

Environmental Issues – Impacts on Industrial Property Value

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Government mandated control of greenhouse gases, nitrous oxides, sulfur dioxide, and other emissions impact a company's bottom line by requiring capital expenditures on no-return compliance projects. Industry is required to comply with these no-return compliance projects by installing additional control technology and equipment. The capital required for the additional controls and equipment represents a form of economic obsolescence that must be accounted for in determining the value of industrial properties.

This article will provide a general overview of the current and future mandatory environmental, health, and safety regulations imposed on industrial facilities and the effect these regulations will have on the valuations of these properties.

Current Environmental Regulations

Most current environmental regulations associated with industrial properties regulate emissions into the air and releases into the soil, surface water, or groundwater. This presentation will focus primarily on regulations on air emissions.

The combustion of fossil fuels generates emissions of nitrous oxides (NO_x), sulfur dioxide (SO₂) and other emissions that contribute to poor air quality if not controlled. Currently, emissions of nitrous oxides, sulfur dioxide and other select emissions are regulated under the 1990 amendments to the Clean Air Act. The Clean Air Act is regulated and enforced by the United States Environmental Protection Agency (EPA). The following are examples of current environmental regulations that impact industrial properties in the U.S.

Ground Level Ozone¹

On September 24, 1998, the EPA finalized a rule known as the NO_x SIP (State Implementation Plan) Call that requires twenty-two states and the District of Columbia to submit state implementation plans addressing the regional transport of ground level ozone. By improving air quality and reducing emissions of NO_x (a precursor to ozone formation), the actions directed by these plans will decrease the transport of ozone across state boundaries in the eastern half of the United States. Under the NO_x SIP Call program, the eight-hour standard for ozone was set at 0.08 ppm and the one-hour standard was set at 0.12 ppm. Areas that do not meet these standards are designated as "non-attainment" regions. Over the past couple of years, emission reduction controls for NO_x were installed at many industrial locations to comply with this program.

In 2008, the EPA tightened the national ambient air quality for the eight-hour ozone standard from 0.08 ppm to 0.075 ppm. This updated standard comes immediately after industry completed many of the NO_x SIP Call projects required by previous standards. Non-attainment areas must comply with these new standards beginning in 2013. The EPA has estimated the updated standard would cost \$8.5 billion to implement.

LOW SULFUR & LOW BENZENE FUELS²

The EPA's Tier II Rules reduced the sulfur content of gasoline from 500 ppm to 30 ppm in 2004 and reduced the sulfur content of on-road diesel fuel from 500 ppm to 15 ppm in 2006. The phase-in of these standards was completed in 2006 for most refineries and importers. In addition, in 2007 refiners had to meet a 500 ppm sulfur cap on all off-road diesel produced. A deadline for all highway and some off-road diesel to be at the 15 ppm Ultra Low Sulfur Diesel (ULSD) level was set for 2010. According to the American Petroleum Institute (API), the total capital expenditure for compliance with EPA Tier II Rules is expected to reach \$20 billion by 2011.

The EPA, under direction of the Clean Air Act, conducted a study of toxic air pollution from mobile sources, including both vehicles and fuels. The study, which focused on the air toxic emissions that pose the most risk to human health, was specifically required to include benzene, formaldehyde, and 1,3-butadiene. The study's results compelled the EPA to promulgate the Mobile Source Air Toxics (MSAT) Phase 2 final rule introducing new controls on the benzene content in gasoline. According to the American Petroleum Institute (API), the total capital expenditure for compliance with MSAT Phase II Rules is expected to reach \$1.1 billion by 2011.

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Future Environmental Regulations

GREENHOUSE GAS REGULATIONS

“One of the most controversial and complex environmental policy challenges facing the U.S. — and the world — is the long-term issue of climate change. This potential problem spans both generations and countries, implicating simultaneously the environment, on the one hand, and the world’s fundamental economic reliance on fossil fuels — a key source of climate change risk — on the other” (2002 Economic Report of the President of the United States).

Fossil fuel combustion also generates emissions of carbon dioxide and other greenhouse gases (GHG), which contribute to the warming of the Earth’s surface. When sunlight strikes the earth’s surface, some of it is reflected back towards space as infrared radiation. GHGs absorb this infrared radiation and trap the heat in the earth’s atmosphere.

