	0.85 ~ 2.85	1.05 ~ 3.56
	5. Pesticides	1.15 ~ 2.10	1.42 ~ 2.64
	6. Others (Sodium cyanide, potassium cyanide)	2.54	3.19
Newly Added substance	1. Steel billet	0.20	Not included in the collection
	2. Coal	0.034	
	3. Industrial waste from 13 industries	0.27 ~ 5.59	
	4. Heavy metal – nickel	2.10	
	5. Heavy metal – copper	2.17	



Collection Rate and Scale

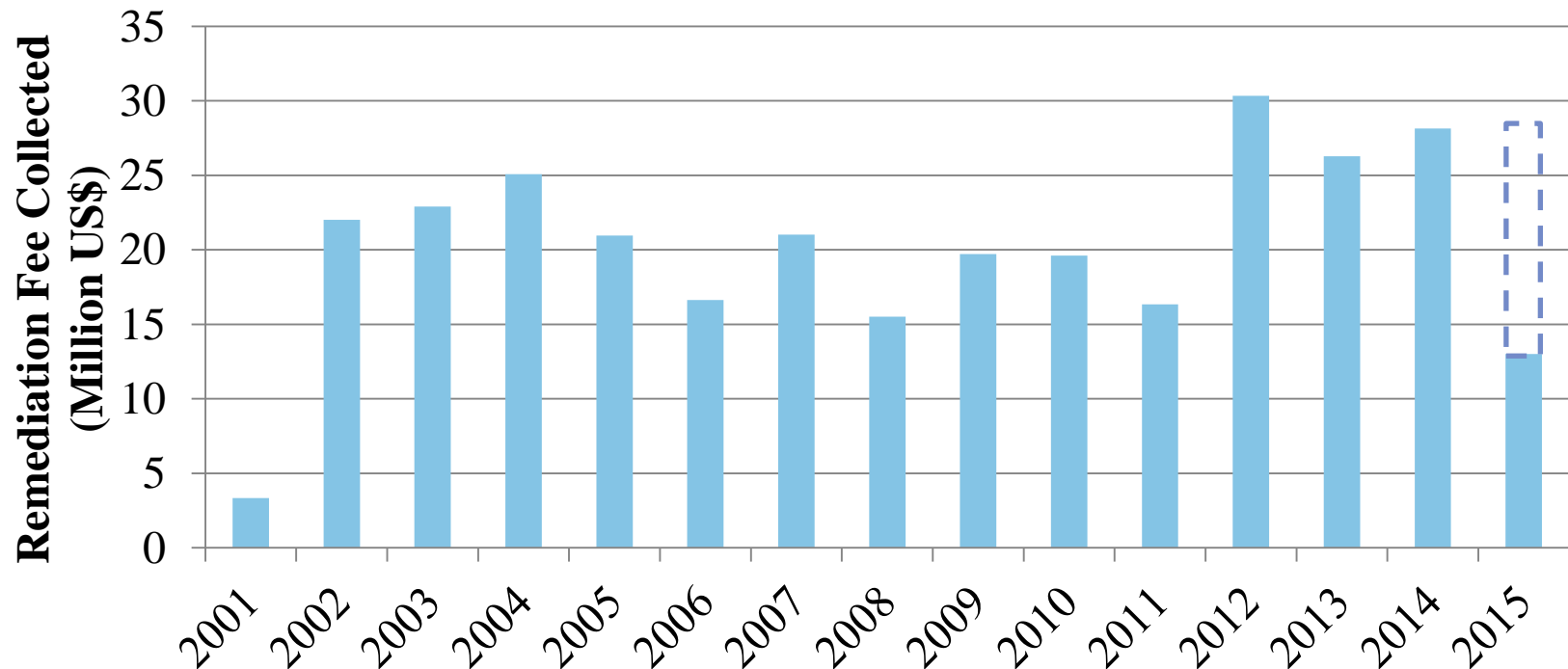
- ❖ The rate of industrial wastes depends on its property.

