

2022 IRP Question and Answer Archive
IRP Q/A Archive for Stakeholder Questions
Updated Oct. 24, 2022

Meeting Administration Questions

Can individuals who do not currently have an NDA in place participate in the technical meetings?

Since AES Indiana plans to share confidential information at its technical meetings, an NDA will be required to attend those meetings. AES Indiana encouraged stakeholders to contact Teresa Morton-Nyhart at Barnes & Thornburg LLP to get a copy of its standard NDA. Teresa can be reached at teresa.nyhart@btlaw.com.

Is there an email address that stakeholders can use to send additional questions?

Yes, aesindianairp@aes.com.

Will recordings of public advisory meetings be accessible after meetings?

Meeting minutes will be posted to AES Indiana's website (<https://www.aesindiana.com/integrated-resource-plan>) following each meeting, but it does not make the recordings publicly available.

Will the fifth Public Advisory Meeting be held at the beginning of November and stakeholders should expect AES Indiana to discuss the results from the reliability analysis?

The focus of Public Advisory Meeting #5 will be to review the Reliability, Stability, and Resiliency and Risk and Opportunity scorecard metrics as well as announce AES Indiana's Preferred Resource Portfolio and Short-Term Action Plan. AES Indiana is currently finishing the reliability analysis with Quanta as well as the risk and stochastic metrics. Quanta will present the findings of the reliability analysis and AES Indiana will present the results of the stochastic analysis as well as discuss the final scorecard results in Public Advisory Meeting #5.

When does AES Indiana anticipate it will share its EnCompass files with stakeholders that have signed non-disclosure agreements with AES Indiana and when the deadline for stakeholders to provide feedback to AES Indiana will be?

AES Indiana will try to get the EnCompass database out to stakeholders within a few days of Public Advisory Meeting #4. The IRP will reach out to stakeholders roughly two weeks after stakeholders receive the database to establish a deadline for stakeholders to provide AES Indiana feedback.

What format will data be provided to stakeholders?

AES Indiana will provide stakeholders the data exported from EnCompass into spread sheets. Stakeholders will be able to use this to input the information into their own EnCompass models or other capacity expansion models and evaluate AES Indiana's modeling results.

Will AES Indiana provide information to inform stakeholders what was used to create the EnCompass modeling inputs, such as whether the inputs were based on revenue requirement values or LCOE values?

AES Indiana will share the values that were loaded into the EnCompass model and will provide sufficient data to support the input value calculations as well.

Modeling Questions

Why is the revenue requirement calculated outside of the EnCompass model rather than using EnCompass?

AES Indiana is still deciding whether to use EnCompass or a method similar to the method used in AES Indiana's 2019 IRP where it used PowerSimm and a spreadsheet PVRR. Both methods should produce similar results, but AES Indiana has not yet decided which to use.

Is there a method to capture inflationary and supply chain pressures on supply-side resources?

Inflation and supply chain issues could impact payback performance, which could impact results since payback performance is a primary driver. It may be relatively conservative to not recognize additional measure costs are increasing due to supply chain pressures, but in large part, AES Indiana partner GDS commonly sees short-term impacts not continue into the long term, which influenced GDS to not include various short-term impacts into the long-term. If GDS were to extend some short-term costs into the long term, the costs would not be met. AES Indiana will consider the proposed 8% inflation number as a starting point and then assume 2% inflation from there.

Is climate change considered in AES Indiana's modeling?

The IRP considers climate change using increased temperature trends. The All-Source RFP is intended to fill a generation need based on the results of the IRP, and the RFP results are evaluated based on quantitative and qualitative factors, which do include costs and effects of environmental impacts.

Is the capital cost of wind declining in AES Indiana's model?

AES Indiana is noticing that and elaborated Bloomberg, Wood Mackenzie, and NREL assume a learning curve with wind and solar, and in the near term, costs are reduced on a real basis due to learning curve improvements.

Does AES Indiana plan to calculate and include gas infrastructure costs in its model?

AES Indiana plans to evaluate all costs associated with gas infrastructure upgrades in the model.

How are imports and exports with MISO modeled in the 2022 IRP?

This is an important modeling constraint that is still being worked out, and AES Indiana plans to share this type of modeling assumption in Public Advisory Meeting #3.

Can AES Indiana commit to making commodity assumptions publicly available?

AES Indiana does not make these commodity assumptions publicly available as it is confidential, proprietary, competitively sensitive, and/or trade secret information; furthermore, those participating in technical conferences have or will receive this information.

Can AES Indiana reconsider the carbon price option based on the U.S. Government Interagency Working Group on Social Cost of Greenhouse Gases caution against using a single estimate?

