AMENDMENT TO THE

PARK

REGIONAL AIR QUALITY ATTAINMENT AND MAINTENANCE PLAN--2000

EMISSION REDUCTION CREDIT BANKING AND TRADING SYSTEM

AS ADOPTED BY THE

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SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

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Amend

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DECEMBER 1983

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Special acknowledgement is due Mr. Richard F. Pierce, SEWRPC Principal Air Quality Specialist, for his contribution to the preparation of this report.

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- SUBJECT: Certification of Amendment to the Adopted Regional Air Quality Attainment and Maintenance Plan (Emission Reduction Credit Banking and Trading System)
- TO: The Legislative Bodies of Concerned Local Units of Government Within the Southeastern Wisconsin Region, namely: the County of Milwaukee and the City of Milwaukee

This is to certify that at a regular meeting of the Southeastern Wisconsin Regional Planning Commission, held at the Milwaukee County Courthouse, Milwaukee, Wisconsin, on the 1st day of December 1983, the Commission did by unanimous vote by all Commissioners present, being 20 ayes and 0 nayes, and by appropriate Resolution, a copy of which is made a part hereof and incorporated by reference to the same force and effect as if it had been specifically set forth herein in detail, adopt an amendment to the regional air quality attainment and maintenance plan, which plan was originally adopted by the Commission on the 20th day of June 1980, as part of the master plan for the physical development of the Region. The said amendment to the regional air quality attainment and maintenance plan pertains to a recommended institutional mechanism for implementing an emission reduction credit banking and trading system in southeastern Wisconsin, and consists of the documents attached hereto and made a part hereof. Such action taken by the Commission is hereby recorded on, and is a part of, said plan, and the plan as amended is hereby transmitted to the constituent local units of government for consideration, adoption, and implementation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and seal and cause the Seal of the Southeastern Wisconsin Regional Planning Commission to be hereto affixed. Dated at the City of Waukesha, Wisconsin, this 2nd day of December 1983.

alfred & Brant

Alfred G. Raetz, Chairman Southeastern Wisconsin Regional Planning Commission

ATTEST:



Kurt W. Bauer Deputy Secretary (This page intentionally left blank)

RESOLUTION NO. 83-20

RESOLUTION OF THE SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION AMENDING THE ADOPTED REGIONAL AIR QUALITY ATTAINMENT AND MAINTENANCE PLAN, THE PLAN BEING A PART OF THE MASTER PLAN FOR THE PHYSICAL DEVELOPMENT OF THE REGION COMPRISED OF THE COUNTIES OF KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WALWORTH, WASHINGTON, AND WAUKESHA IN THE STATE OF WISCONSIN (EMISSION REDUCTION CREDIT BANKING AND TRADING SYSTEM)

WHEREAS, pursuant to Section 66.945(10) of the Wisconsin Statutes, the Southeastern Wisconsin Regional Planning Commission, at a meeting held on the 20th day of June 1980, duly adopted a regional air quality attainment and maintenance plan as documented in SEWRPC Planning Report No. 28, <u>A Regional Air</u> Quality Attainment and Maintenance Plan for Southeastern Wisconsin: 2000; and

WHEREAS, it is envisioned in the adopted regional air quality plan that the plan will be amended from time-to-time as changing conditions may indicate or require; and

WHEREAS, the Board of Supervisors of Milwaukee County in a resolution adopted on November 6, 1981, conditionally approved the regional air quality attainment and maintenance plan contingent, in part, upon the preparation by the Commission of a report pertaining to the establishment of an emission reduction credit banking and trading program in southeastern Wisconsin; and

WHEREAS, the Common Council of the City of Milwaukee in a resolution adopted on January 20, 1981, conditionally endorsed the regional air quality attainment and maintenance plan contingent, in part, on the inclusion in the plan of an emission reduction credit banking and trading policy and program; and

WHEREAS, it is envisioned that an emission reduction credit banking and trading system, if implemented in the Southeastern Wisconsin Region, would further the objectives of the regional air quality attainment and maintenance plan by accelerating the attainment of the established ambient air quality standards in the Region, while providing for continued sound economic growth; and

WHEREAS, the Commission has completed a study of alternative emission reduction credit banking and trading mechanisms, which study encompassed the feasibility of implementing an emission reduction credit banking and trading program within the public and private sectors, duly weighing the administrative and socioeconomic advantages and disadvantages associated with each system; and

WHEREAS, the aforenoted study has resulted in the recommendation that a public state agency—either the Wisconsin Department of Natural Resources or the Wisconsin Department of Development—assume the responsibility as the administrative banking authority; that the responsibility for negotiating individual emission reduction credit trades, sales, or similar transactions remain in the private sector; that the responsible public banking authority establish and maintain a public registry of available emission reduction credits; that such information as contained in the registry be disseminated or otherwise made available to potential buyers in the private sector; that local units of government purchase, register, and accumulate a reserve of emission reduction credits in order to provide a stable market for such credits and to accelerate economic development; and that the public banking authority establish a mechanism to solicit and incorporate public comment on the use of available emission reduction credits; and

WHEREAS, the aforenoted recommendations constitute a plan for implementing an emission reduction credit banking and trading system in southeastern Wisconsin, which plan is intended to amend the adopted regional air quality attainment and maintenance plan; and

WHEREAS, the plan is set forth in the SEWRPC Staff Memorandum entitled, "A Recommended Institutional Mechanism for Implementing an Emission Reduction Credit Banking and Trading System in Southeastern Wisconsin," which memorandum contains proposals, descriptions, and explanatory matter intended by the Regional Planning Commission to constitute an integral part of the regional air quality attainment and maintenance plan and the master plan for the physical development of the Region; and WHEREAS, the Technical Coordinating and Advisory Committee on Regional Air Quality Planning, an advisory committee to the Commission duly constituted pursuant to Section 66.945(7) of the Wisconsin Statutes, at its meeting held on September 22, 1983, endorsed the emission reduction credit banking and trading system as set forth in the aforenoted SEWRPC Staff Memorandum and recommended that the Commission act favorably upon the emission reduction credit banking and trading system plan; and

WHEREAS, under the provisions of Section 66.945(9) of the Wisconsin Statutes, the Regional Planning Commission is authorized and empowered, as the work of making the whole master plan progresses, to adopt the emission reduction credit banking and trading system plan for southeastern Wisconsin as set forth in the aforenoted SEWRPC Staff Memorandum as an amendment to the regional air quality attainment and maintenance plan, and as an integral part of the master plan for the physical development of the Region.

NOW, THEREFORE, BE IT RESOLVED:

FIRST: That the regional air quality attainment and maintenance plan for the Southeastern Wisconsin Region, being a part of the master plan for the physical development of the Region and documented in SEWRPC Planning Report No. 28, which was adopted by the Commission as a part of the master plan on the 20th day of June 1980, be and the same hereby is amended to include the emission reduction credit banking and trading system as set forth in the aforenoted SEWRPC Staff Memorandum.

<u>SECOND</u>: That the said emission reduction credit banking and trading system plan contained in the aforenoted SEWRPC Staff Memorandum and the said descriptive and explanatory matter contained in the aforenoted SEWRPC Staff Memorandum, together with all maps, programs, and descriptive and explanatory matter therein contained, are hereby made a matter of public record; and that the originals and true copies thereof shall be kept, at all times, at the offices of the Southeastern Wisconsin Regional Planning Commission, presently located in the Old Courthouse Building in the City of Waukesha, County of Waukesha, and State of Wisconsin, or at any subsequent office that the said Commission may occupy, for examination and study by whomsoever may desire to examine the same.

THIRD: That a true, correct, and exact copy of this resolution, together with a complete and exact copy of the aforenoted SEWRPC Staff Memorandum, shall be distributed to each of the local legislative bodies of the governmental units within the Region entitled thereto and to such other bodies, agencies, or individuals as the law may require or as the Commission, its Executive Committee, or its Executive Director, at their discretion, shall determine and direct.

The foregoing resolution, upon motion duly made and seconded, was regularly adopted at the meeting of the Southeastern Wisconsin Regional Planning Commission held on the 1st day of December 1983, the vote being: Ayes 20; Nayes 0.

alfred & Brant

Alfred G. Raetz, Chairman

ATTEST:

Kurt W. Bauer, Deputy Secretary

SEWRPC Staff Memorandum

A RECOMMENDED INSTITUTIONAL MECHANISM FOR IMPLEMENTING AN EMISSION REDUCTION CREDIT BANKING AND TRADING SYSTEM IN SOUTHEASTERN WISCONSIN

Char	pter I, INTRODUCTION	- 1
	REGULATORY HISTORY NEED FOR AND PURPOSE OF THE STUDY	2
	GEOGRAPHIC SCOPE OF THE STUDY	9 14
Char	pter II, BASIC CONCEPTS	16
	INTRODUCTION	16
	GENERATING EMISSION REDUCTION CREDITS	1/
	Enforceable Emission Reductions	1/
	Permanent Emission Reductions	10
	Quantifiable Emission Reductions	19
	Quantifiable Emission Reductions	19
	USING EMISSION REDUCTION CREDITS	20
	Interpollutant Trades	20
	Ambient Tests	20
	Level I	21
	Level II	21
	Level III	21
	General Limitations	22
	SUMMARY	23
Char	oter III, ALTERNATIVE AND RECOMMENDED EMISSION REDUCTION	
CF	REDIT BANKING AND TRADING SYSTEMS	24
	PUBLIC AND PRIVATE TRADING SYSTEMS	24
	THE PUBLIC ACTION SYSTEM	26
	THE PUBLIC MONOPOLY/MONOPSONY SYSTEM	- 32
	THE PRIVATE TRADING SYSTEM	35
	THE RECOMMENDED PLAN	38
	PLAN IMPLEMENTATION	41
	SUMMARY	42
Chap	ter IV, SUMMARY	44
	INTRODUCTION	44
	EMISSION REDUCTION CREDITS	47
	ALTERNATIVE PLANS	48
	THE RECOMMENDED PLAN	51
	CONCLUSION	53

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Chapter I

INTRODUCTION

In June 1980, the Commission completed and adopted a regional air quality attainment and maintenance plan for the Southeastern Wisconsin Region. This plan, which is documented in SEWRPC Planning Report No. 28, A Regional Air Quality Attainment and Maintenance Plan for Southeastern Wisconsin--2000, sets forth a comprehensive group of recommended actions to ensure the timely attainment and long-term maintenance of the established federal and state ambient air quality standards in the Region. Prior to Commission adoption of this plan, and as a result of comments received during the public informational meeting and formal public hearing on the plan, the plan was expanded to include a recommendation that the feasibility of implementing an emission reduction credit banking and trading system in the Region be investigated as a means of facilitating the attainment of the ambient air quality standards. Moreover, in a resolution adopted on November 19, 1980, the Board of Supervisors of Milwaukee County approved the regional air quality plan, conditioning such approval in part on the basis that the Commission undertake a study of an emission reduction credit banking and trading system for southeastern Wisconsin. Similarly, the Common Council of the City of Milwaukee endorsed the regional air quality plan in a resolution adopted on January 20, 1981, contingent in part on the development of an emission reduction credit banking and trading program in the Region. Accordingly, the Commission, utilizing planning funds made available from the U.S. Environmental Protection Agency under Section 175 of the Clean Air Act as amended in 1977, agreed to undertake an analysis of alternative emission reduction credit banking and trading systems in order to determine which system configuration would best serve the needs of the economic community of the Region while ensuring the attainment of clean air for all residents in the seven-county area. This report sets forth the results, findings, and recommendations of that analysis.

