

## ACTION PLAN

### 5.0 General

The resources needed to meet IPL's system capacity and energy requirements come primarily from two types of resources: demand-side management (DSM) and supply-side (conventional and renewable) resources. The action plan, consistent with Minnesota Rule 7843.0400, Subp. 3(C), describes IPL's activities over the next five-year time period. IPL plans to:

- Continue to pursue DSM activities in Iowa;
- Continue to develop its PPA and owned wind portfolio, including:
  - Incorporating the 200 MW Turtle Creek PPA, which has an expected 2018 in-service date;
  - Developing up to 500 MW of new wind as approved by the Iowa Utilities Board ("Board" or "IUB") in IUB Docket No. RPU-2016-0005 ("New Wind I") by 2020;
  - Developing up to 500 MW of additional new wind ("New Wind II Project") by 2020, as proposed by IPL in IUB Docket No. RPU-2017-0002;
- Pursue reasonable emission controls and/or natural gas conversions on its remaining coal-fired units;
- Retire older peaking units;
- Retire older intermediate steam units; and
- Continue to investigate and pursue renewable energy.

In addition, IPL is engaged in transmission and environmental related activities which are discussed below. The analysis of all options is ongoing, and the action plan is subject to revision and refinement.

### 5.1 Demand-Side Management Activities

IPL's current Iowa DSM programs are continuing to save kW and kWh. DSM activity and reporting is expected to continue. IPL will continue to analyze potential demand and energy savings from future DSM activities.

### 5.2 Supply-Side Activities

IPL is committed to meeting the demands of its customers. Section 3 identified the types of resources required to meet IPL's customer needs. With the addition of the Marshalltown Generating Station in 2017 and IPL's 500 MW New Wind I Project, IPL does not project a capacity deficit until 2026. IPL plans to meet its resource needs consistent with the regulations of the governing jurisdictions. IPL is currently meeting capacity and energy needs with the following summarized portfolio, with recent additions noted:

- Approximately 550 MW of existing owned and PPA wind resources, including:
  - 99 MW Franklin County Wind Farm purchased in 2017;

- 200 MW Whispering Willow-East Wind Farm;
- 250 MW of wind PPAs;
- 400 MW from nuclear PPA;
- Nominal 630 MW, natural-gas combined cycle, Marshalltown Generating Station, placed into service in 2017;
- Approximately 2,400 MWs of other existing fossil fuel (coal and natural gas) power; and
- MISO market energy.

Section 5.3 below discusses the significant wind additions IPL plans to add to its portfolio in the next few years.

In the 2014 IRP, IPL considered the ongoing viability of its older peaking and intermediate steam units. As discussed in Section 4, IPL plans to retire Centerville CTs Units 1 and 2, Burlington CTs Units 1-4, Grinnell CTs Units 1 and 2, and Fox Lake 1 and 3. The retirements are subject to approval from the MISO through the Attachment Y process.

IPL customers' demands will be met, system reliability within the region will be maintained, and customers' rates will be kept reasonable and competitive. IPL's resource planning process is ongoing and iterative, so IPL will continually review and revise this action plan as new information becomes available. In the interim, all resource options will continue to be considered and evaluated.

### 5.3 Renewable Activities

IPL continues to consider renewable energy technologies, especially wind energy, viable options for future resource needs. Currently, IPL purchases capacity and energy from approximately 250 MW nameplate of wind turbines. IPL's existing, owned wind resources include the 200 MW Whispering Willow East Wind Farm and the 99 MW Franklin County Wind Farm.

IPL continues to develop new wind resources through ownership and PPAs. IPL signed a 15-year PPA for the 200 MW Turtle Creek Wind Farm, which has an expected 2018 in-service date. As part of its New Wind I and New Wind II projects, IPL is developing up to 1,000 MW of wind in Iowa with a 2020 expected in-service date.<sup>1</sup>

These existing resources and planned new wind projects and new PPAs are expected to allow IPL to reach a renewable energy portfolio of over 35 percent in the next five years.

To satisfy Iowa renewable energy requirements,<sup>2</sup> IPL must secure 49.8 MW of nameplate renewable capacity. IPL satisfied this requirement and assigned this capacity to a 65.1% share of the Storm Lake Power Partners Wind Farm. Based on typical capacity factors from Storm Lake Power Partners, this

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<sup>1</sup> See IUB Docket Nos. RPU-2016-0005 and RPU-2017-0002.

<sup>2</sup> Iowa Administrative Code 199-15.11(1).

49.8 MW share equates to approximately 125,000 MWh per year, or 0.8% of Iowa annual retail energy sales. As shown in Appendix 5A,<sup>3</sup> IPL projects a surplus of approximately 1.5–5.5 million MWh per year relative to Iowa’s current renewable energy requirements, over the next ten years.

IPL closed on the sale of its Minnesota retail electric distribution assets in 2015 and now provides wholesale power to Southern Minnesota Electric Cooperative (“SMEC”). Therefore, IPL is no longer subject to the Minnesota Renewable Energy Standard. IPL forwards allocated renewable energy credits (“RECs”, M-RETS Certificates) to SMEC each year via the Midwest Renewable Energy Tracking System (“M-RETS”) based on a load ratio share of SMEC’s load relative to IPL’s load. Appendix 5A contains an estimated forecast of SMEC’s annual REC allocation.

