2025 Integrated Resource Plan (IRP)

Public Advisory Meeting #1 Minutes

Date: Wednesday, Jan. 29, 2025
Time: 10:00 a.m. to 3:00 p.m. (EST)
Location: Virtual via Microsoft Teams

Agenda:

Time	Topic	Speakers
Morning Starting at 10:00 AM	Virtual Meeting Protocols and Safety Message	Claire Rice, Senior Director, Corporate Affairs & Impact, AES Indiana
	Welcome and Overview of AES Indiana	Brandi Davis-Handy, President, AES Indiana
	Overview of IRP & Resource Planning Model	Erik Miller, Director, Resource Planning, AES Indiana
	2022 IRP Recap	Erik Miller, Director, Resource Planning, AES Indiana
	Overview of Existing Resources and Replacement Resource Options	Erik Miller, Director, Resource Planning, AES Indiana
Break 11:45 AM – 12:15 PM	Lunch	
Afternoon Starting at 12:15 PM	Data Center Potential	Erik Miller, Director, Resource Planning, AES Indiana
	Baseline Energy and Peak Forecast	Mike Russo, Forecast Consultant, Itron
	Electric Vehicle (EV) and Solar PV Forecasts	Woody Zhu, EV & PV Modeling Forecasting, Carnegie Mellon University
	DSM Market Potential Study Introduction	Jeffrey Huber, Overall Project Manager and MPS Lead, GDS Associates
	Final Q&A and Next Steps	

Meeting Summary

Agenda and Introductions

Stewart Ramsay, Managing Executive, Vanry & Associates
(Slides 1-4)
Moderator Stewart Ramsay introduced the meeting, outlined the agenda, and mentioned the expected attendance. Stewart provided a brief overview of the agenda, mentioning that Claire Rice would deliver a safety message and explain the virtual meeting protocol. He also outlined

the key speakers and topics for the day, including presentations from Brandi Davis-Handy, Eric Miller, Mike Russo, Woody Zhu, and Jeffrey Huber.

Virtual Meeting Protocols and Safety

Claire Rice, Senior Director of Corporate Affairs and Impact, AES Indiana
(Slides 5-7)

Claire Rice took over and introduced herself to deliver the safety message. She emphasized that safety is AES's number one value and an integral part of culture.

Claire shared safety tips related to the use of space heaters, especially relevant due to the recent extreme cold weather. She advised on proper placement, avoiding flammable materials, not leaving heaters unattended, and ensuring good ventilation.

She then explained the virtual meeting protocol, encouraging participants to use the chat function for questions and to raise their hands if they wanted to ask questions live. Claire also reminded participants to unmute their microphones when speaking and mentioned that being on camera was optional but advised minimizing distractions.

Welcome and Overview of AES Indiana

Brandi Davis-Handy, President, AES Indiana
(Slides 8-13)

Brandi Davis-Handy, President of AES Indiana, welcomed all participants to the 2025 Integrated Resource Plan (IRP) Public Advisory Meeting. She emphasized the significance of the IRP process for gathering input and analyzing the future of AES Indiana's generation resources.

Brandi highlighted that this meeting was the first of five planned meetings, underscoring the importance of stakeholder engagement throughout the IRP process. Brandi reiterated AES Indiana's core values, particularly focusing on safety and the value of "All Together," which emphasizes collaboration and stakeholder involvement. She stressed that including stakeholders early and often in the IRP process is crucial for sharing plans, gathering feedback, and ensuring stakeholder input. She encouraged participants to provide feedback and ask questions throughout the meeting and future public meetings, expressing gratitude for their time and input.

Brandi discussed the dynamic environment of the energy industry, noting the rapid rise of electrification and artificial intelligence (AI) and the expected increase in power consumption. She emphasized AES Indiana's obligation to meet new load demands while maintaining reliability, resilience, stability, affordability, and environmental sustainability. She highlighted the importance of a balanced approach to the energy transition, involving collaboration and coordination with local, state, and federal stakeholders, as well as other partners.

Brandi provided an overview of AES's global operations, mentioning that AES is a Fortune 500 company with operations in 12 countries across four continents, serving over 2.5 million customers. She noted AES's track record of innovation in technologies transforming the energy sector, including energy storage and AI. She then focused on AES Indiana's local impact, detailing the service territory spanning nearly 530 square miles in central Indiana and serving over 530,000 residential, commercial, and industrial customers. Brandi mentioned AES Indiana's membership in MISO (Midcontinent Independent System Operator) and the benefits of low-cost energy delivery through the system.