This report consists of four chapters. Chapter I summarizes the regulatory history leading to state and federal policies concerning the banking and trading of emission reduction credits, sets forth the need for and purpose of the study, and defines the geographic area included in the study. Chapter II presents the basic principles and concepts underlying the functions of emission reduction credits. Chapter III provides an evaluation of alternative banking and trading mechanisms applicable to emission reduction credits-including a public auction system, a public monopoly/monopsony system, and a private trading system--and sets forth the recommended emission reduction credit banking and trading system for the Southeastern Wisconsin Region. This chapter also identifies those agencies having significant implementing responsibilities with respect to the quantification, verification, banking, and trade or sale of emission reduction credits. Chapter IV presents a summary of the findings and recommendations of the study. This report also contains two appendices. Appendix A sets forth the membership of the Technical Coordinating and Advisory Committee on Regional Air Quality Planning which reviewed and endorsed this document. Appendix B presents an example of how an air pollutant emission source may potentially generate, use, and sell emission reduction credits.

REGULATORY HISTORY

The Clean Air Act as amended in 1970 required states to prepare State Implementation Plans (SIP's) to ensure the expeditious attainment of the primary ambient air quality standards as expeditiously as practicable but no later than July 1975. As the July 1975 attainment deadline came and passed, however, it was evident that the existing SIP's were inadequate in terms of resolving the air quality problems in most areas of the country. Since the Clean Air Act amendments of 1970 required all SIP's to contain regulations pertaining to the preconstruction review of major new or modified sources--and mandated the disapproval of construction and operating permits if a source would interfere with either the attainment or maintenance of the ambient air quality standards--the widespread inability of states to achieve the ambient air quality standards gave rise to questions concerning whether or not new source construction or existing source modifications could occur in nonattainment areas. In order to avoid the potentially stifling economic impacts on the construction or modification of major new air pollutant emission sources, the U. S. Environmental Protection Agency (EPA) sought an approach which would accommodate industrial expansion while still ensuring the attainment of the ambient air quality standards.

-2-

During this same period, the U. S. Senate Subcommittee on Environmental Pollution was undertaking a review of the Clean Air Act. In early 1976, as a part of this review and reevaluation effort, the Subcommittee began consideration of a potential change to the Act which became known as the "steel amendment." This amendment was intended to provide for the expansion of steel companies, most of which were located in designated nonattainment areas. This amendment, however, did not allow for new industries to move into a nonattainment area, and generally favored those existing facilities which were slow to meet their compliance schedule for reducing air pollutant emissions. Congress adjourned in October 1976 without taking action on the steel amendment or making any final legislative changes to the Clean Air Act.

In April 1976, the EPA prepared a final draft of its own version of an offset policy. This draft was distributed to the state air pollution regulatory agencies for review and comment. The EPA formally issued its emission offset policy as an interpretive ruling in the Federal Register dated December 21, 1976 (Vol. 41, No. 246). Under this EPA interpretive ruling, a major new source seeking to construct in a nonattainment area, or any major modification to an existing source in such an area, had to meet five conditions. The first condition was that the new or modified source must meet an emission limitation which specifies the lowest achievable emission rate (LAER) defined for that LAER was defined as the lowest emission rate achieved in type of source. practice for a particular source type. In no event was the emission rate limitation defined by LAER to be less stringent than the emission rate specified in the federal New Source Performance Standards (NSPS).

The second condition required that the applicant certify that all other air pollutant emission sources owned or operated by the applicant within the same air quality control region (AQCR) are in conformance with existing emission limitations. Also, if another source owned or operated by the applicant was on a compliance schedule to meet specified emission limitations, the EPA required that the timetable for compliance be accelerated if practicable.

The third condition required the applicant to obtain offsetting emission reductions from existing sources in the area of the proposed source, while the fourth condition required that the offset emissions would yield a positive air

-3-

quality benefit. Together, these two conditions were intended to ensure reasonable further progress towards attainement of the ambient air quality standards in the affected area.

The fifth condition stipulated that sources proposed for construction or modification in a nonattainement area on or after January 1, 1979, could only do so if there were adequate provisions in an approved State Implementation Plan (SIP) to ensure the attainment of the air quality standards. If the EPA determined that the existing SIP did not ensure attainment of the air quality standards in the area of the proposed source, EPA could withhold construction permits until adequate SIP revisions were in place.

This 1976 interpretive ruling allowed exemptions from some of the five conditions under certain circumstances, and also provided some guidance as to the means of crediting offsets obtained from plant close-downs, limitations on plant operating hours, and on switches to cleaner, less-pollution fuels. Certain other issues, such as the geographic area to be considered in obtaining offsets--particularly important in determining hydrocarbon and nitrogen oxide emission offsets--were treated more nebulously. Moreover, this interpretive ruling did not permit the banking of excess emission offset credits. The EPA policy at the time stated that once an emission offset had been executed for a particular source, there could be no left-over credit to bank for additional new growth in future years. Although EPA recognized that the emission offset banking restriction and certain other issues raised by the 1976 policy were controversial, the agency relied on Congress to address such issues through specific guidance in the amendments to the Clean Air Act.

Amendments to the Clean Air Act were enacted by Congress in August 1977. As a part of these amendments, Congress essentially incorporated the emission offset policy as proposed by the EPA during 1976. At the same time, Congress also provided another mechanism for accommodating growth in nonattainment areas. Specifically, the 1977 Clean Air Act amendments required all states to prepare revisions to their SIP by July 1, 1979. If, as a part of this SIP revision process, states provided for controls on existing air pollutant emission sources beyond that required to meet the air quality standards, then a margin for growth would be established which could be used by new sources entering the area. Under such circumstances, the new source would not be required to obtain emission offsets. Existing sources, under this policy, would be required to meet, at a minimum, a control level defined by the EPA as "reasonably available control technology" (RACT), while new sources would be required to meet LAER. Congress envisioned that after July 1, 1979, the revised SIP's would include either an emission offset or growth margin approach to accommodate industrial growth and expansion in nonattainment areas.

In response to public comment on its 1976 policy, and in order to conform with the Clean Air Act as amended in 1977, the EPA revised its interpretive ruling on the emission offset policy in the <u>Federal Register</u> dated January 16, 1979. One of the most significant revisions contained in the 1979 policy was the inclusion of provisions for banking emission reduction credits. The EPA for the first time allowed banked emission reduction credits to be used by a new source entering an area insofar as such credits had been properly certified and accounted for in the SIP, and insofar as the use of such credits would not interfere with reasonable further progress towards attainment of the ambient air quality standards. The EPA also encouraged the establishment of a formal banking mechanism to accurately record, track, and dispense emission reduction credits. The January 1979 emission offset policy and the banking policy were the first components of a series of actions which may collectively be referred to as the "controlled trading" system.

The next major component of the controlled trading system was the "bubble" concept, issued by the EPA in the <u>Federal Register</u> dated December 11, 1979. Under the bubble concept, the owner or operator of a facility could elect to control an air pollutant emission source beyond the legally enforceable requirements of the SIP and credit that excess control against the burden of controlling a more expensive source within that facility. This policy is referred to as the "bubble" concept since it establishes the entire facility as the source of air pollution rather than the individual processes within the facility. The bubble concept may be viewed as an internal emission trade since it allows more economic controls to be used in place of more costly controls if the facility as a whole does not exceed the sum of the individual emission limitations set forth in the SIP. In the <u>Federal Register</u> of August 7, 1980, and later modified in the <u>Federal</u> <u>Register</u> of October 14, 1981, the EPA attempted to streamline the control trading system by introducing the concept of "netting." Netting removes the burden of new source review requirements from industries expanding in either clean air areas or nonattainment areas if any increase in emissions from the entire facility is insignificant. By "netting out" of review the new facility may be exempted from requirements for monitoring and modeling. Thus, a facility desiring to add on a process could control an existing process beyond the legal requirements set forth in the SIP and avoid the lengthy preconstruction permit review procedures if the net overall emission increase at the facility is not significant.

The latest EPA policy statement on emission trading is set forth in the <u>Federal Register</u> dated April 7, 1982. This interim policy statment replaces the initial bubble policy, provides the minimum legal requirements for the creation, banking, and use of emission reduction credits, and sets forth criteria for developing SIP rules under which states can approve emission trades without prior facility-by-facility review by the EPA. It is within the guidelines expressed in the April 7, 1982, emission trading policy statement that the emission reduction credit banking and trading system recommended for the Southeastern Wisconsin Region has been developed.

It should be noted, however, that recent federal Circuit Court decisons may, ultimately, have an impact on emission reduction credit banking and trading programs. Specifically, in the case of <u>NRDC v. Gorsuch</u>, (685 F. 2d 718, D.C. Cir. 1982) a federal Circuit Court decided the narrow issue of EPA's plantwide definition of "source" for New Source Review purposes in nonattainment areas, and ruled that definition invalid. This decision did, however, validate EPA's plant-wide definition of a source in clean air areas for prevention of significant deterioration review purposes. Moreover, the case did not consider the validity of existing source bubbles in nonattainment areas and the Court did not render a decision on this issue. The Court's decision, however, contains language suggesting that all emission trades in nonattainment areas must, in and of themselves, produce progress towards attainment of the ambient air quality standards beyond the progress already mandated by applicable State Implementation Plans (SIP's). This may have the effect of significantly reducing or even eliminating the supply of emission reduction credits available for sale or trade. The EPA, however, disagrees with this ruling and, on March 25, 1983, the Solicitor General filed a petition for Certiorari asking the U. S. Supreme Court to review the decision. On May 31, 1983, the Supreme Court granted the EPA's petition for review.

NEED FOR AND PURPOSE OF THE STUDY

The emissions trading system as defined and promoted by the EPA consists of the use of bubbles, netting, emission offsets, and emission reduction credit banking. These four alternatives involve the creation of "surplus" emission reductions from certain air pollutant emission sources which may subsequently be used to meet requirements applicable to other emission sources.

In general, the bubble concept addresses the internal emission reductions used to achieve the most economical balance of emission control from two or more sources within an existing facility. The bubble may be used insofar as the emissions resulting from control on a particular source at a level less stringent than required by the SIP are offset by the placement of more stringent controls on one or more additional sources.

Netting involves the use of internal emission reductions on existing sources within a facility in order to offset an anticipated increase in air pollutant emissions from a planned new source within that facility, thereby negating the need to undergo new source review requirements. The netting out of new sources eliminates the need for preconstruction monitoring, modeling, application of LAER, and finding external emission offsets.

Emission offsets are external emission reductions required to be obtained by a new source from existing sources in the area when the new source intends to locate in a designated nonattainment area or in a clean air area where the allowable prevention of significant deterioration increment has been used to the maximum. Emission offsets represent the only nonelective component in the emissions trading system, since they are expressly required under the Clean Air Act to demonstrate reasonable further progress towards attainment of the ambient air quality standards. Emission reduction banking provides a system whereby internal or external emission reductions in excess of the emission limitations required by the SIP may be credited for future use, trade, or sale. Banking of emission reduction credits offers an incentive for the owners or operators of major air pollutant emission sources to control air pollution beyond the regulatory limits.