#### 5.4 Transmission Activities

On December 20, 2007, IPL sold its transmission assets to ITC-M. ITC-M is a subsidiary of ITC Holdings. ITC-M is a transmission company, which provides non-discriminatory access to those entities who depend upon the transmission grid. The transaction involved the sale of approximately 6,800 miles of 34.5 kV and higher voltage transmission lines in Iowa, Minnesota, Illinois and Missouri. The transaction, which was examined by the Commission in Docket No. E-001/PA-07-540, was approved in a written order dated February 7, 2008, with an effective date of December 18, 2007. As a result of the transaction, IPL’s status changed from being a transmission owner to a transmission dependent utility (“TDU”).

As a TDU, IPL participates in the planning and stakeholder processes of both MISO and ITC-M. In addition, IPL participates in various ad hoc transmission activities. IPL plans to remain active in transmission planning activities as a TDU.

#### 5.5 Environmental Activities

Environmental activities impact many aspects of IPL’s business, including its generation planning and energy supply decision-making. IPL evaluates proposed regulations to plan for compliance with applicable environmental requirements for air emissions, water and waste management.

IPL’s environmental obligations in Minnesota during the 2017 IRP planning period are forecasted to be minimal due to IPL’s limited fossil-fuel fired electric generation in Minnesota. IPL retired its sole fossil-fuel fired unit in Minnesota – Fox Lake Unit 3 – as of November 2017. Since 2012, carbon dioxide (CO<sub>2</sub>), nitrogen oxide (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) emissions from this unit contributed no more than 0.14% each year, respectively, compared to the overall statewide total emissions reported to the U.S. Environmental Protection

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<sup>3</sup> Appendix 5A is broken into two parts; 500 MW owned wind additions and 1,000 MW owned wind additions, pending IUB’s order on New Wind II.

Agency (EPA) Clean Air Markets Division (CAMD).

### 5.5.1 Planning for Environmental Regulations

Environmental planning entails evaluating regulations, identifying compliance requirements, and understanding associated impacts to IPL's utility operations. The framework for implementing rules issued under the authority of the Clean Air Act (CAA) is discussed in Section 5.5.2. Section 5.5.3 provides an overview of the primary air quality rules that IPL is currently complying with for its emissions reduction requirements. Section 5.5.4 provides a summary of water quality regulations that are being considered in planning for IPL's fossil-fueled electric generation operations. Section 5.5.5 summarizes waste management regulations affecting coal combustion byproduct re-use, ash handling or landfill practices at IPL.

Details of the potential impacts of various environmental regulations and IPL's plan to address the anticipated compliance requirements are provided in IPL's Emissions Plan and Budget (EPB) filing to the Board in IUB Docket No. EPB-2016-0150, as discussed in Section 5.6.1. Until litigation on various environmental rules is resolved in the courts or without further action by the EPA, IPL continues to implement its current multi-emissions compliance plan. IPL monitors the status of environmental regulations that are uncertain and may be subject to change. Accordingly, IPL will review this action plan periodically and notify regulators, as appropriate, should future changes be necessary.

### 5.5.2 Framework Governing Issuance of Air Quality Rules

The federal CAA along with its various amendments provides the framework governing air quality regulations, including emissions compliance requirements for the electric utility industry. The Minnesota Pollution Control Agency (MPCA) and the Iowa Department of Natural Resources (IDNR) are the state agencies that implement federal environmental rules in Minnesota and Iowa, respectively.

As part of the basic framework under the CAA, the EPA is required to establish National Ambient Air Quality Standards (NAAQS), which address six "criteria" pollutants that protect public health and welfare in the United States. Areas that comply with NAAQS are considered to be in attainment; in contrast, routinely monitored locations that do not comply with these standards may be classified by the EPA as nonattainment and require further actions to reduce emissions.

Four of these criteria pollutants are particularly relevant to IPL's electric utility operations: nitrogen oxide (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM), and ozone. Ozone is not directly emitted from IPL's generating facilities; however, NO<sub>x</sub> emissions may contribute to ozone formation in the atmosphere. Fine particulate matter (PM<sub>2.5</sub>) may also be formed in the atmosphere from SO<sub>2</sub> and NO<sub>x</sub> emissions that react to form sulfate and nitrate aerosols.

The CAA also regulates 187 toxic air pollutants, also known as hazardous air

pollutants (HAPs), including mercury. In 2009, the EPA commenced regulation of six greenhouse gases (GHGs) including carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

State implementation plans (SIPs) document the collection of regulations that individual state agencies will apply to maintain NAAQS and other CAA emissions requirements. The EPA must approve each SIP, and if a SIP is not acceptable to the EPA or if a state chooses not to issue separate state rules, then the EPA can assume enforcement of the CAA in that state (in whole or part) by issuing a federal implementation plan (FIP).

### 5.5.3 IPL Planning Considerations for Air Emissions Regulations

The following briefly discusses the primary CAA programs and associated air quality regulatory requirements that IPL considers for its multi-emissions compliance plan. Specifically, this includes the IPL Consent Decree, the Cross-State Air Pollution Rule (“CSAPR”) and the Mercury and Air Toxics Standards (“MATS”). IPL operations also comply with the environmental requirements from other CAA rules as they are issued, such as changes to the NAAQS or other Maximum Achievable Control Technology (“MACT”) rules. However, these currently are not significant drivers of the emissions reductions and air pollution controls needed for IPL’s generation fleet.

