Power Plant Cooling and Associated Impacts

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Water withdrawals for thermoelectric power generation were estimated in 2005 to be 201 billion gallons per day—the highest use of any industry. Most of that water is used for cooling. Power plants boil water to produce steam, which is used to spin the turbines that generate electricity. Then, staggering volumes of water are withdrawn from nearby rivers, lakes, and oceans to cool the steam back into water so it can be used to produce more electricity. The three basic types of cooling systems—once-through, closed-cycle, and dry cooling—differ dramatically in their water usage, with once-through cooling being the most water-intensive and environmentally harmful method. The use of once-through cooling systems causes severe environmental impacts, killing billions of fish, degrading aquatic ecosystems, and increasing the temperature of our rivers, lakes, and ocean waters. Power plants utilizing once-through cooling also are subject to increased incidences of shutdowns or curtailments during times of drought and extreme heat. The U.S. Environmental Protection Agency (EPA) is in the process of issuing standards for the use of cooling water at existing U.S. power plants. A clear,

consistent national policy is needed to ensure that the U.S. electricity sector is moving toward a cleaner and more water-smart future by replacing antiquated and environmentally destructive once-through cooling systems with modern, less water-intensive technologies.