In this scenario, AES Indiana believes there should be some carbon available in the late 2020s, and considering the trends in the market, we believes the carbon estimates using the Current Trends scenario is modest. However, AES Indiana will take this concern into account to better understand perspective on the issue.

Will AES Indiana perform any sub-hourly dispatch modeling to quantify the value/need for flexible and responsive resources?

The EnCompass model uses hourly data, so AES Indiana only has plans to do hourly analysis. Other utilities use sub-hourly modeling to capture the ancillary service value of batteries and other resources, but AES Indiana does not currently have plans to do that; however, it is an item AES Indiana is willing to consider.

When will AES Indiana have a schedule for sharing modeling files?

AES Indiana will send assumption files and a lot of the items that have been covered in the Public Advisory meetings so far within a week of Public Advisory Meeting #3. AES Indiana is still working on the modeling files, which will probably be ready in the next few months, but AES Indiana communicate with stakeholders on the availability of modeling files.

Does ‘all C&I’ refer to all items identified in MPS and, if so, will the bundles include all items identified in realistic achievable potential (RAP) of the MPS?

Yes, C&I refers to all items identified in the MPS. AES Indiana will take the residential RAP and split it in half to make a higher cost and lower cost bundle rather than using the average cost of the whole bundles as AES Indiana previously planned. AES Indiana has issues with modeling bundles at the MAP level related to achievability. AES Indiana has hesitations with MAP because it is getting harder and harder for AES Indiana to achieve its DSM and shared AES Indiana had a meeting with its vendors to discuss ideas for achieving higher levels of DSM and plans to have another meeting. Utilities on the east coast tend to have higher levels of achievable DSM.

What model does Horizon Energy use to develop its power price forecasts?

Horizon Energy uses an EnCompass model for its power price forecasts, which models the entire MISO system using commodity price inputs to model the generation mix selected by MISO. AES Indiana uses the EnCompass model for its capacity expansion and production cost modeling.

Why AES Indiana is not using a base, high, and low forecast for coal prices?

AES Indiana believes coal prices have hit a floor and does not believe any of the

scenarios would impact the price of coal as the Aggressive Environmental scenario would cause more coal to retire, therefore the demand for coal would decrease and the coal market is not as volatile as other commodities.

What does stability measure that is not captured by reliability and resilience?

Stability encompasses VAR support and frequency metrics, which will be included as part of the System Reliability Analysis. Stability would include steady state and transient stability, meaning evaluating whether the system or all units remain in sync, or whether they drift apart and effectively break up the system, which requires a separate analysis.

Will AES Indiana consider gas in its other emissions and byproducts metric?

Yes, AES Indiana is considering including outside the fence emissions, but it is difficult to quantify outside the fence emissions. AES Indiana will consider using outside the fence emissions in its analysis but will likely only evaluate inside the fence emissions.

Is AES Indiana's power system modeling and analysis completed by AES employees or if AES Indiana is contracting this work out to third-parties?

The bottom-up forecasting uses software called LoadSEER provided by Integral Analytics, but AES Indiana is developing in-house expertise with a dedicated engineer to build those forecasts. AES currently uses LoadSEER but supplies the data to build out the forecast. AES Indiana is in implementation for LoadSEER and are currently working through the initial data requests with Integral Analytics, an industry leader, to get the model built up, which is a data-intensive process. AES Indiana has a dedicated demand forecasting engineer as well as T&D planning engineers who conduct the modeling and analysis who work together with the demand forecasting engineer.

Is CYME an Eaton product?

Yes, it is, and AES Indiana used PSLF in the past and noted Synergi and CYME are essentially the same power flow tools.

How is AES Indiana using its AMI data, which provides 15-minute granular data?

AES Indiana is using AMI data for several items, including studying EV charging. When AES Indiana moves to time series analysis, which is not at full deployment yet, AES Indiana will need to have great granularity of detail. AES Indiana expects AMI to play a large role in transitioning it to time series models to allow AES Indiana to utilize the data to create intelligent insights and forecasts. AES Indiana does not have full AMI deployment yet, but it is working towards it and has made significant progress. AMI data can be overwhelming, and while AES Indiana cannot input all its AMI data into models today, there are steps AES Indiana completes to use this data, and AES Indiana is advancing forward so it will be able to input all the data into the models.

Is the integration of distribution and resource planning going to be covered in AES Indiana's IRP?

AES Indiana will cover the integration of its current state distribution system planning and resource planning in more detail in the IRP report; however, the use of LoadSEER is a work in progress/future state and will be more fully integrated into the next IRP.

What is the timeline for system modeling and analysis activities? Will this work consider driving the market for residential and community solar or residential batteries?

