

Study on Policies for Integrated Pollution Prevention and Control

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통합적 환경관리의 정책적 도입방안에 관한 연구

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국 문 요 약

통합적 환경관리의 절차적·조직적·실체적 차원의 접근은 환경관리 측면에서 의사결정을 위한 개념적 기준으로서, 현재 우리나라의 환경법령 및 제도 개선을 위한 관점으로서도 유용하다. 따라서 오염물질 배출시설에 대한 통합적 규제를 위한 법적·제도적 방안에 대한 연구도 절차적·조직적·실체적 측면에서 이루어져야 할 필요가 있다.

먼저, 절차적 측면에 대한 연구는 제도적 유연성을 확보하고 보다 실질적인 환경보호를 위하여 다음과 같은 연구를 필요로 한다. 첫째, 허가신청 이전에 기업과 담당 행정기관 사이의 협의를 통하여 허가절차를 간소화할 수 있도록 '사전협의제도'에 대한 연구를 수행할 필요가 있다. 둘째, 전문적 지식을 보유한 전문가 집단인 working group의 자문을 통하여 허가절차상 행정목적과 기업의 이익이 상호 조화를 이룰 수 있도록 해야 한다. 셋째, 지역환경에 대한 영향을 고려하고 민주적 정당성을 확보하기 위하여 배출시설에 대한 정보공개와 주민참여제도가 마련될 필요가 있다.

다음으로, 조직적 측면에 대한 연구는 집행조직 및 기술조직의 구성 및 운용과 조직 상호 간의 적절한 권한 배분을 위하여 다음과 같은 연구를 필요로 한다. 첫째, 집행조직 및 기술조직의 구성 및 운용방안과 구성원의 자격요건에 대한 연구를 수행하여야 한다. 둘째, 통합적 배출시설규제를 위한 각 조직 내지 기관 간의 적절한 권한배분에 대한 연구가 이루어져야 한다.

마지막으로, 실체적 측면에서 산업별 특성을 고려한 BAT의 선정 및 BREF 작성을 위한 연구를 수행할 필요가 있다. BAT는 현재 매체별로 도입되어 있으나 이를 통합적으로 고려하기 위해서는 허가기준을 설정함에 있어 BAT를 어떠한 방법으로 적용할 것인가를 살펴보아야 하며, 기업의 BAT 채택을 유도하기 위하여 자율환경관리 및 경제적 유인수단, 총량규제 등에 관한 연구가 병행되어야 한다. 더불어 현재 우리의 배출허가 법령이 허가갱신제도를 갖추지 않고 있으므로 이를 도입하기 위한 방안을 지속적으로 연구할 필요가 있다.

주제어 통합적 환경관리, 사전협의제도, 최적실용가능기술, 최적실용가능기술선정을 위한 관련보고서, 허가갱신제도

Abstract

Integrated Pollution Prevention and Control(IPPC) has become an idealistic environmental prevention concept in developed countries and corresponds with principles of Industrial Ecology.

The concept of emissions regulatory integration is a key factor for an integrated environmental management system. While most EU member countries have a cross-media regulatory system, Korea has a media-specific regulatory system which was found to have significant environmental management problems.

The purpose of this study is to integrate the emissions regulatory system by resolving difficulties through procedural, organizational, and substantive analysis of integration.

To this end, the following research was performed: The first task was to determine the target of the integrated emissions regulatory system. In connection with this, the "IPPC directive" of the EU and the "PPCA 2000" schedule 1 of the UK, as well as environmental laws in Korea were compared and analyzed. The second was to design a regulatory system model. This model was divided into three groups after considerations were made regarding the time it would take for the pre-application, application, and permission stages. Lastly, on the basis of this research, a revised bill for an integrated emissions regulatory system was suggested.

Nevertheless, substantive analysis of integration focused on BAT requires supplementation in order to make the integrated emissions regulation system operate normally as an environmental management policy and regulation method. To this end, the specific characteristics of Korean society, culture, and law should be actively considered.

Keywords | Integrated Pollution Prevention and Control, IPPC, Pre-application Stage, Best Available Technique(BAT), BAT Reference(BREF), Renewal of Permission

I . Synopsis

Integrated Pollution Prevention and Control(IPPC) is a concept that originated in Britain and gained wide acceptance throughout European countries(even though it was as of yet unfinished), and attempts to create new approaches to the protection of the environment.