Brandi highlighted AES Indiana's generation portfolio, which includes natural gas, wind, solar, and coal units, with plans to repower the remaining coal units to natural gas by 2026. She noted the substantial changes in the generation portfolio since the last IRP meetings in 2022. Brandi outlined AES Indiana's four focus areas: customer centricity, community and economic development, sustainability, and reliability. She emphasized the company's commitment to improving customer experience, making meaningful investments in the community, accelerating cleaner energy solutions, and modernizing the electric grid. She mentioned specific initiatives, such as rolling out new internal training for customer experience, investing over $2 million annually in community organizations, and investing $1.2 billion in grid modernization to ensure a resilient transmission and distribution infrastructure.

Brandi concluded by discussing the energy transition over the past decade, guided by past IRPs, and the resulting changes in AES Indiana's generation portfolio. She highlighted the retirement of coal units and the addition of renewable resources, as well as the planned repowering of coal units to natural gas. She emphasized the importance of the IRP in looking at customer needs, new technologies, fuel costs, energy policies, and other trends over the next 20 years. Brandi expressed appreciation for stakeholder participation and encouraged continued feedback and questions throughout the IRP process.

Overview of IRP & resource planning model

Erik Miller, Director, Resource Planning, AES Indiana
(Slides 14-21)

Erik Miller began by introducing himself. He then explained the Integrated Resource Plan (IRP) as a 20-year strategic plan required every three years by the Indiana Utility Regulatory Commission (IURC). The IRP involves evaluating both supply-side and demand-side resources to meet electric system demand cost-effectively while considering cost, risk, and uncertainty.

He emphasized the critical role of stakeholders in the IRP process, noting that AES Indiana holds a series of five public advisory meetings and a technical meeting in advance of each public meeting to ensure transparency and collaboration. Erik outlined the timeline for the IRP process, which started in September of the previous year with assumption gathering, including the DSM market potential study and load forecast. The core IRP modeling and portfolio evaluation would follow, leading to the selection of a preferred resource portfolio and short-term action plan, with the final IRP filing scheduled for November 1st. Stewart took a question from Stakeholder Mike Reynolds, who asked if the slides will be shared at some point. Stewart responded and said the slides are posted to the website one week in advance of each meeting and shared a link in the chat.

Erik highlighted the key contributors to the IRP process, including Itron for the load forecast, Carnegie Mellon University for the EV and DG forecasts, GDS Associates for the DSM market potential study, and Charles River Associates for the RFP to inform new resource costs. He also mentioned working with MISO on accreditation changes and Quanta Technology for reliability analysis. Erik explained the use of the encompass model for capacity expansion analysis, which involves inputting assumptions and new resource costs to identify cost-effective options for filling gaps between load and resources. The model evaluates the cost-effectiveness of different portfolios using hourly dispatch and considers energy and capacity revenues. He also mentioned the use of encompass for dispatch analysis, calculating present value revenue requirements (PVRR), and performing stochastic analysis to understand risk and uncertainty.

The evaluation framework for selecting the preferred resource portfolio involves a thorough scorecard process that considers the five pillars of electric service: affordability, environmental sustainability, reliability, resiliency, and stability. The scorecard also includes risk and opportunity analysis, economic impact analysis, and market exposure. Erik noted that the scorecard process does not prioritize one pillar over another but evaluates portfolios based on overall benefits to customers.

2022 IRP Recap

Erik Miller, Director, Resource Planning, AES Indiana
(Slides 22-28)

Erik recapped the 2022 IRP, focusing on the decision to repower Petersburg units 3 and 4 from coal to natural gas. This decision was based on the evaluation that repowering was the most cost-effective and sustainable option, reducing CO2 emissions by half per megawatt-hour while maintaining reliability with a one-for-one capacity replacement. The repowering project received approval in November 2024, with the conversion scheduled for 2026. The project involves working with Babcock Wilcox as the EPC contractor. Erik also emphasized the importance of winter capacity planning on slide 18 as winter is the tight season for AES Indiana. The accreditation values for resources are adjusted accordingly to ensure sufficient capacity during the winter season.