AES Indiana is looking to more fully incorporate LoadSEER in the next IRP as it is in the very early pilot stages of using this product and elaborated this work will help identify the areas of the distribution grid that would benefit from distributed generation.

If the 2,000 MW per technology type constraint does not impact AES Indiana’s modeling results, why would AES Indiana include it as a constraint?

AES Indiana added these modeling constraints because it does not want the model to make choices that are unreasonable. The 2,000 MW cap on each resource type over 20 years was added to act as a safety valve because AES Indiana did not know what the model would select, but the constraint did not impact the model results until the last two years. Since the constraint did not impact the results until the very end of the 20-year modeling timeframe, remodeling everything with the constraint removed for comparison would not add value.

Will AES Indiana be using any of the benchmarking data being collected by the city of Indianapolis to target EE resources based on need?

The IRP identifies the level of EE that AES Indiana will pursue through customer programs independent of the city of Indianapolis’s data. The city of Indianapolis's Building Benchmarking and Transparency Ordinance (<https://www.indy.gov/activity/benchmarking-and-transparency>) can help building owners understand how efficiently their buildings are operating relative to other similar buildings. AES Indiana programs are available to help customers act on these insights through program rebates and incentives and provided a link to its website for more details (<https://www.aesindiana.com/your-business>).

Did AES Indiana include gas infrastructure upgrades as part of its IRP modeling, and if so, what were those costs?

AES Indiana included infrastructure upgrades in the rate for firm gas delivery and are included as a fixed cost, not a capital cost, for the refueled units. More specific cost information can be shared with stakeholders that have signed a non-disclosure agreement with AES Indiana.

Scenario Questions

Do the demand response (“DR”) measures considered for replacement resources cover both opt-in and opt-out customers? Can you please clarify whether participation under AES Indiana’s interruptible tariff has any relation to opt-in and opt-out customers.

Participation under its interruptible tariff is not related to a customer’s opt-in/out status. AES Indiana acknowledges that analysis is different for EE and DR programs. AES Indiana and its consultants are looking at its interruptible tariff as part of the MPS. It is of note that AES Indiana is considering a DR bundle under its interruptible tariff for the 2022 IRP.

Will AES Indiana consider residential battery and solar resources as replacement

resources? Is AES Indiana exclusive modeling of utility-scale solar precluding it from considering residential and community solar?

AES Indiana is modeling utility-scale solar, but AES Indiana is still deciding whether to consider residential battery and solar resources as replacement resources. The current models consider forecasted behind the meter generation, which is organic and not driven by AES Indiana.

Will increased demand due to pumping stormwater from rainfall events be captured in the peak model?

Increased demand due to pumping stormwater would only be captured to the extent that data was embedded in historical peak trends, which is not likely since the peak modeling is structured around the summer when hot weather usually drives the peak rather than pumping stormwater. Pumping stormwater could potentially influence peaks in shoulder months. AES Indiana agreed to look into whether stormwater pumping loads could impact spring peaks.

Why does AES Indiana believe that residential solar will grow after full net metering goes away in July 2022?

AES Indiana thinks customers will still engage in solar projects because customers will still be able to produce energy from solar to fully offset their usage. In addition, customers will still have the ability to sell energy back to the utility at a premium to the wholesale price.

Why does the Decarbonized Energy scenario use a high economic case instead of a case tied specifically to electrification?

The high load economic forecast is used in the Decarbonized Economy scenario because it is logical to assume the associated increases in sales across various industries, including the solar and EV industries, could cause the economy to grow at a slightly elevated rate.

Will storage durations other than four hours be considered in the IRP?

MISO's capacity accreditation for storage resources uses a four-hour discharge requirement. Two-hour storage is treated as getting half the four-hour storage capacity value. AES Indiana models four-hour storage due to the MISO capacity requirements and storage that is designed to dispatch for four hours is optimized for that type of dispatch. AES Indiana will also model 6-hour storage as an option.

Will AES Indiana consider EV battery storage possibilities during the 20-year timeframe in this IRP?

AES Indiana is not considering EV battery storage possibilities at this time, but that is something it can consider in future IRPs.

What configuration and turbine class is AES Indiana assuming for CCGT?

AES Indiana is using Eagle Valley as its benchmark for the operating parameters of the selectable generic CCGT. Eagle Valley is a 2x1 F Class and AES Indiana models the generic CCGT at half the size of Eagle Valley.



Will the 2022 IRP explore green H2 combustion resources or refueling of existing gas resources to operate on H2?

In Public Advisory Meeting #1, AES Indiana discussed its desire to be open to developing emerging technologies like H2, but those technologies will not be considered in its 2022 IRP.

