HOOSIER ENERGY

INTEGRATED RESOURCE PLAN

2017 UPDATE

WHAT IS RESOURCE PLANNING?

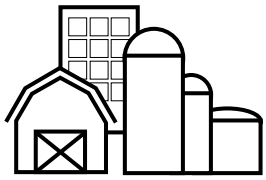
Key features

Inputs

- Member input
- Board policies
- Regulatory requirements
- Risk adjusted least cost

Resource mix

Energy need



Costs and rates

Planning Process

Requirements considered + **Timeline established** + **Resources evaluated**

= **Long range resource plan**

The resource planning process projects future consumer needs and comprehensively evaluates options for meeting those needs.

Resource plan inputs include:

- Future consumer needs
- Resource strategies, regulatory policies and member input
- Financial aspects of plan implementation including financing costs and rate structures

Risk analysis

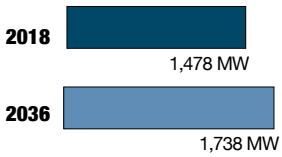
Inputs for the resource planning process are not absolute. Many variables are analyzed to understand the implications and interaction of inputs and impacts on costs and rates.

Uncertain future

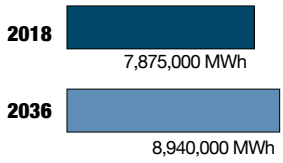
Resource plans will change over time. Course adjustments will reflect input from members and regulators, changes in growth patterns and financial considerations.

THE HOOSIER ENERGY POWER NETWORK

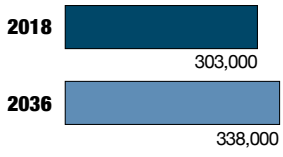
Peak demand
Member peak demand is projected to increase 18 percent by 2036.