The 2022 IRP identified a 200 MW shortfall in every portfolio scenario, which was addressed by selecting battery energy storage as the most cost-effective solution. The Pike County Battery Energy Storage project, a 200 MW four-hour battery system located in Petersburg, received approval in January 2024 and is expected to be completed by Q2 2025. This project is being developed in collaboration with AES's Clean Energy Group and Fluence.

In addition to the Pike County project, the Crossvine Solar plus Battery Energy Storage project was also identified as a key component of the 2022 IRP. This project consists of 85 MW of solar and 85 MW of battery storage, located in Dubois County, Indiana. The Crossvine project is currently pending approval, with an expected completion date in 2027. This project is being developed in partnership with BP Lightsource. These projects are part of AES Indiana's broader strategy to transition to a more balanced and sustainable energy portfolio, reducing reliance on coal and increasing the use of natural gas and renewable energy sources. Stakeholder Greg Krieger asked how the scorecard metrics drive decision-making and if one is given more weight or priority over the other. Erik Miller responded and said in the 2022 IRP, no specific pillar was given more weight. He also said the evaluation was based on overall benefits to customers, considering all pillars equally.

Overview of Existing Resources

Erik Miller, Director, Resource Planning, AES Indiana
(Slides 29-34)

Erik Miller continued the meeting with an overview of existing resources. He talked about AES Indiana's current generation mix and explained the chart on slide 30. It represents the types of resources AES Indiana currently has including storage, solar, wind, oil/diesel, and gas. Erik then went through each resource individually. He provided the unit's name, reference name, technology, ICAP, Summer and Winter accreditation, in-service year, and estimated last year in service. He began with the Petersburg 3 & 4 repowering. These units are being converted from coal to natural gas in 2026, maintaining approximately 1000 MW of capacity. The estimated last year in service for these units is 2042.

He then described AES Indiana's existing gas resources which consist of Eagle Valley, several plant assets at Harding Street Station, and two units at Georgetown Station. Eagle Valley is located in Martinsville, IN. This combined cycle gas turbine plant has a capacity of 682 MW and was brought into service in 2018, with a service life until 2055. Erik moved on to the Harding Street units. Units 5, 6, and 7 were converted from coal to natural gas in 2015-2016, these units have capacities of 96 MW, 102 MW, and 420 MW, respectively, with a service life until 2031-2033. Also at Harding Street, Erik mentioned AES Indiana has simple combustion turbine units 4, 5, and 6. These units have capacities of 73 MW, 75 MW, and 146 MW, respectively, with service lives until 2045-2052. Harding Street also has units GT 1 and 2, which are diesel units. Erik explained these units hardly ever run and are there for system emergency or black start. Georgetown units 1 and 4 have capacities of approximately 70 MW each, with a service life until 2050-2052. Erik then discussed on slide 33, AES Indiana's existing renewable resources, which consist of Hardy Hills Solar, Petersburg Energy Center, Pike County Energy Storage, Crossvine Solar + BESS, Hoosier Wind, and two purchase power agreements (PPA).

Finally, Erik talked about AES Indiana's existing Demand-Side Management (DSM) resources. He mentioned AES Indiana has been consistently promoting energy efficiency at a significant level since 2011 and 2012. He explained the chart on slide 34 and that the DSM program savings amount to about 1.1% per year of 2024 sales. He explained these programs had achieved cumulative savings of approximately 8.4% of 2024 sales. For the 2025-2026 planning years, 11 DSM programs were anticipated to continue operating. Erik explained the Air Conditioner Load Management (ACLM) program provides 43 MW worth of summer capacity value. A pilot program on water heater controls provide both summer and winter capacity value. He also mentioned an interruptible tariff load curtailment program is being developed with Clear Result and Virtual Peaker, expected to be filed later this year. This program was selected as a result of the 2022 IRP.

Replacement resource options

Erik Miller, Director, Resource Planning, AES Indiana
(Slides 35-36)

Erik Miller discussed various replacement resource options being considered to ensure a balanced and cost-effective energy portfolio for the future. As presented on slide 36, the team modeled DSM as a resource, considering energy efficiency programs and their cost-effectiveness for customers. They evaluated the potential and costs associated with land-based wind energy. The feasibility and costs of large-scale solar energy projects were also assessed along with various storage options, including longer-duration storage and emerging technologies, with a focus on 4, 6, and 8-hour storage solutions. Erik explained the team evaluated combined cycle gas turbines (CCGT), simple cycle gas turbines (CT), and reciprocating engines as potential resources. And advanced reactors and SMRs were included in the modeling to explore their potential benefits and feasibility.