Fee Category	Substance Subjected to Fees	Fee rate (\$US)
Waste	Renewable resource	0.27
	General industrial waste (intermediate treatment or final disposal)	0.58
	General industrial waste(reuse)	0.27
	Hazardous industrial waste (intermediate treatment or final disposal)	5.59
	Hazardous industrial waste(reuse)	2.81
	Solidification	0.58



Current Collection Status

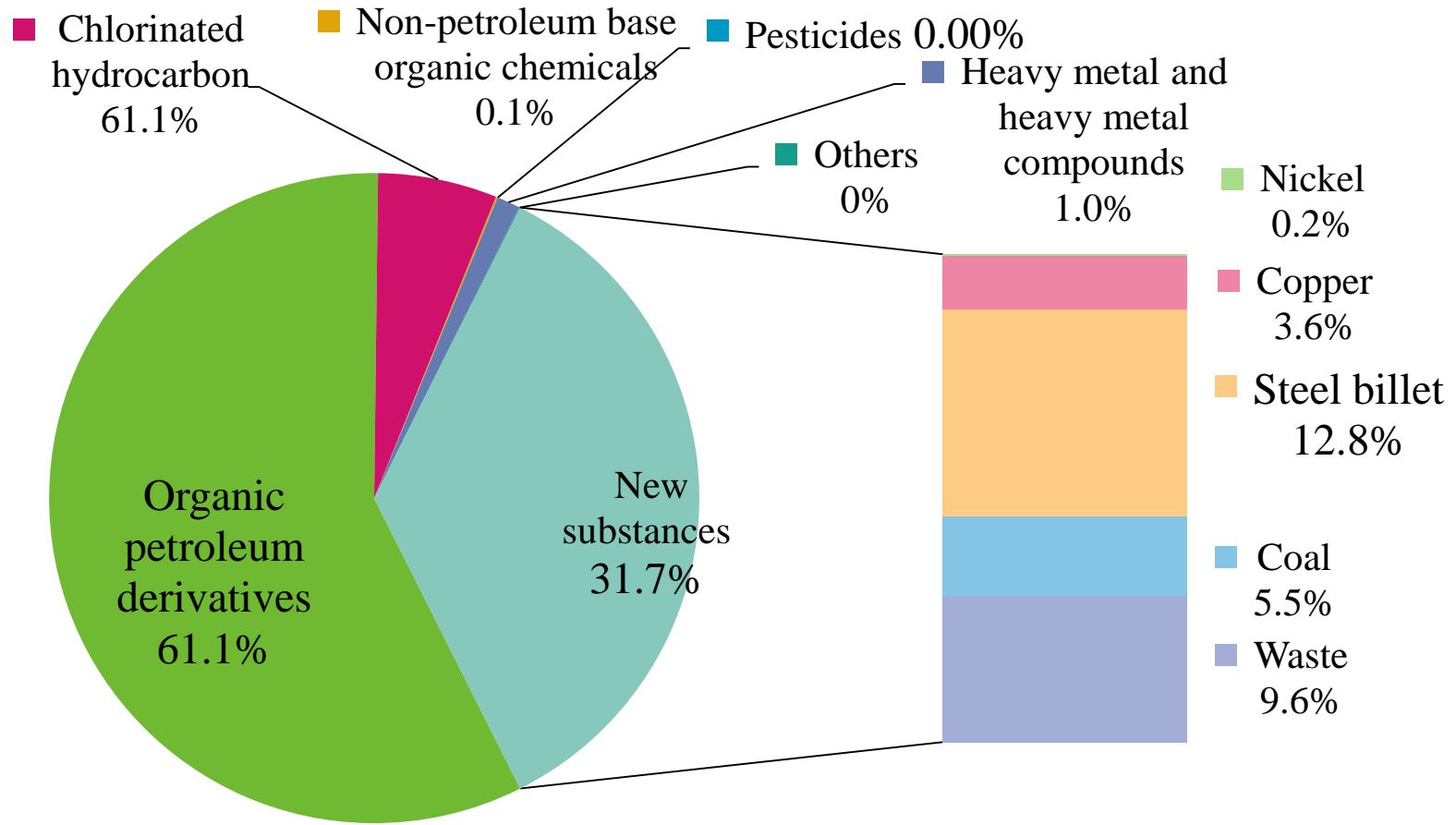
- ❖ Remediation fee collection has been implemented for nearly 15 years. Total amount is about US\$265 million.
- ❖ Average annual amount is between US\$17 million and US\$25 million before revision.
- ❖ About **US\$27 million** collected each year after the revision.





