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***BUSINESS OPPORTUNITIES OF THE
NEW CLEAN AIR ACT:
THE IMPACT OF THE CAAA OF
1990 ON THE AIR POLLUTION
CONTROL INDUSTRY***

*Prepared By
ICF Resources Incorporated
and
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*(Prepared For
Office of Air and Radiation
Environmental Protection Agency)*

August 1992

THE CLEAN AIR MARKETPLACE

**THE CLEAN AIR ACT:
SPURRING INNOVATION, JOBS, AND EXPORTS**



THE CAA AND THE ECONOMY

- **The costs of the Clean Air Act (CAA) are significant**
- **EPA is committed to understanding and minimizing CAA costs**
- **Cost-effective environmental regulations improve economic growth and competitiveness**

EPA

- The purpose of my presentation today is to demonstrate some of the positive relationships that exist between clean air and the economy. Before I do that, I'd like to make a couple of basic points.
 - The costs associated with the Clean Air Act are significant -- initial projections ran as high as \$25 billion.
 - More than at any time in its history, EPA is committed to both understanding and minimizing these costs.
- In fact, much of what I will tell you today is based on the knowledge and experience that EPA has gained in our efforts to understand and minimize these costs.
- As we improve the cost-effectiveness of our environmental regulations, we improve the prospects for economic growth and enhanced competitiveness.
- * [Add-on for environmental groups: This message is important also because it helps build a clean air constituency in the business and labor communities.]

EPA IS TAKING STEPS TO MINIMIZE CAA COSTS

- **New Initiatives**

- ☐ **Market-based Incentives**

- ☐ **Consensus Rulemaking**

- **Studies**

- ☐ **Regulatory Impact Analyses**

- ☐ **812 Benefits Study**

- ☐ **Business Opportunities Study**

- ☐ **Plant Closure Study**



- For example, EPA's efforts to date include the following new initiatives and studies:

Initiatives:

- ☐ The use of market-based incentives within a number of rules
- ☐ The use of consensus-based rulemaking so that all affected parties can present their issues and concerns as the rule is being developed

Studies:

- ☐ Regulatory impact analyses for each regulation prior to its release
- ☐ An ongoing benefits study (812)
- ☐ A business opportunities study
- ☐ An ongoing study of any plant closures resulting from clean air requirements

- So far, the direct savings associated with this focus on cost are in the neighborhood of \$2 billion.
- Important as those dollars are, however -- and we will continue to work to hold down costs -- the broader understanding of the relationship between clean air and the economy that is coming from these efforts may be the most important thing that we learn.

THE CLEAN AIR MARKETPLACE

- **Clean air and economic growth are compatible**
- **The CAA has created important economic opportunities and positive economic impacts**
- **The CAA can create the impetus for enhanced competitiveness and increased exports**
- **EPA is working to foster the Clean Air Marketplace**

EPA

- What we have learned so far leads us to believe that, if done right, clean air and economic growth can go hand in hand. In fact, the Clean Air Act has created a number of positive economic impacts and opportunities, including:
 - Growth in the environmental goods and services industry
 - New job opportunities for U.S. workers
 - New business opportunities for firms retooling for new markets
 - Boost for technological innovation and exports.
- Many have argued, both during the debate leading up to the passage of the law and during the implementation phase, that we are at a fork in the road -- that we have to choose between economic growth and further progress in air quality.
- But based on what we have learned, we agree with that great philosopher Yogi Berra, who said: "When you come to a fork in the road -- take it." We have found that as we implement the Clean Air Act, we can foster economic benefits as well as environmental benefits.
- These benefits can include enhanced international competitiveness and increased exports.
- While we are cleaning the air, we can stimulate job opportunities, technology innovation, and export growth. That is, we are creating the Clean Air Marketplace.