Has AES Indiana developed a levelized cost of energy (LCOE) in relation to rough gas infrastructure upgrade costs?

AES Indiana has not included an LCOE for this option, but it is something they will consider.

Will AES Indiana consider a portfolio of exclusively clean energy resources?

An exclusively clean energy portfolio will be addressed in AES Indiana's scenarios as it has a Decarbonized Economy scenario that assumes a clean energy standard that will likely replace Petersburg's capacity with roughly all renewables, meaning a portfolio will exist that replaces all of Petersburg's capacity with renewables.

Could AES Indiana replace Petersburg with dispatchable energy and not refuel to natural gas?

The purpose of the IRP process is to evaluate the best generation resource mix to reliably serve its customers considering a variety of alternatives in varying scenarios. Gas conversion is one of the alternatives that will be considered in this process, and it is not predetermining gas conversion or any other resource outcome ahead of going through the full evaluation.

Has AES Indiana included its own desire to reduce carbon output in its matrix?

AES Indiana, like all utilities in the state, is legally required to engage in a rigorous stakeholder engagement process when determining future plans for generation resources. AES Corporation and AES Indiana take this responsibility seriously and will meet all obligations in this IRP process, which is currently under way for 2022, and the IRP outcome is subject to approval by Indiana regulators. Through a combination of asset sales, fuel conversions, and retirements, this plan is conditioned upon maintaining reliability and affordability for customers and is subject to regulations and approvals on the local, regional, and national levels; the conditions and necessary approvals may impact the pace of meeting this decarbonization goal. AES Corporation has certain global objectives, but AES Indiana operates in the state of Indiana and is required to engage in a regulatory process through its IRP where it engages with stakeholders to work through the process.

Given NIPSCO's recent announcement that it will delay the retirement dates of the Schahfer units, what changes would AES Indiana have made in its System Reliability Analysis to capture this exposure?

These decisions will impact inputs into Quanta's analysis as the decisions will impact system-wide reliability criteria, such as short circuit strength, and could impact the mitigating actions taken in certain portfolios, such as the addition of synchronous condensers or grid forming inverters. The actual decision to construct and implement

reliability devices is a decision that AES Indiana will make that balances reliability attributes and economics, but the delay in retirements of the thermal units will impact the inputs in the System Reliability Analysis.

Can AES Indiana’s 2022 RFP results for wind resources be relied upon given the RFP was issued prior to the enactment of the IRA, which substantially changed the costs of wind? Can AES Indiana to clarify whether the cost impacts from the enactment of the IRA would increase developer interest in constructing wind resources?

AES Indiana agrees the passage of the IRA would likely impact wind costs and project availability. The price volatility in the market has caused AES Indiana to consider issuing RFPs more frequently – possibly even at the conclusion of AES Indiana’s 2022 IRP process. AES Indiana and Sargent & Lundy are working with RFP bidders to determine how the IRA impacts the offers it received in its 2022 RFP.

Will AES Indiana’s reevaluate tax credit assumptions to include the IRA bonus tax credits, including those using AES Indiana’s injection rights at Petersburg?

AES Indiana wants to consider solar projects around Petersburg to take advantage of the Petersburg interconnection, it is not guaranteed that a project AES Indiana selects would be located in an “energy community.” It is important to consider the “energy community” tax credit, and Erik will discuss the replacement resource cost sensitivity AES Indiana included for renewables to reflect the additional 10% bonus ITC renewables are eligible to receive later in his presentation.

Could AES Indiana include the bonus 10% “energy community” ITC in its Current Trends scenario without performing a sensitivity analysis?

AES Indiana does not consider modeling at specific locations for its IRP modeling as the modeling process considers the advantages of the interconnection at Petersburg in its process and similar results can be achieved using the sensitivity analysis around the 10% “energy community” bonus ITC. The Current Trends scenario modeling results will determine the base volume of renewables and the sensitivity analysis will provide a range of renewables that will be built based on cost.

Has AES Indiana considered exploring surplus interconnected renewables?

This is not something AES Indiana has explored through modeling, but as he mentioned earlier in his presentation, since the model is picking storage to fill AES Indiana’s near-term capacity need, AES Indiana will not preclude considering solar and storage at the site as well. Since the tax credit value for solar resources increased under the IRA, complementing storage with solar could be an attractive option.

Why does the Pete Refuel by 2025/Current Trends portfolio add natural gas resources during the refuel of Petersburg Units 3 and 4 and later retires natural gas units at Harding Street?

The retirement of the Harding Street units are age-based retirement dates and the Harding Street units are modeled to operate until the end of their useful lives. The assumed useful life of the refueled Petersburg units is 20 years.