The EPA presently allows states to either implement banking and trading of emission reduction credits as individual SIP revisions, or to establish generic banking and trading regulations within which such activities may be conducted without following the SIP revision process. At the present time, the Wisconsin Department of Natural Resources (DNR) permits the banking and trading of emission reduction credits on a case-by-case basis, but has not formulated generic banking and trading rules. As of October 1, 1983, however, three requests to bank emissions had been received by the DNR in southeastern Wisconsin. Of these three requests, one was for a particulate matter credit, and two were for volatile organic compound credits.

It is possible that the establishment of a formal institutional mechanism for the banking and trading of emission reduction credits would generate a greater number of such transactions by industries in the State of Wisconsin. A formal banking and trading system would be administered under predetermined and welldefined rules, and would offer industry a greater degree of protection for their emission reduction credits than may otherwise be achieved without generic regulations. With some degree of protection for emission reduction credits, industries would be more inclined to obtain and bank the credits--in order to provide quick access and approval for use or trade--rather than to generate the credits only when needed.

From the standpoint of air pollution control, a formal banking and trading mechanism offers the following advantages:

1. It increases the flexibility of the DNR in developing and implementing rules and regulations to attain and maintain the ambient air quality standards. Emissions trading systems provide an alternative approach to the historic "command and control" approach used by air pollution control agencies.

-8-

- 2. It establishes prescribed rules and regulations to ensure the uniform application of banking and trading transactions for all new source reviews, bubbles, netting, and emission offsets in both clean air areas and nonattainment areas.
- 3. It provides an incentive for industries to reduce their emissions beyond the existing control requirements and may accelerate attainment of the ambient air quality standards.
- 4. It creates a "market place" for both buyers and sellers of emission reduction credits. Without an established banking and trading mechanism, the availability of emission reduction credits may be difficult to ascertain.
- 5. It encourages the development of innovative air pollution control technology.

From the perspective of economic development, the establishment of a formal emission reduction credit banking and trading mechanism offers industry the following advantages:

- 1. It provides an economic reward for controlling air pollutant emissions to a greater degree than specified under existing regulations.
- 2. It reduces uncertainty as to the availability of emission reduction credits.
- 3. It lessens the potential delay in finding, verifying, and purchasing emission offsets and thus allows for more advance planning for expansion and modification.
- 4. It facilitates the use of the bubble and netting, and therefore allows existing air pollution sources to minimize the cost of complying with current and future emission limitations.

Because the establishment of a formal emission reduction credit banking and trading system has the potential to accommodate economic development while ensuring the attainment and maintenance of the ambient air quality standards, the feasibility of implementing such a system in the Southeastern Wisconsin Region should be investigated. Accordingly, it is the purpose of this report to examine the alternative banking and trading system configurations feasible for implementation, and to set forth a recommended institutional mechanism for affecting such a system in the Southeastern Wisconsin Region.

GEOGRAPHIC SCOPE OF THE STUDY

The geographic area considered in this study is the seven-county Southeastern Wisconsin Region which consists of the Counties of Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha. In 1982, these seven counties contained an estimated resident population of about 1.76 million persons, or about 37 percent of the total state population. Of these seven counties, only Walworth County is not within a Standard Metropolitan Statistical Area (SMSA).

The Southeastern Wisconsin Region contains both clean air areas and areas which do not meet the established state and federal ambient air quality standards. Specifically, portions of the Region have been designated as nonattainment for particulate matter (see Map 1), for sulfur oxides (see Map 2), for carbon monoxide (see Map 3), and for ozone (see Map 4).

There are different preconstruction review requirements which a major new or modified source must meet depending on whether the source is proposing to locate in a nonattainment area or a clean air area. In general, the necessity for obtaining emission reduction credits is greater in nonattainment areas than in clean air areas. Accordingly, it may be expected that a formal emission reduction credit banking and trading system would experience greater application in designated nonattainment areas. A formal banking and trading system, however, may also assist new and existing sources in clean air areas of the Region, particularly in such applications as the bubble, netting, or in cases where the prevention of significant deterioration increments have been used to the maximum extent. It should also be noted that a major air pollution source of two or more pollutant species might propose to locate in an



Map 2

SULFUR DIOXIDE NONATTAINMENT AREA IN THE REGION: 1983



Source: Wisconsin Department of Natural Resources.



Source: U. S. Environmental Protection Agency and Wisconsin Department of Natural Resources.

Map 3



PRIMARY AND SECONDARY PARTICULATE MATTER NONATTAINMENT AREAS IN THE REGION: 1983



Source: U. S. Environmental Protection Agency and Wisconsin Department of Natural Resources.



OZONE NONATTAINMENT AREA IN THE REGION: 1983

Source: U. S. Environmental Protection Agency and Wisconsin Department of Natural Resources.

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-14-. Map 4 area which is designated nonattainment for one species and a clean air area for the other species. In such cases, the source would be subject to both the nonattainment area review criteria and the prevention of significant deterioration review criteria. The availability of emission reduction credits could facilitate permit acquisition under both review processes. The institutional mechanisms for establishing an emission reduction credit banking and trading system as set forth herein, therefore, is designed to accommoate the potential requirements for both the nonattainment and clean air areas within the sevencounty Southeastern Wisconsin Region.

SUMMARY

The establishment of a formal emission reduction banking and trading system offers a viable approach to providing for economic development while attaining the goal of clean air throughout the Southeastern Wisconsin Region. The banking and trading of emission reduction credits is advantageous to air pollution control regulatory agencies in that it offers more flexibility for attaining the ambient air quality standards, and is advantageous to industry in that it offers an economic reward for controlling air pollutant emissions. Although the DNR has allowed the banking of emission reduction credits on a case-by-case basis, a more formal, institutional structure of banking and trading may greatly increase the use of this approach for controlling air pollution in southeastern Wisconsin.

This chapter has set forth the regulatory history of emission trading systems, defined the need for and purpose of this study, and has delineated the geographic scope of the study area. The next chapter examines the characteristics of emission reduction credits in terms of their source, availability, and disposition.

Chapter II

BASIC CONCEPTS

INTRODUCTION

The basic unit of currency in the banking and trading system presented in this report is the emission reduction credit. An emission reduction credit is defined as a certified emission reduction below the limitation specified by existing pollution control regulations. It represents a "right" of a source to place an incremental quantity of air pollution into the atmosphere insofar as such additional emissions do not cause a violation of an ambient air quality standard or exceed a prevention of significant deterioration increment. As a transferable "right", an emission reduction credit has a marketable value which is determined essentially by the demand for such rights. In addition to the most obvious condition of general industrial expansion, the demand for emission reduction credits may be influenced by such factors as the legal obligations of the buyers and sellers of this commodity, and by the incentives or disincentives resulting to the buyer or seller potentially affecting a trading transaction. An understanding of the nature and characteristics of emission reduction credits is therefore essential to the establishment of a sound air pollution emission reduction credit banking and trading mechanism.

The concept of a market for emission reduction credits is analogous in some respects to the market for offshore drilling rights on federal lands, the issuance of such commodities as taxi medallions and liquor licenses, and the distribution of mineral land leases or water rights in certain states. Other possible analogies include state turnpike restaurant and service station concessions, transportation route certificates, hospital certificates of necessity, and broadcasting licenses. Each of these represents a "public franchise" purchased by, and issued to, an individual or organization within a fixed set of government regulations and guidelines. Among other relevant items, such government regulations and guidelines generally include provisions concerning the use and transferability of the franchise.

In the examples presented above, the commodity purchased, used, or traded, is the package of administrative permits necessary to establish and conduct a specified operation. Unlike these precedents, however, an emission reduction credit and trading system does not market administrative permits, but rather the commodity marketed is the "right" to have a permit adjusted for an existing source, or issued for a new source, based upon a prior or simultaneous emission reduction. Emission permits as issued by the Wisconsin Department of Natural Resources are for a unique source with a specified set of operating conditions and are not transferable. Moreover, emission permits, as well as other administrative permits, are issued as an entire package of "rights", whereas emission reduction credits may be used, traded, or sold in part. Also, the use of emission reduction credits reduce the pollution rights transferred since, for example, a buyer of 100 tons of credit cannot increase emissions by that full amount. The emission reduction credit is in effect "discounted" by a specified percentage in order to provide reasonable further progress towards attainment of the ambient air quality standards. Without such discounting, no air quality improvement could be expected nor demonstrated through the creation and use of emission reduction credits. Although the level of the discount has not been formally established by the DNR, the DNR's emission offset task force has recommended a 1.2 to 1.0 ratio in emission credits to new emissions, or in effect, a 20 percent discount rate. Conceptually, therefore, it is important to distinguish between the physical air pollution units and the intangible "rights"--emission reduction credits--which can be banked, traded, or sold.

The U.S. Environmental Protection Agency (EPA) has issued criteria for establishing emission reduction credits and has set forth procedures for using such credits to obtain an emission permit or to have an existing permit modified. This chapter presents a review of the criteria which must be followed in generating emission reduction credits and examines the uses to which such credits may be placed.

GENERATING EMISSION REDUCTION CREDITS

There are four criteria which an emission reduction must meet before it can be registered as an emission reduction credit: it must be surplus, enforceable,

permanent, and quantifiable. These four criteria are discussed in the following sections.

Surplus Emission Reductions

The EPA requires that only those emission reductions not presently mandated by existing air pollution control regulations may be designated and used as an emission reduction credit. Required emission reductions are necessary to attain and maintain the established standards and therefore allowing their use as a credit would deteriorate ambient air quality.

In order to qualify an emission reduction as a creditable surplus, it is necessary to establish a baseline level of emissions. This baseline defines the level of emissions below which any further emission reductions may be considered surplus. A baseline emission level must be defined for each pollutant species for each existing or proposed air pollutant source. In general, the determination of the baseline emission level is dependent on whether or not a source lies within or impacts upon a designated nonattainment area. For a source in a clean air area, the baseline may be either the actual historical level of emissions or the maximum allowable level of emissions as defined by existing air pollution control regulations. The determination of which baseline to use in attainment areas can best be made by the DNR at the time such a source submits a request to receive an emission reduction credit.

For existing sources in nonattainment areas, the baseline may be defined as that level of emissions achieved through the application of "Reasonably Available Control Technology" (RACT). For new or modified sources in a nonattainment area, the baseline would be defined as that level of emissions prescribed as the "Lowest Achieveable Emission Rate" (LAER) for a specified industrial process. Where either RACT or LAER has not been defined for a particular source, the source owner or operator must reach agreement with the Wisconsin Department of Natural Resources (DNR) as to the acceptable baseline emission limit.

In order to be considered as surplus, an emission reduction must not have been included as a part of the attainment demonstration in the state implementation plan for achieving the ambient air quality standards (SIP). No emission reductions may thus be credited if they occurred prior to the year of the inventory and monitoring data used to revise the existing SIP since such reductions have already been used to demonstrate progress towards attainment of the standards. If, however, a source has surplus emission reductions which were not included in the SIP attainment demonstration, and if such emission reductions did not impact upon the base year monitoring data used in the SIP analysis, then such reductions may be certified as credits insofar as they were generated after August 7, 1977, the date of the latest amendment to the Clean Air Act.