Such a shift of principles regarding environmental policies entails changes in the system of laws. In the case of the EU, it is recommended that an integrated pollution prevention and control program be introduced at the discretion of each individual member country.

However, such shifts in the system of laws, namely, the translation of the system

of laws from foreign lands into a domestic system of laws needs to be carried out gradually, and in consideration of the domestic legal system presently in force. In order to comply with such requirements, it is essential to determine which area and which concepts of integrated pollution prevention and control can be introduced, and in cases where such concepts are to be introduced, the extent to which such concepts are to be introduced.

Seen from this perspective, the integration of regulations on discharging facilities is highly probable, as the regulations on discharging facilities in many of the related laws, including the Atmospheric Environment Conservation Act and the Water Quality and Aquatic Ecological System Conservation Act, are similar in their content and form.

To this end, this paper reviewed the concept of integrated pollution prevention and control, examined the institutions feasible under the nation's system of laws, and carried out a study on the necessity of introducing an integrated program of regulations for discharging facilities.

To this end, the following research was performed. The first research objective was to determine the target of the integrated emissions regulatory system. In connection with this, the IPPC directive of the EU, 'IPPCA 2000' schedule 1 of the UK, and environmental laws in Korea were compared and analyzed. Secondly, the model of the regulatory system was designed. This model was divided into three groups, the 'pre-application stage', the 'application stage', and the 'permission stage'. Lastly, on the basis of this research, a revised bill regarding integrated emissions regulations was suggested.

II. The Target of Integrated Emissions Control

1. Introduction

Operator¹⁾s may choose regulations by medium type and integrated type to

minimize resistance during the introduction of the integrated emissions control system.

Specific targets for the integrated emissions control system are based on industry, type of emissions facility, scale of the workplace, and degree of risk. These factors are derived by comparing IPPC directives, PPCA 2000(UK), and environmental-related laws in Korea.

2. The First Standard : Fields of Industry

The way in which discharging facilities are classified serves as a criterion that constitutes actual discharge regulating procedures along with permissible discharge standards.

There are two ways to classify discharging facilities. One is a method in which discharging facilities are classified according to the type of industry, characterized by the idea that each individual industry discharges different pollutants. Alternatively, discharging facilities can be classified by the quantity or magnitude of the pollutants discharged, which is a standard that can be altered by pollutant processing technology or the production process.

The former view is considered to be superior to the latter from the perspective of controlling pollutants on an integrated basis that focuses on the characteristic features of the pollutants discharged. At present, discharging facilities are broken down according to Water Quality and the Aquatic Ecological System Conservation Act, the Atmospheric Environmental Reservation Act, and the Korea Standard Industrial Classification Scheme.

IPPC directives²⁾ and PPCA 2000 (UK) have similar regulations in relation to target industries. It is estimated that these industries emit more pollutants than

1) "Operators" are defined as: "in relation to an installation of a mobile plant, the person who has control over its operation".

2) Article 1 (Purpose and scope) The purpose of this Directive is to achieve integrated prevention and control of pollution arising from **the activities listed in Annex I**. It lays down measures designed to prevent or, where that is not practicable, to reduce emissions in the air, water and land from the abovementioned activities, including measures concerning waste, in order to achieve a high level of protection of the environment taken as a whole, without prejudice to Directive 85/337/EEC and other relevant Community provisions.

others. In conclusion, targeted Industries of the integrated emissions control system include energy, production, and processing of metals, minerals, chemicals, waste management, and other activities.

Table1 Industries of the integrated emissions control system

- | |
|---|
| <ol style="list-style-type: none">1. Energy industries2. Production and processing of metals3. Mineral industry4. Chemical industry
Production within the categories of activities contained in this section means production on an industrial scale by chemical processes of substances or groups of substances as listed in Sections 4.1 to 4.65. Waste management
Without prejudice of Article 11 of Directive 75/442/EEC or Article 3 of Council Directive 91/689/EEC of 12 December 1991 on hazardous waste (2):6. Other activities |
|---|

3. The Second Standard : Types of Emissions Facilities

IPPC directives, PPCA 2000 (UK), and related laws in Korea have different substantive conditions, and the second standard is not derived from a horizontal comparative method. Accordingly, considering actual applicability is superior to legal analysis when confirming target emission facilities. Nevertheless, the targets of PPCA 2000 encompass a wide range of fields. The second standard must be confirmed by consulting IPPC directives and facilities for wastewater discharge in the Water Quality Conservation Act, as well as parts of PPCA 2000.