Is AES Indiana considering utilizing the existing units at Harding Street and deferring additional refueling investment at Petersburg?

The Harding Street units are being retired in the model because they reached the end of their useful life without requiring significant upgrades. The Harding Street retirement dates get closer, AES Indiana could reexamine the full cost associated with upgrading the Harding Street units to extend their useful lives but noted he believes it would likely be cost prohibitive to complete the necessary upgrades to extend the Harding Street units' useful lives.

Given that NOx seasonal allowance prices have increased substantially and Petersburg Unit 4 does not currently have significant NOx control devices, why would the model select Petersburg Unit 3 to retire before Petersburg Unit 4?

Petersburg Unit 4 is newer and has better operating and performance characteristics than Petersburg Unit 3, which caused Petersburg Unit 3 to be selected to retire first. Seasonal NOx prices are highest in the near-term and present less of a penalty, and therefore a less meaningful impact for Petersburg Unit 4 dispatch economics in the long-term. Long-term fundamentals also show increasing value outside the NOx season.

Why is a smaller CCGT being selected in 2028 rather than a combustion turbine as the smaller CCGT would not be able to take full advantage of a heat recovery steam generator?

The model preferred the CCGT for its capacity and energy value. New CCGTs are roughly 325 MW per selectable resource, whereas new combustion turbines are roughly 100 MW per selectable resource. The CCGT size is assumed to be a 1x1 and thus benefits from a combustion turbine and heat recovery steam generator configuration.

Load Forecast Questions

Is Moody's the vendor supplying the economic forecast data? If so, which case Itron is using?

Yes, Moody's is the vendor supplying the economic forecast data, and the baseline projection case is being used.

Are the EV sales projections identified on Slide 79 (meeting 1 presentation) only for individual ownership or if the model is also considering EV public transit and business fleet transitions?

GDS's model currently only considers residential EV sales. AES Indiana is currently evaluating incorporating fleet electrification. If fleet electrification were added, it would be a separate piece of analysis layered onto the overall load forecast. AES Indiana will provide additional information on fleet electrification in Public Advisory Meeting #2. Fleet adoption is an item to consider, but fleet adoption is currently even lower than residential adoption, and the fleet EV market is newer than the residential EV market.

How do longer commutes impact EV-related load in Marion County?

80% of charging occurs at home even when individuals drive EVs more and for longer

distances. While individuals may take longer trips and commute longer distances, they will still likely charge their vehicles at home; therefore, longer commutes for individuals who live in Marion County will impact Marion County EV-related load.

Regarding the EV load shapes, what percentage of total charging will be managed charging?

Based on current 2021 levels, 16% are managed and 84% are non-managed. The breakdown will move to 70% managed and 30% non-managed in 2042 using a linear trend. To achieve this increase in managed participation, AES Indiana is modeling the additions of peak time and EV demand response incentives in addition to the current Rate EVX offering.

If the IRP forecast on Slide 69 includes the base EV energy from Slide 81 and the base residential generation from PVs from Slide 87 as well as the base non-residential PV generation from Slide 89, is the net impact the difference between the solid and dashed blue lines on Slide 69 (all references to meeting 1 presentation)?

Yes. As the EV forecast adds to load and the PV forecast subtracts from load to produce the net impact that is not very large due to the similar magnitudes of the additions and subtractions to load.

Do you consider demand increase coming from natural gas furnace conversions to heat pumps?

Yes. This is indirectly captured in the customer trends as an increase in the electrically heated rate customers over the planning period. While both electric heat and non-electric heat customers are growing, electric heat customers are increasing at more than twice the rate as non-heat customers.

Will the load shape change in the high case?

The shape of load will likely not change much due to economic drivers and AES Indiana will use the load forecast into the model that has a load shape based on load shapes from EV, DG, and other factors. EV and DG load shapes will drive the aggregate load shape.

What is the impact of electrification on load shapes, especially related to water heaters and other devices?

AES Indiana worked with GDS and Brightline to complete a potential analysis on electrification and found EV electrification was the only item that had a significant impact on load. Jeffery Huber added the electrification evaluated was naturally occurring without intervention and reiterated the impact is expected to be relatively minimal. Anna responded the responses made sense and thanked the presenters.

How will the dispatch of storage be determined by Quanta?

Quanta is trying to avoid economic analysis in its System Reliability Analysis to allow Quanta to maximize the reliability benefits of storage resources in its dispatch assumptions. Storage will be dispatched in times of need to strengthen reliability and recharge itself during periods when the system can accommodate recharging, without regard to economic characteristics, such as arbitrage opportunities. Quanta is not using EnCompass for this analysis. Quanta will develop roughly 100 deterministic samples for



each portfolio to evaluate the level of risk in the portfolio. Quanta obtained proprietary profiles from AES Indiana that contain measurements it collected over 10 years across its system and the MISO system and is blending this with System Advisor Model data from NREL.