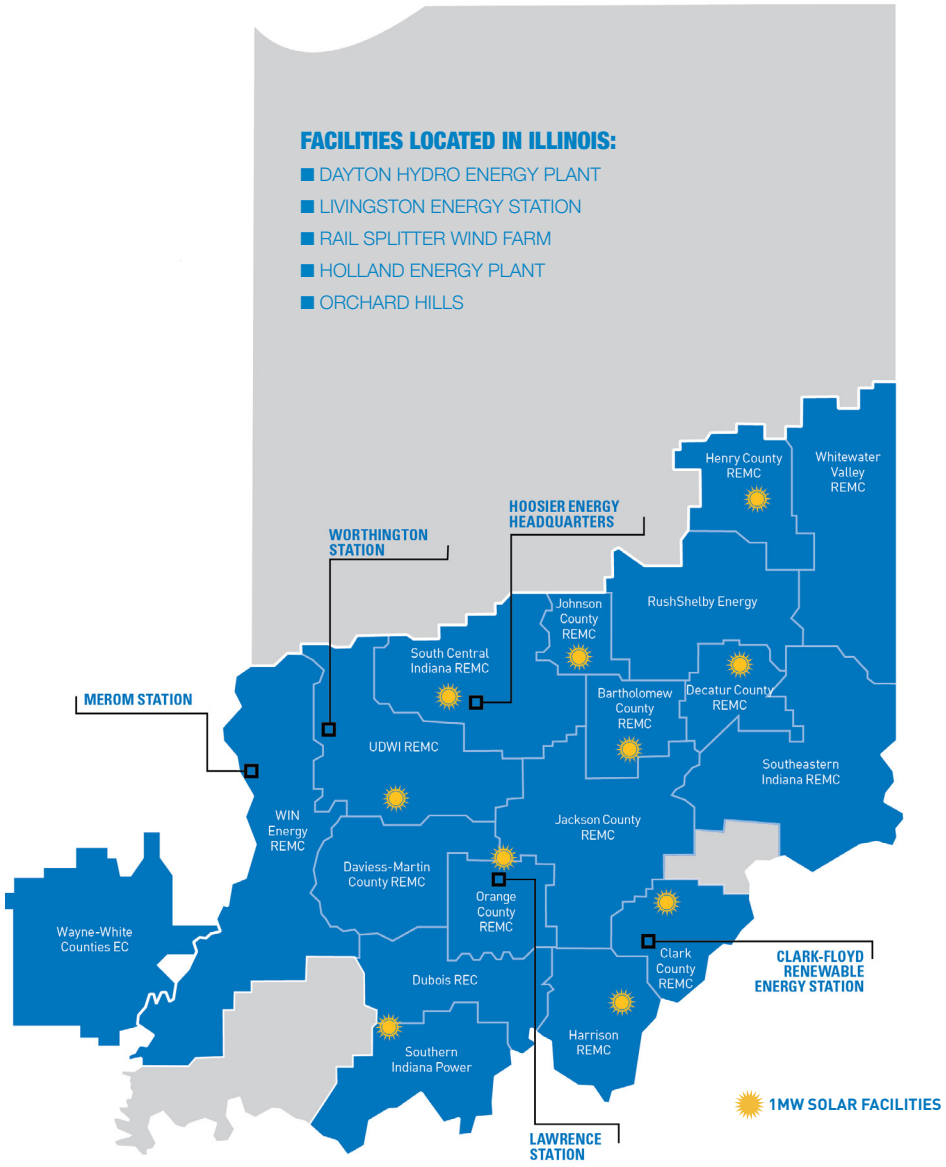


Energy requirements
Member energy needs are projected to increase 14 percent by 2036.



Number of consumers
The number of consumers is expected to increase 11 percent by 2036.





ELECTRIC CONSUMER FACTS

95%
Consumers who have air conditioning.

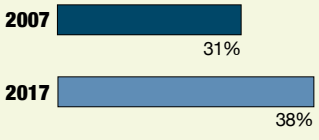
44%
Consumers who use programmable thermostats.

56%
Consumers who use LED lightbulbs.

1,238 kWh
Since 2005, average household monthly electricity use remained relatively constant.

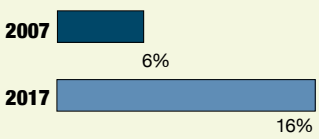
Growing market share for electric heat

The percentage of consumers using electric heat increased by 23 percent over the past ten years.



Efficient heat pumps drive electric cooling

Heat pump air conditioning has almost tripled during the past ten years.



MEETING MEMBER NEEDS

Merom Station

Solar

Holland Energy

Lawrence Station

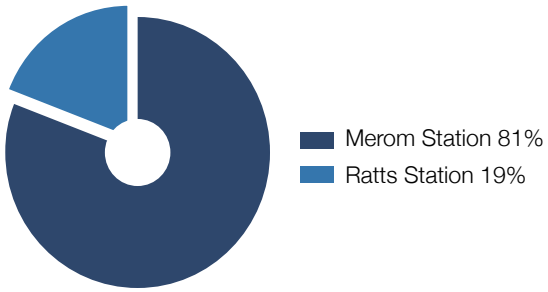
Worthington Station

Renewable facilities

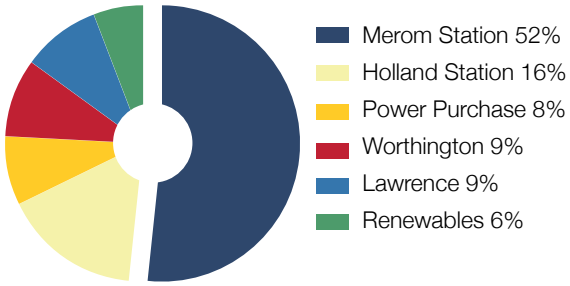
Resource portfolio changes: 2000 to 2018

The Hoosier Energy portfolio has grown and diversified to meet member needs and manage risk.

2000 capacity – 1,250 MW



2018 capacity – 1,906 MW



Hoosier Energy's resource portfolio continues to evolve to meet member needs in a changing market.

Increased capacity

• The portfolio increased approximately 52 percent between 2000 and 2018.

Diversity

• Focus on adding renewable resources

• Purchased power – shift operating risk.

• Fuels – All Hoosier Energy-owned assets added since 2000 use natural gas or renewable resources.

Market changes

• The MISO electricity market, which began functioning in 2005, provides price transparency, reserve sharing, and mitigation of concentration risks.

RESOURCE MIX 2018

Baseload

Baseload resources refer to units with higher capacity factors that are available to operate throughout the year. Other resources could provide baseload energy but far less economically.

The coal-fired Merom Station has a production capacity of nearly 1,000 megawatts and complies with all emission requirements. Other resources include the 150 MW Purchased Power Agreements.

Intermediate

Intermediate resources provide energy for extended periods of the day. These resources are used to meet increasing demand in weekday hours. A combined cycle natural gas power plant is this type of resource.

