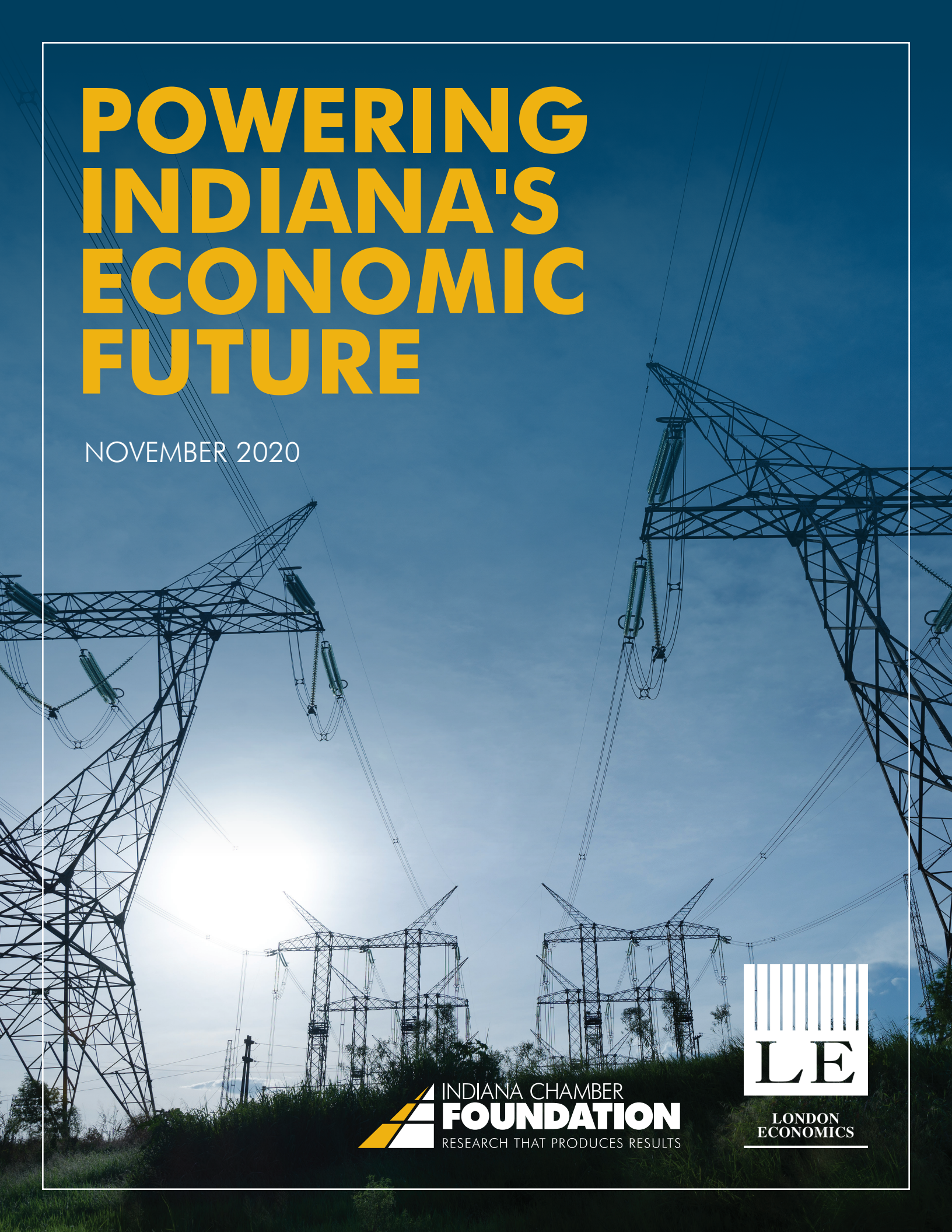
POWERING INDIANA'S ECONOMIC FUTURE

NOVEMBER 2020



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**The Indiana Chamber of Commerce Foundation commissioned London Economics International LLC (LEI) to conduct an objective energy study with input from the Indiana Chamber of Commerce and the Advisory Council. The conclusions and recommendations in the study do not necessarily reflect the views of all the Advisory Council members.*

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Indiana Energy Policy Study

prepared for the Indiana Chamber of Commerce Foundation ("ICCF") by London Economics International LLC

November 10th, 2020

London Economics International ("LEI") was retained by the Indiana Chamber of Commerce Foundation ("ICCF") to perform a study on Indiana's Energy Policy ("the Study"). The Study is intended to contribute to a deeper understanding of the factors driving energy changes, and to aid in the process by providing a solid foundation to assist policymakers, consumers, and other stakeholders in: understanding how the industry and its regulation works; how things have changed; and how things could develop going forward. Finally, the Study explores options to address identified issues, and the avenues available to make such changes. Based on a thorough assessment of Indiana's energy sector, LEI believes the State should adopt a set of principles and activities to direct future policy. These include:

- *creating a clearly defined objective function;*
- *maintaining a technology and ownership neutral approach;*
- *avoiding funding public policy goals through electricity rates;*
- *acknowledging the importance of optionality;*
- *learning from other jurisdictions;*
- *recognizing that distributed energy resources will provide a form of competition;*
- *reviewing definitions of reliability and how much consumers are willing to pay for it;*
- *performing a detailed review of rate design; and*
- *avoiding any sudden policy movements.*

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London Economics International LLC ("LEI") was retained by the Indiana Chamber of Commerce Foundation ("ICCF") to conduct a study on energy policy in Indiana. LEI has made the qualifications noted below with respect to the information contained in this report and the circumstances under which the report was prepared.