According to estimates by the Department of Energy’s Energy Information Administration (EIA), levels of greenhouse gases have increased about 25% since the industrial era began about 150 years ago. During the past 20 years, about 75% of the man-made GHG emissions were from fossil fuels. U.S. GHG emissions totaled 7,147 million metric tons in 2005. According to EIA 2005 projections, GHG emissions will rise roughly 1.2% per year to 8,649 million tons in 2020.³

In 2007, the U.S. Supreme Court ruled that the EPA has authority to regulate greenhouse gases under the 1990 Clean Air Act Amendments (*Massachusetts vs. US Environmental Protection Agency Case 05-1120*). The ramifications of this ruling will impact the value of industrial properties for years to come.

UNITED STATES

Although there are no federal laws regulating GHG emissions in the United States, there has been increased attention to climate change. Several bills to regulate GHG emissions have been introduced in the U.S. House of Representatives and Senate making climate change initiatives a priority on the environmental, legislative, and regulatory front. Although standards have not been developed at the national level, several state and regional organizations are developing, or already have developed, state-specific legislative initiatives to reduce GHG emissions through mandatory programs. The two most advanced programs related to climate change regulation are in California and New Jersey. Obviously, passage of these regulations will have an impact on industrial properties in such states.

California has already passed legislation mandating emission caps on GHG emissions on industry for the first time in history. AB 32: Global Warming Solutions Act and SB 1368: Greenhouse Gas Emissions Performance Standard for Major Power Plant Investments was signed into law in September 2006. AB 32 creates a statewide cap on GHG emissions and requires that the state return to 1990 emission levels by 2020; implementation is slated to begin by 2012. SB 1368 requires GHG emissions performance standard for base-load generation that would not exceed the emissions of a new combined-cycle natural gas power plant.

New Jersey’s governor signed the Global Warming Response Act, which mandates a 16% reduction in GHG emissions from 2006 levels by 2020, and an 80% reduction by 2050. This law is similar to California bill AB32, but is stricter because its 2050 reduction is a mandate, rather than a target.

CHINA

Rapid economic growth, stimulated by a policy of reform and opening up, has helped China to increase the wealth of its population and to provide employment and development opportunities. However, the rapid growth has not come without a price: natural resource depletion and environmental pollution of air, water and soil have been unintended, but significant, side effects. The sources of China’s air quality challenge are multifold: its overwhelming reliance on coal for its energy needs, its poor energy efficiency and conservation practices, and the rapidly increasing role of automobiles in its transportation sector. China aims to reduce energy use and carbon emissions per unit of industrial value-added output by 4 percent this year, relative to 2010 levels. China is the second largest contributor to climate change in the world, and the Chinese Academy of Social Sciences expects that China will surpass the United States as the largest contributor by 2025.⁴

WORLDWIDE

The Kyoto Protocol, which became a legally binding treaty in 2005, requires participating countries to collectively reduce their GHG emissions to an average of about 5% below 1990 levels between 2008 and 2012. The United States is not a participating country having withdrawn from the treaty in 2001. The United States stance in not participating is that the treaty focuses on dramatic short-term reductions and does not balance the need for mitigation through energy efficiency and the need for economic growth. China has signed on to the Kyoto Protocol to the Framework Convention on Climate Change, and has initiated some projects with members of the EU under the Protocol to begin to address the challenge of climate change.

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In July 2008, the world's eight leading industrialized nations—Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States—agreed to set a global goal for reducing GHG emissions. The leaders will “consider seriously” the commitment by the European Union, Canada, and Japan to cut global GHG emissions in half by 2050. This new agreement would include all major GHG emitters and would take effect after 2012, when the Kyoto Protocol expires.

Greenhouse Gas Emissions – Industry Impacts

Because of the uncertainty surrounding GHG emission legislation, the acquisition and operation of industrial facilities have increased risks. Legislation providing a limit on U.S. GHG emissions would probably install a “cap and trade” system under which the federal government would issue permits to companies giving each the right to emit a certain amount of GHG emissions annually. Unused amounts of GHG emissions would be traded allowing more energy efficient companies to sell their GHG emission credits to companies that exceed their allocated levels.

Oil refineries, chemical plants, steel mills, coal-fired power generation plants, paper mills, and cement plants will face the most impact from potential GHG emission legislation. How GHG emission legislation is currently impacting the coal-fired power generating industry is discussed below.