Holland Energy, the Hoosier Energy/Wabash Valley 613-megawatt natural gas combined cycle plant, is an important component of the portfolio that typically provides needed energy during peak months.

Peaking

Peaking resources provide energy on very short notice to meet customer energy needs during very few hours of the year. Natural gas combustion turbines are ideal for this application and demand response can help meet this need.

Lawrence and Worthington generating stations efficiently provide electricity from natural gas turbines to meet short term needs. Fast start capability adds power supply flexibility and the units help meet MISO reserve requirements.

Energy Efficiency

Consumers can help manage system demand through energy efficiency. When consumers use new strategies, products and technologies to reduce consumption, the effect is equivalent to adding generation.

For 2016, annual savings from demand-side management programs totaled 57,800 megawatt-hours. Summer demand was reduced by 12 megawatts and winter demand by 16 MW.

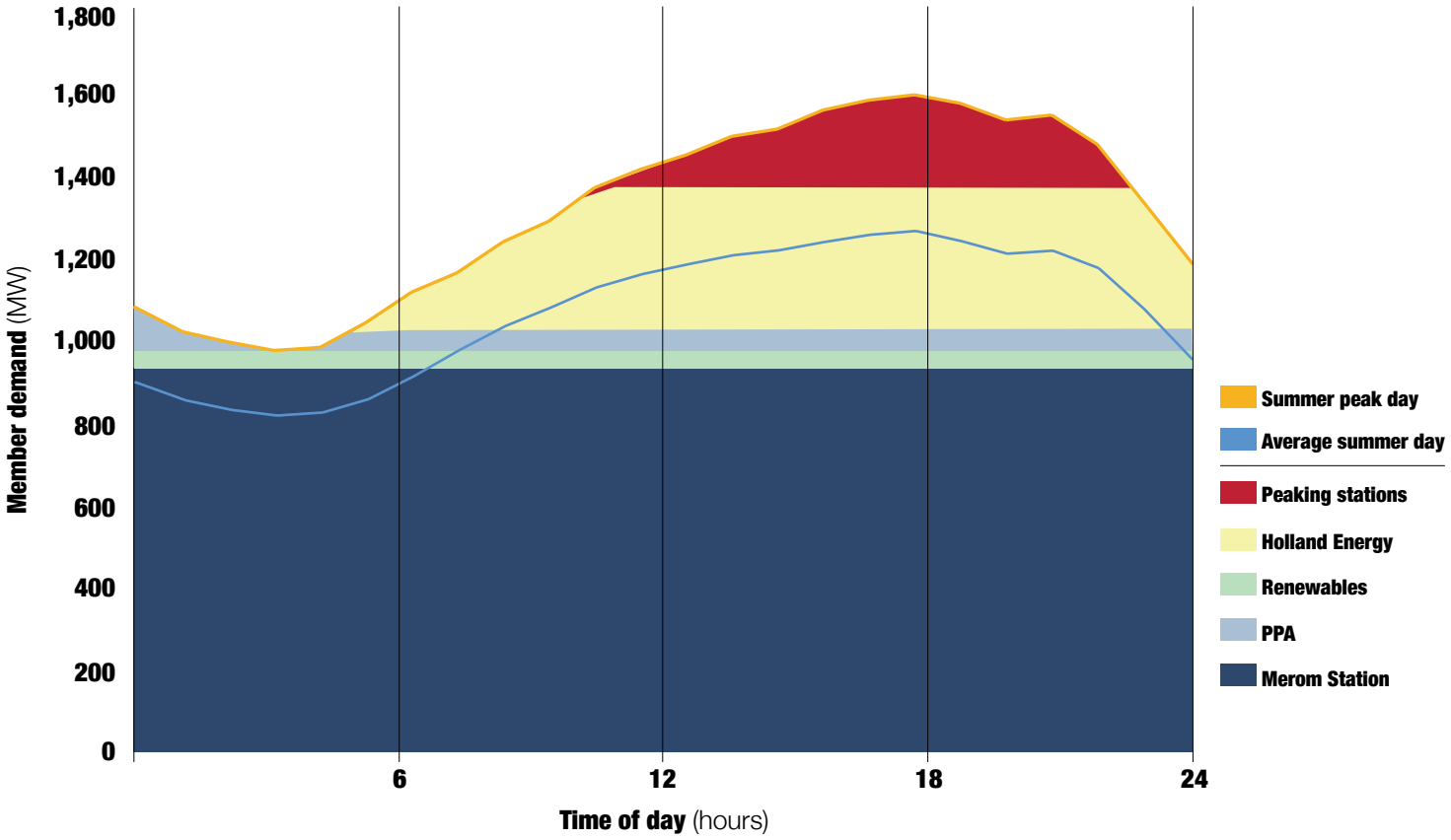
Renewables

Renewable generation includes wind, hydro, solar and biomass facilities that do not rely on traditional fossil fuels. Most renewable facilities operate intermittently and require backup capacity from other generation to meet load and MISO requirements.

