

a \$12 million landfill gas to energy project. Further discussions can be found in the Electricity Resource Assessment and the Energy Infrastructure Issues Brief.

DEC is currently developing a new Solid Waste Management Plan (SWMP) that will assess the State's solid waste management strategies, evaluate the solid waste management priorities, and determine how to maximize material and energy recovery and minimize waste. The draft SWMP will place a priority on reducing materials that end up as waste and will recommend a plan that may negate the need for any new disposal capacity. The SWMP will address the broader environmental implications of solid waste management alternatives, including global climate change, and include an analysis of the environmental and economic benefits of its recommendations to maximize material and energy recovery and reduce waste.

2.7 Bulk Storage of Liquid Fuels and Chemicals

Fossil fuels and fuel additives, added to improve the performance of fuel, are stored in tanks both aboveground and underground. Leaks and spills of both can happen due to human errors, equipment failures or acts of nature. Each year there are many leaks and spills attributable to storage tank systems that contaminate soil, groundwater, surface water, sediment, and the air, thereby raising the potential to adversely impact public health and environmental receptors. The most common exposure concern is the contamination of groundwater and surface water; the majority of New York's population obtains their drinking water from groundwater. In some cases, vapors from spills traveling through soils can create exposure concerns within buildings.

Each year, approximately 16,000 spills of all kinds are reported to New York State. These include spills of petroleum, chemicals, and other materials, e.g., wastewater. About 85 percent of all spills are associated with petroleum products, such as fuel oils, motor fuels, lubricating oils, and transformer/cable fluids. The most common form of petroleum spilled is No. 2 fuel oil used primarily for heating buildings (29 percent). In descending order, the next most frequently spilled types of petroleum include gasoline (10 percent), diesel fuel (9 percent), and waste oils (3 percent). These reflect the quantities stored and in use.

Most petroleum spills are associated with consumers, e.g., commercial/industrial facilities (29 percent), private dwellings (20 percent), and non-commercial/institutional facilities (8 percent). Spills from bulk storage facilities that can be considered part of the petroleum energy infrastructure are less frequent, e.g., major storage facilities (1 percent), gas stations (5 percent), and other non-major facilities (0.5 percent). Likewise, most transportation related spills are from consumers of petroleum products, e.g., commercial vehicles (11 percent), tank trucks (3 percent), and passenger vehicles (2 percent). The frequency of spills from pipelines and vessels is low.³⁴

DEC administers regulations that address these issues by setting standards for storage tank equipment to prevent leaks and spills, secondary containment systems to protect the environment from leaks and spills if they occur, and detection systems, which must meet requirements for inspections and equipment for leak detection to quickly discover problems that do occur. In addition to the State regulations, the Energy Policy Act of 2005 requires EPA and states receiving grant monies to follow a number of enhanced regulatory steps that have since been put into regulations that specifically pertain to the design and operation of certain underground storage tank systems.

³⁴ DEC, Division of Environmental Remediation. *Remedial Programs Annual Reports*. Multiple Years. <http://www.dec.ny.gov/cfm/xtapps/derexternal/index.cfm?pageid=1>

When spills occur, the spiller is required to promptly notify DEC and work on spill cleanup. The DEC oversees cleanups and undertakes the work when spillers cannot or will not do it themselves. Various laws, regulations, and guidance direct the completion of the cleanups to ensure that the public health and environmental concerns are addressed.

2.8 Liquefied Natural Gas

Natural gas can be taken off of the transmission and distribution pipelines and cryogenically liquefied and stored as liquefied natural gas (LNG) for periods of peak natural gas demand. However, since the late 1970s, the construction or operation of any new grid-connected, peak shaving LNG facilities has been prohibited unless DEC first issues a permit.

DEC is in the process of developing permitting regulations for the safe siting, construction, operation, and inspection of LNG facilities. Such permits may incorporate by reference existing nationally recognized standards.³⁵

LNG import facilities generally require a permit from FERC. If located within the State's coastal area, LNG facilities are reviewed by the DOS for their consistency with the policies of the CMP, and approved LWRPs, if applicable.