#### **The IPL Consent Decree**

In 2015, IPL entered into a Consent Decree with the EPA, the State of Iowa, the County of Linn, Iowa, and the Sierra Club. The IPL Consent Decree imposes various requirements on the following IPL generating stations: Burlington, Dubuque, Lansing, M.L. Kapp, Ottumwa, Prairie Creek, Sixth Street, and Sutherland. None of these generating stations are located in Minnesota.

The IPL Consent Decree requirements include, but are not limited to, retirement obligations, refueling certain units from coal-to-gas, emission caps for NO<sub>x</sub> and SO<sub>2</sub>, emission rate limits for NO<sub>x</sub>, SO<sub>2</sub> and particulate matter (PM), installation of certain NO<sub>x</sub>, SO<sub>2</sub> and PM controls and obligations to continuously operate certain emission control equipment. More background information on the IPL Consent Decree is available in IPL's most recent EPB filing with the Board in IUB Docket No. EPB-2016-0150.

#### **CSAPR**

In August 2011, the EPA issued the CSAPR to replace the Clean Air Interstate Rule (“CAIR”) market-based cap and trade program. Similar to the CAIR, the CSAPR established NO<sub>x</sub> and SO<sub>2</sub> emission budgets for fossil-fueled electric generating units (“EGUs”) located in the eastern half of the United States. Compliance with the CSAPR emission caps began in 2015, with additional emission reductions required in 2017.

IPL’s EGUs located in Iowa are subject to state-specific annual NO<sub>x</sub> and

SO<sub>2</sub> emission caps and ozone season NO<sub>x</sub> emission caps. IPL's EGUs located in Minnesota are only subject to annual NO<sub>x</sub> and SO<sub>2</sub> emission caps. IPL is in compliance with the CSAPR requirements.

In September 2016, the EPA issued a final rule to further reduce the CSAPR ozone season NO<sub>x</sub> emission caps in 2017 for several states, including Iowa. IPL is well positioned to meet the revised CSAPR compliance requirements.

### **Mercury and Air Toxics Standards**

In February 2012, the EPA issued the final utility MATS regulating HAPs under CAA Section 112 for coal and oil-fired EGUs. The compliance deadline for the Utility MATS was April 16, 2015 unless a 1-year extension was approved by the state permitting authority.

The final rule requires coal-fired EGUs to comply with emission limits for mercury, filterable PM as a substitute for non-mercury metal HAPs, and hydrogen chloride ("HCl") as a substitute for acid gas HAPs. The rule also allows an alternative standard for SO<sub>2</sub> emissions (instead of HCl) for acid gases if a scrubber is installed. In addition, work practice standards to ensure proper combustion must be conducted for organic HAP emissions.

IPL has implemented environmental control projects and operational procedures at various EGUs, refueled to natural gas and/or retired certain EGUs to achieve compliance with the MATS Rule. Pursuant to a June 2015 Supreme Court decision, the EPA issued a supplemental finding for the MATS rule in April 2016 that concludes, after considering costs, it is "appropriate and necessary" to regulate HAPs from coal-fired EGUs. This finding and other aspects of the MATS rule remain subject to litigation. IPL currently expects continued compliance with the MATS Rule based on their completed actions, but will continue to monitor legal and regulatory developments related to this rule.

#### **5.5.4 IPL Planning Considerations for Water Quality Regulations**

IPL considers compliance with current and future revisions to water quality regulations in its environmental planning efforts. These Federal Clean Water Act ("CWA") requirements are considered by IPL in conjunction with future revisions to regulations affecting ash management practices at IPL's coal-fired EGUs. Together the approach implemented for compliance with these regulatory requirements at IPL's existing EGUs is expected to reduce water consumption, as well as assure no adverse potential effects on aquatic life from water intake and discharge as part of its resource plan.

#### **Thermal Discharge Rule – 316(a)**

Section 316(a) of the CWA applies to point sources with thermal discharges and was established to minimize adverse environmental impacts to fish and other aquatic life. EPA authorizes state agencies to impose alternative effluent limitations for the control of the thermal component of a discharge

through thermal variances. A 316(a) thermal variance is an NPDES permit condition and expires along with the permit. Before a thermal variance can be granted, facilities must demonstrate, through a series of studies, that the alternative limit assures the protection and propagation of the waterbody's balanced, indigenous population of shellfish, fish and wildlife.

IPL has completed the required thermal variance studies and variance applications for 316(a) compliance at its affected facilities. IPL's Prairie Creek and M.L. Kapp generating stations have both received approved thermal variances. IPL anticipates receiving approved thermal variances at its Burlington and Lansing generating stations by the end of 2018.

### **Cooling Water Intake Structure Rule – 316(b)**

Section 316(b) of the CWA requires the EPA to regulate cooling water intake structures to assure these reflect the "best technology available" for minimizing adverse environmental impacts to fish and other aquatic life. More specifically, the rule establishes national performance standards to reduce the mortality of fish and shellfish caused by entrainment (taking in of organisms with the cooling water) and impingement (blocking of larger organisms that enter the cooling water intake by some type of physical barrier such as screens – sometimes referred to as entrapment).

In August 2014, the EPA issued the final Section 316(b) rule applicable to existing and new cooling water intake structures at large steam EGUs. The final rule requires that both impingement and entrainment mortality standards are met for electric generating facilities that withdraw greater than two million gallons of cooling water per day. Facilities can install technology to meet the impingement standard or reduce the cooling water intake velocity to below a set standard (0.5 feet/second). State agencies are being tasked with determining the best approach to comply with the entrainment standard. Facilities withdrawing 125 million gallons per day or more must conduct studies to help state agencies determine whether and what site-specific controls, if any, would be required to further reduce mortality of aquatic organisms. Part of this determination will include consideration of a series of factors, such as cost and social benefits.