Photos: 1) Seattle on a smoggy/clear day

2) Bus emitting exhaust

3) Statue damaged by pollution

4) Child with a respirator

5) Elderly person in hospital

EPA

- Before looking at the Clean Air Marketplace though, we should briefly touch on why there are Clean Air laws in the first place.
- The CAA was enacted to confront serious problems that pose a threat to public health and safety nationwide, at every level of society.
 - Over 100 urban areas don't meet health standards for ozone, carbon monoxide, and particulate matter. That's more than 140 million people still breathing polluted air. These pollutants cause health hazards that range from reproductive problems to respiratory infections, heart disease, and even lung damage. For example, in EPA's ongoing review of smog standards, we're seeing some studies which indicate substantial reductions of lung capacity in previously healthy people resulting from ozone exposures.
 - Acid rain poses risks to human health, as well as forests, lakes, streams, and national monuments.
 - Toxic air emissions continue to create additional human health hazards ranging from respiratory problems, to birth defects, to various forms of cancer.
 - CFCs continue to deplete the Earth's delicate ozone layer -- a problem that has already begun to impact people's lives: children are no longer allowed to play outside during day light hours in some parts of South America, because excessive exposure to UV radiation is causing dramatic increases in levels of skin cancer.

THE CAA AND THE ENVIRONMENT

- **The CAA will ensure that these problems are not passed on to future generations**
- **In real terms, this means a lot less urban smog, less heart, lung, and other disease, and more protection of valuable agricultural and natural resources**

EPA

- The CAA will yield measurable and significant results: Cleaner air, and a healthier environment for everyone, including future generations. In real terms, it means less urban smog, less lung and heart disease, more productive crops and forests, and preservation of America's valuable natural resources.
- The Clean Air Act will ensure that these problems are not passed on to future generations by:
 - ☐ Cutting toxic air emissions by more than 70%;
 - ☐ Cutting acid rain-causing emissions by almost 50%;
 - ☐ Eliminating CFC production by 1995;
 - ☐ Meeting health standards for nearly all areas by the year 2000.

Taken together, these emissions reductions will total 56 billion pounds.

GROWTH IN THE ENVIRONMENTAL INDUSTRY

- **Resources spent on environmental protection do not simply disappear**
- **Environmental protection is a large and rapidly growing business**
- **The CAA will spur even greater growth over the next two decades**

EPA

- The conventional wisdom is that expenditures incurred by companies in complying with the Clean Air Act and other environmental laws constitute "lost" or sacrificed resources -- in fact, if you listen to some critics you'd think that these dollars go into a "green hole."
- We believe that this is the wrong way to think about environmental expenditures. These resources do not simply disappear. They go to firms in the fast growing environmental goods and services industry. These firms produce jobs, profits, and exports.
- The overall environmental marketplace is already large and is growing at a rapid pace. Today environmental protection has become a \$200 billion industry, and is growing exponentially.
 - A recent study conducted by ICF and Smith Barney Inc. projects that in the next three years, revenues in the air pollution control (APC) industry will jump by \$4 to \$6 billion annually; and by \$7 to \$9 billion annually in the following five years, representing a cumulative increase of \$50 to \$70 billion over today's revenues by the year 2000.*

* [Optional: These figures, by the way, are probably conservative, since the report dealt only with those opportunities that could be clearly identified and estimated. Additional revenue gains are probable as the demand created by the CAA ripples through the economy and affects many industries and companies that are not always considered to be a direct part of the "air pollution control" industry.]

NEW JOBS FOR U.S. WORKERS

- **Growth in the environmental industry means new jobs**
- **These jobs include both high-skill/high-wage and medium skill/medium-wage opportunities**

EPA

- Growth in the environmental sector is creating a dynamic mix of new jobs. These jobs include both high-skill/high-wage and medium-skill/medium-wage opportunities.
 - The ICF/Smith Barney study shows that increased demand for employees in air pollution equipment manufacturing, on-site construction, design, and engineering alone could create up to 300,000 new jobs.
- Examples of new jobs abound in a variety of fields, such as:★
 - Energy Conservation and Renewable Energy Services
 - Alternative Transport Systems Technology and Construction
 - Construction of Clean Technologies
 - Inspection and Maintenance and Emissions Monitoring

★[Refer to White Paper for details]

A SECOND CHANCE FOR FIRMS RETOOLING FOR NEW MARKETS

- **The CAA is creating new opportunities for firms retooling for new markets**
- **These new opportunities will help preserve jobs that might otherwise be lost**

SEPA

- As I've shown, the Clean Air Act is creating entirely new job opportunities in relatively new or growing industries. It is equally important to recognize another type of opportunity: the chance for firms in declining markets to retool to capitalize on the growing clean air marketplace.
- Opportunities in the clean air marketplace and other environmental business segments can help preserve jobs that otherwise would have been lost as the defense and other industries "downsize."
- Companies with technological expertise and skilled workforces are well positioned to make this type of strategic shift.