Is AES Indiana forecasting customer DG exports on a daily basis or a more granular basis to ensure customer-provided generation is accounted for when AES Indiana is forecasting MISO purchases?

From a planning perspective, AMI meter data masks customer DG export data, which is why it is important to track DG device information when registering DG devices to allow AES Indiana to track that information individually to be able to differentiate between a DG resource’s generation and a customer’s load for planning purposes.

Is AES Indiana currently able to differentiate between DG generation and a customer’s native load or is it something AES Indiana is currently working on?

AES Indiana is currently implementing this ability with LoadSEER. LoadSEER helps differentiate between native load and a DER’s behind the meter generation, but it takes time for the software to learn because it is learning what the exports look like given weather and other factors, such as time and day of the week. AES Indiana does not forecast DG customer generation and exports to the grid for purposes of its Day-Ahead generation and load estimates. AES Indiana looks to Indianapolis load history to project the Day-Ahead forecast, which includes historical DG customer generation on the AES Indiana system and is already net of DG resource production. For the IRP longer-term horizon, AES Indiana is including DG customer generation and exports in its forecast in Itron's load forecast.

Other Questions

Will AES Indiana provide actual tons of CO2 reduction in addition to CO2 intensity reduction?

AES Indiana will provide this information in future meetings, especially as it discusses scenario results and the IRP Scorecard in Meeting #4. If this information is needed sooner, AES Indiana will arrange a method of sharing it.

On slide 28 (meeting 1 presentation), can you provide actual tons of CO2 reduction in addition to CO2 intensity reduction?

Here is a table of historical CO2 emissions for AES Indiana’s portfolio. Adding the retirement of Pete 2 in 2023 will result in 2-3 million fewer tons per year going forward.

Year	CO2 (Million tons)
2009	16.7
2010	17.2
2011	15.8
2012	14.7
2013	16.2

2014	17.0
2015	13.9
2016	12.2
2017	11.5
2018	12.1
2019	12.8
2020	10.4
2021	11.0

Will AES Indiana provide more information regarding AES Indiana’s largest customers?

Yes. The list of AES Indiana’s top 20 customers by use is available on FERC Form 566. This form is currently posted on the AES Indiana IRP website.

What percentage of load comes from religious commercial buildings?

Based on the load disaggregation performed by GDS as part of the DSM Market Potential Study Analysis, 6.4% of load is categorized as assembly which includes but is not limited to religious commercial buildings.

Are or will you include a significant push or incentive to get residential and commercial buildings to convert from gas to electric heat pump heating and water heating in a model?

AES Indiana offers a variety of rebates for the installation of efficient HVAC and water heating equipment today through its portfolio of energy efficiency programs.

For your home: <https://www.aesindiana.com/home-improvement-rebates>

For your business: https://www.aesindiana.com/sites/default/files/2021-08/0121-AESIN-CPRE-2153654-HVAC%20Application_FILLABLE.pdf

We are assessing the potential for enhanced electrification programs through the Market Potential Study that we are conducting with GDS. More details on this analysis will be provided in future meetings.

When does AES Indiana expect to issue the All-Source RFP?

AES Indiana expects to issue its 2022 All-Source Generation RFP later in the week (as of April 12, 2022). The RFP will be posted publicly to the AES Indiana RFP website (<https://www.aesindiana.com/request-proposals-rfp>).

How is ‘cost-effective’ defined?

In Indiana, the economic potential is screened using the utility cost test, which compares the avoided cost of the utility to the cost of the measure to determine whether the cost is effective, which is more generous than other tests that are used in other states that require the full measure cost to be used. If a measure is considered cost effective, implementing it would reduce the PVRR, which would ultimately result in a reduced cost for customers. AES Indiana further evaluates program cost effectiveness at the program level once the IRP is completed as a component of the DSM Plan filings by looking at the

benefit of certain measures (e.g., equipment rebate programs) using both the utility cost test, which looks at the benefit to all customers, and the participant cost test, which evaluates the payback periods for participating customers.

What residential incentives are being proposed for HVAC systems, especially related to air-conditioning?

AES Indiana currently offers a variety of rebates for residential customers to help with efficient HVAC system upgrades, and current program offerings can be found online at <https://www.aesindiana.com/homeimprovement-rebates>. GDS distinguishes between heating and cooling, specifically by technology (e.g., air-conditioning, heat pump electric furnace, etc.) and this level of detail will be available in the appendix of the MPS report when that is completed.

How can AES Indiana customers register for the CoolCents program?