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List of acronyms

A/S	Ancillary Services
ACE	Affordable Clean Energy
ACS	American Community Survey
AEO	Annual Energy Outlook
AEP	American Electric Power
AMI	Advanced Meter Infrastructure
AML&P	Anderson Municipal Light and Power
AMR	Automatic Meter Reading
APT	Arbitrage Pricing Theory
ASHARE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ATRR	Annual Transmission Revenue Requirement
AUR	Alternative Utility Regulation
BRP	Baseline Reliability Projects
BTM	Behind-the-Meter
BTU	British Thermal Units
C&I	Commercial and Industrial
CAGR	Compound Annual Growth Rate
CAIDI	Customer Average Interruption Duration Index
capex	Capital Expenditures
CAPM	Capital Asset Pricing Model
CC	Combined-cycle
CCA	Community Choice Aggregation
CCOS	Class Cost of Service
CCRs	Coal Combustion Residuals
CCS	Carbon Capture and Storage
CCUS	Carbon Capture, Utilization, and Storage
CELRL	Corps of Engineers Great Lakes and Ohio River Louisville District
CEO	Chief Executive Officer
CES	Clean Energy Standard
CHOICE	Comprehensive Hoosier Option to Incentivize Cleaner Energy
CHP	Combined Heat and Power
CIP	Capital Improvement Plans
CLCPA	Climate Leadership and Community Protection Act
CO2e	CO2 equivalents
Cook	Donald C. Cook Nuclear Plant
Co-Ops	Cooperative Utilities
COS	Cost of Service
CPS	Clean Energy Portfolio Standard
CREZ	Competitive Renewable Energy Zones
CSAPR	Cross State Air Pollution Rule
CT	Combustion Turbine
DERs	Distributed Energy Resources
DSC	Debt Service Coverage
DSM	Demand-Side Management
Duke	Duke Energy Indiana, LLC
E85	Flex Fuel
EE	Energy Efficiency
EERS	Energy Efficiency Resource Standard
EGS	Electric Generation Supplier
ELG	Effluent Guidelines
ERCOT	Electric Reliability Council of Texas
ERI	Environmental Resilience Institute
ESG	Environmental, Social, and Governance
ESM	Earning Sharing Mechanisms
EVs	Electric Vehicles
FERC	Federal Energy Regulatory Commission
FIT	Feed-In Tariff
FPL	Federal Poverty Level
FSC	Fisher, Sheehan & Colton
G&T	Generation and Transmission
GHG	Greenhouse Gas
GHI	Global Horizontal Irradiance
GIPs	Generation Interconnection Projects
GPI	Great Plains Institute
GSP	Gross State Product
GWh	Gigawatt hour

HEAG	Home Energy Affordability Gap
HERS	Home Energy Rating Systems
HGL	Hydrocarbon Gas Liquids
HVAC	Heating, Ventilation and Air Conditioning
I&M	Indiana Michigan Power Company
ICCF	Indiana Chamber of Commerce Foundation
IDEM	Indiana Department of Environmental Management
IEA	Indiana Energy Association
IEC	Indiana Electric Cooperatives
IGWS	Indiana Geological and Water Survey
I&M Transco	AEP Indiana Michigan Transmission Company
IMM	Independent Market Monitor
IMPA	Indiana Municipal Power Agency
INDIEC	Indiana Industrial Energy Consumers, Inc.
IOU	Investor Owned Utilities
IPL	Indianapolis Power & Light Company
IPP	Independent Power Producers
IRC	Indiana Residential Code
IRP	Integrated Resource Plan
ISO	Independent System Operator
ITC	Investment Tax Credit
IURC	Indiana Utility Regulatory Commission
JTS	Joint Transmission System
kW	kilowatt
kWh	kilowatt-hour
LBNL	Lawrence Berkeley National Laboratory
LCA	Life Cycle Assessment
LCOEs	Levelized Costs of Electricity
LCOP	Levelized Cost of Pipeline
LEI	London Economics International LLC
Li-ion	Lithium-ion
MAGI	Modified Adjusted Gross Income
MAP	Maximum Achievable Potential
MATS	Mercury and Air Toxics Standards
MMcf	Million Cubic Feet
MEPs	Market Efficiency Projects
MGT	Midwestern Gas Transmission
MISO	Midcontinent Independent System Operator
MIT	Massachusetts Institute of Technology
MPSC	Michigan Public Service Commission
MTEP	MISO Transmission Expansion Plan
Munis	Municipally-owned utilities
MVPs	Multi-Value Projects
MW	Megawatts
MWh	Megawatt hour
NASEO	National Association of State Energy Officials
NERC	North American Electric Reliability Corporation
NIPSCO	Northern Indiana Public Service Company
NMA	National Mining Association
NPD	Non-Powered Dams
NSI	Net Scheduled Interchange
NWA	Non-wires Alternative
NYSERDA	New York State Energy Research and Development Authority
O&M	Operation and Maintenance
OED	Office of Energy Development
OMS	Organization of MISO States
OPSI	Organization of PJM States Inc.
OUCC	Office of Utility Consumer Counselor
OVH	Ohio Valley Hub Pipeline
PBR	Performance-based Ratemaking
PIM	Performance Incentive Mechanism
PPA	Power Purchase Agreement
PRA	Planning Resource Auction
PTC	Production Tax Credit
PUCO	Public Utilities Commission of Ohio
PV	Photovoltaic
RAB	Regulated Asset Base
RAP	Realistic Achievable Potential
RCTM	Regional Capacity Trading Market
RECs	Renewable Energy Credits

REMC	Rural Electric Membership Corporation
REV	Reforming the Energy Vision
RFPs	Requests for Proposals
RGGI	Regional Greenhouse Gas Initiative
ROE	Return on Equity
RP&L	Richmond Power and Light
RPM	Reliability Pricing Model
RPS	Renewable Portfolio Standard
RTEP	Regional Transmission Expansion Plan
RTOs	Regional Transmission Organizations
RUS	Rural Utility Service
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SMRs	Small Modular Reactors
SPV	Special Purpose Vehicle
SUFG	State Utility Forecasting Group
T&D	Transmission and Distribution
TDSIC	Transmission, Distribution, and Storage System Improvement Charge
TIER	Times Interest Earned Ratio
TWh	Terawatt hour
US	United States
US DOE	US Department of Energy
US EIA	US Energy Information Administration
US EPA	US Environmental Protection Agency
WACC	Weighted Average Cost of Capital
WVPA	Wabash Valley Power Association
YTM	Yield to Maturity

1 Executive summary

The Indiana Chamber of Commerce Foundation ("ICCF") engaged London Economics International LLC ("LEI") in June 2020 to conduct a study on energy policy ("the Study") in Indiana, which aims to review "Indiana's energy needs, production, consumption, pricing, economic impacts, public policy options, and regulatory systems."[1, 2] Specifically, the Study intends to:

- offer a solid foundation to assist policymakers, consumers, and other stakeholders in understanding how the industry and its regulation works. These topics are covered in Sections 4 through 6;
- provide an understanding of how things have changed. A notable component here relates to rising energy costs, although other issues to be addressed include the energy mix, reliability, and regulatory considerations (to name a few). This is covered in Section 7 and the beginning part of Section 8;
- provide reliable information on how things could develop going forward. Again, an important component here relates to costs, but it is not the only area of concern. This is covered in the latter part of Section 8, as well as Section 9; and
- identify options that are available to address issues discovered in the Study (e.g., lower costs or reduce growth rate trajectory of costs, enhance reliability), determine the avenues available to make such changes (e.g., legislative process, regulator), and suggest a list of recommendations most useful to all stakeholders and policymakers. These topics are considered in Sections 10 and 11, with concluding remarks and recommendations explored in Section 12.

To achieve these goals, LEI has prepared this comprehensive report to provide a deeper understanding of the factors driving energy changes in Indiana and the region. The report covers the following topics, as shown in Figure 1: an overview of Indiana's energy resources, electricity industry, and regulatory framework; a comparison of the State's national and regional ranking for electricity costs, affordability, and reliability; a discussion of the factors that have driven and will continue to drive cost changes in Indiana and the region; a review of other considerations and concerns; a discussion of what can be done through the legislative process; and an overview of the goals of various stakeholders.