Hoosier Energy plans to add 200 MW of solar generation to the resource mix beginning in 2020 pending contract finalization. This PPA will supplement the current wind, hydro, solar and landfill gas renewable resources. This PPA will allow Hoosier Energy to achieve the voluntary Board program target of 10 percent of member energy requirements from renewables by 2025.

RESOURCE CONTRIBUTIONS

How assets will meet member needs in 2018



FUELS

Coal

Although opposed by the current Administration, there remains a potential for carbon regulation in the future. Future environmental rules, the resulting potential for significant cost increases, and low natural gas prices make new coal-fired generation an uneconomic resource choice.

Natural gas

Natural gas combined cycle plants offer low capital costs and flexible operating characteristics. Low fuel costs and moderate environmental risk make natural gas attractive although price volatility and pipeline capacity remain potential issues.

Energy efficiency

Often called the "fifth fuel"(after coal, natural gas, nuclear, and renewables), energy efficiency offers options to help manage future power requirements. While cost effective, energy efficiency can be limited and highly dependent upon customer participation.

Renewable energy

Tax incentives, public policy requirements and consumer support have led to widespread construction of wind and solar projects across the nation. However, these resources remain non-dispatchable and availability during peak periods is less than traditional resources.

KEY RISKS

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Environmental rules and regulations

Status of Carbon Regulation

On August 3, 2015 President Obama announced EPA's issuance of its final rules for reducing carbon emissions from new, modified or reconstructed units (111(b)) and existing units (typically referred to as the Clean Power Plan or 111(d)) along with a proposed Federal Implementation Plan (FIP). Overall the final rule for the Clean Power Plan (CPP) calls for a 32% reduction in power plant CO2 emissions by 2030 from 2005 levels. States more dependent on coal face greater emissions reductions. Indiana is required to reduce CO2 emission by 39% from EPA's 2012 baseline by 2030.

In February 2016 the U.S. Supreme Court issued a stay of the CPP. The stay freezes implementation of the rule until the judicial review process for the rule is complete. In March 2017, President Trump requested that the U.S. Court of Appeals for the District of Columbia halt its review of the legality of the CPP. He also signed an Executive Order directing the Environmental Protection Agency to review the CPP, with the focus upon potentially dismantling the plan. These actions will undoubtedly increase the legal uncertainty surrounding the rule as well as likely extend the compliance timeline by two to three years assuming that the regulation survives judicial review.

The state of Indiana, already a participant in the legal challenges to the rule, chose to end planning for CPP implementation as a result of the stay. In the absence of state activities, utilities and independent third parties continue to refine analysis and compliance strategies with large variations due to uncertainty discussed above.

Implications for Resource Planning

While the final outcome of the CPP is still uncertain, recent market trends have created a situation that resembles a possible future with the regulation in place. Natural gas fired generation has increased due to low prices spurred by a large supply expansion from unconventional sources. In addition, tax credits, state mandates and declining capital costs have fueled the growth of renewable energy investments. Over this time load growth has slowed due to a combination of energy efficiency gains, economic slowdown and a decline in the energy intensity of gross domestic product. These trends have

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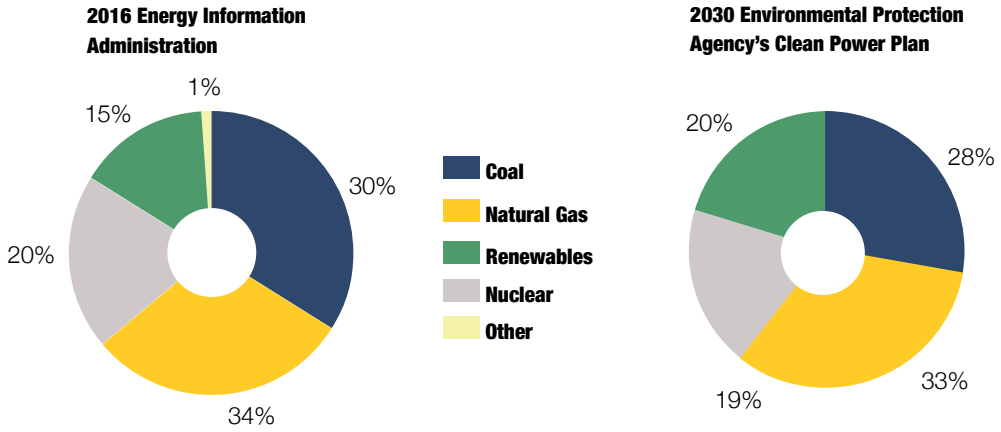
KEY RISKS