Table2 Facility classification of the “PPCA 2000” Schedule 1 in UK

Industry	Activities
Energy industries	Combustion activities
	Gasification, liquefaction and refining activities
Production and processing of metals	Ferrous metals
	Non-ferrous metals
	Surface treating metals and plastic materials
Mineral industries	Production of cement and lime
	Activities involving asbestos
	Manufacturing glass and glass fibers
	Production of other mineral fibers
	Other mineral activities
Chemical industry	Ceramic production
	Organic chemicals
	Inorganic chemicals
	Chemical fertilizer production
	Plant health products and biocides
	Pharmaceutical production
	Explosives production
	Manufacturing activities involving carbon disulphide or ammonia
Storage of chemicals in bulk	
Waste management	Incineration and co-incineration of waste
	Disposal of waste by landfill
	Disposal of waste other than by incineration or landfill
	Recovery of waste
Other	Production of fuel from waste
	Paper, pulp and board manufacturing activities
	Carbon activities
	Tar and bitumen activities
	Coating activities, printing and textile treatments
	The manufacturing of dyestuffs, printing ink and coating materials
	Timber activities
	Activities involving rubber
	Treatment of animal and vegetable matter and food industries
Intensive farming	

4. The Third Standard : The Scale of the Workplace

The scale of the workplace in the Clean Air Conservation Act and the Water Quality Conservation Act need to be considered in order to apply an integrated emissions control system to Korea. The scale of the workplace in domestic acts is significant as an integrated application of emissions control due to being classified by the discharged quantities of pollutants. Considering a phase-in policy, it is reasonable that class 1 workplaces will be the first application target.

Table3 Workplace classification in the Air Conservation Act

Class	Total air pollutant emissions per year
1	80 tons or more
2	20 tons or more but less than 80 tons
3	10 tons or more but less than 20 tons
4	2 tons or more but less than 10 tons
5	less than 2 tons

Table4 Workplace classification in the Water Quality Conservation Act

class	Total wastewater discharges per day
1	2,000m ³ or more
2	700m ³ or more but less than 2,000m ³
3	200m ³ or more but less than 700m ³
4	50m ³ or more but less than 200m ³
5	less than 50m ³

5. The Fourth Standard : Degree of Risk

Degree of risk plays an important role in confirming preferential application targets. This standard is an abstract concept and needs to be more specific. Being associated with integrated emissions control, degree of risk can be translated as 'environmental pollution potential'. In this way, facilities which emit, as stated pursuant to the Clean Air Conservation Act Art.2 (9) a "specific air pollutant", and

pursuant to the Water Quality Conservation Act Art.2 (9) “specific substances harmful to the quality of water”, and in Annex IV “heavy metals,” should be the initial targets.

Table 5 Specific air pollutants in the Clean Air Conservation Act

1. Cadmium and its compounds	19. Methyl disulfide
2. Hydrogen cyanide	20. Aniline
3. Lead and its compounds	21. Chloroform
4. Polyester	22. Formaldehyde
5. Chromium and its compound	23. Acetaldehyde
6. Arsenic and its compounds	24. Benzidine
7. Hydrargyrum and its compound	25. 1,3-butadiene
8. Propylene glycol	26. Polycyclic aromatic hydrocarbon
9. Chlorine and hydrogen chloride	27. Ethylene glycol
10. Fluorine	28. Dichloromethane
11. Asbestos	29. Styrene
12. Nickel and its compounds	30. Tetrachloroethylene
13. Vinyl chloride	31. 1,2-dichloroethane
14. Dioxin	32. Ethylbenzene
15. Phenol and its compounds	33. Trichloroethylene
16. Beryllium and its compounds	34. Acrylonitril
17. Benzene	35. Hydrazine
18. Carbon tetrachloride	

6. Conclusion

Considering all the factors that are studied in this chapter, application targets for an integrated emissions control system include class 1 workplaces in six industries, with waste management involved in case studies and model programs. In addition, degree of risk is the standard to confirm application targets.