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COAL-FIRED POWER GENERATING INDUSTRY

“Efforts to build coal-fired generating capacity in the United States have been halted by paralysis and indecision in part because of the uncertain potential limits on carbon emissions” (David Crane, President of NRG Energy).

Coal is currently the world's leading fuel for electricity generation, and its use is projected to double by 2030. Within the United States, coal now fuels more than half of the electricity generation. Additionally, coal is the source of over 50% of greenhouse gases for the United States. There is little doubt coal plants will dominate new base-load generation for many years to come. Climate change and other energy concerns have created a pressing need to move coal-to-energy technologies onto a development pathway toward near-zero emissions.

The Electric Power Research Institute (EPRI) contends that big cuts in emissions linked to global warming from coal-fired power plants could come at a considerable cost to the U.S. economy. The current estimate is that it would cost between \$400 billion and \$1.8 trillion over the next four decades. The EPRI cost estimate is based on a 50% economy-wide cut in carbon emissions from 2010 levels by 2050.⁵

The process of capturing carbon dioxide and storing it is very complex and costly. Integrated gasification combined cycle (IGCC) power plants that convert coal to gas for generating electricity, with the ability to capture the generated CO₂ and transport it to an underground injection site for permanent storage, are currently being developed by industry and the U.S. Government. For coal-fired power plants currently in operation, changes in plant design are required in order to be able to capture carbon dioxide from flue gases and locations must also be identified to store or use the carbon dioxide. Then there remains the question of who holds title to the carbon dioxide, industry or government.

HEALTH AND SAFETY REGULATIONS

Other no-return compliance regulations focus on health and safety issues. In the aftermath of September 11, 2001 and BP's Texas City refinery explosion in 2004, health and safety compliance projects have come to the forefront of industry. The cost of these health and safety compliance projects represents a stay in business cost for companies. The following are examples of current health and safety regulations that impact industrial properties in the U.S.

AMERICAN PETROLEUM INSTITUTE – RECOMMENDED PRACTICES 752 & 753⁶

API – Recommended Practices 752 - Management of Hazards Associated with Location of Process Plant Buildings and 753 - Management of Hazards Associated with Location of Process Plant Portable Buildings provide guidance to owners and operators of processing facilities regarding building siting. These API standards are considered a recognized industry standard. API RP-752 and RP-753 recommended practices ensure:

- Protect occupants from accident hazards such as heat, blast overpressure, and projectiles
- Establish minimum safe distances for building structures away from hazardous areas
- Evaluate the location of trailers

While the Texas City disaster was a refinery incident, its effects have everyone concerned in process industry operations. Companies are dedicated to meeting these API recommendations. Occupied structures located in blast zones or hazardous areas may need to be structurally reinforced or relocated to other areas in the plant. The burden of relocating building infrastructure away from hazardous areas is both costly and interruptive to operations. In some instances the cost to comply with these recommended practices could range in the millions.

DEPARTMENT OF HOMELAND SECURITY – SITE SECURITY⁷

The Department of Homeland Security as outlined in the National Infrastructure Protection Plan has established requirements for critical infrastructure that includes petrochemical facilities, commercial facilities, dams, nuclear power plants, and nuclear fuel processing facilities. The ability to protect the critical infrastructure and key resources of the United States is vital to national security, public health and safety, and economic vitality. Attacks on critical infrastructure could significantly disrupt the functioning of government and business in addition to producing cascading effects far beyond the targeted sector and physical location of the incident.

The Department of Homeland Security and various state agencies review critical infrastructure facilities to determine what level of security is needed at each particular site. Depending upon this review, an industrial facility may be faced with the task of adding extra fencing, entrance barriers, card-lock readers, and extra security monitors. In some instances the cost to comply with these site security requirements could range in the millions.

Effects on Valuations for Industrial Properties

The above discussed environmental regulations and no-return compliance projects are the result of current and future government regulations that require compliance by industry in order to stay in business. These no-return compliance projects result in an economic reduction in the enterprise value both in the near and long term due to the added investment required and/or the increased operating costs, with no offsetting revenue or income benefits. This economic reduction in value is a form of economic obsolescence that must be accounted for in all three approaches to value.