Stakeholder Ron Wielage asked a question about the remaining CO2 generated by the units discussed on slide 32. He wondered if the CO2 resulted in pollution in the service area. Erik Miller addressed the question and said under current U.S. EPA rules, there is no requirement to limit CO2 emissions from these resources (as listed on slide 32). He also explained that currently, there is no legal recourse for CO2 emissions or pollution.

Data center potential

Erik Miller, Director, Resource Planning, AES Indiana
(Slides 37-38)

Erik Miller discussed the potential impact of data centers on AES Indiana's load forecast. He mentioned that they were in advanced discussions with some data center customers and planned to model several scenarios to account for this uncertainty. Erik explained that AES Indiana intended to include some data center load scenarios in the IRP, although they had not yet determined exactly what those scenarios would look like. He noted that they did not know whether the base case portfolio would include data centers, but regardless, they planned to run a scenario without data centers to evaluate the impact.

Erik highlighted that the load forecast without data centers would be represented by the black line as shown on slide 38, while scenarios with data centers would show increased load, potentially up to one gigawatt or more. He emphasized the importance of modeling multiple scenarios to capture the potential impacts of data centers, especially considering recent market disruptions like DeepSeek.

Baseline energy and peak forecast

Michael Russo, Forecasting Consultant, Itron
(Slides 39-64)

Mike Russo began by introducing himself. He explained that he was there to present the baseline energy and peak load forecast for AES Indiana. He went on to explain the methodology and key drivers. For the methodology, the forecast was based on economic factors, end-use intensities, and weather trends. The models used were monthly models built from tariff build sales and customer data, covering the period from January 2011 to September 2024.The forecast excluded future energy efficiency programs, electric vehicles (EVs), and solar adoption, focusing instead on historical data and trends. This means that while historical energy efficiency savings were embedded in the data, no new savings from future programs were included in the baseline forecast. This approach ensures that the forecast reflects the current state without assuming additional future efficiency gains.

Mike explained that the key economic drivers included household income and a weighted composite economic variable combining Marion County and Indianapolis MSA households. These drivers were used to forecast residential customers and their energy use. Mike answered a question from Stakeholder Patrick Kelly, he asked what the miscellaneous category or factors contained therein of residential end use intensity (based on slide 47)? Patrick noted the continuous annual rise of the miscellaneous category kilowatt hours per household seems very noticeable. Mike responded and said the miscellaneous end use from the Energy Information Administration (EIA) encompasses more than one end use, including dehumidifiers and miscellaneous plug loads. The EIA models miscellaneous as a function of personal income, which explains the increase.

Mike continued the presentation by explaining that end-use intensities, which represent the energy consumption of specific appliances and systems, were projected to decline at a slower rate in the future compared to historical trends. This was due to the impact of past federal codes and standards, particularly in lighting. Stakeholder Sunil asked Mike Russo how he judges the accuracy of the residential and commercial SAE models (based on slide 57). Mike answered that the models are judged by statistical fit, statistical significance of variables, adjusted R-squared or absolute percent error, and out-of-sample testing. Stakeholder Brennan then asked if there is any new data on residential or commercial increases in EV usage. Mike answered by saying historical data includes some level of EV adoption, but future EV usage will be handled separately in the next presentation.

The forecast incorporated trends in cooling degree days (CDDs) and heating degree days (HDDs), reflecting increasing temperatures over time. This adjustment was made to account for the impact of climate change on energy consumption patterns. Finally, the peak load forecast was driven by sector-level models, with cooling, heating, and base load demands interacting with peak day CDDs and HDDs. This approach allowed for a detailed understanding of how different factors contribute to peak energy demand. Stakeholder Sunil asked another question: What is the net effect of an increase in the cooling degree day normals and a decrease in the heating degree day normals on load? Mike Russo answered that the effect is somewhat offsetting on energy, but summer peaks are increasing faster than winter peaks due to the underlying heating and cooling requirements.