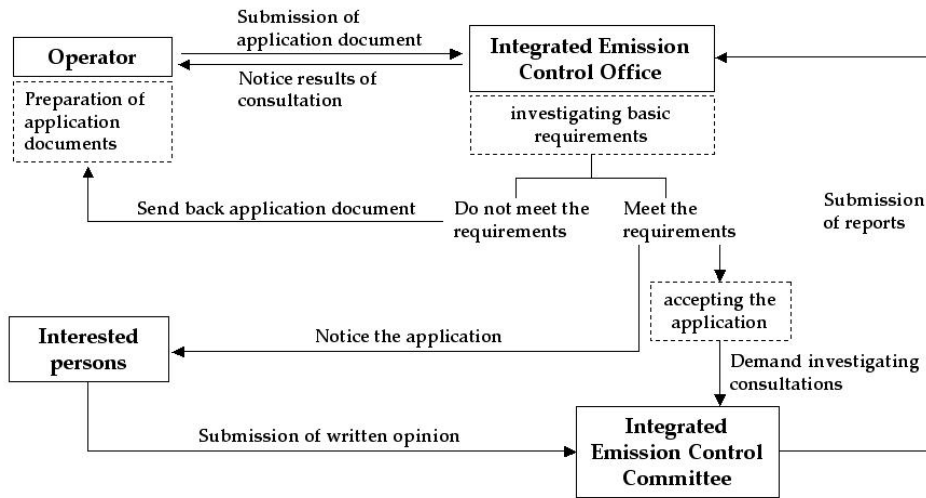
III. Pre-application Stage

1. Introduction

The Pre-application Stage can be classified by pre-application contacts. If an operator does not request pre-application contacts, the application process passes to

the Application Stage. The following diagram shows the control model when an operator requests contacts.

Figure1 The control model of the Pre-application Stage



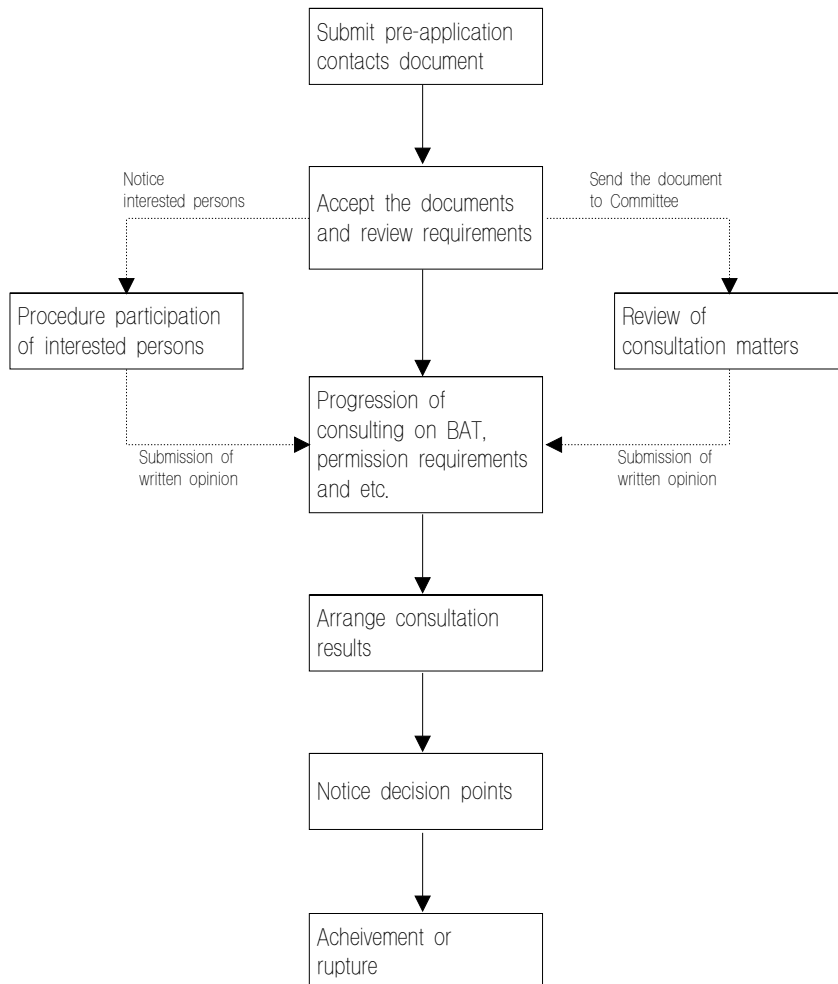
2. Pre-application Contacts

Reviews of an application for emissions in the present regulatory system has numerous problems due to cursory inspections which do not flexibly consider the current status of the facilities, regional conditions, and the situations of the emitted pollutants. Given the technical, economic, and regulatory complexity of industrial installations, pre-application contacts between the operator and competent authorities are of strategic relevance for an efficient permit process. The operator will obtain a written 'scoping opinion' on the required content of the environmental statement from authorities. This opinion increases the calculability of the permit procedure for the operator and gives him some planning security for his project. The result of the pre-application contacts tends to have a decisive influence on the content of the discharge permission. Nevertheless results of the consultation do not have binding powers due to the legal characteristics of the pre-application contacts in administrative law.