Sources: U.S. Energy Information Administration; Environmental Protection Agency.

combined to reduce the amount of coal in the overall generation mix of the U.S. from 45% in 2010 to 32% in 2016.

The EPA's modeling of the CPP did not anticipate the absence of coal from the generation mix. In fact it estimated that coal generation would account for 28% of U.S. electricity supply in 2030 not far from 2016 levels. The market trends are potentially creating new expectations for baseload coal resources. In particular, baseload coal resources will need to become more flexible and may start to be viewed as intermediate resources with strong seasonal run times in the summer and winter. The Merom station has experienced a reduction in capacity factor in recent years related to these trends and similar capacity factors are forecast for the mid-term.

The shift away from baseload coal to renewables and natural gas could increase several sources of volatility. Reliance on natural gas generation, both from increasing capacity factors at existing natural gas plants and new builds to replace retiring coal capacity, would raise power market sensitivity to swings in natural gas fuel prices. Moreover, increases in renewable energy generation drive down marginal energy prices in times of high resource output creating a low price situation due to zero fuel costs. When wind and solar resources are not available more and much higher priced generation has to dispatch to cover the gap. The result will be a wider spread between high and low prices (volatility) occurring more frequently than in the past.

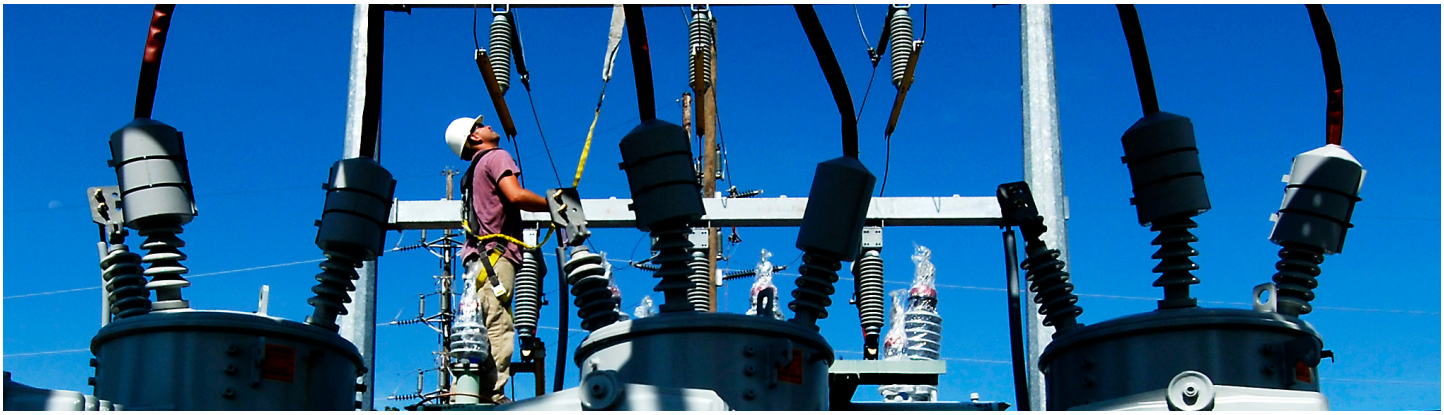
Another potential impact of increasing coal retirements and replacing the energy production with renewables will be an increase in capacity price. In a situation similar to being exposed to a volatile energy market, Hoosier Energy may face increased risk surrounding capacity prices if historical capacity resources are reduced and create a short capacity position.

Renewables

Hoosier Energy is progressing towards achieving the Board-approved target of supplying 10 percent of member energy needs through renewable resources by 2025. The addition of the 200 MW Solar PPA beginning in 2020, pending Board approval, will continue to diversify Hoosier Energy's commitment to diversity in size, location, and technology. With the addition of the PPA to the renewables portfolio, Hoosier Energy will meet the Board-approved target.