Forecast Results

Michael Russo, Forecasting Consultant, Itron
(Slides 65-67)

There was a brief break for lunch and then the meeting resumed. Moderator Stewart Ramsay called the meeting back to order and began with a question from Stakeholder Ron Wielage. He asked how increased use of heat pumps affects the increasing cooling variable. Mike Russo responded to the question and said the projections of heat pumps are based on the Energy Information Association’s (EIA) regional assumptions, which show a slight increase in heat pumps.

After the question, Mike Russo talked about what the forecast results looked like. He noted that the forecasts are based on historical data and trends and are adjusted for expected changes in economic conditions and end-use efficiencies. He referenced the charts on slide 66 to say the residential sales forecast is expected to grow at 1.3 % per year. He noted the forecast does not include future energy efficiency savings, electric vehicles (EVs), or solar adoption. He went on to say the small and large commercial and industrial sectors are forecasted to grow at 0.3% per year and the total energy forecast is projected to grow at 0.7% per year.

Mike referenced slide 67 to explain that summer peaks are expected to grow at 0.8% per year and winter peaks are expected to grow at 0.5% per year. He then handed the meeting back to Erik Miller.

Starting IRP Portfolio/Morning Recap

Erik Miller, Director, Resource Planning, AES Indiana
(Slides 68 & 69)

Erik Miller began this section by noting that the presentation was ahead of schedule according to the agenda. He then provided a brief recap of the morning's content, using slide 69 (Starting IRP Portfolio with data center example) to illustrate his points. Erik explained that the morning discussion covered the fundamentals of an IRP. He used the graph on slide 69 to display the load forecast, clarifying that DSM is not included because the model selects it. He pointed out that the black line represents the load, while the bars at the bottom indicate AES Indiana resources. Erik highlighted that this graph shows AES Indiana winter capacity position, as winter is AES Indiana's "tight" season. He concluded by explaining that the gaps or white spaces against the black line represent the areas AES Indiana aims to fill, which is the purpose of the planning model.

Erik then recapped what he said about data centers in the morning. He explains the black dotted line is an example data center load ramp, and that AES Indiana is in advanced discussions with a few data centers customers. As a result, AES Indiana does intend to include some data center scenarios, load scenarios in this IRP. AES Indiana does intend to still run a scenario that doesn't include data centers. Erik explained the example chart assumed approximately one GW worth of data center. This is approximately 1/3 of load to double load. Erik explained that there could be market disruptions like the Deep Seek news. As a result, AES Indiana intends to model multiple scenarios to capture potential impacts of data centers.

Erik then explained the Itron will run a high and low economic scenario which with have varying economics. He said that there will essentially be 3 forecasts to choose from. Erik said Dr. Woody Zhu from Carnegie Mellon is going to talk about the EV and PV forecast and the base high and low EV and PV forecast. Erik explains that a few different scenarios will be looked at in environmental policy. He explains these could include things like greenhouse gas rules going away or the IRA going away. Then there will be a portfolio with greenhouse gas rules and with some more aggressive scenarios as well.

Stewart does a quick reminder about using the chat function to ask questions then he turns it over to Woody Zhu.

Electric Vehicle/Solar PV Forecasts

Woody Zhu, Assistant Professor, Carnegie Mellon University
(Slides 70-95)

Woody Zhu welcomed everyone on the call and introduced himself. He introduced the team he worked with: Wenbin Zhou (CMU), Erik Miller (AES Indiana), Rob Witworth (AES Indiana), Ryan Yang (AES Indiana), Victoria Cooper (AES Indiana).

Woody explained that distributed energy resources (DERs) were the main focus of this project. He explained that DER is a set of small-scale generation and storage technologies that are connected to the electric distribution system. Woody presented a slide showing a bar graph labeled “Number of Solar Installation in the United States”. This shows a dramatic growth in adoption of DERs over the last decade. He explained the goal of this project was to provide a long-term substation-level and territory-level forecast for the growth of EV and customer solar on AES Indiana’s system, provide base, high, and low forecasts for inclusion in AES Indiana IRP Scenario Analysis, and reveal insights that inform strategic decision-making.