Specific consultations are:

- Contents in application documents
- Contents in connection with attached documents
- Adoption of BAT
- Substantial requirements of permission
- Economic incentives
- Scope of non-disclosure information

Figure2 Procedure of pre-application contacts



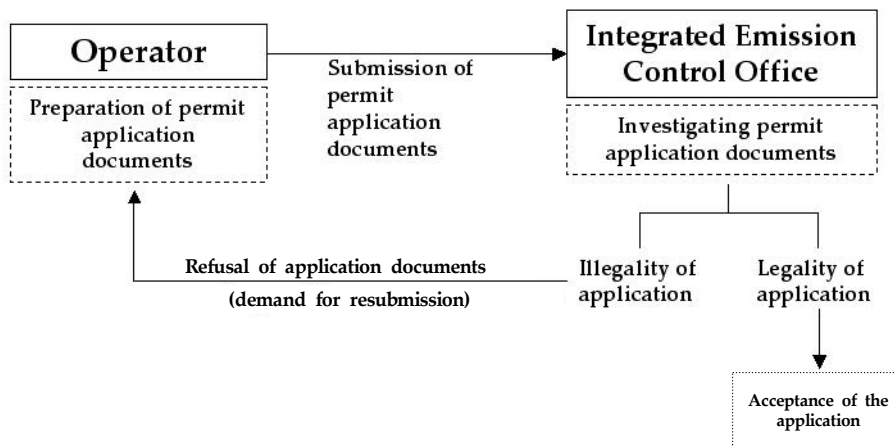
IV. Application Stage for Integrated Permission

1. Introduction

In general, the Integrated Emissions Control Office (IECO) and local authorities may agree that permit applications are complete. This is also a result of the detailed pre-application contacts which took place before the formal application.

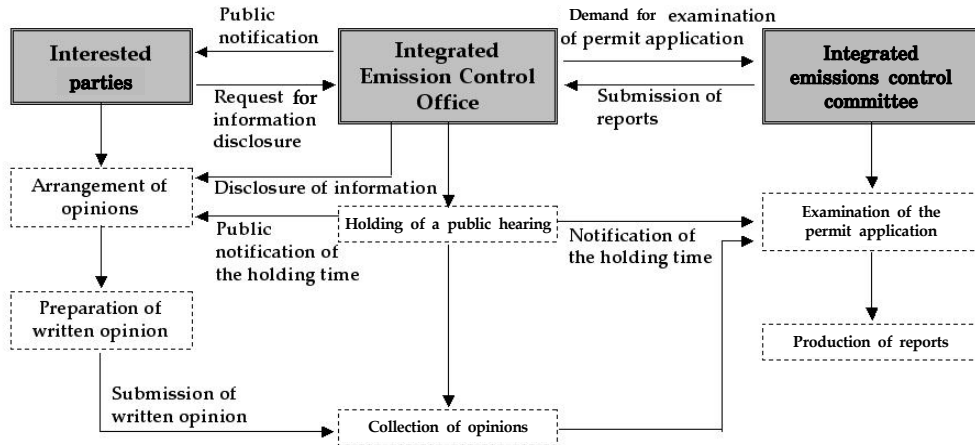
The application stage for integrated permission is divided into the investigation of the formal requirements stage and the substantial requirements stage. Each regulation model for the stages is summarized in Figure 3.

Figure3 The control model of the Application Stage for Integrated Permission regarding forma I requirements



In the stage for investigation of formal requirements, the IECO ensures that the contents of the application documents are compiled properly.

Figure4 The control model of the Application Stage for Integrated Permission regarding substantial requirements



In the stage for investigation of substantial requirements, the IECO protects the participation rights of interested parties via disclosure of information and examines the validity of the permit application from the technical viewpoint of the Integrated Emissions Control Committee(IECC).