Throughout the Study, LEI has compared Indiana's energy sector relative to other states in the region. For the purposes of this Study, "region" is defined as the following neighboring states: Illinois, Kentucky, Michigan, and Ohio. These states were selected due to their proximity to Indiana, as well as their similarities with the State.

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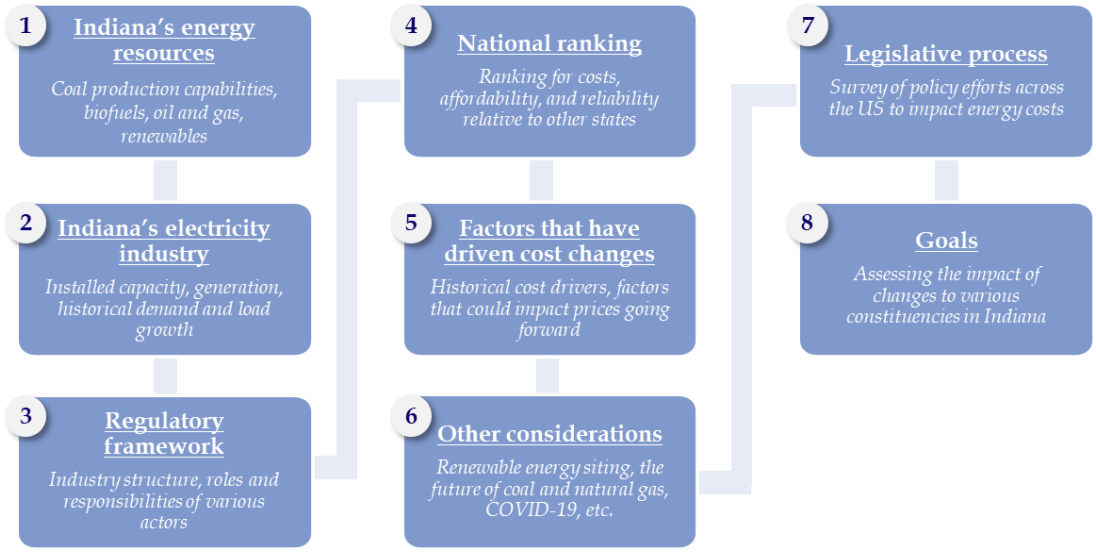
[1] Contract between ICCF and LEI signed on June 12, 2020.

[2] ICCF. *Request for Proposals: Indiana Energy Policy Study.* April 1, 2020. p. 1.

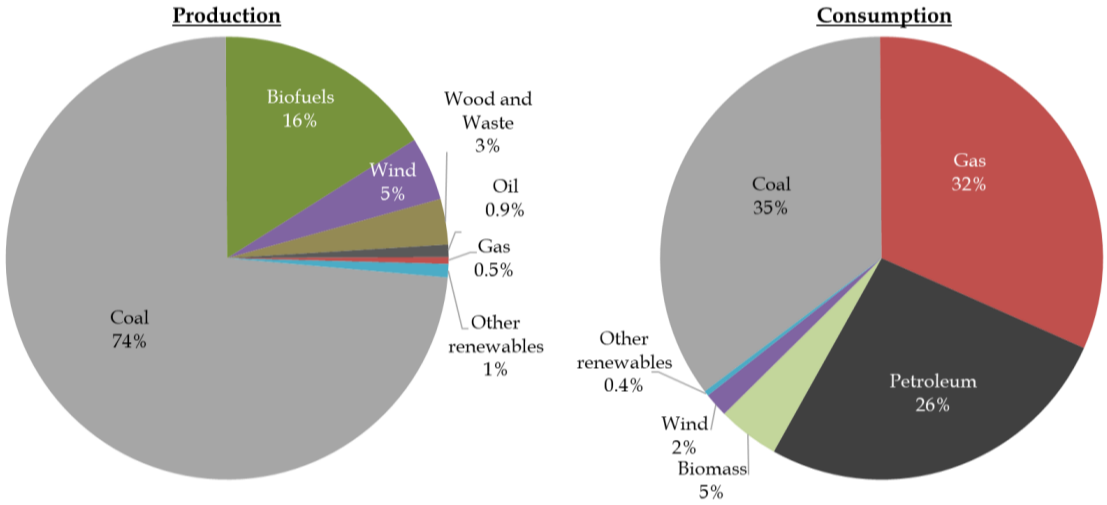
Figure 1. Issues examined in the Study



1.1 Indiana's energy resources

Indiana, with a population of 6.76 million, produces and consumes a wide range of energy, including fossil fuels and renewable resources. Considering all fuels and uses, in total, Indiana is a net importer. Fossil fuels include coal, oil, and natural gas, while renewable resources include biomass products such as biofuels and wood and waste energy, as well as wind, solar, hydroelectric, and geothermal. Figure 2 presents a visual representation of Indiana's production and consumption of energy by source for 2018 using EIA data, excluding imports to the State.

Figure 2. Indiana's energy production and consumption by primary source (2018) – illustrative



Note: EIA data is based on in-state resources, so nuclear energy imported from Michigan is not included in either chart. Additionally, data is standardized and presented in British thermal units. Therefore, this figure is presented as illustrative.

Source: Based on information from the EIA's State Energy Data System. Final data for 2019 to be released on June 25, 2021.

The current state and future potential for these energy resources in Indiana is discussed briefly below, with further details provided in Section 4:

- **coal** has historically been Indiana's dominant energy resource in terms of reserves, production, and consumption, although coal's production and consumption has declined over the past decade. Indiana ranked 7th nationally in terms of coal production in 2019, and this downward trend is expected to continue;
- while production and proven reserves of **oil and gas** are comparatively much lower than coal, oil and gas are still important resources on the consumption side, with natural gas, in particular, growing in usage over the past decade;
- **biofuels**, notably fuel ethanol, are an essential foundation of Indiana's renewable and total energy production base. Biofuels are one energy resource where Indiana's in-state production exceeds its in-state consumption. Indiana ranked 5th nationally in the production of both ethanol and biodiesel in 2018;
- **renewable energy resources** have grown in usage over the past decade and are expected to continue growing in usage going forward. This is particularly true for wind and solar, primarily due to technological improvements, declining costs, and various government and other incentive programs. Storage is also being developed in Indiana to help balance intermittent resources. However, there is limited potential for other renewable resource development such as **hydro, geothermal, and wood and waste biomass**;
- **nuclear** plays an essential role in Indiana's overall electricity supply mix (making up around 10% of Indiana's electricity consumption in 2019), although no nuclear plants are located in the State. Nuclear generation stems from Indiana Michigan Power ("I&M")'s Cook nuclear plant (2.2 GW), located in Michigan, which dedicates 65% of its output to I&M retail customers in Indiana. Based on recent data, Units 1 and 2 will continue their operations until 2034 and 2037, respectively. New conventional nuclear build appears to be uneconomic; going forward, small modular reactors ("SMRs") are viewed by some as a next wave, but it is not clear whether their promise will be realized; and
- **cogeneration** systems are an important resource primarily for industrial customers in Indiana, as they provide an efficient means of generating on-site power while recovering thermal energy for use in industrial processes. These systems total 2,418 MW of capacity in the State and are used mostly in primary metals and petroleum refining applications.