In 2018, the G & T will receive the first 25 MW from the Meadow Lake PPA, which is a 20-year PPA sourced from the Meadow Lake Wind Farm. An additional 50 MW will be purchased through the same 20 year PPA from Meadow Lake beginning in 2020. EDP Renewables is the owner of Meadow Lake and also the owner of the Rail Splitter project in Central Illinois with which Hoosier has a 25 MW PPA.

KEY RISKS



Transmission price constraints

Congestion is a significant cost risk. Congestion is a result of the locational marginal pricing (LMP) methodology, which reflects the value of energy at specified locations throughout the MISO footprint. If the same priced electricity can reach all locations throughout the grid, then LMPs are the same. When there is transmission congestion generally caused by heavy use of the transmission system, energy cannot flow either from or to other locations. This forces more expensive and/or more advantageously located electricity to flow in order to meet the demand. As a result, the LMP is higher in the constrained locations.

Hoosier Energy has worked with both ACES and outside consultants to analyze congestion between the generation stations and the Hoosier load zones. The analysis, which includes the MISO-approved transmission expansion plans, generally shows some improvement to congestion impacts even though construction of those lines is currently impacting dispatch of generating units. Therefore, long-term congestion impacts appears to be a low risk at this time.

Hoosier Energy's success in preserving grandfathered agreements (GFAs) provides congestion benefits to members. GFAs act as a hedge against congestion costs and provide about $3 million in annual benefits to members. Hoosier Energy has successfully fought prior attempts to eliminate GFAs but the potential for future threats remain.

In addition, GFAs are exempt from charges for the largest and most expensive MISO transmission projects. Based upon MISO's cost and allocation forecasts, the benefit of avoiding these costs for the GFA portion of Hoosier's member load is estimated to be $6 million in 2018 and increasing in the future.

MISO is in the process of developing another portfolio of projects. This is a multi-year study to position the grid in support of changing resource mix. The effort is expected to conclude in 2019. Therefore, Hoosier Energy continues to face transmission cost risk from new transmission projects authorized by MISO.

KEY RISKS

Markets

The forward power market remains a viable alternative to satisfy a portion of member needs. Recently, the impact of low natural gas and renewables prices has been to depress market power prices, thereby placing increasing pressure on coal-fired generation. Improvements in gas-extraction technology have increased sources of supply beyond those traditionally counted upon to supply markets and driven natural gas prices lower.

Renewables prices have declined as lower capital costs and favorable policies have led to increased market penetration.

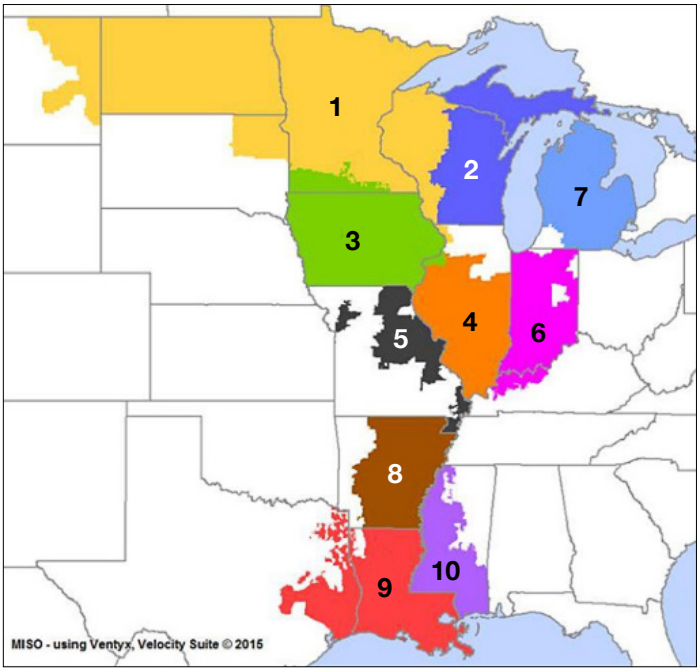
In the intermediate-to-longer-term, it is anticipated that downward price pressures will continue from gas-fired generation and renewables, particularly solar, as well as from stagnating load growth. Long-term market exposure can be hedged through assets or purchased power agreements.