2. Permit application

Complete and correct application documents are a prerequisite for speedy and efficient permissions procedures. The interviews indicate that public authorities mix experiences with the quality of permit applications. Some public authorities complained of incomplete application documents. Other public authorities reported that larger companies, in general, submit complete application documents whereas smaller companies tend to be dependent on the advice of the competent authorities in order to prepare the required documents.

Under IPPC directives, an application to the competent authority for a permit includes a description of:

- The installation and its activities,
- The raw and auxiliary materials, other substances, and the energy used or generated by the installation,
- The sources of emissions from the installation,
- The conditions of the site of the installation,
- The nature and quantities of foreseeable emissions from the installation into each medium, as well as identification of significant effects of the emissions on the environment,
- The proposed technology and other techniques for prevention, or where this is not possible, reduction of emissions from the installation,
- Where necessary, measures for the prevention and recovery of waste generated by the installation,
- Further measures planned to comply with the general principles of the basic obligations for the operator as provided for in Article 3,
- Measures planned to monitor emissions into the environment

In application documents for part A facilities, an application to the competent authority for a permit includes a description of:

- The national grid,
- A site condition report,
- Relevant offences,
- Technical ability,
- Finances,
- Management systems,
- Sites of Special Scientific Interest (SSSIs),
- European sites, as defined by regulation 10,
- Health-authority area

To make a comparative study of the IPPC, UK, and Korea, additional descriptions for integrated permit application documents include:

- The conditions of the site of the installation,
- Environmental impact assessment,
- BAT,
- Further measures planned to comply with the general principles of the basic obligations of the operator,
- Measures planned to monitor emissions into the environment,
- Relevant offences,
- Finances,
- Management systems

3. Examination of the IECC

The IECC is consulted for planned projects during the pre-application phase and the permitting procedure. In addition to standard consultation requirements set forth in the regulations, the IECC in a given case must ensure that the project has been fully examined by the IECC. In general, the opinions of the IECC are not binding. Exceptions include the opinions given by local governments on the compatibility of the project with local zoning regulations and physical plans.

The IECC is organized by related civil and public experts, and charged with technical examination in order to improve habitual investigations of public authorities. The IECC is established as a kind of committee in the IECCO. Application documents are thoroughly discussed by expert subcommittees within the IECC.

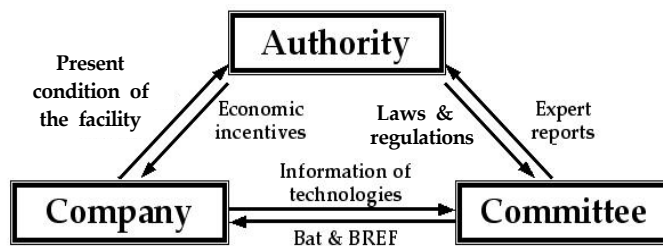
4. Disclosure of information

The most basic and important thing to realize is the right to know administrative information and that that information is properly disclosed. However, personal information is included in administrative information, and information regarding individuals should be protected under current laws. As a result of the rapidly developing information revolution, new legal discussions have emerged regarding problems associated with infringement on human rights arising from the

distribution of information; particularly problems associated with the legal protection of information and the holding of information.

For the disclosure of information for BAT, the most important issue is for companies to offer the government technical information. To this end, economic incentives should be given to companies and an information network needs to be organized. An example of an information network is shown in Figure 5.

Figure5 Information Network



The portal service site for environmental information (<http://etips.me.go.kr/>) is recommended as a disclosure method for BAT and BREF information.

With respect to the scope of disclosure information it is advisable to limit:

- The content of the application documents
- The content in connection with attached documents
- Consultations on pre-application contacts
- Information regarding environmental impact

5. Consultation with the public

Consultation with the public can be in the form of submission of written opinions and/or through public hearings. The objective of public hearings is to discuss problems related to the project and to hear objections raised by citizens and NGOs. The public has the right to make objections, but it is not mandatory that a public hearing takes place.