2.9 Energy Generation Projects in Adjacent States or Provinces

For decades, New York has taken actions to reduce air pollution, including most recently GHG emissions. Going forward, State energy decisions that may affect energy imports from out of State should assess and, if possible, quantify, the potential environmental ramifications of that generation on New York. For example, decisions regarding new transmission lines into the State from adjacent system operators could allow the flow of electricity generated from facilities emitting undesirable pollutants that could be transported into New York, or could negate GHG emission reductions achieved in-state. Such projects should be evaluated to determine whether the project is consistent with New York's clean energy and environmental goals. Appendix B summarizes potential environmental impacts and corresponding regulations and policies to energy system components as a quick reference.

³⁵ National Fire Protection Association. *Codes and Standards: NFPA 52 and 59A*. <http://www.nfpa.org/>

3 Economic Analysis of State/Federal Regional Environmental Initiatives

Energy production and use by New Yorkers typically comes at some cost to the environment. Energy companies use natural resources during generation, whether to generate the power itself, e.g., water for hydropower, as a repository for the wastes of generation, e.g., discharges to air or surface water, or simply as a byproduct of generation, e.g., mortality of fish and wildlife. The policies and procedures used by DEC to protect and conserve these natural resources result in a monetary cost to energy producers and transporters. While the cost to energy producers can be quantified in dollars and cents, the cost to the State's natural resources are not similarly quantifiable.

The natural resources of New York belong to the people of the State. DEC is entrusted with protecting and managing these resources to ensure their continued existence for future generations. Energy producers are the beneficiaries of New York's abundant natural resources, but they do not have an inherent right to use, and in some cases, exhaust the people's resources. Thus, the cost of compliance with regulatory requirements should be viewed as a necessary part of the business of energy generation.

3.1 Air Quality Matters

The environmental benefits resulting from air quality regulatory requirements include health-related benefits, reductions in acid and nitrogen deposition, and improved visibility. While direct environmental benefits resulting from these programs have not been quantified, much can be learned from the analyses of the recent EPA rulemakings for the revised PM and ozone NAAQS. For the PM NAAQS revision, EPA calculated a range of benefits for fully meeting the revised 24-hour PM_{2.5} standard, using estimates based on the opinion of outside experts, along with published scientific studies.³⁶

These calculations, based on national data, show that the revised PM standard will yield \$9 to \$76 billion a year nationwide in health and visibility benefits in 2020. For example, estimates based on an American Cancer Society Cancer Prevention study value the benefits of meeting the revised 24-hour PM_{2.5} standards at \$17 billion a year in 2020. The annual health benefits of meeting the revised 24-hour PM_{2.5} standards by 2020 include: 1,200 to 13,000 fewer premature deaths in people with heart or lung disease, 2,600 fewer cases of chronic bronchitis, 5,000 less nonfatal heart attacks, 1,630 fewer hospital admissions for cardiovascular or respiratory symptoms, 1,200 fewer emergency room visits for asthma, 7,300 fewer cases of acute bronchitis, 97,000 less cases of upper and lower respiratory symptoms, 51,000 fewer cases of aggravated asthma, a reduction of 350,000 days when people miss work or school, and two million fewer days when people must restrict their activities because of particle pollution-related symptoms. EPA estimates the cost of meeting the revised 24-hour PM_{2.5} standards at \$5.4 billion in 2020. This estimate

³⁶ EPA, Office of Air Quality Planning and Standards. *Regulatory Impact Analysis for the Review of the 2006 National Ambient Air Quality Standards for Particle Pollution*. 2006. <http://www.epa.gov/ttn/ecas/ria.html>. EPA interpreted the American Cancer Society study to derive these health-related estimates.

includes the costs of purchasing and installing controls for reducing pollution to meet the standard. Thus, benefits are estimated to exceed costs by a ratio of more than 3:1.