Midcontinent Independent System Operator

The MISO footprint is divided into 10 zones for resource adequacy purposes. The purpose of the zones is to reflect transmission capability between the zones and ensure reliability during peak conditions. Hoosier Energy has generation and load in two zones: zone 6 (Indiana) and zone 4 (Illinois). Hoosier Energy has a capacity deficit in zone 6 of roughly 200 MW that is offset by excess resources of the same amount in zone 4. Overall, Hoosier Energy's capacity resource portfolio is balanced.

The results of a recent MISO Survey indicate that, based on current assumptions, there are sufficient resources to serve expected load through the 2021-22 Planning Year. This means that short-term capacity should be available and relatively inexpensive versus the long-term cost of dispatchable generation assets. In addition, ACES recently completed an analysis that concluded separation between zones 4 and 6 is unlikely over the next few years. Therefore, given limited load growth and ongoing transmission investment, the price differential between the two zones should remain manageable. However, these are projections that will change especially if load growth is different than expected and/or due to unanticipated resource retirements.

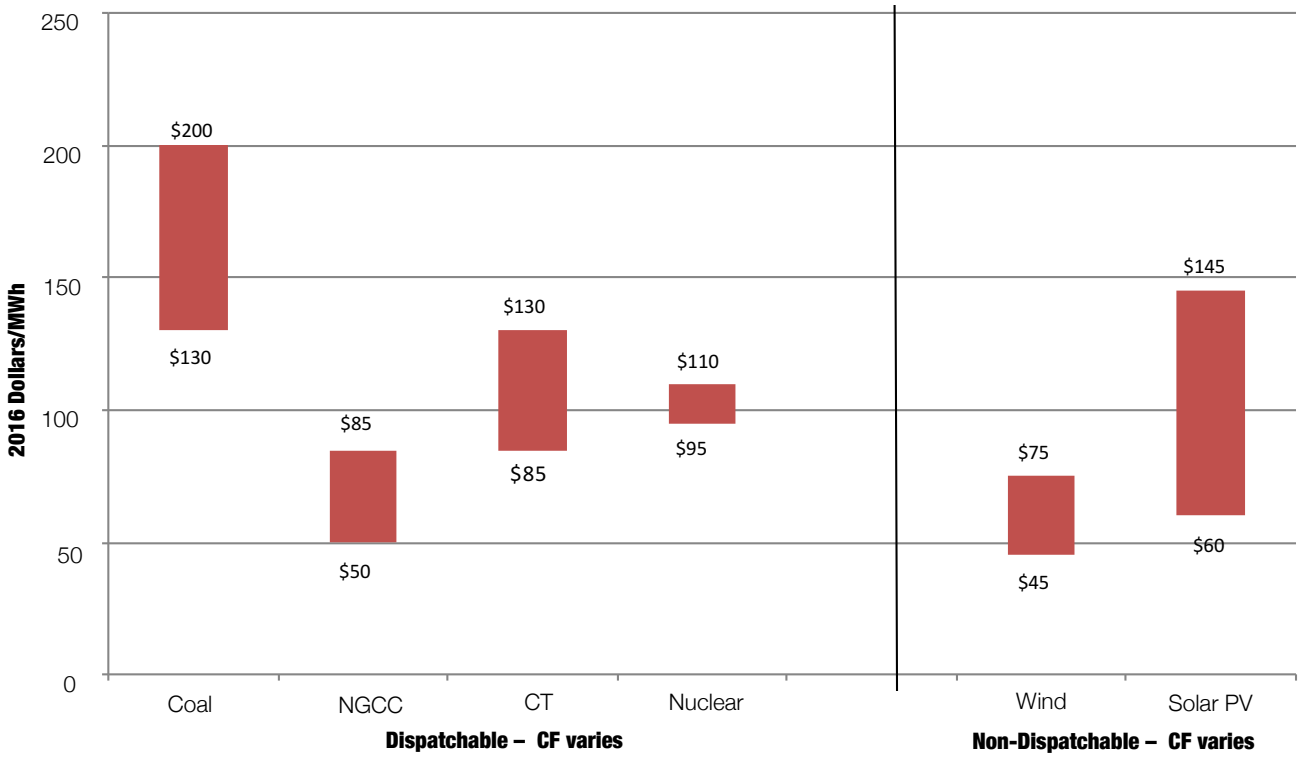
MISO continues to propose changes to this construct with the stated goal of further enhancing long-term resource adequacy. In 2017, MISO proposed changes to the locational requirements to address the integration of external resources. This was driven by a large generator moving from PJM to the MISO resource construct. MISO also introduced a plan to create inter-zonal hedges for certain qualified long-term historic agreements. Given the complexities, MISO recently announced a delay in implementation of these changes until the 2019 – 20 Planning Year.