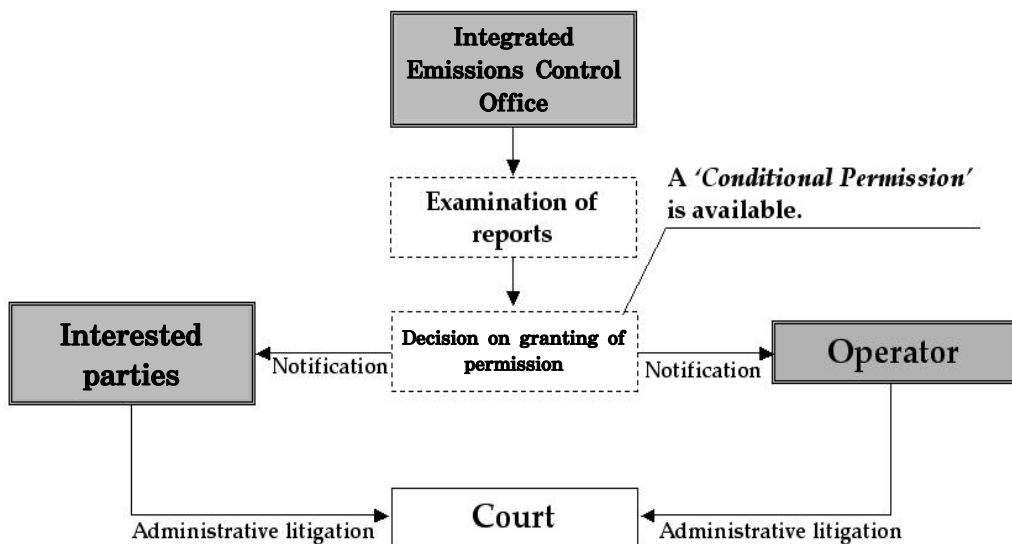
The impact of public consultation on the content of planning permissions may be slightly greater than environmental permits. With regard to planning procedures, local authorities may acknowledge a certain influence from the public on the final decision. The influence is explained by the relevance of planning issues for the public and by the fact that local decision makers are elected representatives who are accountable to the public.

V. Decision Stage for Permissions

1. Introduction

The IECO makes decisions through investigative reports from the IECC and written opinions. If the IECO judges that an application is lawful, permission will be awarded. An overview of the regulatory model is displayed in Figure 6.

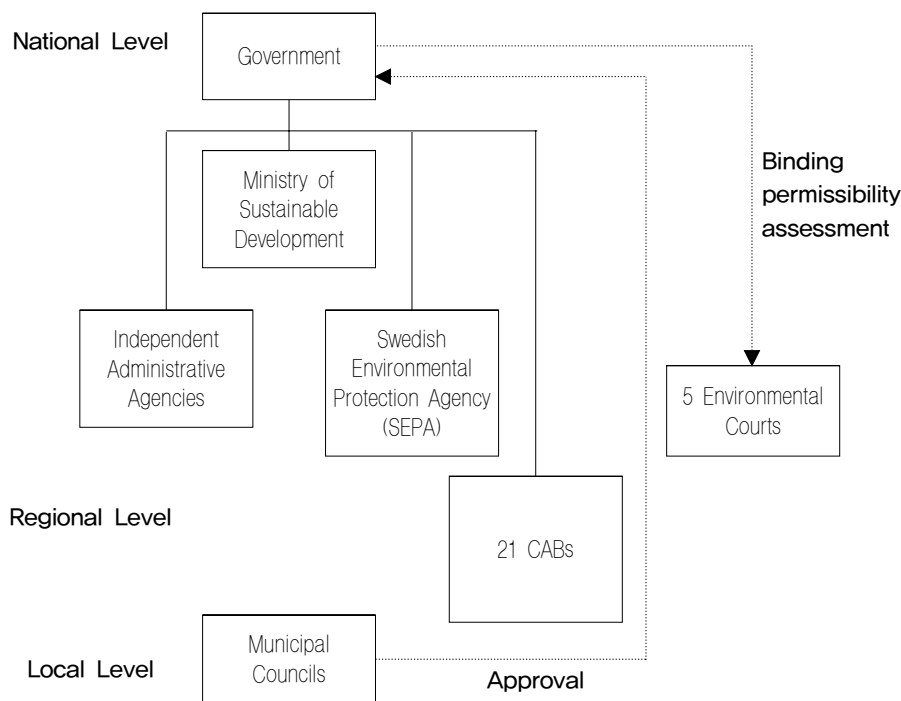
Figure6 Regulatory model of the permit decision stage



2. Organization and competence distribution

Organizations connected with the integrated emission permit are the IECO and the IECC. The IECO has the authority to decide, while the IECC participates in the decision process of the IECO through the permit procedures.