1.2 Indiana's electricity industry

Indiana's electricity sector is regulated and is served by vertically integrated utilities and several independent power producers ("IPPs"). An overview of the State's electric industry structure is illustrated in Figure 3. In Indiana, electric utilities fall into three categories:

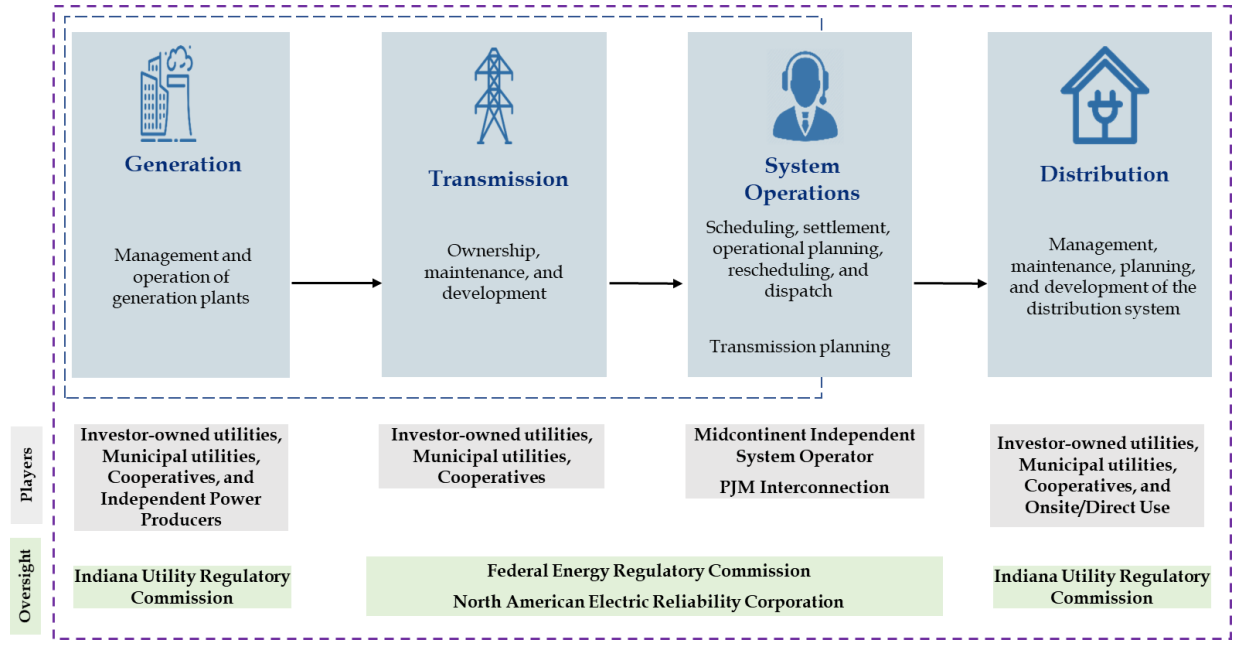
(i) investor-owned utilities ("IOUs");

(ii) municipal utilities ("munis"); and

(iii) rural electric membership cooperatives ("REMCs" or "co-ops").

These utilities differ in terms of their business models, governance and oversight structures, and profit motivations. IOUs are owned by shareholders and, naturally, are profit-oriented. In contrast, co-ops are owned by their members, and munis, by the host municipality, and so are typically not profit-oriented.

Figure 3. Electric industry structure in Indiana



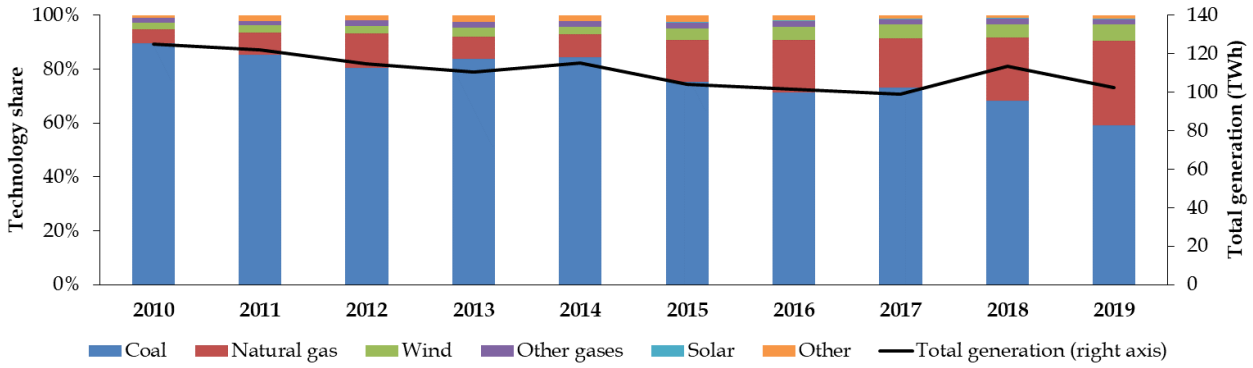
Note: All Indiana cooperatives and most munis are self-regulating, thus, are not under the IURC.

IOUs, Wabash Valley Power Association, Hoosier Energy, and munis own and maintain the transmission lines in the State. However, either the Midcontinent Independent System Operator ("MISO") or the PJM Interconnection ("PJM") coordinates the flows on these transmission lines. Meanwhile, IOUs, REMCs, and munis own, operate, and maintain the distribution assets within their exclusive service territory.

The State's in-state **generation mix** is dominated by coal (59% as of 2019), followed by natural gas (31%), and wind (6%) resources. Indiana's resource mix has evolved significantly over the past decade, with coal's share of generation decreasing from 90% in 2010. Meanwhile, natural gas and wind generation have increased over the same period—up from 5% and 2% of generation in 2010, respectively. Figure 4 demonstrates this evolution in the State's generation mix over the 2010-2019 period.