For the ozone NAAQS revision, EPA performed an illustrative analysis of the potential costs and human health benefits of meeting the revised standard.³⁷ After applying a baseline of controls of both national and regional measures, which included CAIR and federal motor vehicle programs, EPA estimated the additional emissions reductions that would be necessary for non-attainment in areas across the country to attain the ozone NAAQS. The costs for reducing emissions to meet the ozone NAAQS was estimated to be between \$5.5 and \$8.8 billion nationally.

EPA also estimated the national health benefits associated with meeting the ozone NAAQS in terms of fewer premature deaths, asthma and other respiratory illnesses,³⁸ and the total national annual value for these benefits were estimated to be between \$1.5 and \$22 billion.

The costs to ratepayers for utilities and generators to comply with existing and proposed rulemaking efforts by DEC are expected to be reduced as a result of the Energy Efficiency Portfolio Standard (EEPS) under development by PSC. The goal of that proceeding is to reduce electricity demand by 15 percent from the current projected demand in 2015. If successful, this proceeding will not only reduce energy costs for ratepayers in New York, it may also lower the costs of complying with environmental regulations.

3.2 Water Quality and Ecological Considerations

The primary regulatory costs for disturbance to habitat during construction of generation and transmission facilities are regulated in ECL Article 24 (Freshwater Wetland Act), ECL Article 25 (Tidal Wetlands Act), and Article 15 (Protection of Waters). These laws were enacted in the 1970s and thus the cost of avoiding, minimizing or mitigating wetland and stream habitat disturbance has long been incorporated as a cost of doing business.

Costs of incorporating Best Technology Available (BTA) for cooling water intake structures at electric generating facilities arise from the requirements of the federal Clean Water Act, and will vary by station. Prior to publication of its regulations governing requirements for BTA, EPA did an economic analysis looking at costs across the industry.³⁹ The U.S. Supreme Court recently reviewed the question of whether EPA, and therefore the states, are permitted to use a cost/benefit analysis when imposing BTA

³⁷ EPA, Office of Air Quality Planning and Standards. *Regulatory Impact Analysis of the Proposed Revisions to the 2008 National Ambient Air Quality Standards for Ground-Level Ozone*. July 2007. <http://www.epa.gov/ttn/ecas/ria.html>

³⁸ According to U.S. EPA's regulatory impact analyses (2006, 2007), the 2020 benefits related to lower ozone by attaining the revised ozone NAAQS are up to 1,100 fewer premature deaths nationally, and the 2020 national PM co-benefits are a reduction of up to 2,400 annual deaths. The Harvard Six-City Study methodology yielded an estimate of 1,400 fewer premature deaths while the American Cancer Society methodology estimated 620 fewer premature deaths. For health benefits related to ozone exposures, EPA estimated 1,400 fewer hospital admissions for person less one year of age, 1,700 fewer hospital admissions for persons from ages 65 to 99, 1,200 fewer asthma related emergency room visits, 570,000 less school absences and 1,500,000 fewer minor restricted activity days. The PM co-benefits expected include 1,400 fewer cases of nonfatal myocardial infarction, 690 fewer asthma related emergency room visits, 1,200 less cases of acute bronchitis, 10,000 fewer incidences of lower respiratory symptoms (ages 8 to 12), 7,500 fewer incidences of upper respiratory symptoms (ages 7 to 14), 9,400 fewer occurrences of asthma exacerbation for asthmatic children ages 6 to 18, and 65,000 less missed work days.

³⁹ For new and existing facilities, this analysis can be found respectively at EPA. *New Facilities*. 2009. <http://www.epa.gov/waterscience/316b/phase1/economics/index.html> and EPA. *Large Existing Electric Generating Plants*. 2009. <http://www.epa.gov/waterscience/316b/phase2/econbenefits/final.htm>

requirements on large power plants. It concluded that the Clean Water Act permits, but does not require, EPA to perform a strict cost benefit analysis in determining BTA. The decision preserved EPA's and the states' discretion to determine how to reasonably factor costs into the BTA decision.