Current Collection Status

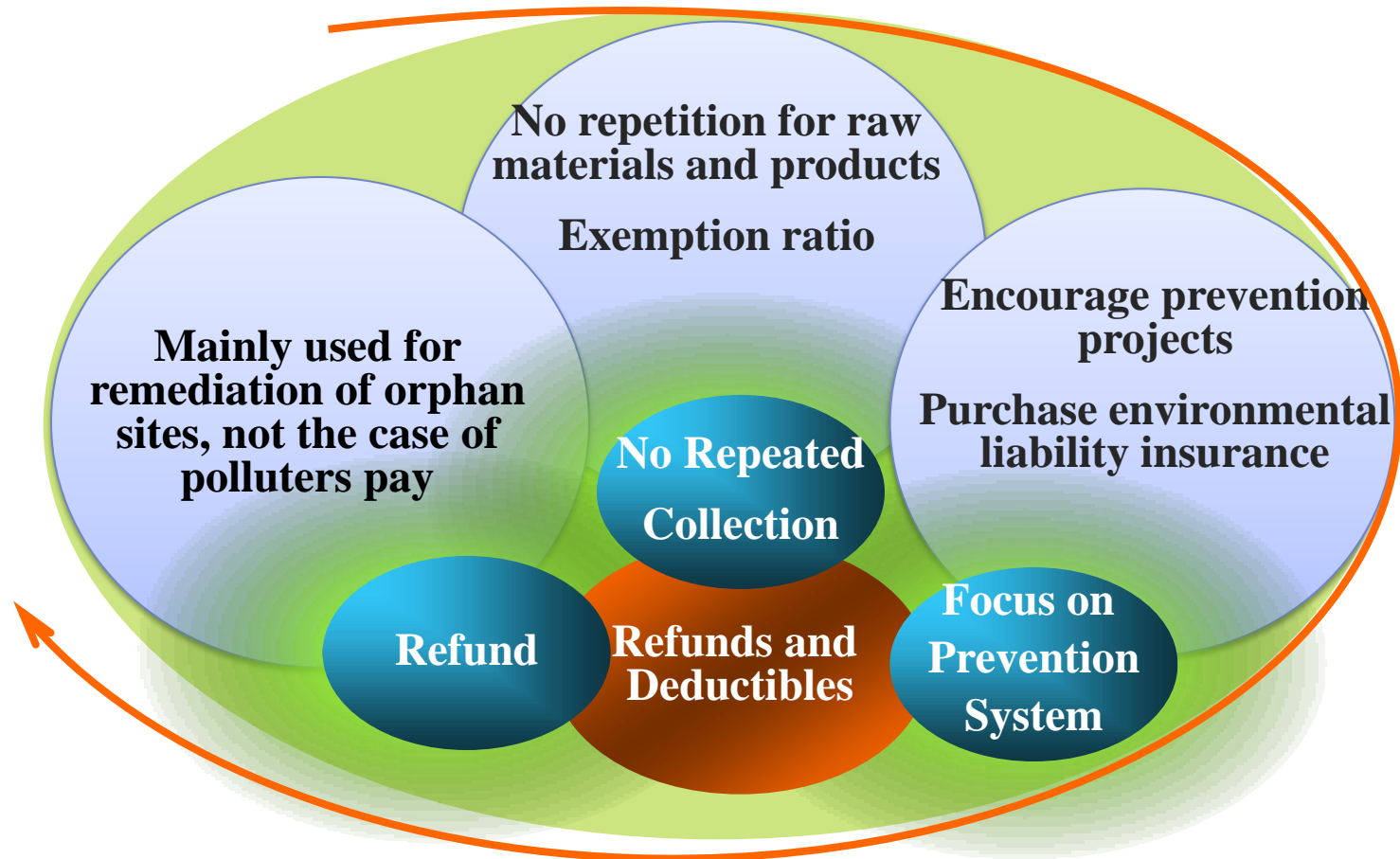
❖ US\$27 million collected each year after the revision.