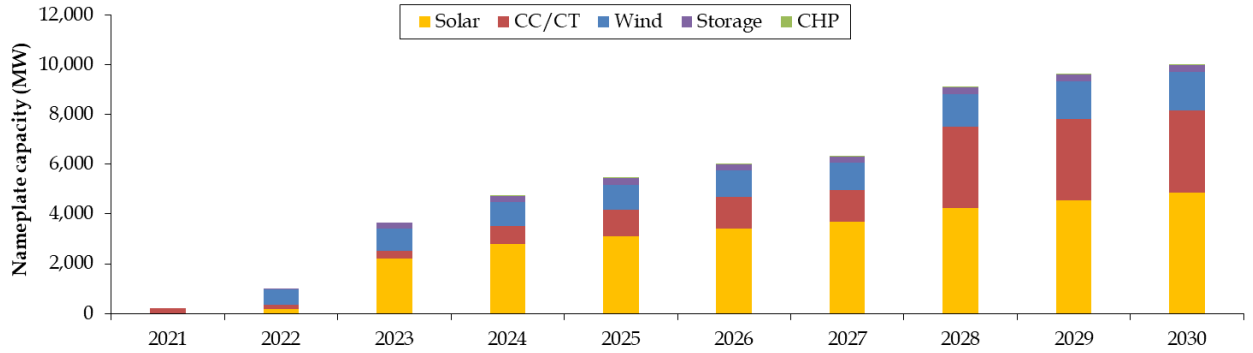
In terms of **planned retirements and additions**, as much as 7.7 GW of coal is set to retire by 2028 (29% of 2019 total installed summer capacity for all resources), based on the most recent integrated resource plans ("IRPs") filed by Indiana's regulated utilities. This will be replaced primarily by anticipated additions in natural gas, solar, and wind-powered generation (3.3 GW, 4.8 GW, and 1.6 GW by 2030, respectively), which are illustrated in Figure 5.

Figure 4. In-state electric generation in Indiana (2010-2019)



Source: US EIA. *Net Generation by State by Type of Producer by Energy Source.* 2020.

Figure 5. Cumulative planned resource additions, 2021-2030



Note: Includes I&M's preferred portfolio, which incorporates additions in both Indiana and Michigan. Natural gas additions are represented by the CC/CT bar (combined-cycle ("CC") gas plant/combustion turbine ("CT")). CHP refers to combined heat and power systems.

Sources: IURC. *2020 Report to the 21st Century Energy Policy Development Task Force.* August 14, 2020; various utility IRPs.

Notably, the additions to renewable generation in Indiana are occurring amidst less aggressive **clean energy policies** in the State. For instance, the Comprehensive Hoosier Option to Incentivize Cleaner Energy ("CHOICE") program, Indiana's voluntary clean energy program, was adopted in 2011. While it targets voluntary procurement of 10% of electricity (relative to 2010 retail sales) from clean energy sources by 2025, there has been no utility participation in the program to date.

Nevertheless, Indiana generated 6% of 2010 electricity sales from renewables (wind, solar, hydro) in 2019. This suggests that State- and Federal-level government action is not the only means through which greater renewables deployment can be encouraged, and that this has occurred in large part through improving project economics. A review of other clean energy policies in the State, as well as further details pertaining to Indiana's electricity industry, are covered in Section 5.

1.3 Regulatory framework

The Indiana Utility Regulatory Commission ("IURC") governs IOUs and some munis. The IURC is governed by its legislative mandate to balance the interests of utilities with the interests of the customers they serve. The goal is to ensure "just and reasonable" rates consistent with service and reliability expectations. The Commission governs IOUs, and nine munis only in terms of setting rates and charges; REMCs set their rates and charges through their Boards, opting out of the IURC's jurisdiction. Electric rates in Indiana are determined through the traditional cost of service ("COS") approach with several pass-through charges.

Indiana passed the Alternative Utility Regulation ("AUR") Act in 1995. Under this law, an energy utility can choose to adopt alternative regulatory mechanisms and establish rates and charges based on market or average prices, price caps, index based prices, and prices that use performance-based rewards or penalties (either related or unrelated to its return or property), which are designed to promote efficiency in providing retail energy services.[3] Rates and charges are to be in the public interest and enhance or maintain the value of the utility's retail energy service or properties.[4] Any energy utility that plans on adopting an alternative regulation should submit an alternative plan to the Commission. The Commission will review and approve, deny, or revise the plan. The energy utility may accept or reject the Commission's Order modifying the proposed plan. An energy utility may also withdraw a proposed plan prior to the Commission's approval.[5]

Indiana's ratemaking process for electric and gas utilities is similar to what is being used in many US jurisdictions; the process begins with a utility filing an application with the Commission to request for changes to its rates and/or terms of service. The process—which can either be fully litigated or settled—usually takes a year to complete. Further information regarding the ratemaking process is discussed in Section 6.

1.4 Indiana's national and regional ranking

Over the last ten years, Indiana's national ranking for electricity prices across all customer classes has worsened significantly. As illustrated in Figure 6, the decline has been most substantial for commercial customers, with electricity prices falling from 18th best in the country in 2010 to 37th by 2019, followed by industrial (16th to 32nd) and residential customers (17th to 31st). Averaged across all customer classes, Indiana ranked 28th in the nation in terms of electricity prices (2019), down from 13th in 2010. However, despite this substantial drop in national ranking, the percentage difference between prices in Indiana and the top ranking state in both years has not

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[3] Indiana Code § 8-1-2.5-6. Title 8, Article 1, Chapter 2.5 Alternative Utility Regulation. <http://iga.in.gov/legislative/laws/2020/ic/titles/008#8-1-2.5>

[4] Indiana Code § 8-1-2.5-6.

[5] Ibid.

changed significantly.[6] Within each customer class, Indiana has gone from ranking within the cheapest half of states in the nation to the most expensive half over the 2010 to 2019 period.

Figure 6. Indiana's national ranking for electricity prices by customer class (2010 versus 2019)

Source: Form EIA-861 – Annual Electric Power Industry Report (2010-2019)

In addition to Indiana's national ranking, LEI considered the State's ranking vis-à-vis its neighboring states, namely Illinois, Kentucky, Michigan, and Ohio ("the region") by analyzing and comparing:

(i) average electricity rates;