DEC is currently revising its regulations regarding endangered species to provide better protection for endangered, threatened and special concern species in New York and to clarify the process by which developers must evaluate and address the existence of endangered species or their habitat at an energy facility. The need to comply with any new or changed regulation could potentially and primarily affect permitting costs for wind energy facilities, transmission lines, and cables/pipelines. Prior to publication of any changes to the regulations, a regulatory impact assessment would need to be conducted to evaluate economic impact of the new regulations.

FERC requires an individual economic analysis for all hydroelectric projects applying for a license.⁴⁰ The analysis is specific to the viability of the project to operate under the constraints of its license including all environmental conditions but in particular for the protection of aquatic and other resources. Thus, the economic analysis of a DEC WQC is included in the studies required by FERC.

The requirements and policies of the Stormwater General Permit Program for Construction Activity have been in effect for 15 years and thus, the costs associated with implementing these standards have become part of normal business costs for the given energy industrial sector. There will be no new costs associated with these program requirements in the foreseeable future.

3.3 Open Space and Public Lands Considerations

There are also economic costs associated with constructing energy production and transmission facilities in a manner that minimizes impacts on valuable open space resources, as the design and location of such facilities may consequently require modification. Similarly, respecting constitutional and statutory restrictions on the use of State lands that were acquired for their open space values, e.g., watershed protection and public recreation, may prevent energy production and transmission facilities from being constructed in otherwise preferable locations and may require design modifications. Delaying the construction of such facilities until authorizing constitutional amendments or statutes can be adopted may also result in economic costs.

3.4 Oil and Gas Exploration and Production, Underground Gas Storage and Deep Geothermal Wells

Oil and gas exploration, development and production stimulate investment, create jobs, and generate revenues. Direct monetary gains are realized by operators and their employees, royalty owners, contractors and support industries. Local and State governments receive benefits from the property taxes levied on the industry, permit and fee revenues paid, and the overall development of their local regions.

The cost of doing business and the pace at which oil and gas exploration, development and production proceeds, is partially dependent upon DEC's oil and gas regulatory program, including the permitting of

⁴⁰ Black, R. B. McKenny, and R. Unsworth. *Economic Analysis for Hydropower Project Relicensing: Guidance and Alternative Methods*. 1998. <http://www.fws.gov/policy/hydroindex.htm>

new wells. DEC's goal in regulating the oil and gas industry is to ensure that development of New York's non-renewable energy is done in an environmentally sound manner for the benefit of current and future generations, and thus regulatory economic costs are imposed. DEC's regulatory requirements on the oil and gas industry add significant environmental protection consistent with the legislative mandates of New York's Oil, Gas and Solution Mining Law. While the costs of compliance with environmental regulation may appear high, the costs to society of not regulating are far greater. Because it is comparatively easy to calculate the direct monetary costs of regulation, these costs may be questioned when a corresponding monetary value is not assigned to the benefits of regulation. However, the intrinsic value of maintaining clean air, water and soil can be readily found in increased property values, decreased healthcare costs, increased recreational and tourist use, and improved production from forestry, fishery and agriculture.

3.5 Solid and Hazardous Waste Management

EPA and DEC's Division of Air Resources and Division of Solid and Hazardous Materials regulations for solid and hazardous waste management facilities (i.e., municipal waste combustors and landfill gas-to energy projects) that have the potential to produce energy have not substantially changed over the past 15 years. As such, the costs associated with implementing these regulations have become part of the everyday normal business costs for the given energy industrial sector. For the most part, there will be no new costs associated with these program requirements for the foreseeable future.

3.6 Bulk Storage of Liquid Fuels and Chemicals

The State's regulations for the bulk storage of liquid fuels and chemicals have not substantially changed since 1994 and, as such, the costs associated with implementing these regulations have become part of normal business costs for these owners. There will be new costs to implement the federal Energy Policy Act of 2005 requirements; however, those costs are not yet fully defined.

3.7 Liquefied Natural Gas

The State's regulations for the storage of LNG are still in development and, therefore, costs for compliance with the new requirements are still undefined.

4 APPENDIX A - Environmental Laws, Rules and Policies that Apply to Energy Systems

This Appendix lists the environmental laws, regulations, policies, and initiatives that State regulatory entities follow in regulating the development and use of energy. The New York State Environmental Conservation Law (ECL) is structured first as “Article(s)” followed by “Title” in the first subset.