IPL has identified five electric generating facilities that may be impacted by the finalized Section 316(b) rule: Burlington; Lansing; M.L. Kapp; Ottumwa; and Prairie Creek. IPL completed initial field studies required for 316(b) compliance in 2016 and finalized additional studies in 2017. While the schedule for 316(b) compliance is as soon as practical; the final compliance deadline is contingent on when requirements get incorporated into an affected facility's wastewater permit.

### **Effluent Limitation Guideline (ELG)**

The EPA is required to periodically update the national technology-based regulations to reduce pollutants in industrial wastewater discharges into the waters of the United States. In November 2015, EPA published the final ELG

rule that phases in compliance based on existing NPDES permit cycles during the November 2018 to December 2023 timeframe. The final rule establishes more stringent limits in NPDES permits for EGUs. As a result, IPL anticipates new discharge limits and compliance schedules to be incorporated into existing NPDES permits when the permits come due for renewal, which typically occurs on a five-year cycle. Of the seven wastewater discharges identified in the final rule, four would impact IPL, including: fly ash transport water; bottom ash transport water; landfill and surface impoundment leachate; and non-chemical metal cleaning wastewater.

IPL has identified seven electric generating facilities that may be impacted by the final ELG rule: Burlington; Emery; Lansing; Marshalltown; M.L. Kapp; Ottumwa; and Prairie Creek. IPL primarily expects to comply through closing ash ponds and converting to “dry” or circulating ash management systems. Additional technologies will be installed to treat other wastewater discharges at coal-fired and natural gas plants based on technical feasibility studies.

On September 18, 2017, the EPA published a final rule update in the Federal Register, which postpones the earliest compliance dates for flue gas desulfurization (“FGD”) wastewater and bottom ash (“BA”) transport water from November 1, 2018 to November 1, 2020. The “compliance-by” date, December 31, 2023, remained unchanged in the final rule update. EPA’s two-year extension for these two waste-streams does not alter the company’s strategic plan for compliance as described above.

#### 5.5.5 IPL Planning Considerations for Solid Waste Management Regulations

The Resource Conservation and Recovery Act (“RCRA”) of 1976 requires the EPA to develop regulations governing the identification and management of hazardous wastes. The RCRA was amended in 1980, designating coal combustion residuals (“CCR”) to be managed as “non-hazardous waste” until further study could be completed by EPA. CCR is what remains after the direct combustion of coal in coal-fired EGUs to generate electricity. There are different types of CCR, including fly ash, bottom ash and boiler slag.

In April 2015, the EPA issued a final rule, which established minimum federal criteria for managing CCRs in surface impoundments and CCR landfills. The final rule became effective in October 2015 and phases in initial compliance through October 2018, with on-going requirements thereafter through the life of the asset. Compliance includes a series of geotechnical studies and on-going performance standards, certified by professional engineers, for surface impoundments and CCR landfills. Results of these studies and records of on-going performance standards must be made publicly available via a company internet website.

IPL has identified seven current or former coal-fired EGUs with one or more existing CCR surface impoundments and two active CCR landfills subject to the final rule: Burlington; Fox Lake; Lansing; M.L. Kapp; Ottumwa; Prairie Creek and Sutherland.



The final CCR rule is aligned with the final ELG rule. Therefore, IPL will comply by closing ash ponds and converting to “dry” or circulating ash management systems by 2025. IPL completed closure of its Fox Lake ash pond in 2016.

## 5.6 Environmental Regulatory and Related Initiatives

The following section describes IPL's significant on-going and emerging environmental regulatory initiatives. Section 5.6.1 discusses IPL's most-recent EPB filing for its coal-fired EGUs. IPL's ongoing consideration of potential GHG regulation risk is discussed in Section 5.6.2 below.

### 5.6.1 Emissions Plan and Budget (“EPB”)

IPL is responsible for developing and managing an EPB filing within the State of Iowa, consistent with the requirements of Iowa Code § 476.6(20). In accordance with this statute, each rate-regulated public utility that owns one or more electric generating facilities fueled by coal and is located in the State of Iowa is required to file an EPB at least every two years. An EPB provides a utility's compliance plan and related budget to meet applicable federal and state environmental requirements. IUB approval demonstrates that IPL's EPB is expected to reasonably achieve cost-effective compliance with applicable environmental requirements.

On April 1, 2016, IPL filed an updated EPB with the Board, in Docket No. EPB-2016-0150, that addresses the 2017-2018 budget time period, and provides IPL's understanding of current and emerging air, water and waste environmental compliance requirements that will impact IPL through 2021, as well as a discussion of how IPL will meet these requirements.

The primary projects presented in the 2016 EPB are the installation of selective catalytic reduction (“SCR”) technology at the Ottumwa Generating Station Unit 1, the refueling from coal to natural gas of the Prairie Creek Generating Station Unit 4 by the end of 2017, and the refueling from coal to natural gas of the Burlington Generating Station Unit 1 by the end of 2021. In addition, the EPB describes the programmatic approach IPL has undertaken – referred to as the Water and Ash Program – to develop its planned water and ash compliance projects.

Updates to the IPL EPB are generally performed every two years.