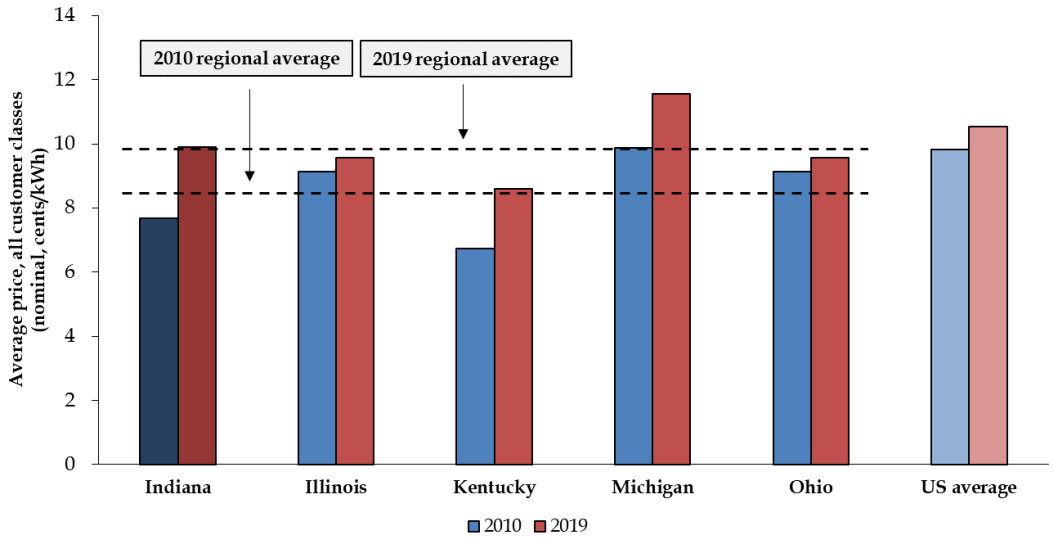
(ii) energy affordability; and

(iii) reliability.

For **average electricity rates**, LEI considered the rates charged to customers across the region over the period 2010-2019, using data from the US Energy Information Administration ("EIA") – see Figure 7. Indiana's comparative advantage of having "cheaper-than-average" energy prices as compared to neighboring states deteriorated over the period (from second lowest in the region in 2010 to fourth by 2019). Notably, over the period studied, Indiana has experienced the highest growth in residential, commercial, and industrial electricity rates of all the states in the region.

[6] In 2010, Indiana's average electricity prices across all customer classes were 24% higher than Wyoming's (which were the lowest in 2010) – 7.67 cents/kWh (IN) versus 6.20 cents/kWh (WY). By 2019, Indiana's average electricity prices across all customer classes were 29% higher than Louisiana's (which were the lowest in 2019) – 9.91 cents/kWh (IN) versus 7.71 cents/kWh (LA).

Figure 7. Average delivered electricity prices in Indiana and neighboring states (2010 and 2019)



Year	Indiana	Illinois	Kentucky	Michigan	Ohio	Regional average	US average
Average electricity prices (all customer classes)							
2010	7.7	9.1	6.7	9.9	9.1	**8.5**	**9.8**
2019	9.9	9.6	8.6	11.6	9.6	**9.8**	**10.5**
CAGR	2.9%	0.5%	2.8%	1.8%	0.5%	**1.6%**	**0.8%**
Residential							
2010	9.6	11.5	8.6	12.5	11.3	**10.7**	**11.5**
2019	12.6	13.0	10.8	15.7	12.4	**12.9**	**13.0**
CAGR	3.1%	1.4%	2.6%	2.6%	1.0%	**2.1%**	**1.3%**
Commercial							
2010	8.4	8.9	7.9	9.8	9.7	**8.9**	**10.2**
2019	11.0	9.1	10.2	11.4	9.7	**10.3**	**10.7**
CAGR	3.1%	0.2%	2.9%	1.7%	0.0%	**1.6%**	**0.5%**
Industrial							
2010	5.9	6.8	5.1	7.1	6.4	**6.2**	**6.8**
2019	7.4	6.5	5.6	7.1	6.6	**6.6**	**6.8**
CAGR	2.5%	-0.5%	1.1%	0.0%	0.3%	**0.6%**	**0.1%**

Source: US EIA. *Average Price by State by Provider, Form EIA-861, Detailed State Data.* 2020.

Generally, the electricity rates charged by IOUs and munis in Indiana have been relatively lower than those charged by the co-ops, with IOUs 24% lower and munis 19% lower per year from 2010 to 2019. However, co-ops tend to serve less densely populated regions, contributing to higher costs. The average annual growth rates in electricity costs are comparable between co-ops and munis, while the growth rate for IOUs has been higher historically.

For **energy affordability**, LEI used three metrics to assess energy affordability in Indiana and the region:

1. the home energy affordability gap ("HEAG"), which quantifies the difference between economically 'affordable' and 'actual' home energy bills for low-income households;
2. the home energy burden for low-income households as a percentage of gross income; and

3. the average percentage of households facing unaffordable energy bills.

Data showed that Indiana's HEAG was lower than the regional average for the period 2012-2019 (except in 2015), where a lower affordability gap is better. However, Indiana went from having the 3rd lowest HEAG in the region in 2012, to the 4th by 2019. Relative to the national average, Indiana's affordability gap has been higher since 2017. Moreover, low-income households in Indiana (those with incomes below 50% of the Federal Poverty Level ("FPL")) paid 30% of their annual income (on average) for their home energy bills from 2012 to 2019. Affordability may also be impacted by COVID-19. Section 9.7.2 discusses the potential impact of the COVID-19 pandemic on ratepayers.

Finally, for **reliability**, LEI assessed metrics such as the System Average Interruption Duration Index ("SAIDI"), System Average Interruption Frequency Index ("SAIFI"), and the Customer Average Interruption Duration Index ("CAIDI"). Generally, across all three metrics, Indiana's IOUs have performed slightly worse than the national average on a customer-weighted basis over the 2017-2019 period.

Overall, Indiana's rates have increased faster than the national average, and affordability has fallen, while reliability is moderately lower than national norms. Detailed analyses of each of these metrics are provided in Section 7.

1.5 Cost drivers

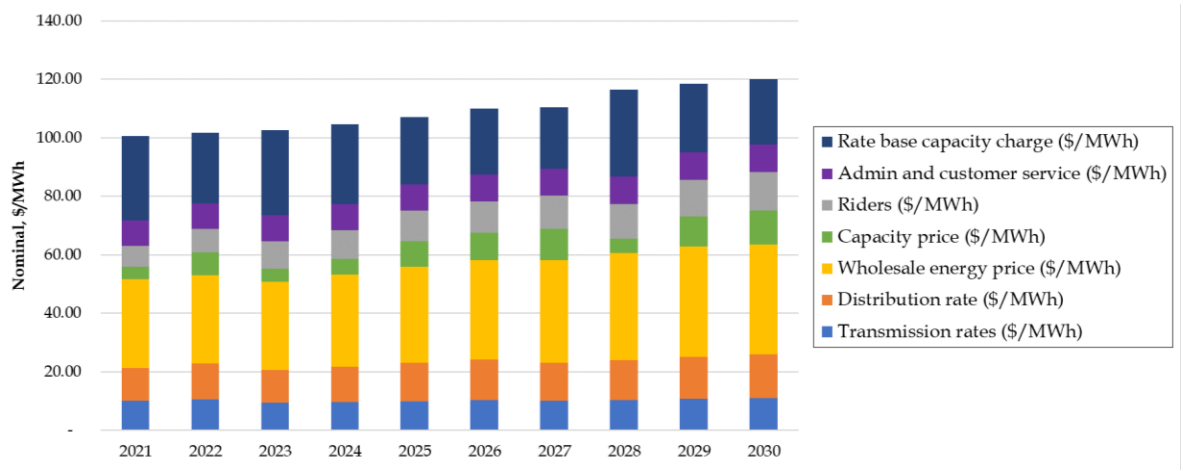
As demonstrated in Figure 7 above, Indiana's electricity prices have risen steadily in the last decade, growing at a compound annual growth rate ("CAGR") of 2.9% over the 2010 to 2019 period. This growth rate has meant that electricity prices in the State have risen faster than the national average inflation rate of 1.8% (for consumer prices) and 0.8% (for electricity prices) for the same period. This has eroded Indiana's comparative price advantage relative to its neighboring states. Rising electricity prices have primarily been driven by:

- **flattening demand,** or a lack of significant increase in demand, following the global financial crisis. Indiana's load has declined at a CAGR of -0.4% from 2010 to 2019, compared to growing at a CAGR of 0.2% from 2000 to 2009. This has translated to higher rates, as the fixed costs of providing electric service are spread across a shrinking customer base;
- significant replacement and maintenance of **aging infrastructure**, which has been facilitated partly by the Transmission, Distribution, and Storage System Improvement Charge ("TDSIC") tracker (introduced through legislation in 2013). Current TDSIC plans amount to $4.3 billion in approved investments as far out as 2026, with $1.2 billion in capital expenditures ("capex") already shouldered by ratepayers; and
- investments in **environmental retrofits** in compliance with Federal regulations. Investments totaled over $4.6 billion during the 2010 to 2020 timeframe and included projects to install pollution control equipment and convert coal units to gas.

While rate increases over the past decade in Indiana have changed its relative position among its peers, the forces pushing rates higher in Indiana are not unique. The change in relative status

may be partly a matter of timing. Going forward, it is reasonable to assume that depending on the evolution of the power sector in peer states, rates in some states may begin to rise at a rate faster than Indiana's. For example, Illinois and Ohio both face challenges with regards to whether to mandate ratepayer support for aging nuclear stations; green energy ambitions in Illinois, and to a certain extent Michigan, are likely to place upward pressure on rates in those states; and in some cases, neighboring states have significantly older infrastructure (for example, Chicago's natural gas distribution system) that requires costly upgrades.

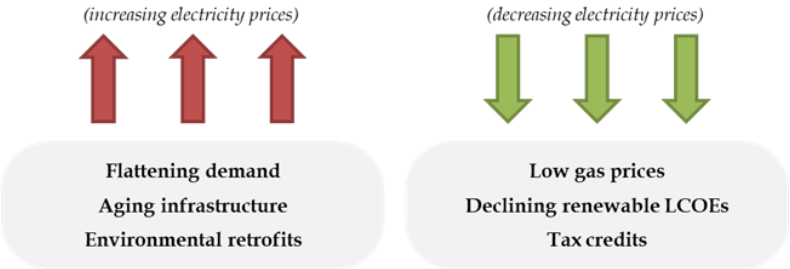
Figure 8. Forecast delivered blended energy rates in Indiana



Source: LEI analysis

Across the region, there will be upward pressure on wholesale electricity prices going forward stemming from evolving environmental regulations, electrification of transportation and heating (even if outside of Indiana), expanding energy efficiency efforts, and the possible emergence of distributed energy resources ("DERs"), where the latter two work to reduce system demand. On the other hand, there will likely be downward pressure on electricity prices from factors such as low (though gradually rising) natural gas prices and the declining costs of renewables (mainly wind and solar). Section 8 includes a detailed overview of LEI's forecast of electricity prices in Indiana, given these numerous drivers. The directional impact of these drivers is illustrated in Figure 9. LEI projects that the IOUs' blended electricity rates will increase at a CAGR of 2% in the next ten years (Figure 8). The forecast growth is slightly lower than the historical electricity rate growth from 2010 to 2019.

Figure 9. Directional electricity price impact of various cost drivers



1.6 Other considerations

Electricity-related issues are evolving, and stakeholders are increasingly engaged in the debate over the future of the power sector at the national and state level. Some of these issues include: natural gas bans; the potential growth in load due to electrification; the carbon life cycle impacts of various generation resources; the directional path for coal-fired generation going forward; issues around renewable energy siting; energy efficiency; and uncertainty around the impacts of COVID-19. These considerations are summarized briefly below, with an in-depth discussion in Section 9:

- **natural gas bans:** bans on natural gas usage are becoming central to discourses in certain states, which could have longer-term implications for Indiana if the conversation reaches more prominence at the Federal level. Changing electricity system dynamics have also led to discussions around the potential for stranded costs associated with considerable new-build gas-fired generation resources in the longer-term;
- **electrification:** increasing electrification **could** lead to significant growth in electricity consumption, peak demand, and changes in consumption patterns. Heating and transportation applications are the largest areas of potential growth in electrification for Indiana. High electrification scenarios would likely require more new-build generation capacity in the longer term, although managing consumption could reduce the overall need for this new capacity;
- **carbon and life cycle impacts of coal, natural gas, solar, and wind:** life cycle greenhouse gas ("GHG") emissions estimates for wind and solar resources are significantly lower than emissions estimates for fossil-fuel fired resources. Based on a review of a large number of Life Cycle Assessment ("LCA") studies, median life cycle GHG emissions estimates for combined-cycle natural gas are about half those of coal (although methane leakage rates are a concern). Carbon capture and storage technologies can significantly reduce emissions from fossil-fuel fired electricity generation, although they are not considered economically viable at present;
- **coal's future:** coal generation and capacity have been consistently decreasing over the past decade, and the economic and environmental factors that have impacted coal-fired resources historically are expected to continue. A significant number of coal plant retirements are expected in the next decade, with legacy costs that will continue to be repaid through electricity rates. Further pressure would emerge if more stringent environmental rules or carbon pricing policies were to be implemented;
- **renewable energy siting:** Indiana's ability to develop its theoretical wind and solar potential will largely depend on siting considerations, although this is not the only issue. Debates around renewable energy siting have already emerged as a contentious issue in Indiana, with local zoning ordinances impacting some proposed project developments. While there is no *one-size-fits-all* solution, state-level guidelines can aid local authorities in their consideration of renewable energy siting rules;
- **energy efficiency:** energy efficiency ("EE") is a useful resource in technology-neutral, least-cost system planning. It can postpone or reduce the need for new-build electricity generation, transmission, and distribution infrastructure. Therefore, EE measures should

form an important resource in utility IRPs, but the selection of EE measures should only occur if it is less expensive than generation alternatives with similar environmental characteristics. Further expansion of energy efficiency levels is possible in Indiana, although actual levels will depend on economics and barriers to participation; and

- **uncertainty around COVID's impact on load and utilities:** there is significant uncertainty around the implications of the COVID-19 pandemic on load, the possibility of demand destruction, planning around supply-side resources (both new and existing), and the implications of all these factors on ratepayers.