Enforceable Emission Reductions

In order to receive credit for an emission reduction, that reduction must be enforceable by state and federal regulatory agencies. Accordingly, any emission reduction that is to be credited must be incorporated into some form of compliance instrument which is legally binding and practicably enforceable. In southeastern Wisconsin the principal compliance instrument would be the DNR-issued pre-construction or operating permit presently required for all major air pollution sources. Through the permit process, a source could obtain enforceable emission reduction credits for voluntary restrictions on hours of operation or limits on production or input rates.

Permanent Emission Reductions

If an emission reduction is to be credited, it must be a permanent reduction in the level of pollution released by a source. Under this stipulation, mobile source controls would not qualify as emission reduction credits since the federal motor vehicle emissions control program provides for a long-term decline in emissions from the total vehicle fleet as newer model year vehicles equipped with more pollution control equipment replace older, more polluting Thus, such activities as promoting carpools and van pools do not vehicles. meet the permanence criterion and cannot be used to obtain an emission reduc-Only stationary sources can therefore obtain emission reduction tion credit. credits. In this regard, it is important to note that a stationary source which receives credit for an emission reduction achieved through the use of a compliance instrument which limits process or production rates cannot increase production in the future without first obtaining compensating emission reductions in order to meet this permanence criterion.

Quantifiable Emission Reductions

Prior to crediting an emission reduction, a reliable basis for quantifying the amount and rate of the reduction must be firmly established. In order to quantify an emission reduction credit, emissions must be measured or calculated both before and after the reduction. The same procedure-for example, stack tests, emission factors, throughput rates, or monitoring results--should be used in quantifying the emissions before and after the reduction. This criterion ensures that the emission reduction is real and that its use as a credit will not deteriorate ambient air quality.

USING EMISSION REDUCTION CREDITS

The EPA has established certain guidelines for, and limitations on, the use of emission reduction credits. These guidelines and limitations are examined in the following sections.

Interpollutant Trades

Under the EPA guidelines, the emission reduction credits issued for one pollutant species may not be used to meet the emission limitation requirements for another pollutant species. Since the attainment and maintenance of the ambient air quality standards depends on the implementation of a prescribed set of actions set forth in the (SIP) individually for each pollutant species, the use of an emission reduction credit given for one pollutant species would not serve to implement the SIP if used in exchange for another pollutant species. Therefore, only emission reduction credits granted for particulate matter can be used to offset emission requirements for particulate matter, and so on for each pollutant species.

Ambient Tests

In nonattainment areas, the use of an emission reduction credit cannot cause a violation of any ambient air quality standard nor can it impede the progress towards attaining an ambient air quality standard. In attainment areas, the use of an emission reduction credit cannot cause a prevention of significant deterioration standard to be exceeded. Before an emission reduction credit may be used, therefore, it is necessary to demonstrate the effect of that additional increment of pollution on ambient air quality.

In general, exchanges involving emission reduction credits for volatile organic compound and nitrogen oxide emissions do not require extensive air quality simulation modeling analyses to estimate their impact on ambient air quality. Since the principal impact of these pollutant species is the formation of ozone over broad geographic areas, each ton of emission decrease may be considered equivalent and offsetting to a corresponding increase in emissions within the same area.

The air quality impact of particulate matter, sulfur oxide, and carbon monoxide emissions, generally is most significant near the source of release. In addition to the distance between the sources of these pollutant species, such factors as plume rise parameters, meteorology, and topography, may influence the relative impact of emission sources for these pollutant species. More detailed analyses using air quality simulation models may be required in exchanges for these pollutant species in order to ensure that the use of emission reduction credits will not deteriorate ambient air quality.

The EPA has established a three-tiered screening process for determining the degree of required modeling necessary for evaluating the ambient air quality impact of trades involving particulate matter, sulfur oxide, and carbon mon-oxide emissions.

Level I: In general, no ambient air quality simulation modeling is required if the proposed particulate matter, sulfur oxide, or carbon monoxide emission reduction credit trade results in a net decrease in the baseline emission level; the emission sources involved in the trade are located in the same immediate vicinity; and, no increase in emissions occurs at the source with the lowest effective plume height. In exchanges where these criteria are met, it can reasonably be assumed that a pound-for-pound trade of the same pollutant species would have an equivalent effect on ambient air quality and thus no simulation modeling effort is required.

Level II: For emission reduction credit exhanges not meeting all the criteria for a level I analysis, some air quality simulation modeling is required. For trades in which there is a net decrease in the baseline emission level, and which will not cause an exceedance of the applicable prevention of significant deterioration increments at the receptor of maximum predicted impact, only a limited modeling demonstration need be undertaken.

Level III: If an emission reduction credit trade does not meet the criteria for either a level I or level II analysis, then a comprehensive air quality simulation modeling effort is required. In such cases the dispersion modeling effort must consider all emission sources within the area of impact. In general, a level III analysis is required if the net baseline emissions will increase as a result of the trade or if the trade will have a significant impact on ambient air quality at the location of the receptor showing the maximum impact. This modeling effort is intended to ensure that the ambient air quality impact resulting from the emission reduction credit trade is equivalent to the impact of the initial emission levels regulated in the SIP.

General Limitations

The Clean Air Act as amended in 1977 requires that plans for designated nonattainment areas include a demonstration of reasonable further progress in reducing emissions each year at a rate sufficient to attain the ambient air quality standards by statutory deadlines. In general, reasonable further progress is measured as an areawide decrease in pollutant emissions. Trades of emission reduction credits in nonattainment areas which increase total emissions can generally only occur as individual SIP revisions in which it is demonstrated that the trade is consistent with the reasonable further progress schedule, or in which the reasonable further progress schedule is revised as a part of a proposed SIP revision. Such trades may also occur in cases where existing sources were required to reduce emissions beyond the limit necessary to bring the area into attainment. In such cases, a growth margin is established in the SIP which may be used to compensate for any increase in emission levels without violating the reasonable further progress requirement. In attainment areas, emission reduction credit trades which increase total emissions may be permitted but may consume all or part of the allowable increment or necessitate a prevention of significant deterioration review.

Irrespective of the attainment or nonattainment status of the area in which they are located, the Clean Air Act, as amended in 1977, requires all new or expanding sources of air pollution to meet new source performance standards. This requirement prohibits the use of internal offsets to meet new source performance standards. Thus, emission reduction credits may not be used to meet new source review requirements for best available control technology (BACT) in prevention of significant deterioration areas, or the lowest achievable emission rate (LAER) control technology in nonattainment areas. Only in the case of an expanding source can internal emission reductions be used to "net out" of new source review. Such sources must still meet new source performance standards, but are not subject to BACT requirements in clean air areas or to LAER requirements in nonattainment areas.

Finally, the EPA allows emission reducton credit trades between fugitive dust emission sources and process or stack emission sources if, based on air quality simulation modeling analyses, it is demonstrated there is no deterioration of ambient air quality. The EPA proposes that such trades should be required to establish a monitoring program after the trade has been affected in order to evaluate the impact of the fugitive dust control efforts. If the monitoring results indicate that the initial fugitive dust controls do not provide the anticipated improvements in ambient air quality, further reductions may be required.

SUMMARY

This chapter has described the nature and characteristics of the basic unit of currency in a banking and trading program: the emission reduction credit. Specifically, this chapter has examined the means and limitations in generating and using emission reduction credits. In the following chapter, the alternative systems for the banking and trading of emission reduction credits are identified.

Chapter III

ALTERNATIVE AND RECOMMENDED EMISSION REDUCTION CREDIT BANKING AND TRADING SYSTEMS

After an emission reduction credit has been generated, it must be confirmed and certified by the Wisconsin Department of Natural Resources (DNR). Confirmation and certification of the emission reduction credit by the DNR ensures that the credit is surplus, enforceable, permanent, and quantifiable, and firmly establishes the ownership of the credit. The credit may then be used by the owner to meet a contemporaneous emission limitation requirement or stored in a bank for future internal use or external sale. If an emission reduction credit is to be used for internal expansion purposes only, then the type of banking and trading system in operation need only insure the future availability of the credit to the owner over a specified time period. If, however, a credit is to be made available for sale or trade, the nature of the banking and trading system in operation is an important determinant in establishing a market for such credits.

Although a number of areas throughout the United States have investigated the possibility of developing formal emission reduction credit regulations, there are only four areas which have actually incorporated banking systems into their air pollution control programs: the Jefferson County Air Pollution Control District, which encompasses Louisville, Kentucky, began operation in June 1979; the Bay Area Air Quality Management District, which includes all or part of nine counties around San Francisco, California, began operation in January 1980; the South Coast Air Quality Management District, which includes the Los Angeles, California, metropolitan area, began operation in June 1980; and the Puget Sound District in the State of Washington began operation in June 1980. Though each of these four programs operate under differing rules concerning the certification, banking, and use of emission reduction credits, they share a common factor in that they are all administered by public agencies acting as a banking authority. More detailed information on the operating characteristics of these four programs may be found in the EPA publication entitled, "Emission Reduction Banking and Trading Update," Volume 2, October 1980, and in the U.S. General Accounting Office publication entitled, "A

Market Approach to Air Pollution Control Could Reduce Compliance Costs Without Jeopardizing Clean Air Goals," March 1982.

There are three basic alternative trading mechanisms which can be implemented to market emission reduction credits: the public auction system, the public monopoly/monopsony system, and the private trading system. In general, there are both advantages and disadvantages associated with the implementation of either the public type trading systems or the private trading system. This chapter identifies the principal advantages and disadvantages attendant to public and private trading systems, and evaluates each of the three basic alternative trading systems for feasibility of implementation in the Southeastern Wisconsin Region.

PUBLIC AND PRIVATE TRADING SYSTEMS

In order to establish a successful trading system, there must be a secure market for emission reduction credits. Under the public alternatives, buyers and sellers of emission reduction credits have a greater assurance of security since all trading would be done under the auspices of a government agency which would control such factors as price, availability, and ultimate use. Trades conducted under the private system may not provide such assurances since the price for emission reduction credits could vary significantly between individual trades and thereby lessen the demand for such credits and diminish the market base. Initial and long-term market stability, therefore, is probably best achieved through the public trading alternatives since those systems are better able to avoid large price fluctuations for emission reduction credits or as a result of a buyer's lack of information concerning prevailing market prices.

Under both the private and public trading systems there will be transaction costs associated with the exchange of emission reduction credits. In the public systems, transaction costs will be incurred by the responsible government agency overseeing the transfer of emission reduction credits between two or more private entities. Transaction costs associated with a private trading system, however, may be higher than with a public system since more time will be required to bring buyers and sellers together, to negotiate sale prices, and to confirm the applicability of the emission reduction credits for meeting the buyer's emission permit limitations. On the other hand, transaction cost may be minimized if private agencies engaged in other similar buying and selling actions can use an existing operation with offices, personnel and marketing strategies in handling the emission credit system along with other related business.

It should be noted, however, that the potentially greater profit incentive associated with a private trading system may provide for a greater generation of emission reduction credits available for external trade or sale. Prices mandated by a governmental agency for emission reduction credits may be set lower than an open market-determined price and thus reduce the incentive for private concerns to produce more such credits. Conversely, a public agency could establish a price for emission reduction credits at an artificially high level and thereby reduce the potential buyers demand for credits. Although private transactions could avoid these deficiencies in the public trading systems, private trading systems may not always have the best marketing data available to judge the prevailing costs of emission reduction credits. Both the public and private trading systems must seek a price level for emission reduction credits which will encourage the steady production of credits while ensuring an adequate supply of buyers.

