

Introduction

This report, the 11th edition of the Cumulative Environmental Impact Report (CEIR-11), describes how power plants affect the environment and discusses how industry restructuring interacts with natural resource issues.

Power plants in Maryland, like all industrial facilities across the United States, affect the environment in various ways. For more than 25 years, the Maryland Department of Natural Resources (DNR) Power Plant Research Program (PPRP) has been investigating how power plants impact Maryland's air, water, land, and cultural resources.

We need power plants and transmission lines to support the basic needs of modern society. At the same time, we must continually ask: What impacts do power plants have on the environment? Are the impacts significant? What are the costs to minimize the impacts?

The electric power industry across the United States is in the midst of change, which is affecting how power plants are managed and regulated. Wholesale competition has been a fact of life for several years, and now many states are introducing competition at the retail level. In Maryland, restructuring has brought changes in the types of power plants that are being proposed and constructed, and in the companies that are siting and building these facilities. Whereas in the past, large utility companies would build and operate power plants, generating electricity to serve their own service territories, now electricity generation has become a competitive market, with power plant developers and operators vying to sell power to supply the regional grid.

PPRP's Legislative Mandate and Overview of Activities

The Maryland legislature created the Power Plant Siting Program, precursor to the current PPRP, in 1971 as a result of extensive public debate regarding the potential effects on the Chesapeake Bay from the Calvert Cliffs Nuclear Power Plant. Calvert Cliffs was a source of concern because the plant uses a once-through cooling system that withdraws 3.5 billion gallons of water per day from the Bay and discharges the water back to the Bay with a temperature elevation of about 12°F. The controversy over potential environmental impacts during the licensing of Calvert Cliffs prompted the creation of PPRP to ensure a comprehensive, technically based evaluation and resolution of environmental and economic issues before decisions were made regarding whether and where to build other generating facilities.

Today, PPRP continues to play this role in providing a comprehensive set of technically based licensing recommendations for proposed generating facilities. PPRP also conducts research on power plant impacts to the Chesapeake Bay, one of Maryland's greatest natural resources. In addition to surface water concerns, PPRP's evaluations consider impacts to Maryland's ground water, air, land, and human resources. PPRP examines all of these areas in its review of

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Since its mandate in 1971, PPRP has been studying how power plants affect Maryland's natural resources, especially the Chesapeake Bay and its ecosystems. In concert with other State agencies, PPRP is responsible for managing the comprehensive review of new power plants and transmission lines. The Program's legislative mandate is to ensure that adequate electricity is provided to Maryland users at a reasonable cost, while minimizing environmental impacts.

proposed power facilities, including new plants, expansions of existing plants, and transmission lines. To construct any of these facilities, a company must obtain a Certificate of Public Convenience and Necessity (CPCN) from the Maryland Public Service Commission (PSC). As part of this licensing process, applicants must address a full range of environmental, engineering, socio-economic, planning, and cost issues.

PPRP is responsible for managing the technical review of CPCN applications. This is the only process within the State regulatory framework that allows a comprehensive review of all electric power issues. The goal of the review, which consolidates the concerns of several State agencies, is to ensure that adequate electricity is provided to Maryland users at a reasonable cost while minimizing the impacts on the environment.

As part of its comprehensive review, PPRP coordinates the involvement of the Departments of Natural Resources, Environment, Agriculture, Business and Economic Development, Transportation, and Planning, and the Maryland Energy Administration. PPRP consolidates the recommendations of those agencies and represents them before the PSC in the CPCN hearing process.

As part of the CPCN process, the PSC holds a series of public hearings. On the basis of background information presented by the applicant, the state agency evaluations coordinated by PPRP, and input from local governments, environmental groups, and citizens' groups, the PSC decides whether to grant a CPCN. When the PSC grants a license, it also determines what conditions it will place on the license to ensure that the new or modified facility operates in an environmentally acceptable way.

During the past two years, there has been a significant increase in the pace of power plant licensing in Maryland and throughout the region. In large part, this increase is due to competitive restructuring, which has allowed the development of "merchant" power plants. Prior to restructuring, a power plant developer in Maryland typically would have negotiated a contract with an electric utility (such as PEPCO or BGE) and/or with a large industrial user to purchase the plant's electrical output at a certain price. In the restructured power industry, by contrast, a merchant plant developer can choose to design and build a plant speculatively, planning to sell the output via a regional grid (such as the PJM Interconnection) at market prices. (Section 2 includes more detail about the operation of the regional power system.) Because electricity prices have spiked to very high levels during peak demand times in the summers of 1999 and 2000, substantial financial incentives exist for merchant power plant developers in the mid-Atlantic region.

Throughout this CEIR, examples are provided of recent and ongoing licensing cases, highlighting significant issues that have arisen and innovative approaches to impact assessment that PPRP has developed.