Photo: Sunraycer car (GM)

- The GM Sunraycer car is one of many new technological innovations in the clean air marketplace. GM's Hughes Aircraft subsidiary played a big part in developing the Sunraycer. GM/Hughes have used their technical expertise in advanced technologies such as photovoltaic cells, space vehicle materials, and aerodynamics to produce a state-of-the-art solar-powered vehicle.
- Additional adaptation of defense-related technologies such as high-tech monitoring and remote sensing are anticipated as the Clean Air Marketplace grows.

CLEAN AIR REQUIREMENTS DRIVE TECHNOLOGICAL INNOVATION AND COST SAVINGS

- **New laws and regulations drive the development of new environmental technologies**
- **The CAA provides flexibility that makes innovation possible:**
 - ☐ ***Title I:* Economic Incentives Program**
 - ☐ ***Title II:* Mobile source/stationary source trading; I/M program**
 - ☐ ***Title III:* MACT early reduction**
 - ☐ ***Title IV:* SO₂ emissions allowance trading**

SEPA

- Historically, the development of new environmental technologies and the growth of the environmental marketplace have been driven most powerfully by new laws and regulations at the Federal level.
- The specific Titles of the CAA provide the flexibility that makes innovation possible. For example:
 - ☐ ***Title I:*** EPA is developing an Economic Incentives Program which will provide a structure for trading and other incentives-based programs like RECLAIM in Los Angeles
 - ☐ ***Title II:*** Mobile source/stationary source trading is provided for, including the so-called "cash for clunkers" program. New opportunities are created for taking SIP credit for CNG conversions of fleet vehicles, as is happening in Colorado. New Inspection and Maintenance provisions will create new jobs in the auto repair and training fields.
 - ☐ ***Title III:*** The new air toxics program allows sources to take credit for early pollution reductions by delaying applicability of MACT requirements.
 - ☐ ***Title IV:*** An emissions allowance trading program is the linch pin of the Acid Rain program.

CLEAN AIR REQUIREMENTS DRIVE TECHNOLOGICAL INNOVATION AND COST SAVINGS (CONT'D)

- **Two types of cost savings result:**

- ☐ **Least-cost air pollution control**
- ☐ **Lower cost manufacturing as companies operate "smarter"**

SEPA

- The Clean Air Act represents the most ambitious effort to use economic incentives and other market mechanisms to provide the flexibility necessary for maximum technical innovation.*
- Two types of cost-savings result from the stringency and flexibility built into the Act: Least-cost air pollution control; and lower overall manufacturing costs as companies operate "smarter." Companies facing more demanding air pollution control requirements, have been taking this opportunity to rethink how they make their products.** [Lead into next slide]

* Optional: Among the principal innovation-inducing aspects of the CAA are the performance standards approach to setting toxic air pollution limits embodied in Title III, and the SO₂ allowance trading program established under Title IV. The CAA's acid rain provisions have already borne technological fruit: Scrubber manufacturers now guarantee 95% SO₂ removal, up from only 80% several years ago.)

** Optional: A leading experts on international competitiveness, Michael Porter of the Harvard Business School, has studied the international response of firms to more stringent pollution controls. Porter notes that "Strict environmental regulations do not inevitably hinder competitive advantage against foreign rivals; indeed, they often enhance it. Tough standards trigger innovation and upgrading."

Photo: Kennecott Facility - Artist's Conception

- Examples of technology innovation and cost savings include:
 - **Kennecott Corporation.** By 1995, the Kennecott Corporation plans to have completed reconstruction of the cleanest smelter in the world near Salt Lake City. The project is expected to create 3,300 new jobs over three years, and more than 500 companies are expected to benefit from contracts to work on the smelter project. Kennecott's new clean smelter will make the company one of the most efficient and lowest-cost copper producers in the world.
 - **IBM.** An IBM facility in Elmira, New York recently redesigned a CFC-based electronic chip cleaning process, substituting environmentally friendly water-based cleansers instead. By implementing a cleaner, more efficient process, IBM has saved \$22 million.
 - **3M.** In 1990, 3M invested \$26 million in a project at its plant in Hutchinson, Minnesota to reuse toxic solvents. Expected savings are \$5 million to \$7 million a year in solvent purchases.
- Each of these companies has found that clean air can go hand in hand with improved efficiency and competitiveness.