AES Indiana customers can participate in CoolCents by installing a smart-thermostat or by having the program install an auxiliary control switch connected to their HVAC unit. AES Indiana further detailed to determine if either of these options are compatible with a customer's system, please call 866-908-4915 or visit the program website, <https://www.aesindiana.com/coolcentrs-airconditioning-management>, for more information.

Are any delays expected to announced AES Indiana solar and battery projects due to supply chain issues or perspective tariffs currently being discussed?

Hardy Hills is expected to come online in 2023, and AES Indiana is working with the developer to ensure the project is on track and did not have any updates at this time for Hardy Hills. The Petersburg Energy Center is slated for operation in 2024, so it has more time prior to commercial operation, but there are also no updates or changes on the timeline for that project.

What is AES Indiana projecting to do when current Rate REP 15-year contracts expire?

AES Indiana will work with Rate REP customers to determine the appropriate and most customer beneficial rate after the expiration of their contract, and those customers may be eligible for Rate CGS or Rate EDG. The energy generated from existing Rate REP solar projects is forecasted to continue through the IRP study period.

Is AES Indiana considering starting costs for CTs and CCGTs as the share of variable energy grows?

AES Indiana will capture climate change using increased temperature trends for the calculation of normal weather shared in Public Advisory Meeting #1.

Where do residential solar and community solar fit into the RFP?

AES Indiana conducted a solar forecast based on behind the meter solar (i.e., customer driven solar), which AES Indiana reviewed in Public Advisory Meeting #1. AES Indiana models solar in its Capacity Expansion Model, and if community solar-scale resources are selected in the planning model, a portion of the solar could be community solar or AES Indiana could position it that way.

How large of a solar system is possible to install at the Petersburg site?

AES Indiana currently will have 200 MW of injection rights at the Petersburg interconnection following the planned retirement of Petersburg Unit 2 and operation of the Petersburg Energy Center. AES Indiana will specifically request projects that utilize the interconnection in its 2022 RFP. AES Indiana will have 200 MW of injection rights and any projects that utilize the injection rights could account for more or less than 200 MW. AES Indiana will consider projects that are larger, but moving forward with a project larger than 200 MW would require additional steps to secure additional injection rights.

Does AES Indiana plan to discuss resource adequacy assumptions?

AES Indiana plans to model resource accreditation using MISO's seasonal construct. Public Advisory Meeting #3 will focus on reliability and resource adequacy.

Will AES Indiana allow bidders to submit offers using the remaining injection rights in Petersburg?

As a result of AES Indiana's 2019 IRP, AES Indiana retired Petersburg Unit 1 and will retire Petersburg Unit 2, but AES Indiana is also adding the Petersburg Energy Center, which is 500 MW. AES Indiana would be seeking to fill the injection rights left over from these events, which is roughly 200 MW.

When does AES Indiana expect its Certificate of Public Convenience and Necessity ("CPCN") filings to occur?

The timing of CPCN filings are currently unknown and will be better known when the results from the final IRP and a new Short Term Action Plan are complete later this year.

How can environmental groups state that the grid will be more reliable without gas and coal?

AES Indiana's IRP is a process and venue for all stakeholders to present and provide feedback and positions, and it welcomes all viewpoints and will take stakeholder comments into consideration in the IRP process.

Why did AES Indiana mention dispatchable generators when the section is addressing distribution?

The slide presented was specifically directed at distribution, but AES Indiana is focused on the generators that are connected to the distribution system to ensure if it receives dispatch signals or needs to control the generator, AES Indiana is able to do so in a safe manner. Situations could occur where it receives a dispatch signal from a generator, but AES Indiana knows it has crews working on lines nearby, AES Indiana is able to lock out that signal, and other safety items. DG could be a dispatchable generator, but dispatchable generators could also include storage, or rotating machineries, but since the distribution system is starting to look more like the transmission system, AES Indiana has to ensure switching and tagging orders are aligned.

If AES Indiana withholds some level of renewables and stated if it uses an automatic generation control ("AGC") system, could operate renewables as dispatchable and added there are more sophisticated approaches being used

elsewhere, such as Hawaii, to make solar paired with storage dispatchable?

Solar operators in Hawaii face the same issues and operations as presented.

Do presented circuit diagrams indicate what is actually occurring or is it just illustrative?

The circuit diagrams are illustrative to demonstrate challenges presented to AES Indiana distribution system planners and the tools the model allows AES Indiana to utilize to develop solutions.

What capability does AES Indiana have to address battery installation issues given it has a TDSIC plan in place?