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The American Society of Appraisers describes economic obsolescence as the loss in value caused by conditions external to the asset. Economic obsolescence can be defined as a form of depreciation, or an incurable loss of value, caused by any combination of unfavorable conditions external to the property such as the local economy, economics of the industry, availability of financing, encroachment of objectionable enterprises, loss of material and labor sources, shifting of business centers, passage of new legislation, adverse impact of governmental regulations and restrictions, or other similar characteristics.⁸

The following sections address how economic obsolescence from environmental regulations and no-return compliance projects (together referred to as Environmental, Health & Safety or “EH&S”) influence the three approaches to value.

COST APPROACH

In the cost approach, the cost new must be reduced to reflect physical deterioration, functional obsolescence, and economic obsolescence attributable to the subject property. All components of depreciation and obsolescence must be quantified to result in the cost indicator of value. EH&S compliance projects increase the amount of economic obsolescence by requiring industrial properties to install control technology and equipment as required by government or other agencies.

INCOME APPROACH

When applicable, the income approach estimates future revenues, operating expenses, capital requirements and working capital changes. The resulting net cash flow is then discounted to present value to determine the value of the business enterprise. EH&S compliance projects impact the income approach to value the following ways:

1. Requiring additional capital expenditures for control technology and equipment;
2. Increasing raw material cost due to change in manufacturing process;
3. Decreasing revenues by having restrictions on operating rates; and
4. Increasing operating expenses due to extra labor requirements, maintenance, and consumable materials.

SALES COMPARISON APPROACH

The sales comparison approach is used to establish value through an analysis of recent transactions of comparable properties. Actual sales are analyzed and adjusted to reflect differences in size or capacity, market conditions, age, condition of improvements and location between the subject and the market comparables. To recognize differences in EH&S regulatory liability, adjustments must be made to market comparables to compare EH&S regulatory liabilities to those of the subject property. Therefore, a knowledgeable buyer will require a discount in purchase price to take into consideration the costs of compliance for EH&S regulatory liabilities of the subject property.

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DOCUMENTATION SUPPORT

In order to effectively support deductions for economic obsolescence from EH&S compliance projects, proper documentation is required. A person should speak to knowledgeable managers and engineers at the subject industrial property to find out what EH&S issues impact the subject currently and in the future. Specific items to request for EH&S compliance projects at the subject property include:

Environmental Regulation Compliance Projects

- Forecast of future budgeted capital expenditures outlining projected environmental pollution control requirements, particularly those specifically required by government and/or agencies or court orders.
- Approved plans for expenditures for major pollution control projects which provide a summary description of the project, cost of the project, how the project will impact revenues and expenses, and time of completion.
- Documents or press releases showing commitment to the compliance project.
- Governmental or agency publications outlining the regulation.
- Articles on how the subject industry will be impacted by current and future environmental regulations.

Health & Safety Compliance Projects

- Forecast of future budgeted capital expenditures outlining projected health and safety requirements, particularly those specifically required by government and/or agencies or court orders.
- Approved plans for expenditures for major health and safety projects which provide a summary description of the project, cost of the project, how the project will impact revenues and expenses, and time of completion.
- Surveys or drawings that detail areas impacted by the health and safety project.
- Documents or press releases showing commitment to the compliance project.
- Government or agency publications outlining the regulation.

Summary

Understanding and being able to explain how EH&S compliance projects impact the value on industrial property is a key component in the appraisal of industrial property. A well developed valuation will have the EH&S compliance projects quantified and deducted from the market value of the property each year until the expenditure is made.

The article is based on a paper presented at the 2007 Property Tax Symposium, Institute for Professionals in Taxation, Indian Wells, California.

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- ¹ 2007 Proposed Revisions to Ground-Level Ozone Standards, U.S. Environmental Protection Agency. August 2007, <http://www.epa.gov/air/ozonepollution/pdfs/20070620_fs.pdf>.
- ² Industry Surveys — Oil & Gas: Production & Marketing. Standard & Poor's, June 1, 2006.
- ³ Industry Surveys — Oil & Gas: Production & Marketing. Standard & Poor's, June 1, 2006.
- ⁴ "Climate Pressure may Cool Economy," Business Daily Update, March 16, 2005.
- ⁵ Electric Power Research Institute (2007). Global Climate Change, <<http://www.epri.com/>>.
- ⁶ American Petroleum Institute (2007). Recommended Practice 752 and Recommend Practice 753 (draft). Washington, DC
- ⁷ U.S. Department of Homeland Security (2007). National Infrastructure Protection Plan, Washington, DC
- ⁸ Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets (2005). American Society of Appraisers, Washington, DC.