Woody then gives an overview of the EV unit prediction results. He shows a graph that depicts the total number of EV units starting at 2024 to 2048. He mentioned that there is a lot of uncertainty in the actual growth. Then, he shows a graph with the forecasted EV energy (MWh). Next, Woody presents the forecast for customer solar units. This is roughly 18,000-80,000 installations in 2050. He states the market is growing, but there is still a lot of uncertainty. After that, he presents a chart showing the customer solar energy (MWh) forecast. This is roughly .3 million to 1.2 million in 2050. Woody explains the key takeaways are: there is a rapid initial growth phase for EV/solar adoption, which gradually slows, with a plateau projected around 2036. At the substation level, the analysis identifies significant spatial disparity in growth magnitude and uncertainty. This pattern suggests that high-adoption substations are also areas of high forecast uncertainty. A listener asked if the Customer solar unit forecast was just for residential. Woody went on to confirm that as true.

Next, Woody presents a high-level overview of the development methodology. He explains data has been actively collected from various sources in the real world. CMU developed a cutting-edge machine learning model that is able to digest all the information that can be found online. Using that model CMU can calibrate the performance model to produce a prediction of the EV and solar growth. The model and their predictive results are used to generate useful insights for policymakers as well

Woody then provides an overview of the data that was used in the analysis. There are four major categories of data that have been utilized in analysis and model development. First is the PV data that was provided by AES Indiana. This includes very detailed customer level solar records that give information about the location and the time when and where solar has been adapted. Also access to very fine-grained information such the battery information, the capacity of the panels, Installers was used. Information on the power grid provided from AES Indiana such as outage records and load records were utilized. Woody then explained that data from the US Census Bureau was used and that enables mapping of grid related information and can help provide a demographic profile. For example, there is information on household income and education level. The demographic survey was collected by the American Community Survey.

Woody then clarified that in order to get the estimation of the energy, the standard that has been adopted in the previous IRP was followed. Woody explained the assumption chart on slide 81. He said the chart gives you the mapping from the energy level to the unit of the adoptions or both solar and EV. Woody then provided an overview of the PV data and stated that it is one of the main sources that was used to construct the model and the forecast. Woody presented a figure that showed the spatial distribution of the solar adoption across Indianapolis. The figure showed there is a high concentration in terms of adoption in the downtown area. Then Woody presented a bar graph showing the cumulative historical PV installations over the last decade. Woody observed that there is significant growth in terms of the number of PV adoptions. Woody summarized by saying this data shows rapid growth in terms of adoption. Woody emphasized there is a very strong spatial heterogeneity.

Next, Woody presented an overview of the EV data. Woody presented a map showing EV adoption in the state of Indiana and explained that most of the EV adoption in that state is taking place in the downtown area or the north part of the city. Similar to the PV adoption, Woody emphasized there is a very strong spatial heterogeneity. Woody then presented two bar graphs that show the comparison between gas vehicles and EV vehicles registered per year in Indiana from 2018-2024. The gas vehicle registration graph depicts a constant number of registrations per year, while the EV graph shows increasing registrations each year since 2018. Woody explained this emphasized one of the technical challenges that he wanted to address when developing the predictive model.

Woody then went to the next slide and presented the distribution system analysis. Woody explained that, using data from AES, he calculated the number of installations at the circuit level and substation level, and then found that there are roughly 5 installations per circuit and roughly 24 installations per substation. Woody explained this underscores the issue of data sparsity at a substation and circuit level. This means there is not enough information to train the model on a substation or circuit level to understand the dynamic growth. Woody went on to say if one is to look at the final predictive result, it turns out there are roughly 24 installations to 786 installations at the substation level in year 2050, which is a significant change compared to the number being seen in 2024. This shows the need to take immediate action to keep up with the growing demand.

Next Woody explained the correlation analysis that was conducted on the covariates. Woody presented data that was collected from the US Census data such as household income, household size, and median age. Woody explained that from the map on slide 85 you can see there is a strong spatial correlation between those covariates and the number of adoptions meaning, the inclusion of these covariates is vital for the model.

Woody went on to summarize the data analysis take aways. There's a considerable sparsity, both temporally and spatially, which creates a lot of technical challenges for developing the model to make accurate predictions for the growth of PV and EV. When looking at individual records, one can see that there is very strong randomness and very is unpredictable as data sparsity is an issue being faced. Next Woody explained that the DER growth of the data may depend strongly on some of the key exogenous factors that have been found through our correlation analysis.

Woody then jumped in the method of how the base forecast was derived.