INNOVATION PROVIDES EXPORT ADVANTAGE

- **CAA-driven technological innovation yields export advantages**
- **Air pollution control is a rapidly growing international market**
 - **\$30 billion market currently; OECD projects growth to \$42 billion by 2000**
 - **Asia offers near-term opportunities; Eastern Europe offers longer-term opportunities**

SEPA

- Technological innovation as a result of the CAA translates into an export edge for U.S. companies. This can happen in two ways:
 - First, non-environmental companies can become tougher international competitors as they become "smarter" in response to Clean Air Act requirements.* Kennecott, shown earlier, is an example of this point.*
 - Second, in the air pollution control industry, technical leadership leads to export leadership. Joy Environmental Technologies Inc. (JET) and its German partner Gottfried Bischoff & Co., recently announced a \$155 million contract with Taipower of Taiwan. The venture will install advanced wet scrubbers in a Taichung power plant which will reduce SO₂ more than 90%. JET expects to open a Taipei office this year.
- Air pollution control is a large and growing international industry. The OECD estimates the global APC market at \$30 billion now, and projects it will grow to \$42 billion by 2000. Growth is expected during the next decade in several key regions:
 - The Asian Development Bank predicts a fivefold to tenfold increase in air and water pollution in Asia due to an expected 300% increase in the number of vehicles and a 150%-200% expansion in industrial and mining activities. Taiwan, for example, is expected to spend up to \$36 billion on pollution control over the next six years. South Korea expects to spend \$2-3 billion a year on environmental cleanup.
 - Eastern Europe offers longer-term market potential in APC. U.S. companies compete against the Japanese, the Germans, and other Europeans for a share of this increasing market. [Lead into next slide]

Photos: Pollution in Taipei and Moscow

In these next two slides we can see dramatic examples of pollution problems, and therefore pollution control markets, abroad -- in Taipei and Moscow. International air pollution control is already a \$200 billion market, according to the Department of Commerce; and the U.S. share of the market has already reached 40%.

WHAT EPA IS DOING TO FOSTER THE CLEAN AIR MARKETPLACE

- **Supporting technology development and commercialization to reduce pollution and save energy**
- **Promoting exports of U.S. technologies and services**



- The EPA is taking steps to improve its role as a technology advisor and leader by catalyzing efforts to develop and commercialize new technologies; disseminating information to industry; and responding to innovative entrepreneurs.
- Several of our most important initiatives aimed at promoting innovation and exports include [Refer to White Paper for program details]:
 - *NETAC* (National Environmental Technology Applications Corporation), founded with a start-up EPA grant, brings business, government, and academia together to help guide new environmental technologies to the market.
 - *Environmental Training Institute*, a joint federal/private venture, provides environmental training to developing country officials, building demand for U.S. pollution control exports.
 - *U.S.-Asia Environmental Partnership* is another government/industry partnership seeking to bring U.S. "know-how" to bear on Asia's pollution problems, thus promoting U.S. exports.
 - *NICE*³, the National Industrial Competitiveness through efficiency: energy, environment, and economics program, involves EPA and DOE providing funds to state agencies to promote energy efficiency and reduce pollution.
 - *Green Lights** invites companies to install energy-efficient lighting, reducing their lighting bills and cutting pollution.
 - *Golden Carrot* is an EPA-sponsored contest in which refrigeration makers are competing for a cash prize for the most energy-efficient product.
 - *Energy Stars Computer Program* is a series of partnerships between EPA and eight computer makers to develop more energy-efficient computers.

ADD-ON SECTION

SLIDE/DESCRIPTION	PLACEMENT
1. Recent OAR Projects	After "What EPA Is Doing To Foster The Clean Air Marketplace," p. 15.
2. "It Is Easy Being Green" - Statistics on markets for green products (Text)	After "SunRaycer Car," p. 9.
3-4. Energy Slides (Text-2 slides)	After "Pollution in Moscow and Taipei" photo slides, p. 14.
5. EPA Green Lights Program - (Graphic w/ Program Logo and Title)	After "What EPA Is Doing To Foster The Clean Air Marketplace," p. 15.
6. "Building a Consensus Among Stakeholders" (Text)	After "What EPA Is Doing To Foster The Clean Air Marketplace," p. 15.
7. "What State and Local Governments Are Doing" (Text)	After "What EPA is Doing To Foster The Clean Air Marketplace," p. 15 (and after insert #5, if added).