Collection Policy Characteristics

- ❖ The fee collection system strives to be fair and equitable
 - Non-Repetitive Collection
 - Export Refund
 - Encourage pollution prevention





Encourage Pollution Prevention

- ❖ Conducting pollution prevention projects or purchasing an environmental liability insurance can be combined to get **reimbursement of maximum 25%**.
 - It is explicitly stipulated that the pollution prevention project within a control or remediation site can not apply for reimbursements.
- ❖ All fee payers may apply.





Encourage Pollution Prevention

- ❖ New investment in facility for preventing soil and groundwater pollution



Pollutant interception facilities



Corrosion prevention coating



Stainless steel storage tanks

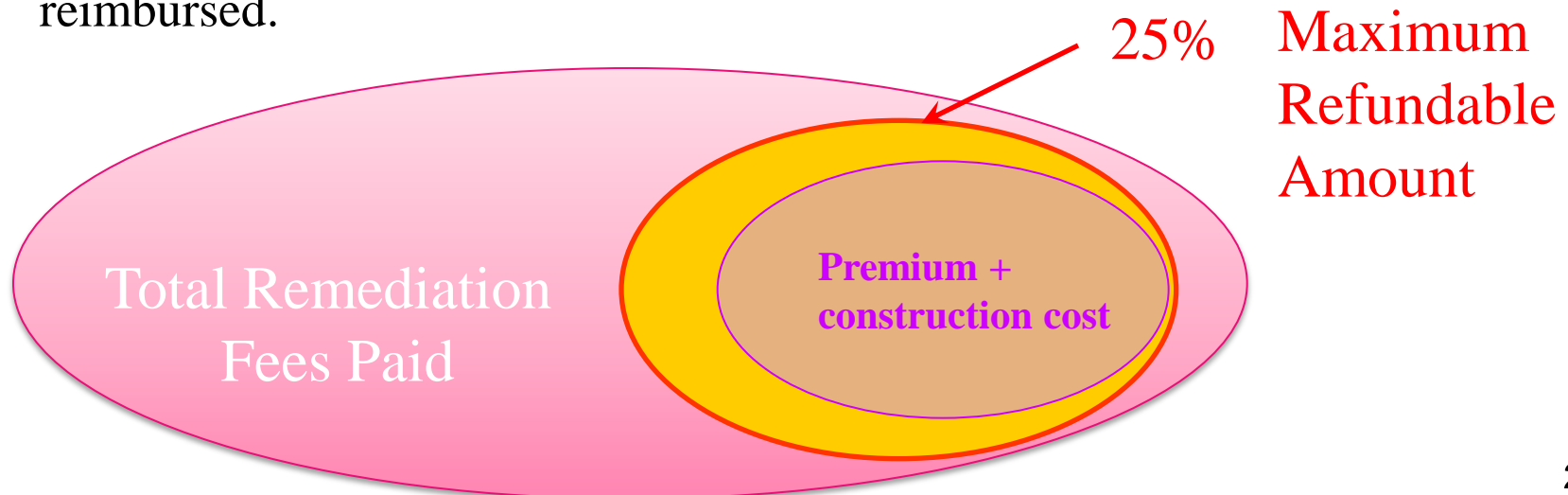


Cathodic corrosion protection



Encourage Pollution Prevention

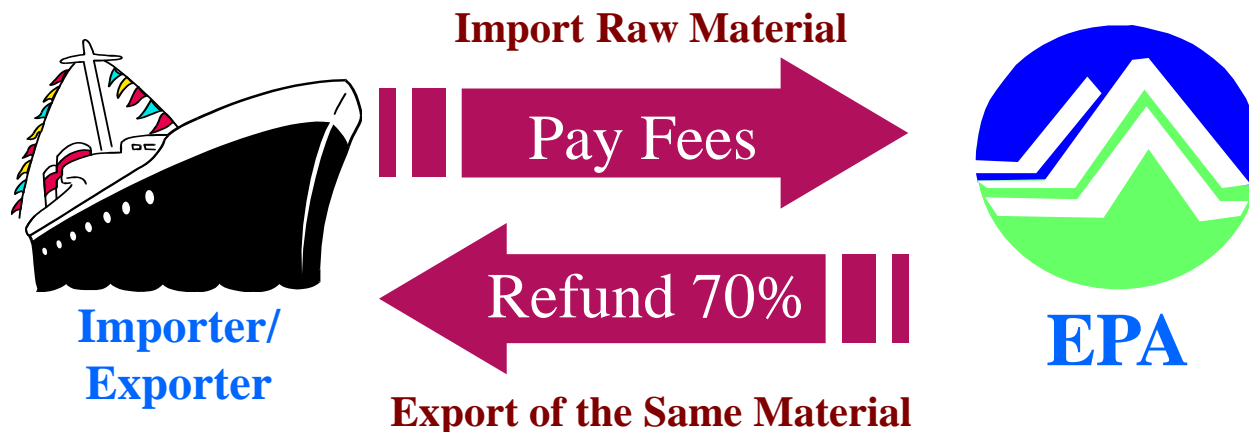
- ❖ Reimbursements are also given to companies that purchasing environmental damage liability insurance.