4.1 Air Resources

United States Code 42 U.S.C. § 7401-7671q – Establishes Federal standards for air pollutants. Prevents significant deterioration in areas of the country where air quality meets Federal standards.

ECL Article 1 Section 1-0101 – This section declares that it is the policy of the State of New York to control air pollution in order to enhance the health, safety, and welfare of the people of the State and their overall economic and social well-being.

ECL Article 3 Section 3-0301 – This section gives the commissioner of the Department the power to, among other things, provide for prevention and abatement of all air pollution.

ECL Article 19:

Section 19-0103 – This section declares that it is the policy of the State of New York to maintain a reasonable degree of purity in the air resources of the State, and that codes, rules and regulations established under Article 19 should be clearly premised upon scientific knowledge of causes and effects.

Section 19-0105 – This section declares that the purpose of Article 19 is to safeguard air resources from pollution by both controlling existing air pollution and preventing new air pollution.

Section 19-0107 – This section broadly defines the terms “air contaminant” and “air pollution,” among others.

Section 19-0301 – This section declares that the Department has the power to promulgate regulations preventing, controlling, or prohibiting air pollution.

Section 19-0303 – This section proscribes the procedure for the adoption of any code, rule, or regulation pursuant to ECL Article 19, and sets forth various considerations that the Department must make in adopting such regulations.

Section 19-0305 – This section authorizes the Department to enforce the codes, rules or regulations established in accordance with ECL Article 19.

Section 19-0306 – This section requires the Department to establish operating requirements for municipal solid waste incinerators.

Section 19-0311 – This section sets forth the requirements for permits for sources subject to the federal Clean Air Act (42 U.S.C. § 7401 et seq.).

ECL Article 71 Sections 71-2103 and 71-2105 – These sections set forth the civil and criminal penalty structures for violations of ECL Article 19, or of any code, rule or regulation promulgated pursuant to ECL Article 19.

6 NYCRR Part 200 – General Provisions: This part contains general provisions and a listing of federal standards and requirements that have been delegated to New York by the US Environmental Protection Agency to include in permits issued by New York State.

6 NYCRR Part 201 – Permits and Certificates: This regulation applies to those terms and conditions which are subject to permitting, including applicability criteria, compliance, monitoring, recording, and reporting.

DEC Program Policy/Guidance Document Air Guide10 – Federal Enforceability of Information in Air Operating Permits

6 NYCRR Part 202 – Emissions Verifications: This Part establishes the general criteria for verifying emissions by means of emissions sampling, testing and associated analytical determinations, and sets forth the general requirements for submitting annual emission statements.

6 NYCRR Part 204 – NO_x Budget Trading Program: This Part establishes the monitoring, recordkeeping, and reporting requirements for facilities subject to the NO_x Budget Trading Program.

6 NYCRR Part 217 – Motor Vehicle Emissions

6 NYCRR Part 218 – Emission Standards for Motor Vehicles and Motor Vehicle Engines.

6 NYCRR Part 219 – Incinerators: This Part establishes emission limitations, permitting requirements, and operating requirements for incinerators.

DEC Program Policy/Guidance Documents 92 Air 32 – Application of Part 212 vs. Part 219 in terms of Burning Discrete Waste Streams.

6 NYCRR Part 223 – Petroleum Refineries

6 NYCRR Subpart 225-1 – Fuel Composition and Use - Sulfur Limitations: This Subpart limits the amount of sulfur in the fuel sold or used in each regulated area of New York State.

6 NYCRR Subpart 225-2 – Fuel Composition and Use - Waste Fuel: This Subpart defines the types of waste fuels that may be fired in New York State. Also, this Subpart sets the minimum permitting criteria for facilities that are eligible to fire these waste fuels.

6 NYCRR Subpart 225-3 – Fuel Consumption and Use – Gasoline

6 NYCRR Subpart 225-4 – Motor Vehicle Diesel Fuel