### 5.6.2 Potential Greenhouse Gas Regulation

In April 2007, the U.S. Supreme Court concluded in *Massachusetts v. EPA* that GHGs meet the CAA definition of an air pollutant. In 2009, the EPA issued a finding that GHG emissions contribute to climate change, and therefore, threaten public health and welfare, also called the “Endangerment and Cause or Contribute Findings for GHGs”. Taking effect in January 2010, this finding enabled the EPA to issue rules to report and regulate GHG emissions under the CAA.

In October 2015, the EPA issued the final rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," more commonly referred to as the Clean Power Plan ("CPP"). The CPP issued under CAA Section 111(d) establishes guidelines for states to follow in developing plans to reduce CO<sub>2</sub> emissions from fossil-fueled EGUs in existence prior to January 8, 2014. In February 2016, the Supreme Court issued a stay of the Clean Power Plan until pending legal challenges are resolved, which places implementation of the final rule on hold.

In October 2015, the EPA also issued "Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units," under CAA Section 111(b). The final rule includes requirements on CO<sub>2</sub> emissions from new natural gas-fired combined cycle ("NGCC") units greater than 25 MW that are constructed after January 8, 2014. IPL's Marshalltown Generating Station has been designed and constructed to achieve compliance with these standards.

In March 2017, the Promoting Energy Independence and Economic Growth Executive Order was signed which instructs the EPA to review and if appropriate take action to suspend, revise, or rescind the 111(d) and 111(b) final rules. In April 2017, the EPA subsequently published Federal Register notices announcing the commencement of this review. At the request of the Department of Justice, the D.C. Circuit Court has suspended the current litigation over the 111(d) and 111(b) regulations.

In October 2017, the EPA published a proposed rule for public comment to repeal the CPP. The current EPA is proposing a change in legal interpretation from the previous administration that will apply the phrase "best system of emission reduction" ("BSER") to only consider technological or operational measures that can be applied to or at an individual source (i.e., directly to or at an EGU). The proposal asserts this would be consistent with the agency's historical practice of regulation under CAA Section 111(d) and that the existing regulation was flawed by considering actions legally beyond the scope of EPA's statutory authority. Furthermore, the EPA states that the agency has not yet determined whether it will issue a replacement rule. Therefore, a separate advance notice of proposed rulemaking ("ANPR") has been released for public comment in 2018. The ANPR solicits information on approaches that meet the EPA's revised legal interpretation for BSER including how it should be determined; the roles and responsibilities of the States and EPA; and interaction of these compliance requirements with other CAA rules, such as New Source Review. The EPA has not yet taken action in response to the EO to suspend, revise, or rescind the 111(b) final rule.

IPL is currently unable to predict with certainty the outcome of the EPA's 111(d) and 111(b) rules for CO<sub>2</sub> emissions and its related litigation. IPL is continuing to implement a long-term strategic plan that advances cleaner energy opportunities that will benefit our customers and result in lower CO<sub>2</sub> emissions. By adopting a long-term view, we remain flexible on our environmental compliance plans irrespective of the changing policy landscape.

In addition, currently EGUs at two of IPL's electric generating facilities are subject to CO<sub>2</sub> and CO<sub>2</sub>-equivalent ("CO<sub>2</sub>e") permit limits. These permit limits were established as part of EPA's Prevention of Significant Deterioration ("PSD") permit program. Ottumwa Unit 1 has a 12-month rolling average CO<sub>2</sub> emission rate limit of 2,927.1 lb/MWh-net and an annual CO<sub>2</sub>e mass cap of 8,000,325 tons. Marshalltown Units 1 and 2 have a 12-month rolling average CO<sub>2</sub> emission rate limit of 951 lbs/MWh-gross and an annual CO<sub>2</sub>e mass cap of 1,318,647 tons, respectively. IPL is well positioned to continue to achieve compliance with these applicable permit limits.

Scenario: Add 500 MW

Interstate Power and Light (IPL) Renewable Status

Year	Projected Retail and Wholesale Sales				Renewable Energy Credit (REC) Share Percentages		
	Projected IPL IA Retail Sales (MWh)	Add 3.09% Distribution Energy Losses (MWh) <sup>1</sup>	Projected IPL MN Wholesale Sales (MWh)	Projected IPL IA & IL Wholesale Sales (MWh)	IA Retail (%)	MN Wholesale (%)	IA & IL Wholesale (%)
2017	14,807,852	15,280,004	891,129	474,866	91.79%	5.35%	2.85%
2018	14,927,787	15,403,764	895,576	129,593	93.76%	5.45%	0.79%
2019	14,967,827	15,445,080	900,045	15,611	94.40%	5.50%	0.10%
2020	15,092,537	15,573,766	904,537	15,721	94.42%	5.48%	0.10%
2021	15,188,787	15,673,086	909,052	15,831	94.43%	5.48%	0.10%
2022	15,291,677	15,779,256	913,588	15,941	94.44%	5.47%	0.10%
2023	15,396,955	15,887,891	918,148	16,053	94.45%	5.46%	0.10%
2024	15,505,607	16,000,007	922,730	16,165	94.46%	5.45%	0.10%
2025	15,618,377	16,116,373	927,336	16,278	94.47%	5.44%	0.10%
2026	15,731,968	16,233,586	931,964	16,392	94.48%	5.42%	0.10%
2027	15,846,385	16,351,651	936,615	16,507	94.49%	5.41%	0.10%
2028	15,961,634	16,470,574	941,290	16,623	94.50%	5.40%	0.10%
2029	16,077,721	16,590,363	945,988	16,739	94.52%	5.39%	0.10%
2030	16,194,652	16,711,023	950,709	16,856	94.53%	5.38%	0.10%
2031	16,312,434	16,832,560	955,454	16,974	94.54%	5.37%	0.10%
2032	16,431,072	16,954,981	960,222	17,093	94.55%	5.35%	0.10%
2033	16,550,574	17,078,293	965,015	17,213	94.56%	5.34%	0.10%

<sup>1</sup> REC share ratios adjust for 3.09% distribution energy losses to put retail and wholesale sales at equivalent electric system level. Without adjustment, retail sales are generally at secondary and distribution level, wholesale sales are generally at distribution and transmission level.