 - If incident of pollution occurs, insurance claim shall cover remediation fee which reduces the remediation burden of businesses.
- ❖ The reimbursable amount is 25% of remediation fee paid
 - If the payer has paid US\$1 million remediation fee, the maximum amount of reimbursement is US\$250,000. If the combination of construction cost and insurance premium is less than US\$250,000, then the total money spent is reimbursed.





Export Refund

- ❖ Businesses express that no pollution is caused if imported substances that are not used up and then exported again. Since the remediation fee has already paid, reimbursements is granted to compensate the cost.
 - 70% of the fee is refunded



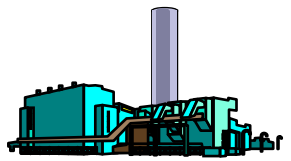


Quality Control and Quality Assurance



Auditing Process

- ❖ Payments of the Remediation Fee are audited through the following process.
- ❖ 3% of the fee collected is used in the auditing.



Fee-payers



EPA



EPA



Notification



**Database
Cross-Checking**



**Primary
Auditor**



Accountant

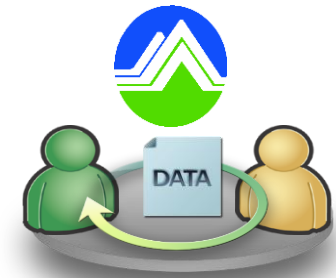
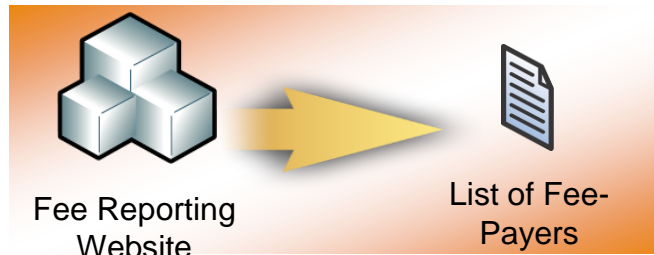