It is evident that there are valid general arguments for selecting either a public or a private trading system. It is necessary, therefore, to more closely examine the operational characteristics of the specific types of public and private trading systems which may be selected for implementation in the Southeastern Wisconsin Region.

THE PUBLIC AUCTION SYSTEM

Under the public auction system, available emission reduction credits are periodically made available to potential buyers through publicly held sales. Depending on the type of auction system employed, potential buyers of emission reduction credits may either bid against each other or against a predetermined market price. This type of system is administered by a designated or specifically created public or private agency or commission. The banking and trading authority does not necessarily have to be a governmental agency but the auction of emission reduction credits must be conducted in a public forum. The public or private agency designated for the banking and trading of emission reduction credits under this type of system need only govern the transfer of credits by conducting auction sales to bidders. The banking and trading authority merely acts as a sales agent between the buyers and sellers of emission reduction credits. It should be noted, however, that the Wisconsin Department of Natural Resources (DNR) would be actively involved in a public auction system even if a private agency were selected to administer the auctions since the DNR would maintain responsibility to confirm and certify all potential emission reduction credits.

The designated banking and trading authority may obtain the emission reduction credits for auction by either direct purchase or through acceptance of the credits on consignment. Under the direct purchase option, the banking and trading authority assumes certain inherent risks since it might not be possible to dispose of the emission reduction credits at or above the price it paid for them. If a ready market for emission reduction credits is available, however, the banking and trading authority may be able to profitably sell the credits and use the proceeds to underwrite the cost of operating the auction system. The consignment option is considerably safer to administer from a cost standpoint since the banking and trading authority does not incur a risk of losing money in a transaction or of acquiring a large inventory of emission reduction credits for which there is no demand. The consignment option does, however, reduce the incentive for the banking and trading authority to dispose of the available credits.

When the banking and trading authority accepts emission reduction credits on consignment, the owner of the credits may establish a "reserve". A reserve is the price below which the owner will not allow a credit to be sold. Although the use of an established reserve may be a constraint on the banking and trading authority, it does provide a greater incentive to generate emission reduction credits by ensuring the owner of a minimum market value. The banking and trading authority may also use a version of the reserve by establishing minimum bid levels prior to the auction. In certain types of auctions it is possible to have emission reduction credits up for bid which are not sold because of either lack of demand or excessive price. If the emission reduction credits were accepted by the banking and trading authority on consignment, then the unpurchased credits could be returned to their owner or held for the next auction. If emission reduction credits frequently remain unpurchased, or if a large number of consigned credits accumulate in the bank, a disincentive for the generation of emission reduction credits may result. In such cases the banking and trading authority may deem it feasible to directly purchase the unsold credits in order to ensure a continuing level of credit production. Such a direct purchase by the banking and trading authority is analogous to federal farm price supports established by the government to ensure an even supply of certain essential commodities.

In an auction system, a decision must be made as to the unit of the emission reduction credit placed up for bid. Emission reduction credits could be auctioned as single units--that is, for example, one ton per year--or in uniform blocks--such as 10 emission reduction credits per block--or they can be sold as they are generated by the owner. In the latter case, if a facility owner generated 13 emission reduction credits, they would be sold as a 13 unit The single unit emission reduction credit sale allows a buyer to block. purchase only those credits for which he has immediate need. Single unit purchases, however, would require more extensive bookkeeping on the part of the banking and trading authority in order to account for the generation and use of emission reduction credits. Multiple-unit block sales, whether in uniform size or based on production, may require buyers to purchase emission reduction credits significantly in excess of their present requirements. Although the sale of emission reduction credits in multiple-unit blocks may initially be an incentive to the producers of the credits, in the longer term mandatory block size purchase requirements may reduce the demand for credits. Moreover, whereas purchases of multiple-unit blocks may not adversely affect large emission sources, smaller sources may actually be prevented from entering It should be noted, however, that the unused portion of the the market. multiple-unit emission reduction credit block could be redeposited in the bank under new ownership and resold at a later auction. Thus, the principal argument in single versus multiple-unit block sizes is a question of the immediate cash flow associated with the purchase.

-28-

A final consideration in evaluating the public auction system is the type of bidding mechanism used to distribute the emission reduction credits. There are three general types of auction systems: the "Dutch" auction system, the The "Dutch" "English" auction system, and the "Traditional" auction system. auction system is a method for determining the market clearing price of the available emission reduction credits. Under this system, the banking and trading authority collects or accumulates a sifficient number of emission reduction credits to justify holding an auction. The banking and trading authority then informs the public and interested parties about the auction-describing what is being offered and the conditions of sale as well as establishing an initial, relatively high, price per unit of emission reduction credit--and solicits orders for the credits at that price. If a full subscription is not obtained, all orders are returned, a new lower price for the emission reduction credits is established, and the bidding process is re-ini-This process may be repeated many times until a full subscription is tiated. In order to avoid the repetition of the multiple bidding process, obtained. bidders could indicate to the banking and trading authority how many emission reduction credits they would be willing to purchase at each of several alternative prices. This alternative procedure is termed the schedule of payment variation. In this option, the first price at which all emission reduction credits are ordered is defined as the overall unit sales price.

The "English" auction system is similar to that used for the sale of U.S. Treasury bills. In this system, blocks of emission reduction credits would be auctioned serially until all were sold. The emission reduction credit block size would be uniform, but the price for each block would not. The first block sold would probably bring a higher price, from a bidder who has a greater and more immediate need, than the last block sold. The question of need for emission reduction credits, however, may diminish the effectiveness of the "English" auction system for trading pollution rights. For certain pollutants, the proximity of the proposed new or expanded source to the location where the emission reduction credit was generated is a determining factor in establishing the value of a credit block. A new or expanding source will place higher value on a block of emission reduction credits from a source five miles away than it would on the same size block of credits from a source 10 miles away since, as noted in the last chapter, the required demonstration of

reasonable further progress towards attainment of the ambient air quality standards would be easier to quantify. In general, the further a new or expanding source is in relation to the point at which the emission reduction credits were generated, the more blocks of credits it must obtain to demonstrate reasonable further progress. The "English" auction system, therefore, may not accurately reflect the true market value of the available emission reduction credits.

The "Traditional" auction system responds more fully to the specific nature of the emission reduction credit as a commodity. Each emission reduction credit block has its own relatively unique characteristics in terms of pollutant species, size, location at which it was generated, and relative impact on ambient air quality. In the "Traditional" auction system, what is offered for sale is the emission reduction credit as generated by any one producer. The blocks in the "Traditional" auction system are individual lots of emission reduction credits, either consigned or brought directly and not necessarily of uniform size. This system is similar to that used by the federal government to auction offshore oil leases. Oil lease tracts are not uniform in size and may vary in value from bidder-to-bidder based upon such considerations as the proximity to other oil lease locations held by the bidder. In an emission reduction credit auction, a particular block of credits may be worth more to the owner of a source located near the source of the credits than to the owner of a source further away. In the "Traditional" auction system, therefore, emission reduction credits would be offered as they were generated and the bidder would have to buy enough blocks to meet its emission permit requirements.

In general, the pulic auction system--whether using the "Dutch", "English", or "Traditional" system--is a convenient method for selling or trading emission reduction credits. Administrative burdens are reduced under the auction system since sales or trades occur at specific points in time and may involve more substantial exchanges than would occur on a transaction-by-transaction basis. Transaction costs are also minimized to the producer, buyer, and banking and trading authority. There is little, if any, negotiation involved, information is relatively easy to obtain and, if the "Dutch" system includes the schedule-of-payment variation, sales or trades can be affected quickly. Whether emission reduction credits are traded or sold simultaneously, as in the "Dutch" system, or serially, as in the "English" and "Traditional" systems, the public auction system alternative enables a potential buyer to readily ascertain the price for such credits. The auction system also enables the buyers of emission reduction credits to determine the prevailing market value for the commodity and to assess what level of bidding competition will be required to secure the available credits.

On the other hand, there are certain potential disadvantages to implementing a form of public auction system for selling and trading emission reduction credits. In particular, an auction of credits may not be held at times corresponding to the demands for such credits by new or expanding sources. It may be that, like Treasury bills which are auctioned off once a week, a high, regular frequency of emission reduction credit auctions would not interfere with the expansion of industry, but the balance of supply and demand for such credits will in all practicality dictate the frequency at which credit auctions will be held.

In an auction system where a buyer must buy large blocks of emission reduction credits, there is a potential disadvantage that the buyer may be forced to purchase more credits than he needs. Although this situation may be advantageous from an air quality standpoint, it could ultimately reduce the demand for emission reduction credits. This can be avoided in the "Dutch" and "English" auction systems, but not in the "Traditional" auction system, by defining a block to be one unit of emission reduction credit. Also, in an auctioning system, like the "Dutch" system, where all emission reduction credits are required to be sold out, potential buyers may not only have to acquire more credits than they can use, but significant time delays in obtaining the necessary credits may also be experienced. It would be possible, however, to modify the "Dutch" system to include a minimum bid which, if reached before attaining full subscription, would be considered the lowest acceptable price. In this case, those orders received at that minimum bid price would be completed and the remaining unsold emission reduction credits retained until the next auction.

-31-

In summary, public auction systems represent a viable method for trading or selling emission reduction credits. The three variations discussed herein-the "Dutch", "English", and "Traditional" auction systems--are not rigid and it would be possible to substantially modify or combine the attributes of each system to more efficiently provide for the trading and selling of emission reduction credits in the Southeastern Wisconsin Region.

THE PUBLIC MONOPOLY/MONOPSONY SYSTEM

Under a public monoply/monopsony system, a specifically designated existing or created public agency would have the sole authority to purchase emission reduction credits from a producer and would be the sole source from which potential buyers could obtain such credits. As in the case of the private auction system, the designated banking and trading authority need not necessarily be a governmental body, but all details concerning the purchase and sale of emission reduction credits must be publicly available.

In a public monopoly/monopsony system, the banking and trading authority has nearly complete control over the generation and distribution of emission reduction credits. As the sole buyer of emission reduction credits, the banking and trading authority may influence the production of such credits by controlling the price paid for the purchase of the rights. The banking and trading authority may also control the use of the emission reduction credits since it would establish the price at which such credits are sold to potential buyers. It may also refuse to permit certain buyers or classes of buyers from purchasing and using emission reduction credits. The banking and trading authority, however, cannot dictate the behavior of the market for emission reduction credits. If the authority does not establish a payment schedule that adequately compensates the producer for his emission reduction credits, then the incentive for generating the credits is greatly diminished. Also, if the price is too low, the producer may retain documentation of a qualifying emission reduction and delay actually obtaining a credit until the prevailing market price improves or until it must use or dispose of the emission reductions. In either case, the marketable quantity of available emission reduction credits would be reduced without sufficient compensation to the producers. Alternatively, if the banking and trading authority establishes the selling

price of the emission reduction credits too high, potential buyers of the credits may cancel or postpone construction or expansion plans, or relocate to another area entirely.