Forecast as of October 2016.

Scenario: Add 500 MW

Interstate Power and Light (IPL) Renewable Status

Year	Projected IPL RECs Shares				IA RPS Compliance Summary	
	IA Retail REC Share	% of Retail Sales	MN Wholesale REC Share	IA & IL Wholesale REC Share	Needed RECs <sup>1</sup>	Excess Retail RECs
2017	1,546,834	10.4%	90,493	48,222	125,674	1,421,160
2018	1,671,739	11.2%	97,476	14,105	125,674	1,546,065
2019	3,098,448	20.7%	180,841	3,137	125,674	2,972,774
2020	3,881,457	25.7%	225,719	3,923	125,674	3,755,783
2021	4,047,727	26.6%	235,052	4,093	125,674	3,922,053
2022	4,012,771	26.2%	232,612	4,059	125,674	3,887,097
2023	4,007,089	26.0%	231,846	4,054	125,674	3,881,415
2024	3,959,583	25.5%	228,631	4,005	125,674	3,833,909
2025	3,912,111	25.0%	225,381	3,956	125,674	3,786,437
2026	3,911,663	24.9%	224,845	3,955	125,674	3,785,989
2027	3,783,725	23.9%	216,984	3,824	125,674	3,658,051
2028	3,619,491	22.7%	206,853	3,653	125,674	3,493,817
2029	3,484,283	21.7%	198,675	3,516	125,674	3,358,609
2030	3,484,500	21.5%	198,237	3,515	125,674	3,358,826
2031	3,484,713	21.4%	197,800	3,514	125,674	3,359,039
2032	3,484,923	21.2%	197,364	3,513	125,674	3,359,249
2033	3,485,131	21.1%	196,928	3,513	125,674	3,359,457

<sup>1</sup> Forecasted requirements based on past 5-year max of RECs retired for compliance.  
Requirement based on 199 IAC 15.11(1) = 49.8 MW of capacity for IPL.

Scenario: Add 500 MW

Interstate Power and Light (IPL) Renewable Status

Facility	Projected Annual RECs																
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Franklin County	219,783	310,070	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424
Whispering Willow	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657
New Owned Wind I (Approx. 500 MW)			835,315	1,716,926	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984
Adams Wind Farm	12,038	12,038															
Ag Land Energy 1 and 3 Wind Farm	11,969	11,969	11,969	11,969	11,969	2,992											
Ag Land Energy 2 Wind Farm	5,681	5,681	5,681	5,681	5,681	1,420											
Ag Land Energy 5 & 6 Wind Farm	11,488	11,488	11,488	11,488	11,488	11,488	11,488	11,488	11,488	11,488	11,488						
Arnold Wind Farm	6,346	6,346	6,346	4,759													
Flying Cloud Wind Farm	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303				
Hancock Wind Farm	137,382	137,382	137,382	137,382	137,382	137,382	137,382	137,382	137,382	137,382	137,382	125,934					
Hardin Hilltop Wind Farm	48,427	48,427	48,427	48,427	48,427	48,427	48,427	48,427	48,427	48,427	20,178						
Hawkeye Power Partners (aka Cerro Gordo) Wind Farm	101,120	101,120	101,120	101,120	101,120	101,120	101,120	50,560									
Junction Hilltop Wind Farm	26,355	26,355	26,355	26,355	26,355	26,355	26,355	26,355	26,355	26,355	6,589						
Kirkwood Community College Wind Farm	4,710																
Leonardo 1 Wind Farm	7,665	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	1,533						
Michelangelo 1 & 3 LLC Wind Farm	15,330	18,396	18,396	18,396	18,396	18,396	18,396	18,396	18,396	18,396	3,066						
Michelangelo 4 LLC Wind Farm	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	8,432							
Minn Wind I & II (aka Beaver Creek) Wind Farm	5,284																
Neppel Wind Farm	5,098	5,098	3,399														
New Bohemia Solar	8	8	8	8	8	8	8	8	8	3							
Optimum 3, 4, 5 & 6 LLC Wind Farm	30,660	36,792	36,792	36,792	36,792	36,792	36,792	36,792	36,792	36,792	6,132						
Optimum 7 LLC Wind Farm	6,899	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	1,533						
Sieve Wind Farm	1,488																
Storm Lake Power Partners (aka Buena Vista) Wind Farm	191,003	191,003	47,751														
Turtle Creek Wind Farm			803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624
Venus 3 LLC Wind Farm	3,066	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	2,300						
Wilmont Hills Wind Farm	5,500	5,500	5,500	5,500	5,500	1,833											
Windom (aka Bingham) Wind Farm	40,644	40,644	40,644	40,644	20,322												
<b>TOTAL</b>	<b>1,710,101</b>	<b>1,808,069</b>	<b>3,307,372</b>	<b>4,136,247</b>	<b>4,312,224</b>	<b>4,274,998</b>	<b>4,268,752</b>	<b>4,218,192</b>	<b>4,167,632</b>	<b>4,166,860</b>	<b>4,030,744</b>	<b>3,851,992</b>	<b>3,708,689</b>	<b>3,708,689</b>	<b>3,708,689</b>	<b>3,708,689</b>	<b>3,708,689</b>

Note - The first three facilities are owned, the rest are linked to purchase power agreements (PPAs).