Site Inspection



Database Cross-Checking

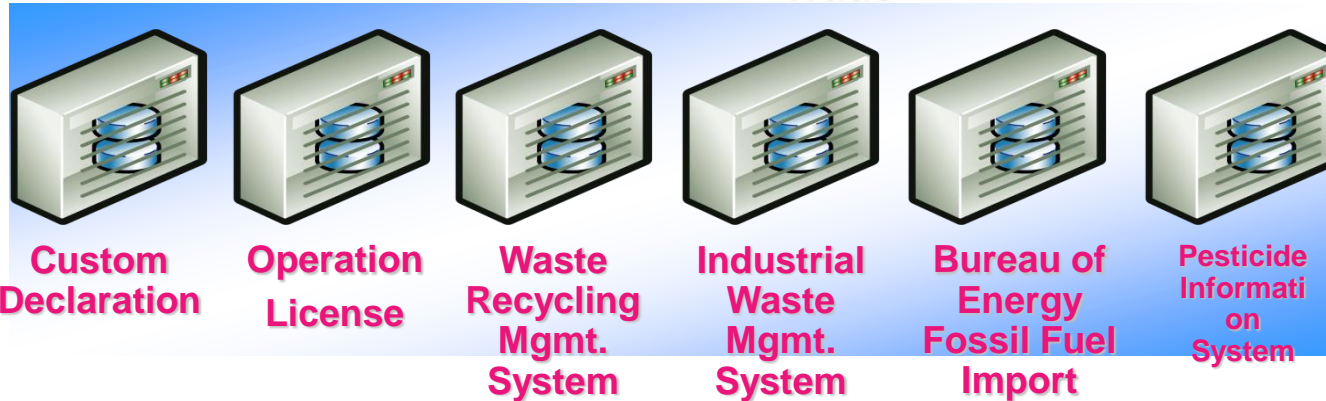
❖ Cross-checking with other government database



Manufacture



Import and waste





Third Party Inspection

- ❖ A registered accounting firm will further inspect the correctness of the payment.
- ❖ Audit through other channels such as financial records and tax records.
- ❖ Report any anomalies