The PPRP Web site (<http://www.dnr.state.md.us/bay/pprp/>) houses online information about PPRP and its activities and programs. Web site users can learn about how and why PPRP was established, and read about recent program activities. For example, from the PPRP Program Activities page one can view the Atmospheric Deposition Measurement and Analysis Information Resource page, a repository for atmospheric deposition data focusing on the Chesapeake Bay watershed, or read abstracts of recent reports online.

The Web site also includes the *Electricity FactBook*, which provides detailed information about power generation in Maryland. PPRP's site is constantly being updated and has several publications that are available for downloading.

New Issues

This report summarizes key findings from almost 30 years of studying power plant impacts to natural resources. New issues continue to emerge as the power industry changes, technology advances, and evaluation methods evolve. This section provides a brief overview of a few key topics, each of which is discussed in more detail later in this report.

Restructuring of the Power Industry

Since the late 1980s, a growing number of experts and policymakers began to question the assumption that electricity generation should be a monopoly enterprise, with electric power being generated almost exclusively by large utilities and distributed by those utilities to their service territories. As a result of action at the federal level to require open access to transmission facilities, competition in electricity supply began. Maryland has now joined other mid-Atlantic states (Pennsylvania, New Jersey, the District of Columbia, and Delaware), as well as California and several Northeast states, in introducing retail-level competition for electricity generation. As of July 2000, residential customers in Maryland are free to select the company that will supply their electricity, and to “shop around” for favorable rates and packages. Transmission and distribution of electricity will continue to be provided by the local utility company. The restructuring legislation requires Maryland’s major utilities to cap their electricity rates for the first four years after competition is introduced (i.e., until July 2004).

Competitive restructuring has changed the approach to construction of new power plants in Maryland in important ways. Generating capacity is no longer being constructed by regulated utilities, but rather by merchant plant developers serving the deregulated wholesale and retail markets in the region. A much smaller amount of new capacity (but consisting of numerous projects) takes the form of self-generation or cogeneration projects, which are installed within an industrial or commercial facility to meet on-site demands.

More details regarding competitive restructuring and its potential effects are discussed in Sections 2 and 3 of this report.

Reliability

Recent highly publicized incidents of blackouts, brownouts, and transmission system failures have increased public concerns regarding transmission reliability. In the past, reliability of the transmission grid was achieved through the voluntary cooperation of utilities, who worked closely together to ensure compliance with reliability standards. These voluntary standards were promulgated by the North American Electric Reliability Council (NERC) and smaller regional councils across the United States. In today’s bulk power market, users and owners of transmission facilities are now competitors with little incentive to cooperate.

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A recurring topic throughout this CEIR document is the restructuring of the power industry. Retail customers can now select their electricity supplier, although utility companies will continue to be responsible for delivering that electricity through the transmission and distribution network. Individual companies can now generate electricity and sell it on a retail basis. Restructuring has also created new opportunities for marketing more environmentally friendly types of power generation, or “green power.”

Federal legislation has been proposed to address reliability nationwide. One proposal would create a national organization with the authority to set mandatory regulatory standards, with oversight from the Federal Energy Regulatory Commission (FERC). An additional, more controversial, proposal addresses the fact that siting new transmission facilities is becoming more difficult across the country. This proposal would grant FERC the ability to issue a CPCN for needed transmission facilities, even if a state commission has withheld approval. Section 2 of this report has more discussion of transmission reliability, including information on the severe power outages experienced on the Eastern Shore in July 1999.

Green Power

With restructuring, consumers can opt to purchase some or all of their power requirements from suppliers offering generation from renewable, or environmentally preferable, resources. Power generated from these resources is generally referred to as "green power." There is considerable debate over what is or should be included in the definition of green power. For instance, hydroelectric resources, while renewable and emission-free, can have significant impacts to riverine ecology and habitat, causing harm to fish and other species. Wind energy creates visual and land use impacts and can harm migrating birds. Solar photovoltaic technology also requires large land areas, and there are concerns regarding toxic chemical use and releases from the manufacture and the ultimate disposal of solar panels. PPRP has compiled a booklet and Web site (www.mdgreenpower.org) that discusses the environmental characteristics of renewable energy technologies, as well as "traditional" fossil fuel and nuclear generation.

The Maryland state government has established a goal that 6 percent of its electricity purchases will be directed to green power sources, for the purpose of encouraging investment in and development of environmentally friendly generating technologies. For purposes of this goal, green resources are defined as solar, wind, biomass, landfill gas, and municipal solid waste. Although Maryland's geography is not ideally suited for some types of renewable energy, the wind resources in western Maryland could support some wind power development. Furthermore, Maryland has substantial biomass resources in the form of agricultural and wood waste, which can be exploited as fuel. Additional information about green power and the State's activities is provided in Section 3.