In 2018, however, MISO plans to make seasonal resource adequacy a priority during discussions with stakeholders. This could potentially have a larger impact on Hoosier Energy than the locational changes due to Hoosier Energy's dual peaking system (winter forecast peak slightly higher than summer forecast peak). Hoosier Energy will continue to monitor and participate in the MISO resource adequacy discussions to mitigate this risk.

ENERGY COST OF NEW GENERATION

The chart below reflects the U.S. Energy Information Administration's forecasted ranges of levelized cost of electricity for new generation resources entering service in 2022, based on current dollars. The referenced coal facility includes carbon capture and storage and is assumed to remove 90 percent of the plant's CO2 emissions. This chart indicates that gas-fired and renewable generation will be the most economic alternatives as generation portfolio additions. While wind and solar generation may be less expensive on a levelized cost basis than some alternatives, they are intermittent energy sources and cannot be dispatched as needed.



Source: Energy Information Administration (April 2017)

Counterparties

Hoosier Energy members are well served by maintaining a mix of owned and purchased resources. In addition to the purchased power agreements, Hoosier Energy uses PPAs to acquire wind, solar and hydro renewable resources. Hoosier Energy-owned generation includes a mix of sole and jointly-owned facilities. Hoosier Energy and Wabash Valley worked jointly to develop the Lawrence peaking facility in 2005 and purchase the Holland combined-cycle facility in 2009.

Future generation resource options will likely include additional partnerships with existing or new counterparties. Options may include shared ownership or Hoosier Energy taking a partial interest in generation resources owned by other companies.

RESOURCE CHANGES

2018-2022

New resources include:

- 16 MW Orchard Hills LFG begins in 2018.
- 25 MW Meadow Lake wind PPA begins in 2018.
- 25 MW Story Wind PPA expires in 2019.
- Pending 200 MW solar PPA: 100 MW begins January 1, 2020 and second 100 MW begins January 1, 2021.
- 50 MW Meadow Lake wind PPA begins January 1, 2020.

2023 and beyond

- December 31, 2023 expiration of PPA for 100 MW.
- The capacity expansion plan shows a 71 MW deficit in 2024.
- December 31, 2025 expiration of PPA for 50 MW.

ACTION PLAN

MARKET INTERACTIONS	Use market purchases/sales to meet short term needs during 2018, hedging strategies to reduce market price risk, monitor markets for opportunities and explore opportunities to hedge capacity differential between MISO zones.
DSM, RENEWABLE RESOURCES	Develop DSM resources with members; pursue additional renewable opportunities consistent with the Board Policy renewable portfolio standard of 10 percent of member energy requirements by 2025.
CARBON REGULATIONS	PA Consulting modeling of future carbon legislation indicates the potential for reduction in Merom capacity factors by mid-2020s, when CO2 restrictions are potentially effective. The model suggests the addition of more energy resources, including renewables and a NGCC in the late 2020s time period.
LONG-TERM NEEDS	Hoosier Energy worked with PA Consulting to perform a resource screening and portfolio analysis. The analysis consists of a 20-year forward assessment of Hoosier Energy's Member forecast load and resources required to serve requirements on a low cost and reliable basis. The analysis included sensitivities of several variables including load growth, commodity costs, capital costs, renewable resource costs and environmental regulations. Assuming the base load forecast, under all 5 market cases, the analysis recognizes a need for inexpensive capacity and selects a gas-fired combustion turbine in the mid-2020s. Under low load cases, the resource need does not occur until later in the planning horizon and the model favors solar resources.

ACRONYMS USED

CF
Capacity Factor

CO2
Carbon Dioxide

CPP
Clean Power Plan

CT
Combustion Turbine

DSM
Demand Side Management

EPA
Environmental Protection Agency

FERC
Federal Energy Regulatory Commission

FIP
Federal Implementation Plan

GFA
Grandfathered Agreements

G&T
Generation and Transmission Cooperative

IURC
Indiana Utility Regulatory Commission

LMP
Locational Marginal Price

LRRP
Long Range Resource Plan

MISO
Midcontinent Independent System Operator

NGCC
Natural Gas Combined Cycle

PJM
PJM Interconnection

PPA
Purchased Power Agreement

PRS
Power Requirement Study

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