Site Inspection

❖ 300 Site Inspection per year

Selection Principals

Normal Reporting

- No sufficient supporting document
- Did not report regularly
- Major fee-payer

Reporting Error

- Reported Wrong Amount
- Adjustment of wavering percentage
- Export refund



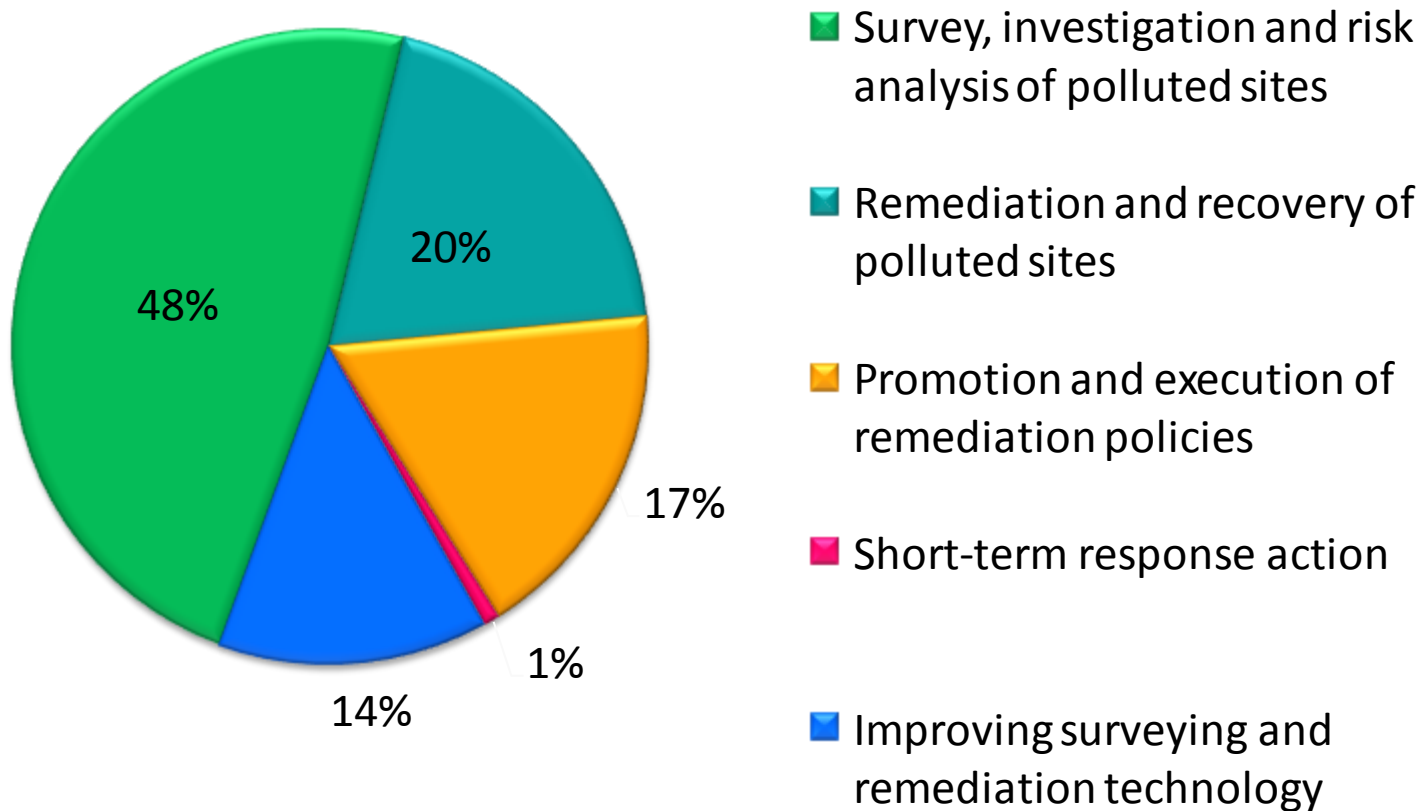


Conclusion



Expenditure of Remediation Fund

❖ The expenditure of the remediation fund is US\$33 million/year between 2010 and 2014.





Accomplishments

❖ A total of 3,090 polluted sites has been remediated and removed from the list.

Control Sites	Currently listed			Delisted			Total
	Groundwater pollution	Control sites	Remediation sites	Groundwater pollution	Control sites	Remediation sites	
Factory	9	121	54	0	53	0	237
Gas Station	0	63	18	0	60	3	144
Illegal Dumping Site	0	10	6	0	15	0	31
Farmland	0	2635	0	0	2940	0	5575
Storage Tank	1	3	1	0	1	1	7
Others	15	39	10	1	21	0	86
Total	25	2871	89	1	3090	4	6080

As of March 3rd, 2016



Conclusion

- ❖ The Soil and Groundwater Pollution Remediation Fund is established not only as resource for authority to enhance pollution control and remediation of orphan sites but as incentive for industrial to modify highly potential polluted process.
- ❖ The Fund is composed of 8 sources. The main source is Pollution Remediation Fee.
- ❖ The Fund is utilized for 7 objectives. The main emphasis is pollution investigation & remediation.