RECENT OAR PROJECTS

Business Opportunities Report

Clean Air Marketplace Conference (April '92)

Clean Air Marketplace Database

- Recently, EPA's Air Office has undertaken a series of major projects that explore and document the positive economic impacts of the CAA. These projects include:
 - The *Business Opportunities* Report, commissioned from ICF and Smith Barney, which documents the principal new business opportunities created by the Act.
 - The *Clean Air Marketplace* Conference, held in April '92, brought business and government leaders together to discuss these themes. We expect to repeat this conference in September 1993.
 - The *Clean Air Marketplace* Database, drawn from business and technical journals, identifies hundreds of technological innovations, new projects, and new job-creating ventures resulting from the CAA.

IT IS EASY BEING GREEN

- **Growth in the clean air marketplace is reinforced by the growing market for green products**
 - **More and more Americans are considering the environmental impacts of the products they consume**
 - **"Green Products" are continuing to claim increasing market shares**

EPA

- The growth in clean air and other environmental business opportunities is reinforced by the growth of "green" consumer products. Green products are gaining increasing market shares in the U.S. According to an industry source, for example, 11.4% of all new products introduced in 1990 were promoted as being "green," up from 1% in 1986. So Kermit was wrong after all: *It is easy being "green."*
- This trend reflects the fact that Americans, in poll after poll, are increasingly concerned about the environment. In a 1990 Wall Street Journal NBC poll, eight of ten Americans identified themselves as environmentalists.

THE CAA WILL REDUCE U.S. OIL IMPORTS

- **The CAA supports U.S. national energy policy by reducing oil imports**
- **Imported fuel will be replaced with fuels derived from domestic natural gas and grain**
- **Companies will choose energy-efficient compliance technologies**

EPA

- Implementation of the Clean Air Act will reduce U.S. oil imports in at least two ways:
 - Many new compliance technologies will also be more energy efficient, as companies try to operate "smarter" when it comes to energy and cost-savings; and
 - Clean Air Act oxygenate requirements will result in the replacement of fuel imports with MTBE and ETBE, which are derived from domestic gas and grain, respectively.
- Gains in energy efficiency, which often result from learning to be "smarter" producers, also give companies a cost and, therefore, a competitive edge over their counterparts in other countries.

ECONOMIC GROWTH DOES NOT REQUIRE MORE ENERGY

- **Economic growth and energy consumption are not directly correlated**
- **Japan derives more GNP from each BTU than the U.S. economy**

GEPA

- Contrary to conventional wisdom, economic growth and growth in energy consumption are not directly correlated: Japan's economy, among the most fastest growing of the industrialized nations, is also the least energy-intensive.
- In fact, when Japan increased its energy efficiency in response to the 1970's world oil market shocks, it significantly reduced its level of air pollution at the same time. Now the Japanese economy derives more GNP from each BTU than the U.S. economy.
- Another way to view this comparison between Japan and the U.S. is that we generate much more pollution per dollar of GNP.

Photo: EPA Green Lights Program Logo



BUILDING A CONSENSUS AMONG STAKEHOLDERS

- **EPA seeks the greatest possible consensus among all parties:**
 - **Making CAA implementation a joint venture with all interested parties**
 - **Consulting early and often with industry groups**



- EPA efforts to build consensus on environmental regulations have enjoyed unprecedented participation by all parties involved.
- "Reg-Neg" roundtables and advisory committees have been successful in building consensus on many issues. [See white paper for examples]

WHAT STATE/LOCAL GOVERNMENTS ARE DOING

EPA is building on new models of market-based approaches

Seed money provided to states and local governments

Universities are getting involved



- Without question, states and local governments can and should play an important role in supporting the clean air marketplace.
- EPA has created a grant program to provide seed money to encourage states and local governments to develop, as part of their air quality plans, market-based incentives and other programs to spur innovation. To date, grants have gone to Illinois, several Northeastern jurisdictions, and Houston.
- The Air Emission Reduction Center, a new cooperative research center at the New Jersey Institute of Technology has been established to develop manufacturing technology with reduced emissions. AERC supports the notion that effective advanced pollution control can contribute to U.S. industry through innovation.