Hardin Hilltop Wind collection of CyHawk, Greene, Hardin, Poverty Ridge, Sutton, Wind Family, and Zontos // Adams Wind Farm collection of G McNeilus, McNeilus Windfarm LLC, and GARMAR Wind

Scenario: Add 500 MW

**Interstate Power and Light (IPL) Renewable Status**

Year	Annual REC Commitments		
	Total Produced RECs	RECs for IPL's GPP <sup>1</sup>	Hancock Sale to CIPCO (2MW)
2017	1,710,101	-19,715	-4,836
2018	1,808,069	-19,912	-4,836
2019	3,307,372	-20,111	-4,836
2020	4,136,247	-20,312	-4,836
2021	4,312,224	-20,515	-4,836
2022	4,274,998	-20,721	-4,836
2023	4,268,752	-20,928	-4,836
2024	4,218,192	-21,137	-4,836
2025	4,167,632	-21,348	-4,836
2026	4,166,860	-21,562	-4,836
2027	4,030,744	-21,778	-4,433
2028	3,851,992	-21,995	
2029	3,708,689	-22,215	
2030	3,708,689	-22,437	
2031	3,708,689	-22,662	
2032	3,708,689	-22,888	
2033	3,708,689	-23,117	

<sup>1</sup> GPP - Green Pricing Program - Assumed 1% annual growth rate from 2016 actual sales.

Scenario: Add 1,000 MW

Interstate Power and Light (IPL) Renewable Status

Year	Projected Retail and Wholesale Sales				Renewable Energy Credit (REC) Share Percentages		
	Projected IPL IA Retail Sales (MWh)	Add 3.09% Distribution Energy Losses (MWh) <sup>1</sup>	Projected IPL MN Wholesale Sales (MWh)	Projected IPL IA & IL Wholesale Sales (MWh)	IA Retail (%)	MN Wholesale (%)	IA & IL Wholesale (%)
2017	14,807,852	15,280,004	891,129	474,866	91.79%	5.35%	2.85%
2018	14,927,787	15,403,764	895,576	129,593	93.76%	5.45%	0.79%
2019	14,967,827	15,445,080	900,045	15,611	94.40%	5.50%	0.10%
2020	15,092,537	15,573,766	904,537	15,721	94.42%	5.48%	0.10%
2021	15,188,787	15,673,086	909,052	15,831	94.43%	5.48%	0.10%
2022	15,291,677	15,779,256	913,588	15,941	94.44%	5.47%	0.10%
2023	15,396,955	15,887,891	918,148	16,053	94.45%	5.46%	0.10%
2024	15,505,607	16,000,007	922,730	16,165	94.46%	5.45%	0.10%
2025	15,618,377	16,116,373	927,336	16,278	94.47%	5.44%	0.10%
2026	15,731,968	16,233,586	931,964	16,392	94.48%	5.42%	0.10%
2027	15,846,385	16,351,651	936,615	16,507	94.49%	5.41%	0.10%
2028	15,961,634	16,470,574	941,290	16,623	94.50%	5.40%	0.10%
2029	16,077,721	16,590,363	945,988	16,739	94.52%	5.39%	0.10%
2030	16,194,652	16,711,023	950,709	16,856	94.53%	5.38%	0.10%
2031	16,312,434	16,832,560	955,454	16,974	94.54%	5.37%	0.10%
2032	16,431,072	16,954,981	960,222	17,093	94.55%	5.35%	0.10%
2033	16,550,574	17,078,293	965,015	17,213	94.56%	5.34%	0.10%

<sup>1</sup> REC share ratios adjust for 3.09% distribution energy losses to put retail and wholesale sales at equivalent electric system level. Without adjustment, retail sales are generally at secondary and distribution level, wholesale sales are generally at distribution and transmission level.

Forecast as of October 2016.



Scenario: Add 1,000 MW

**Interstate Power and Light (IPL) Renewable Status**

Year	Projected IPL RECs Shares				IA RPS Compliance Summary	
	IA Retail REC Share	% of Retail Sales	MN Wholesale REC Share	IA & IL Wholesale REC Share	Needed RECs <sup>1</sup>	Excess Retail RECs
2017	1,546,834	10.4%	90,493	48,222	125,674	1,421,160
2018	1,671,739	11.2%	97,476	14,105	125,674	1,546,065
2019	3,098,448	20.7%	180,841	3,137	125,674	2,972,774
2020	4,440,543	29.4%	258,191	4,487	125,674	4,314,869
2021	5,789,532	38.1%	336,078	5,853	125,674	5,663,858
2022	5,754,744	37.6%	333,469	5,819	125,674	5,629,070
2023	5,749,241	37.3%	332,523	5,814	125,674	5,623,567
2024	5,701,931	36.8%	329,113	5,766	125,674	5,576,257
2025	5,654,673	36.2%	325,648	5,716	125,674	5,528,999
2026	5,654,441	35.9%	324,897	5,715	125,674	5,528,767
2027	5,526,718	34.9%	316,822	5,584	125,674	5,401,044
2028	5,362,697	33.6%	306,477	5,412	125,674	5,237,023
2029	5,227,704	32.5%	298,085	5,275	125,674	5,102,030
2030	5,228,134	32.3%	297,434	5,274	125,674	5,102,460
2031	5,228,560	32.1%	296,785	5,273	125,674	5,102,886
2032	5,228,983	31.8%	296,136	5,272	125,674	5,103,309
2033	5,229,402	31.6%	295,489	5,271	125,674	5,103,728

<sup>1</sup> Forecasted requirements based on past 5-year max of RECs retired for compliance.  
Requirement based on 199 IAC 15.11(1) = 49.8 MW of capacity for IPL.