Stewart jumped in and raised a question from stakeholder Sunil about the areas of uncertainty in your forecast. Woody confirmed he will do this.

Woody then explained the mechanism of the model, which aims to estimate the number of adoptions in the next period for a specific regression. Specifically, they want to predict the number of adoptions for both EV and PV for the next month in the region. The prediction is based on two main effects: exogenous influence and endogenous effect. Exogenous influences include factors identified through correlation analysis, such as subsection level load time series data provided by AES, which plays a critical role in the adoption of EV and PV.

Additionally, outages significantly affect adoption levels in local communities. Other exogenous factors considered in the model include information from the Census Bureau, such as inflation-adjusted annual median household income, annual household heating fuel usage percentage, and educational attainment of the population ages 25 and over. All these factors contribute to the prediction of EV and PV adoption.

Woody emphasized the importance of endogenous effects, which refer to the strong interdependence between observations. Woody stated heuristically, when there is a high adoption level in a local community, it is more likely that others in the same community will adopt similar technologies. This makes sense because people tend to follow their neighbors' actions, such as installing solar panels. The modeling assumption of endogenous effects has been shown to deliver accurate prediction results.
To implement the model, Woody explains that they discretized space and time. In terms of space, they look at the substation level, and in terms of time, they discretize the entire time horizon into months. The number of adoptions in a specific grid depends on historical adoptions within the same grid and neighboring grids. For example, in AES territory map, the number of adoptions in Lawrence depends not only on adoptions within Lawrence but also on neighboring substations.

At this point Stewart raised a question from stakeholder Sunil. The question was regarding not seeing any discussion on federal state policy impacts on EV and PV adoption and if that makes sense.

Woody responds saying that is a good question then goes onto say that there have been multiple discussions on the topic. Woody stated that both federal and state policy impacts are implicitly incorporated into the model design. This is something they plan to discuss further when introducing the hyperparameters. The selection of hyperparameters in the model depends on these policies at both the federal and state levels.

Woody continued by discussing the process of predicting a model and quantifying the uncertainty of the prediction to produce high and low predictions. Woody provided an illustrative example to explain the framework being used, which is a cutting-edge machine learning framework called conformal prediction. This framework is agnostic on certain qualification frameworks and is capable of producing upper and lower bounds of a prediction.

Woody explained that the framework works by separating the data sets and creating a calibration set. This calibration set is used to evaluate the model's performance, and based on this evaluation, the knowledge is extrapolated to predict future performance. The framework helps in understanding how well or poorly the model will perform in the future.

An example is given where the green line on slide 94 represents the prediction produced by the predictor model. The conformal prediction framework calibrates the performance of the predictive model and generates upper and lower bounds of the forecast, indicated by the blue line. This understanding is used to construct high and low base predictions.

Woody said one key advantage of conformal prediction is that it provides a statistical guarantee. For instance, if a prediction is delivered at a 90% confidence level, the confidence interval generated by the conformal prediction framework has a high confidence of containing the ground truth in the future.

Woody mentions that they will show more results in the next exercise to demonstrate how the framework works in practice. He also referred back to a previous question regarding policy impact, indicating that there are three key points to discuss further.

Stewart paused for a question from stakeholder Zach Schalk. The question is about the impact of policy changes on compensation rates or rate structures for EV or PV owners and whether these changes are included in the model. Woody Zhu responded by confirming that there is a column in the PV and EV data that shows policy changes, which are incorporated into the model. He mentioned that the model includes information on the rates customers adopted when they installed their solar panels, and any policy changes are considered in the predictions.

Woody then continued to discuss three key hyperparameters that are crucial for the final forecast: confidence level, tipping point, and penetration rate. The confidence level determines the quality and quantity of the predictions, and they chose a 70% confidence level based on discussions with AES Indiana and model evaluation. The tipping point, which indicates when the fastest growth rate will occur, was determined through literature studies and expert opinions, with the US tipping point expected between 2021 and 2031, and the Indianapolis region around 2029. The penetration rate, indicating the saturated market size, was determined through public surveys and discussions, with a final selection of 56%.

Woody went on to explain for PV, similar hyperparameters were chosen. The confidence level is 90% for residential predictions and 10% for commercial units. He stated the tipping point for solar panel growth is expected to continue rising until 2029, with policy incentives taking effect until 2022, leading to a final selection of 2032 for the tipping point parameter. The penetration rate is 7% for residential units and 4% for commercial units, with California having the highest rate at 8%.