AES Indiana is installing reclosers as part of its TDSIC plan and would consider to possibly switch the circuit if the situation on the figure presented were to actually occur. The discussion around adding a battery is just a possibility AES Indiana is discussing, which will not always make sense, but could be the correct solution under the right circumstances. AES Indiana is only presenting on a future state possibility, and AES Indiana will identify the correct solution to the application and installing a small battery will not always make sense.

Is AES Indiana looking at having level 2 charging in only residential settings or is AES Indiana anticipating level 2 charging in commercial spaces?

AES Indiana continues to monitor EV charging, but he is currently seeing level 1 or 2 charging occur both residentially and in non-residential areas, such as grocery stores or office building parking lots.

If a customer approaches AES Indiana to install a level 2 or level 3 charging system, would AES Indiana complete an analysis to identify any required line or transformer upgrades?

Yes, AES Indiana reviews the request, evaluates load, the grid, and whether there is adequate capacity and identifies any necessary equipment that would be needed to serve the customer.

Are there lessons learned or any information from the Blue Indy program that will help address the issues?

AES Indiana can follow up on any lessons learned from the Blue Indy program, but the primary focus in analysis is to understand the chargers that are on the system, understanding charging behavior, and develop methods to model actual EV charging currently on the system. There are also lessons learned from other utilities that are facing the same level 3 charging challenges, and in some situations, the most cost-effective alternative is a high-capacity discharge battery rather than reinforcing substations and taking other steps, so there are lessons learned that are dependent on-site location, behavior, and other innate characteristics of the facility. This highlights the need for stronger integration between resource planning and T&D planning groups, which AES Indiana is already fostering.

Is MISO's dispatchable intermittent resource program is still in place?

MISO has been working towards dispatchable solar, although exact timelines for

implementation are not clear. AES Indiana added this is an area AES Indiana will continue to monitor, and it is important to note that MISO's dispatchable intermittent resource program would impact resources' capacity factor but would not likely have an impact on resources' capacity credit. The dispatchable intermittent resource program has been implemented for wind resources but has not yet been implemented for solar resources. MISO can dispatch wind resources in one direction (adjusting output lower than instantaneous capability), which helps to optimize generation and curtailments in real-time. Wind and solar are still only available when weather allows, therefore renewable resources are not in the same category as dispatchable resources, such as thermal and storage. Wind and solar were assumed to follow a defined generation profile for modeling purposes.

Questions in Stakeholder Presentations

What market was used to develop the cost comparison in Wartsila's analysis and how does it compare to the AES Indiana footprint?

Bhawramaett Broehm of Wartsila responded that Wartsila's study was conducted using data from the Southern Power Pool ("SPP") market, which is adjacent to the MISO market in which AES Indiana is a participant. The cost values will change when comparing markets, and even different nodes within a market, but Wartsila believes the model would produce similar results in the MISO market because the renewable resource penetration is increasing in MISO as well. Wartsila has not yet completed this research using MISO data.

Were NEI members working on breeder reactors to transmute thorium to U-233 (byproducts of which decay to safe levels in only 80 years) given waste disposal issues are not yet solved?

Marcus Nichol of NEI responded that some of NEI's developers are working on recycling technologies to be able to utilize used fuel as new fuel for their reactors. There is a misperception surrounding used nuclear fuel. There there are three items to consider when evaluating the ways to deal with waste for any resource: technology, money to pay for it, and a place to put it. The nuclear industry has the technology to safely handle, store, and dispose of nuclear waste. The nuclear industry collects waste management funds up front and during operations and has over \$40 billion ready and sitting in a trust fund for disposal. The Yucca Mountain Nuclear Waste Repository is currently designated by law as the ultimate location to dispose of nuclear waste. Some individuals believe the industry should utilize a consent-based siting process to determine the location of final disposal. The United States Congress will work to determine the correct disposal locations, but in the meantime, there is not a lot of concern because there is a relatively small volume of waste in its solid form and is easily managed. The industry is working on consolidated storage facilities to be able to manage nuclear waste storage, so he views this as an item to continue to pursue rather than a barrier for nuclear powered resources.

Where is nuclear fuel sourced?

Marcus Nichol of NEI responded is mined mostly in Canada, Kazakhstan, and Australia, though other countries also provide some nuclear fuel, including the U.S. The fuel then

needs to be processed, and enrichment is one of the most important of those steps. There is enrichment in the United States, and other countries, but Russia is a key supplier of enrichment. The United States is pursuing actions to eliminate the Russian source of enrichment in response to the invasion of Ukraine.

Is there technology that can destroy long-lasting nuclear waste?

Marcus Nichol of NEI responded by stating there are companies working on recycling technologies that can turn used fuel into new fuel for advanced reactors and reduce the amount of used fuel that needs to go to a final disposal facility.