Scenario: Add 1,000 MW

Interstate Power and Light (IPL) Renewable Status

Facility	Projected Annual RECs																
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Franklin County	219,783	310,070	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424	327,424
Whispering Willow	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657	659,657
New Owned Wind I (Approx. 500 MW)			835,315	1,716,926	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984	1,917,984
New Owned Wind II (Approx. 500 MW)				592,123	1,844,590	1,844,590	1,844,590	1,844,590	1,844,590	1,844,590	1,844,590	1,844,590	1,844,590	1,844,590	1,844,590	1,844,590	1,844,590
Adams Wind Farm	12,038	12,038															
Ag Land Energy 1 and 3 Wind Farm	11,969	11,969	11,969	11,969	11,969	2,992											
Ag Land Energy 2 Wind Farm	5,681	5,681	5,681	5,681	5,681	1,420											
Ag Land Energy 5 & 6 Wind Farm	11,488	11,488	11,488	11,488	11,488	11,488	11,488	11,488	11,488	11,488	11,488						
Arnold Wind Farm	6,346	6,346	6,346	4,759													
Flying Cloud Wind Farm	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303	143,303				
Hancock Wind Farm	137,382	137,382	137,382	137,382	137,382	137,382	137,382	137,382	137,382	137,382	125,934						
Hardin Hilltop Wind Farm	48,427	48,427	48,427	48,427	48,427	48,427	48,427	48,427	48,427	48,427	20,178						
Hawkeye Power Partners (aka Cerro Gordo) Wind Farm	101,120	101,120	101,120	101,120	101,120	101,120	101,120	50,560									
Junction Hilltop Wind Farm	26,355	26,355	26,355	26,355	26,355	26,355	26,355	26,355	26,355	26,355	6,589						
Kirkwood Community College Wind Farm	4,710																
Leonardo 1 Wind Farm	7,665	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	1,533						
Michelangelo 1 & 3 LLC Wind Farm	15,330	18,396	18,396	18,396	18,396	18,396	18,396	18,396	18,396	18,396	3,066						
Michelangelo 4 LLC Wind Farm	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	8,432						
Minn Wind I & II (aka Beaver Creek) Wind Farm	5,284																
Neppel Wind Farm	5,098	5,098	3,399														
New Bohemia Solar	8	8	8	8	8	8	8	8	8	3							
Optimum 3, 4, 5 & 6 LLC Wind Farm	30,660	36,792	36,792	36,792	36,792	36,792	36,792	36,792	36,792	36,792	6,132						
Optimum 7 LLC Wind Farm	6,899	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	1,533						
Sieve Wind Farm	1,488																
Storm Lake Power Partners (aka Buena Vista) Wind Farm	191,003	191,003	47,751														
Turtle Creek Wind Farm			803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624	803,624
Venus 3 LLC Wind Farm	3,066	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	9,198	2,300						
Wilmont Hills Wind Farm	5,500	5,500	5,500	5,500	5,500	1,833											
Windom (aka Bingham) Wind Farm	40,644	40,644	40,644	40,644	20,322												
<b>TOTAL</b>	1,710,101	1,808,069	3,307,372	4,728,370	6,156,814	6,119,588	6,113,342	6,062,782	6,012,222	6,011,450	5,875,334	5,696,582	5,553,279	5,553,279	5,553,279	5,553,279	5,553,279

Note - The first four facilities are owned, the rest are linked to purchase power agreements (PPAs).

Hardin Hilltop Wind collection of CyHawk, Greene, Hardin, Poverty Ridge, Sutton, Wind Family, and Zontos // Adams Wind Farm collection of G McNeilus, NcNeilus Windfarm LLC, and GARMAR Wind

Scenario: Add 1,000 MW

**Interstate Power and Light (IPL) Renewable Status**

Year	Annual REC Commitments		
	Total Produced RECs	RECs for IPL's GPP <sup>1</sup>	Hancock Sale to CIPCO (2MW)
2017	1,710,101	-19,715	-4,836
2018	1,808,069	-19,912	-4,836
2019	3,307,372	-20,111	-4,836
2020	4,728,370	-20,312	-4,836
2021	6,156,814	-20,515	-4,836
2022	6,119,588	-20,721	-4,836
2023	6,113,342	-20,928	-4,836
2024	6,062,782	-21,137	-4,836
2025	6,012,222	-21,348	-4,836
2026	6,011,450	-21,562	-4,836
2027	5,875,334	-21,778	-4,433
2028	5,696,582	-21,995	
2029	5,553,279	-22,215	
2030	5,553,279	-22,437	
2031	5,553,279	-22,662	
2032	5,553,279	-22,888	
2033	5,553,279	-23,117	

<sup>1</sup> GPP - Green Pricing Program - Assumed 1% annual growth rate from 2016 actual sales.