Figure7 The Permit and Inspection System in Sweden



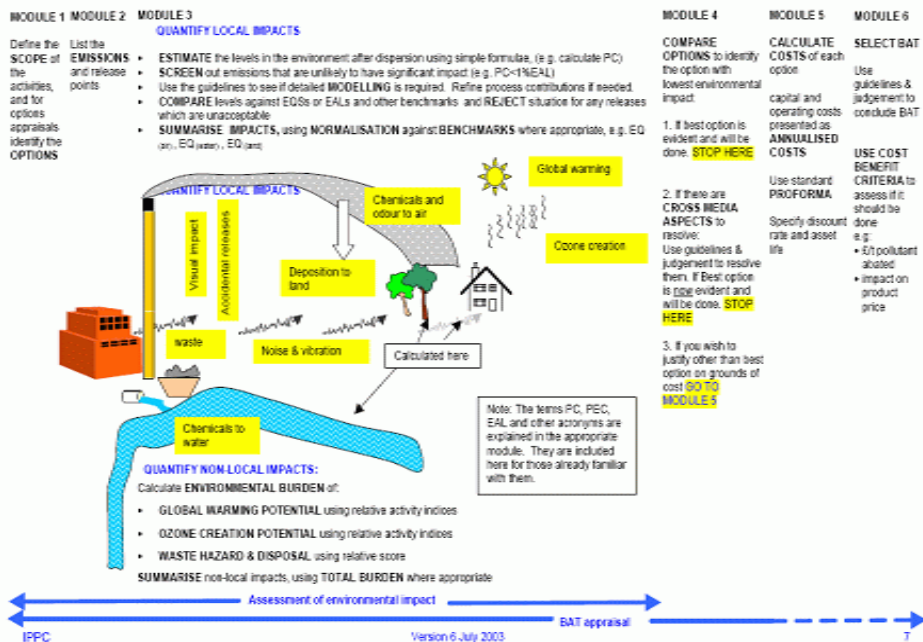
Accordingly, competence distribution between IECO and IECC should be designed. To consider the professional and technical viewpoints of the IECC, independent competencies need to be vested. However, the problem of competence distribution is the substantial effect of the IECC in the permit procedure. In conclusion, the formal legal status of the IECC will be a model for general decision-making institutions, and the IECO was bound practically by decision-making for the IECC.

3. Application of BAT

From the perspective of rational choice it is relevant whether environmental quality objectives and preferences are determined by generic decisions or on a case-by-case basis. Having determined the relevant environmental objectives and preferences, the assessment of a project's environmental effects and the choice of the most cost-effective control measures can only be accomplished through case-specific decisions. This follows from the infinite number of factors which can define the technical characteristics of different projects and control measures, local environmental conditions and cost-effective solutions. Any generic technical prescriptions such as BAT based binding emission standards restrict, from the perspective of the rational decision model, the scope of optimal choices.

This restriction is, by definition, the purpose of binding BAT based emission standards, because control measures are to be eliminated from consideration if they do not meet binding emission limit values.

Figure8 BAT assessment process in IPPC



VI. Conclusion

Integrated Pollution Prevention and Control(IPPC) has become an idealistic environmental prevention concept in developed countries and corresponds with the principles of Industrial Ecology.

The concept of emissions regulatory integration is a key factor for an integrated environmental management system. While most EU member countries have a cross-media regulatory system, Korea has a media-specific regulatory system which was discovered to have many environmental management problems.

Accordingly, the purpose of this study is to integrate the emissions regulatory system by resolving difficulties through procedural, organizational, and substantial analysis of integration.

To this end, the following research was performed. First the target of the integrated emissions regulatory system was determined. In connection with this, 「IPPC directive」 of the EU and the 「PPCA 2000」 schedule 1 of the UK, as well as environmental laws in Korea were compared and analyzed. The second was to design a regulatory system model. This model was divided into three groups after considerations were made regarding the time it would take for the pre-application, application, and permission stages. Lastly, on the basis of this research, a revised bill for an integrated emissions regulatory system was suggested.

Nevertheless, the substantial analysis of integration focused on BAT needs to be supplemented in order to make the integrated emission regulatory system operate normally as an environmental management policy and regulation method. For this, characteristics of society, culture, and the legal system in Korea need to be actively considered.

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