1.7 What can be done through the legislative process?

As Indiana seeks to refresh its energy policy, policymakers and interested stakeholders can consider related legislative efforts pursued across the country. Legislatively mandated processes already established in Indiana include the Transmission, Distribution, and Storage System Improvement Charge ("TDSIC") established in 2013 (discussed in Section 8.1.2), and the AUR Act of 1995 (mentioned previously and also discussed in Section 6.2.1).

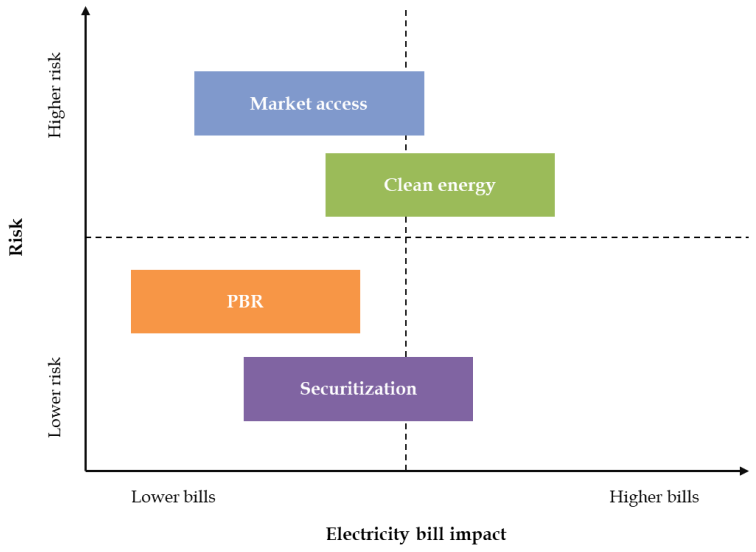
Section 10 presents a survey of legislative efforts pursued across the country, along with specific case study examples, which can be categorized into the following four areas:

- **clean energy:** arguably the most pursued state initiative in the country, with 1,500 bills related to clean energy, renewables, or emissions reductions considered in the 2019 legislative session. The most ambitious targets are being set in the Northeastern US (e.g., New York's goal is to reach 100% carbon-free electricity by 2040);
- **market access:** through the introduction of varying levels of wholesale and retail competition, some states have enabled heightened market access for generators and customers. In the region, this has been implemented in some form in Illinois, Michigan, and Ohio;
- **treatment of legacy assets:** states in the region have implemented controversial subsidies for uneconomic coal and nuclear assets (e.g., Ohio House Bill 6, which was passed in July 2019). These actions may cause additional costs to ratepayers. Meanwhile, other states across the country have enacted bills that allow securitization of these assets instead; and
- **alternative ratemaking regimes:** most states in the region (Illinois, Michigan, and Ohio) use or are in various stages of exploring performance-based ratemaking ("PBR") mechanisms.

Each of these legislative actions vary in terms of the perceived risks associated with their implementation, as well as their potential impacts on electricity bills going forward. Figure 10 provides a graphical summary of this high-level assessment, which is explained in Section 10.2.6.

Ultimately, the magnitude of risk and overall impact on electricity bills will depend on numerous interacting factors, as well as the degree to which each policy action is implemented. These considerations are explored in Section 10.

Figure 10. Risk versus bill impacts of various policy actions



Note: See Section 10.2.6 for further context regarding the placement of each of these four policy actions in the above matrix.

1.8 Goals, interests of key stakeholders, and potential paths forward

Electricity regulatory policy can be viewed as a constrained optimization process among many competing goals, with stakeholder groups rarely finding themselves completely satisfied with outcomes. In Section 11, LEI has put forward five alternative pathways that Indiana could consider for the evolution of its electricity sector:

1. **enhanced status quo**: under this pathway, traditional utilities would remain the primary engine of new investment in the sector but would be subject to a regulatory regime with an increased incentives approach, as well as a strengthened mandate to consider non-wires solutions and third party ownership alternatives to direct investment wherever possible;
2. **DER-centric**: this would build on the enhanced status quo, but would be focused on increasing opportunities for DERs, provided doing so does not result in cross subsidies. DERs are defined as small, modular, energy generation and storage technologies that provide electric capacity close to the source of load and are either connected to the distribution system or isolated from the grid in standalone applications. To promote DER opportunities, LEI envisions the following elements, among others: establishing standardized interconnection procedures; setting performance standards to ensure utilities provide DER owners with timely cost estimates; providing bill credits to DER owners for any excess generation produced; and allowing DER owners to retain the environmental attributes of their resources;
3. **baseload preservation**: this would incorporate the enhanced status quo, but would also require utilities to include in their IRPs an assessment of plans for life extension and efficiency improvements at existing coal and nuclear stations;

4. **aggressive decarbonization**: this would include all elements of the enhanced status quo and DER-centric pathways, as well as require Indiana to set a specific year to target reaching net zero emissions across the economy; or
5. **competitive wholesale market**: this would include elements of the enhanced status quo and DER-centric pathways, except that IRPs would be discontinued, utilities would be required to unbundle their generation portfolios, and competition would be introduced at both the wholesale and retail levels.

To assess each of these pathways, LEI compared their potential outcomes relative to multiple goals. Each pathway was reviewed according to criteria such as its impact on reliability, affordability, predictability, and accessibility, among others. Based on these factors, LEI's view is that there appears to be some justification for a DER-centric approach.[7]

1.9 Concluding remarks and recommendations

Indiana does not need to be a first mover in implementing any policy actions; experience in other jurisdictions can be mined to improve outcomes in Indiana. There is no need to reinvent the wheel. Best practices should be adapted to local needs; for example, if Indiana were to examine and adopt some form of PBR, any such mechanism should be tailored according to how Indiana defines performance, rather than relying on definitions established by other states that have implemented it. Likewise, were Indiana to decide to incorporate climate change into its policies, a focus on least cost approaches rather than technology specific directed procurements would likely produce better outcomes than experienced in other states.

LEI believes the State should adopt the following set of principles and activities to guide future policy and achieve reliable energy at an appropriate cost. At a high level, and as explored in-depth in Section 12, these principles and recommendations include:

- establishing a clearly defined objective function;
- maintaining a technology and ownership neutral approach;
- avoiding the support of public policy goals through electricity rates;
- recognizing the importance of optionality;
- relying on lessons learned from other jurisdictions;
- acknowledging that DERs will provide a form of competition regardless of whether the market is unbundled;
- reassessing desired levels of reliability and who pays for it;
- conducting a detailed review of rate design; and
- avoiding any sudden policy movements.

[7] See Figure 138 (page 201) and surrounding discussion for more details.