Due to the need to provide a steady supply of both emission reduction credits and potential buyers for the credits in order to maintain market stability, the banking and trading authority must devise a mechanism for determining the price to be paid to the credit producer and the price to be paid by the credit buyer. Generically, there could either be a uniform price structure--wherein all credits are purchased at a single set price and sold at a single set price --or a differential price structure. Differential pricing, however, could present certain legal difficulties and would place significant administrative burdens on the banking and trading authority. On the other hand, a uniform price structure may not reflect the differing costs from source to source to produce an equal amount of emission reduction credits. In either case, the establishment of a sound price structure for the purchasing and selling of emission reduction credits under a monopoly/monopsony system will be critical in determining market stability.

One of the principal advantages to the monopoly/monopsony system is that emission reduction credits can be obtained by a buyer on an as-needed basis instead of waiting for periodic auctions. Also, the designated banking and trading authority in a monopoly/monopsony system does not have to concern itself with selling out entire subscriptions or holding emission reduction credits between auctions.

Transaction costs are generally less in the monopoly/monopsony system as compared with other systems since there is only one purchaser and one seller of emission reduction credits. Buyers and sellers of emission reduction credits need only contact the designated banking and trading authority to conduct all transactions. Moreover, if market stability is attained through the establishment of a sound price structure, the monopoly/monopsony system assures the producer of emission reduction credits that there will be a buyer for his credits, and provides the buyer a greater assurance that there will be enough credits to meet his needs. In addition, the buyer of emission reduction credits need only purchase the quantity of pollution rights necessary to meet his permit requirements since there would be no necessity to buy or sell credits in blocks.

Since the sale of emission reduction credits in a monopoly/monopsony system is continuous, depending on buyer demand, the administrative mechanism for handling such sales must be constantly maintained. With the auction system, sales of emission reduction credits take place only at specified times. The purchase of emission reduction credits by the banking and trading authority under either the monopoly/monopsony system or the public auction system would be expected to occur continuously.

As noted earlier, one of the principal considerations in establishing a monopoly/monopsony system is determining the purchase and sale prices for the emission reduction credits. It is much more difficult in this type of system to clearly ascertain the optimum price levels for emission reduction credits than in the bidding structure of the public auction system. One potential means to determine price levels is for the banking and trading authority to proceed in an iterative fashion, adjusting prices paid and charged until market stability is attained. This type of iterative process, however, is costly and time consuming. Moreover, vagaries in demand by the potential buyers would not be taken into account by uniformly changing the price levels for the available emission reduction credits. Differential pricing techniques, however, may be subject to legal challenges if the banking and trading authority unilaterally adjust sale prices for a specific buyer or class of buyers.

Notwithstanding the limitations of the public monopoly/monopsony trading system, it does provide certain advantages over the public auction system. Specifically, transaction costs would generally be lower, and emission reduction credits could be purchased on an as-needed basis and in the exact quantity to meet the requirements of the buyer. The public monopoly/monopsony system, therefore, represents a viable emission reduction credit trading option for implementation in the Southeastern Wisconsin Region.

THE PRIVATE TRADING SYSTEM

The private trading system represents an alternative to the public trading systems since government involvement is kept at a minimum. Even in a private trading system, however, it is not possible nor desirable to completely eliminate all government participation, but under this alternative the air pollution control agency would only be required to confirm and certify the creation and use of the emission reduction credits and to ensure that all transactions provided for reasonable further progress towards attainement of the ambient air quality standards.

There are two potential options which may predominate the transactions in the private trading system: the direct transaction and the brokerage transaction. In the direct transaction, the buyers and sellers of emission reduction credits deal one-on-one to affect an agreement. In the brokerage transaction, the transfer of emission reduction credits is accomplished with the aid of some middleman or broker. In either case, all transactions are conducted by private individuals or organizations with very little influence from a governmental regulatory body.

The concept of a broker for emission reduction credits implies that there is a substantial, well-developed market for the credits. This would probably not be the case in the initial stages of establishing a banking and trading system. Accordingly, most transactions during the early periods of private trading would be direct transactions. After a market for emission reduction credits has been well established, the brokerage option may prove more advantageous to industry from a cost and time standpoint. In a stable market, a new or expanding source needing emission reduction credits would seek out a borker with credits to sell. If there were an insufficient supply of credits to meet the source's demand, the broker would then negotiate with existing facilities to induce the generation of credits for sale to the new source. In a large enough market, a broker would probably find it advantageous to accumulate a stockpile of emission reduction credits, whether through direct purchase or on consignment, in order to expedite credit transactions. Speculation of this nature would, of course, be accompanied by a greater profit incentive for the brokerage firm.

Government involvement in a private trading system may range from a virtual "hands-off" approach--except for administering the required regulatory responsibilities of confirming and certifying the emission reduction credits and approving their ultimate use--to a strict oversight function which would include such responsibilities as the registration and licensing of brokers, placing restrictions on market participants, and requiring extensive post-trade monitoring and other reports. One aspect of a private trading system which will probably not fall under the auspices of a governmental agency is the establishment of the price for emission reduction credits. A publicly responsible banking and trading authority may set price guidelines which would establish price ceilings and floors for emission reduction credits, but excessive government intervention in a private market would negate the purpose of creating a private trading system.

Indeed, one of the principal advantages to a private trading system is the limited amount of governmental resources required to establish an emission reduction credit trading program. A private banking and trading system could thus be established more rapidly and at a lesser cost than required under either alternative public trading systems. This is not to say that the private trading system is free of administrative burdens: the governmental agency will still require strict control over the documentation, verification, and maintenance of the emission reduction credits.

The private trading system may also represent the best means for providing market stability by matching the supply of emission reduction credits with the demand. Theoretically, if the demand for emission reduction credits is low, the price will decline. If the price falls far enough, production of emission reduction credits will not prove profitable and supplies will decrease. Alternatively, if demand for emission reduction credits increase, prices will follow suit leading to a greater incentive to create more credits. If government intervention in establishing floors and ceilings on the price paid for credits can be avoided, the prevailing price for the credits should accurately reflect market conditions.

Under a private trading system, emission reduction credits can be sold upon demand as long as the credit has been generated. If the available supply of

emission reduction credits has been exhausted, however, a delay will be incurred in finding alternative sources and affecting the necessary emission reductions. Of further consideration is the fact that buyers in a private trading system can purchase precisely the number of emission reduction credits required to meet the permit limitations. This provides for the most efficient use and allocation of emission reduction credits and allows for the maximum level of economic growth.

One of the principal disadvantages in the private trading system as compared to the public trading systems is the relatively high costs which may be anticipated to occur in private transactions whether conducted directly or through a brokerage firm. These costs are generally associated with seeking out the owner of emission reduction credits, evaluating their utility for obtaining a permit, and negotiating a sale price. This process requires the buyer to expend his own resources in a direct transaction, or to pay a broker in nondirect transactions.

In a private trading system there is an element of uncertainty and risk not present in the public systems. Particularly in the initial stages of the banking and trading system, a private market will be more susceptible to the vagaries of the supply and demand of emission reduction credits and resulting fluctuations in price. Such instability can generally be avoided in public trading systems where the source and price of emission reduction credits are more open to the public forum. In a public system, a buyer can readily obtain information concerning the availability of credits and can therefore make a knowledgeable decision on the value of the credits. In a private system, however, there is not guarantee that the buyer will be adequately informed of the complete supply of credits and may therefore make an erroneous decision as to the price to pay for such credits.

In summary, a private trading system poses a greater uncertainty and risk to the buyer of emission reduction credits than is assumed in a public trading system. A private trading system, however, provides greater flexibility for obtaining emission reduction credits and may, after the initial shart-up period, provide for the greatest market stability. A private trading system, therefore, represents a viable option for implementation in the Southeastern Wisconsin Region.

THE RECOMMENDED PLAN

As may be seen in the foregoing evaluation of the public auction system, the public monopoly/monopsony system, and the private trading system, there are both advantages and disadvantages associated with the implementation of each of these alternative emission reduction credit banking and trading systems. No single alternative presented represents a unique and opitimum system which can be readily selected for implementation in the Southeastern Wisconsin Region. The recommended emission reduction credit banking and trading system plan, therefore, must retain the most advantageous elements of each alternative system while minimizing those elements detracting from the sound functioning of the system selected for implementation. In general, what is desired is a banking and trading system that will provide the most stable market for the buying and selling of emission reduction credits at the least cost and with the greatest expediency for potential traders.

The first step in the banking and trading process is to generate the emission reduction credit. This credit results from the efforts of a source owner to reduce air pollutant emissions beyond that point prescribed by existing statutory and regulatory limits. If the emission reduction is confirmed and certified by the Wisconsin Department of Natural Resources (DNR) as being surplus, permanent, enforceable, and quantifiable, then the credit may either be used by the source owner contemporaneously for a pollution permit modification, or it may be deposited in a bank for future use, trade, or sale. Since the DNR must confirm and certify the emission reduction credit, and since the DNR must ultimately approve the use of the credit in a proposed transaction, it would be most practical from an administrative standpoint to have the DNR act simultaneously as the banking authority rather than to transfer the necessary documentation to and from another surrogate agency designated as a credit The recommended plan, therefore, proposes that the DNR assume repository. responsibility as the banking authority.

As the designated banking authority, the DNR would provide the necessary accounting and tracking procedures for firmly establishing ownership and disposition of the emission reduction credits. To aid in this function, it is recommended that the DNR establish a formal registry which properly annotates the credit owner, the pollutant species for which the credit has been issued, the number of pollution units associated with the credit, and the source characteristics from which the credit was obtained. Information on the credit source characteristics--such as location, stack height, stack gas exit velocity, and plume rise--when compared with the emission characteristics of the extent to which the credit could be used to demonstrate reasonable further progress towards attainment of the ambient air quality standards.

In the event that the DNR declines to accept, or is unable to accept, the authority as the formal public banking agency for emission reduction credits, it is proposed that the Wisconsin Department of Development (DOD) assume the responsibility for this banking function. Since the DOD has the promotion of economic development in the State as a primary function, and since one purpose of the emission reduction credit policy is to facilitate economic growth, the DOD represents a logical and viable alternative to the DNR as the public banking agency. Designation of a state agency, such as the DOD or the DNR, acting as the banking authority also has the benefit of permitting the program to be administered on a uniform basis over the entire State. Although the designation of the DOD as the banking authority would add an additional step in the marketing process for emission reduction credits--since the DNR would remain the agency responsible for certifying such credits and transmitting the necessary credit information to the DOD for registration and tracking in the bank--this alternative may provide for better dissemination of information to new or expanding industries concerning the purpose and availability of emission reduction credits.

Although the recommended banking authority--the DNR or, alternatively, the DOD--is a public agency, the trading mechanism need not be confined to a governmental unit. In fact, as noted earlier in this chapter, public trading systems may not be as flexible as a private trading system in terms of providing emission reduction credits in a timely manner, particularly if one of the auction mechanisms is selected for implementation. Moreover, the public monopoly/monopsony system may provide disincentives to both producers and buyers of emission reduction credits if an acceptable price structure cannot readily be established. The principal disadvantage of a private system, however, is that the lack of information on the availability and price of emission reduction credits may extend negotiations for and the cost of such credits. Since the DNR or, alternatively, the DOT is recommended to be the sole public banking agency, data on credit availability may be readily obtained from a centralized and indisputable source. A potential buyer of emission reduction credits could simply refer to the DNR or DOD-maintained registry to ascertain the amount, location, and nature of the existing credits which may fulfill his development needs. Negotiations for the purchase of the needed credits could then proceed directly with the registered credit owner without further public intervention as to price. Such a public banking/ private trading system may be expected to minimize both public and private transaction costs, to accelerate the time necessary to unite potential buyers with available producers, and to establish the most representative fair market value for the generated emission reduction credits. For these reasons, the Commission staff recommends that the trading of emission reduction credits be left the responsibility of the private sector with informational support being provided on request by the public banking agency.