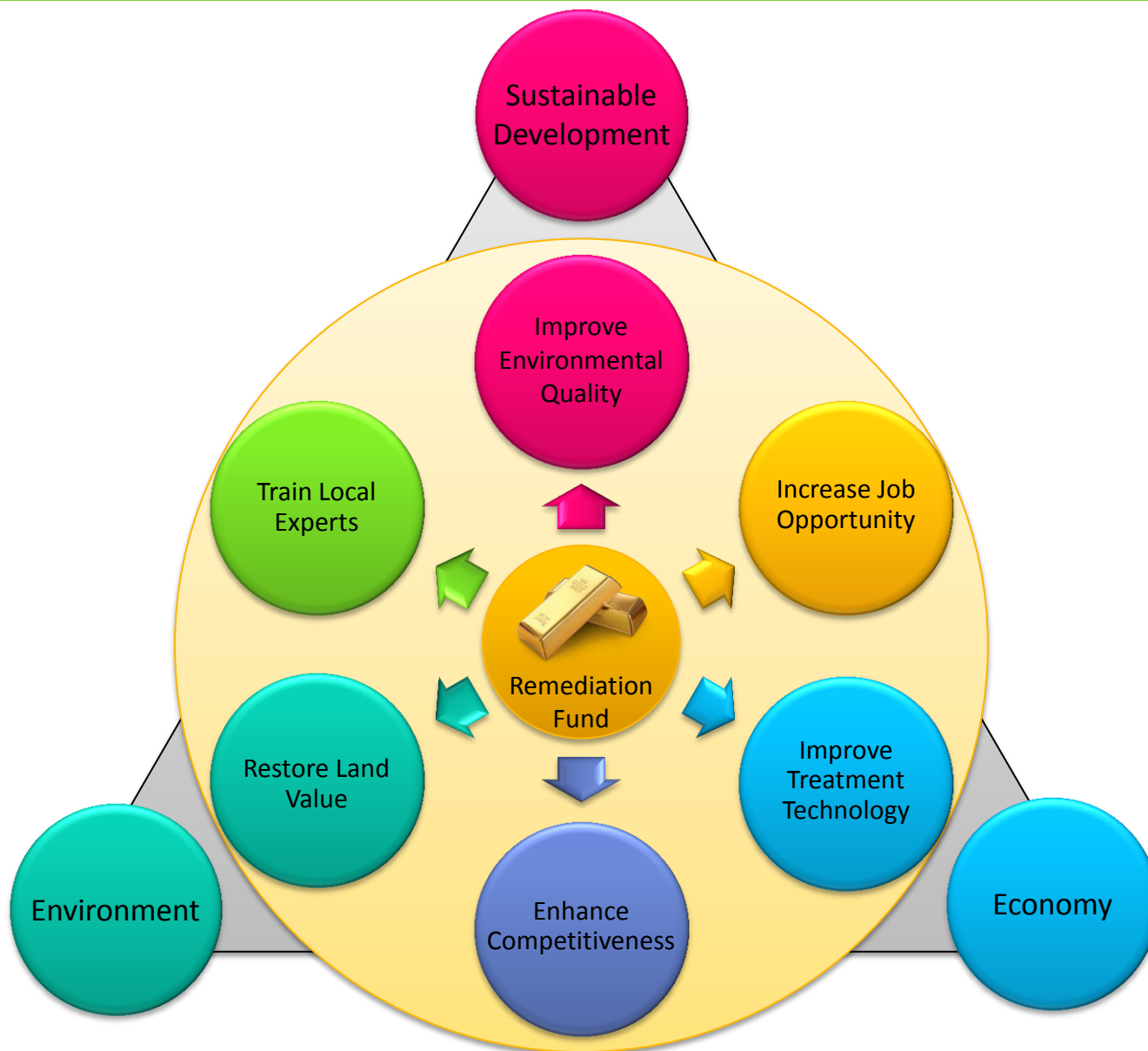


Conclusion

- ❖ The fund is mainly used for systematic pollution investigation, health risk assessment and control of pollution in order to manage all contaminated sites and potential ones.
- ❖ Soil and Groundwater Pollution Remediation Fund Management Board (EPA) and Soil and Groundwater Pollution Remediation Department (EPB) are the main institution for the Fund execution.
- ❖ Employing USD\$1 from the fund does induce USD\$1.43 real production transactions in the macro economy and the total fund employing averagely increases 271 employment.



Thinking Further





行政院環境保護署

Environmental Protection Administration
Executive Yuan, R.O.C. (Taiwan)

Thank you