It was also noted earlier in this chapter that if the banking and trading of emission reduction credits were to be effective in promoting economic growth while still providing for attainment of the ambient air quality standards then there must be a stable market for such credits, that is, credit production must be approximately equal to credit demand. A private trading system in itself does nothing to ensure a steady production of emission reducton credits. One means to overcome this limitation would be for individual municipalities, through the local economic development authority, to purchase and bank emission reduction credits as they are produced. A more actively involved municipality could also generate its own emission reduction credits in certain cases, or could identify privately-owned potential sources of credits for later development. In either case, a local municipality could accumulate a reserve of emission reduction credits which could be given or sold to prospective new industry looking to locate or expand within its jurisdictional bound-In addition to potentially accelerating local economic development, aries. There is a greater assurance of a stable market for emission reduction credits when a local governmental agency acts as a major, though not monopsonic, buyer of the credits.

Finally, since the sale and use of emission reduction credits represents an allocation of natural resource, there should be some provision made for public comment on the disposition of large quantities of credits. Since the DNR is responsible for issuing or modifying air pollution permits, that agency may require a public review and comment period on all emission reduction credit transactions in excess of 100 tons of any pollutant species. This provision would ensure that the most responsible use of the available air resources in the Region is being made while accommodating economic growth.

PLAN IMPLEMENTATION

There are two principal implementation steps which must be taken prior to the initial operation of the recommended emission reduction credit banking and trading system: the establishment of appropriate administrative rules enabling the responsible state agency to develop the program; and the provision of funds to administer the program at the state level, and to purchase credits at The first step, the development of administrative rules, the local level. would be the responsibility of the banking agency--either the Wisconsin Department of Natural Resources or the Wisconsin Department of Development--and would be set forth in the Wisconsin Administrative Code. If existing legislation in the Wisconsin Statutes is deemed insufficient to allow either Department to develop the required administrative rules, enabling legislation would be required. The development of appropriate rules and regulations should proceed as expeditiously as practicable upon designation of either state agency as the emission reduction credit banking authority.

The second step, the provision of funding, must be addressed at both the state and local level. Insofar as the purpose of an emission reduction credit banking and trading program is to facilitate economic development while accelerating the attainment of the ambient air quality standards, funds to cover the administrative costs incurred by the designated state banking agency could be derived from the general revenue fund or from special purpose funds made available under Section 105 of the federal Clean Air Act as amended in 1977. Administrative costs would be limited in general to two program areas: the maintenance of a central registry of available emission reduction credits, and the dissemination of information concerning the availability and type of such credits to interested parties in both the public and private sector. Since emission reduction credits would normally be issued as a part of the permit ing process required under regulations promulgated by the Wisconsin Department of Natural Resources, the cost to certify emission reduction credits would be incorporated into the permit application fee paid by the requesting source owner or operator.

At the local level, it is envisioned that the purchase and accumulation of emission reduction credits would fall under the auspices of a local department of economic development or its equivalent. As a purchaser and owner of emission reduction credits, such a public agency would act essentially as a private body: assuming all costs and risks associated with the banking and trading of emission reduction credits. The degree to which local funding is made available to the municipality's department of economic development, therefore, would depend on the perception by the local government as to the effectiveness of such credits in stimulating or accelerating economic growth within its jurisdiction.

SUMMARY

This chapter has examined alternative emission reduction credit banking and trading systems for possible implementation in the Southeastern Wisconsin Region. Specifically, this chapter has evaluated the nature and operational characteristics of public trading systems--including the public auction system and the public monopoly/monopsony system--and a private trading system. Each of these alternative emission reduction credit banking and trading systems were found to have both certain advantages and disadvantages in terms of trading efficiency, transaction costs, and guarantee of a stable market. No single type of system, therefore, could be adopted in whole for implementation in the Southeastern Wisconsin Region.

The recommended regional emission reduction credit banking and trading system is an amalgamation of the best operational elements from both the public and private forms of trading systems. The recommended plan contains the following provisions:

- o that the DNR or, alternatively, the DOD accept the responsibility as the public banking authority;
- o that the responsibility for negotiating all emission reduction credit trading transactions reside in the private sector;
- o that the responsible public banking authority, either the DNR or DOD, establish and maintain a public registry of available emission reduction credits, and that such information as contained in the registry be disseminated or otherwise made available to potential buyers in the private sector;
- o that local units of government purchase, register, and accumulate a reserve of available emission reduction credits in order to provide a stable market fo such credits by assuring potential producers of a buyer, and in order to accelerate economic development by using such reserves to attract new industry or encourage expansion of existing industry; and
- o that the DNR or the DOD establish a mechanism to solicit and incorporate public comment on the ultimate use of available emission reduction credits.

Implementation of the preceding five elements of the recommended emission reduction credit banking and trading system may be expected to accommodate and encourage economic growth in the Region while ensuring the prompt attainment and long-term maintenance of the ambient air quality standards in southeastern Wisconsin.

Chapter IV

SUMMARY

INTRODUCTION

The Clean Air Act as amended in 1970 required states to prepare State Implementation Plans (SIP's) to achieve the primary ambient air quality standards by July 1975. As that deadline approached, however, it became obvious that the SIP's were inadequate in terms of resolving the air quality problems in most areas of the country. This widespread inability to attain the ambient air quality standards gave rise to questions concerning whether or not new source construction or existing source modifications could occur in nonattainment areas. In order to avoid the potentially stifling economic impacts associated with a ban on new source construction, expansion, or modification, the U.S. Environmental Protection Agency (EPA) sought an approach which would accommodate new industrial demand while still ensuring the attainment of the ambient air quality standards.

Both the EPA and the U.S. Congress addressed the problem of industrial expansion and the goal of clean air during a review of the Clean Air Actin 1976. Although Congress adjourned without taking action on the Clean Air Act, the EPA prepared and distributed an interpretive ruling known as the emission offset policy. The draft of the emission offset policy was distributed to state air pollution control agencies in April 1976 and formally published in the Federal Register on December 21, 1976. Under this EPA interpretive ruling, a major new source of air pollution seeking to locate in a nonattainment area, or an existing source seeking a major modification in such an area, could do so if certain conditions were met. These conditions specified that a new or modified source in a nonattainment area must meet an emission limitation defined as the "Lowest Achievable Emission Rate" (LAER), must certify that all other sources owned by the applicant within the same air quality control region (AQCR) were in compliance with existing air pollution control regulations, and must include obtaining offsetting emission reductions from other sources in the area such that an air quality benefit was realized. Another condition stipulated that sources proposed for construction or modification on or after

January 1, 1979, could only do so if there were adequate provisions in the SIP to ensure the attainment of the ambient air quality standards. Congress essentially incorporated the EPA-developed emission offset policy in the amendments to the Clean Air Act enacted in August 1977.

The initial EPA emission offset policy did not allow excess emission reductions to be banked by a source for future use. In 1979, however, the EPA reversed this position and included a provision for the banking of emission reduction credits insofar as such credits had been properly certified and included in the SIP, and insofar as the use of such credits would not interfere with reasonable further progress towards attainment of the ambient air quality standards. The EPA also encouraged the establishment of a formal banking and trading mechanism. The latest EPA policy statement on controlled emission trading was promulgated in April 1982. This policy statement provides the minimum legal requirements for the creation, banking, and use of emission reduction credits, and sets forth criteria for developing SIP rules under which states can approve emission trades without prior review by the EPA.

Emission reduction credit banking and trading provides a system whereby internal or external emission reductions in excess of the emission limitations required by the SIP may be credited for future use, trade, or sale. It is expected that the establishment of a formal mechanism for the banking and trading of emission reduction credits will generate a greater number of such transactions by industries in southeastern Wisconsin.

From the standpoint of air pollution control, a formal banking and trading mechanism offers the following advantages:

 It increases the flexibility of the DNR in developing and implementing rules and regulations to attain and maintain the ambient air quality standards. Emissions trading systems provide an alternative approach to the historic "command and control" approach used by air pollution control agencies.

- 2. It establishes prescribed rules and regulations to ensure the uniform application of banking and trading transactions for all new source reviews, bubbles, netting, and emission offsets in both clean air areas and nonattainment areas.
- 3. It provides an incentive for industries to reduce their emissions beyond the existing control requirements and may accelerate attainment of the ambient air quality standards.
- 4. It creates a "market place" for both buyers and sellers of emission reduction credits. Without an established banking and trading mechanism, the availability of emission reduction credits may be difficult to ascertain.
- 5. It encourages the development of innovative air pollution control technology.

From the perspective of economic development, the establishment of a formal emission reduction credit banking and trading mechanism offers industry the following advantages:

- 1. It provides an economic reward for controlling air pollutant emissions to a greater degree than specified under existing regulations.
- 2. It reduces uncertainty as to the availability of emission reduction credits.
- 3. It lessens the potential delay in finding, verifying, and purchasing emission offsets and thus allows for more advance planning for expansion and modification.
- 4. It facilitates the use of the bubble and netting, and therefore allows existing air pollution sources to minimize the cost of complying with current and future emission limitations.

Because the establishment of a formal emission reduction credit banking and trading system has the potential to accommodate economic development while ensuring the attainment and maintenance of the ambient air quality standards, the feasibility of implementing such a system in the Southeastern Wisconsin Region is investigated herein. The purpose of this report is to examine the alternative banking and trading system configurations feasible for implementation, and to set forth a recommended institutional mechanism for affecting such a system in the Southeastern Wisconsin Region.

EMISSION REDUCTION CREDITS

The basic unit of currency in a banking and trading system of this nature is the emission reduction credit. An emission reduction credit, defined as a certified emission reduction below the limitation specified by existing air pollution control regulations, represents a right to place an incremental quantity of a pollutant into the atmosphere insofar as such additional emissions do not cause a violation of the ambient air quality standards. As a transferable right, an emission reduction credit has a certain market value which is determined essentially by the demand for such rights.

There are four criteria which an emission reduction must meet before it can be registered as an emission reduction credit. First, the emission reduction must be surplus, that is, it must not be required under existing air pollution control regulations. Second, the emission reduction must be enforceable by state and federal air pollution control agencies. Third, the emission reduction must be permanent. Fourth, the emission reduction must be quantifiable in order to ensure that the reduction is indeed real and that its use as a credit will not deteriorate ambient air quality. If an emission reduction is confirmed as meeting all four of these criteria, then it may be banked as a credit for future use, trade, or sale.

Under EPA guidelines, emission reduction credits issued for one pollutant species may not be used to meet the emission limitations for another pollutant species. Also, the use of an emission reduction credit cannot cause a violation of an ambient air quality standard nor can it impede progress towards attaining an ambient air quality standard. In order to evaluate the impact that the use of an emission reduction credit may have on ambient air quality, it may be necessary to use detailed air quality simulation modeling techniques.

ALTERNATIVE PLANS

There are three basic alternative trading mechanisms which can be implemented to market emission reduction credits: the public auction system, the public monopoly/monopsony system, and the private trading system. Under the public auction system, available emission reduction credits are periodically made available to potential buyers through publicly held sales. In this type of system, which is administered by a designated or specifically created public or private agency or commission, potential buyers of the emission reduction credits may either bid against each other or against a predetermined market price. The designated banking and trading authority may obtain the emission reduction credits for auction by either direct purchase or through acceptance of the credits on consignment.

There are three basic bidding mechanisms which may be used to distribute emission reduction credits in a public auction system: the "Dutch" auction system, the "English" auction system, and the "Traditional" auction system. In the "Dutch" auction system, the banking and trading authority accumulates a sufficient number of emission reduction credits to hold an auction, informs the public about the auction, and solicits orders for credits at a predetermined price. If a full subscription is not obtained at the time of the auction, all orders are returned, a lower price for the credits is established, and the bidding process is reinitiated.

In the "English" auction system, blocks of emission reduction credits would be auctioned serially until all were sold. Each block of emission reduction credits would be of uniform size but the price per block would vary based on demand. In the "Traditional" auction system, emission reduction credits are offered for sale in lots as generated by any one producer. Under this type of auctioning sytem, a potential buyer would have to purchase a sufficient number of varying lot sizes of credits to meet his demand. Comparatively, the "English" auction system is analogous to the technique used to sell U.S. Treasury bills, while the "Traditional" auction system is similar to that used by the federal government to seel offshore oil leases. In general, public auction systems--whether using the "Dutch", "English", or "Traditional" bidding mechanisms--offer a convenient method for selling or trading emission reduction credits. The public auction systems offer reduced administrative burdens and minimize transaction costs. Public auction systems also allow potential buyers to readily determine the prevailing costs of the emission reduction credits and to assess the level of bidding competition that will be required to secure the available credits. On the other hand, because of scheduling problems, public auction systems may not provide credits to the market at times corresponding to the demand for such credits by new or expanding sources. Moreover, in an auction system where a buyer must purchase large blocks of emission reduction credits, the buyer may have to obtain more credits than he needs: a situation which could diminish the demand for such credits. It is possible, however, to substantially modify or combine the positive attributes from each of the three auction mechanisms to more efficiently provide for the trading of emission reduction credits.

Under a public monopoly/monopsony system, a specifically designated existing or created public agency would have the sole authority to purchase emission reduction credits from a producer and would be the sole source from which potential buyers could obtain such credits. In such a system, the banking and trading authority has nearly complete control over the generation and distribution of emission reduction credits. Since the banking and trading authority controls all facets of the purchase and sale of emission reduction credits, it is essential that the authority establish a payment schedule that adequately compensates the producer of such credits and that is attractive to potential buyers of the credits. Without a sound price structure, market instability would result because of too few credits to meet demand on too little demand to absorb all of the available credits.

One of the principal advantages to the public monopoly/monopsony system is that emission reduction credits can be obtained by a buyer on an as-needed basis instead of waiting for periodic auctions. Also, the banking and trading authority does not have to concern itself with selling out entire subscriptions or holding emission reduction credits between auctions. Moreover, if market stability is attained through the establishment of a sound price structure, the public monopoly/monopsony system assures the producer of a buyer for his credits and provides the buyer a greater assurance that there will be sufficient credits available to meet his needs. In addition, the buyer of credits under this type of system should be able to procure only the exact number of credits he needs, and, since sales are continuous, he should be able to obtain the credits precisely when he needs them.

The primary disadvantage to the implementation of a public monopoly/monopsony system is associated with the establishment of a sound price structure for the emission reduction credits. It is much more difficult in this type of system to clearly ascertain the optimum price levels for emission reduction credits than in the bidding structure of a public auction system. One potential means to determine price levels is to proceed in an iterative fashion, adjusting prices paid and charged until market stability is attained. The iterative process, however, is costly and time consuming. Differential pricing techniques could be used to establish credit costs, but such techniques may be subject to legal challenges if the trading authority unilaterally adjusts sale prices to a specific buyer or class of buyers. If, however, an equitable price structure is maintained, the public monopoly/monopsony system would represent a viable option for implementation in southeastern Wisconsin.

The private trading system represents an alternative to the public trading systems since government involvement is kept at a minimum. Private trades may be affected either as a direct transaction between the buyer and seller of emission reduction credits or through the assistance of some middleman or broker. The concept of a broker for emission reduction credits implies that there is a substantial, well-developed market for such credits. Since this would probably not be the case during the initial stages of market development, most transactions, at least at first, would probably be direct. After the market has stabilized, the brokerage option may prove more advantageous to industry from a cost and time standpoint.

Government involvement in a private trading system could range from a "handsoff" approach--except for confirming and certifying the emission reduction credits--to a strict oversight function which may include registering and licensing brokers, placing restraints on market participants, and requiring extensive post-sale monitoring. One aspect of a private trading system which probably would not fall under the auspices of a governmental agency, however, is the establishment of a price for the emission reduction credits. Indeed, one of the principal advantages of a private trading system is the limited amount of governmental resources required to administer the trading program since the cost of the credit transactions would remain in the private sector.

A private trading system may represent the best means for achieving market stability by matching the supply of emission reduction credits with the demand. In this type of system, emission reduction credits can be sold on demand as long as the credit has been generated. If the available supply of credits has been exhausted, however, a delay may be incurred in finding alternative sources. When credits are available, buyers in a private trading system can purchase the exact amount of credits necessary to meet their demand.

One of the principal disadvantages of a private trading system is the relatively high costs which may be associated with seeking out the owner of emission reduction credits, evaluating their utility for obtaining a permit, and negotiating a sale price. This process requires the buyer to expend his own resources in a direct transaction, or to pay a broker in a nondirect transaction. There is also more uncertainty and risk in a private trading system as compared with a public system. A private market, particularly in the initial stages of development, will be more susceptible to the vagaries of the supply and demand of credits. This may result in large fluctuations in price for the available credits. Such instability may be avoided, however, when the sources and prevailing prices of emission reduction credits are more open to the public forum. If the buyers and sellers of emission reduction credits have sufficient access to cost and availability data, a private system may provide the greatest flexibility for affecting credit transactions.

THE RECOMMENDED PLAN

Based upon an evaluation of the three alternative banking and trading systems discussed herein, it is obvious that no single alternative system considered represents an optimum technique for encouraging the transfer of emission reduction credits in southeastern Wisconsin. The recommended emission reduction credit banking and trading system, therefore, selectively retains the most advantageous elements of each alternative while minimizing the detracting elements. In general, the recommended banking and trading system plan provides the most stable market for the buying and selling of emission reduction credits at the least cost and with the greatest expediency for potential traders. The recommended plan, therefore, contains the following provisions:

- o that the Wisconsin Department of Natural Resources (DNR) or, as an alternative, the Wisconsin Department of Development (DOD) accept the responsibility as the public banking authority;
- o that the responsibility for negotiating all emission reduction credit trading transactions reside in the private sector;
- o that the responsible public banking authority, either the DNR or DOD, establish and maintain a public registry of available emission reduction credits, and that such information as contained in the registry be disseminated or otherwise made available to potential buyers in the private sector;
- o that local units of government purchase, register, and accumulate a reserve of available emission reduction credits in order to provide a stable market for such credits by assuring potential producers of a buyer, and in order to accelerate economic development by using such reserves to attract new industry or encourage expansion of existing industry; and
- o that the DNR or the DOD establish a mechanism to solicit and incorporate public comment on the ultimate use of available emission reduction credits.

As may be seen, the recommended plan is an amalgam of both public and private system options. The recommended plan calls for a public banking authority-the DNR or the DOD--with a private trading system. Such a public banking and private trading system may be expected to yield the most stable market for emission reduction credits at the least cost, with the greatest expediency, and with a minimum of government intervention.

CONCLUSION

The concept of controlled emission trading represents a most significant departure from the historical "command and control" approach associated with previous air pollution abatement programs. A formally established mechanism for the banking and trading of emission reduction credits offers a potentially viable alternative to mandated emission controls and limitations deemed necessary by regulatory agencies to attain and maintain the ambient air quality standards. Indeed, an established emission reduction credit banking and trading system may encourage and yield technological innovations in the field of air pollution control, and may provide sufficient incentives to accelerate the attainment of the ambient air quality standards. In addition to these potential benefits, implementation of the recommended emission reduction credit banking and trading system as set forth herein may be expected to accommodate and encourage economic growth in the Region while ensuring the prompt attainment and long-term maintenance of the ambient air quality standards in the Southeastern Wisconsin Region. (This page intentionally left blank)

APPENDIX

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Appendix A

TECHNICAL COORDINATING AND ADVISORY COMMITTEE ON REGIONAL AIR QUALITY PLANNING

Richard A. Keyes	Environmental Engineer, Professional
Chairman	Services Division, Milwaukee County
	Department of Public Works
Barbara J. Becker	President, Southeastern
Vice-Chairman	Wisconsin Coalition for Clean Air
Richard F. Pierce	Principal Specialist, Environmental
Secretary	Planning Division, Southeastern
	Wisconsin Regional Planning Commission
Alice G. Altemeier	League of Women Voters, Ozaukee County
Kurt W. Bauer	Executive Director, Southeastern
	Wisconsin Regional Planning Commission
Wesley J. Beaton	Director of Environmental
	Health, City of Racine
Gerald D. Bevington	Assistant Director, Bureau of Air
	Management, Southeast District, Wisconsin
T.1. 17 D.1.1	Department of Natural Resources
John W. Blakey	President, Quality Aluminum
Eductor 7 Hereine	Casting Company, Waukesha
Edwin J. Hammer	Environmental Engineer, Bureau of
	Environmental Analysis and Review,
John C. Hannen	Wisconsin Department of Transportation
John C. Hanson	Director, Racine County
	Department of Environmental Control
Paul Koziar	Deputy Director, Bureau of Air Management,
Carlton Nach	Wisconsin Department of Natural Resources
John H. Daige	. S. Environmental Protection Agency, Region V
John n. raige	Iransportation Urricer,
	Northeastern Illinois Blenning Commission
Kenneth W. Realand	Northeastern Illinois Planning Commission
Keimeen W. Kagtand	Department of Machanical Engineering
	University of Wisconsin-Medison
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1100 K. Keimerrererererererererererererererererer	Department of Public Works Milwaukee County
Herbert E Rinley	Health Officer Waukesha
norsere de Arproy	County Health Department
Rodolfo N. Salcedo	Environmental Scientist
	Department of City Development
	City of Milwaukee
Harvey Shebesta	District Director Wisconsin
	Department of Transportation
Mark P. Steinberg	Superintendent Air Quality Environmental
	Planning and Policy Division
	Wisconsin Electric Power Company
Herbert R. Teets	Division Administrator
	U. S. Department of Transportation
	Federal Highway Administration
George A. Zimmer	Supervisor. Environmental Health
	City of Kenosha Health Department

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Appendix	в

A SCHEMATIC REPRESENTATION OF THE POSSIBLE GENERATION AND USE OF EMISSION REDUCTION CREDITS