Woody then highlighted that in addition to forecasts, they also provide a dashboard that allows users to play with the predictive tool by tuning hyperparameters. The predictions are publicly available online, and users can access detailed statistics and references used in the predictive model.

Zach Schalk asked whether the model factors in the "Solar for All" program, which has federal funding to deploy various types of local solar to serve more than 1000 low-income households by 2029.

Woody Zhu responded by stating that their forecast results are comprehensive because they have utilized all available solar data from AES. Although Woody does not have specific knowledge about the program, they believe the solar data provided by AES likely includes information from all programs. Woody then deferred to Erik Miller for further clarification.

Erik Miller acknowledged Woody's response and mentioned that they would revisit the assumptions to ensure they fully capture the "Solar for All" program. He explained that they use a basis for penetration rate and tipping point to adjust the forecast and would circle back to verify their approach. Erik noted that this is one of the many uncertainties in the IRP due to the change in administration and the freezing of funds for the program. He emphasized the need to work with stakeholders to determine the final approach.

Woody Zhu thanked Erik and opened the floor for additional questions. Stewart Ramsay clarified that a question about federal policy incentives was broader and not specific to Woody's model.

Next Stewart called to attention a question from stakeholder Sunil who asked whether the model factors in the price expectation for gasoline. Woody Zhu responded by stating that the model does not factor in gasoline prices directly. However, Woody emphasized that the model uses conformal prediction, which allows for reliable high and low base predictions even if some factors are overlooked. This approach ensures statistical reliability, although the confidence intervals might be wider if many factors are ignored.

Woody then moved on to discuss the model evaluation. He explained that the model's performance was tested using out-of-sample experiments, comparing it to other state-of-the-art methods. The results showed that their model followed the ground truth closely and delivered stable and accurate predictions with smaller errors compared to other methods. The model's performance was quantified using metrics like mean, absolute error and standard deviation, and it outperformed existing baselines significantly.

Woody also highlighted the reliability of their uncertainty quantification (UQ) framework. He explained two key metrics: validity (how likely the confidence interval covers the ground truth) and size (how wide the confidence interval is). Their method achieved nearly 100% validity and the smallest confidence interval compared to other baselines, making it both reliable and efficient for generating useful insights.

Woody concluded by thanking the audience and stating he is open to questions.

2025 DSM Market Potential Study ("MPS") Introduction

Jeffery Huber, Overall Project Manager and MPS Lead, GDS Associates
(Slides 96-122)

Stewart began with a brief introduction of Jeff, who then elaborated on his background, mentioning his previous work with AES Indiana and the IRP. Jeff outlined the agenda for his segment of the presentation, highlighting key topics such as the MPS Overview, Market Research Activities, Energy Efficiency Overview, Demand Response Overview, and the IRP inputs.

Jeff then began to discuss how his work plays into the overall process. Jeff stated that the market potential study is a look into the realm of what is possible, primarily energy efficiency and demand response. He looked at items such as cost effectiveness and what is achievable. He said one of those levels of achievable potential gets chosen to be put into the IRP as a selectable resource. Then what gets selected from the IRP gets put out to an RFP for vendors to bid on and to implement and administer those programs. It becomes part of what is developed as part of the process and becomes the implementation plan that ultimately gets offered to AES customers.

Jeff continued by explaining past studies and the current scope. He states the overall effort, and scope has been relatively similar, but there have been some minor changes for 2025. He went on to explain the scope of this MPS. First is an end-use analysis which is primary market research to collect data on the types of electric end uses and equipment that are being used in homes and businesses. As well as being part of the MPS, this is also used to inform some elements of the load forecast. Next, Jeff briefly discussed Secondary Market Research. This is looking to other research that's available. Jeff explained this could be data from AES for other purposes, EM&V results, or data from regional sources. Jeff then explained that next is the energy efficiency market potential study. Jeff said this is the actual "nuts and bolts" he will be talking through the methodology of that. Jeff said then the Demand Response Study will be discussed and the electrification analysis. Then Jeff states the last element of the scope is to take the results of the market potential study and create DSM IRP inputs.

Jeff then went on to discuss the deliverables for this project. First, Jeff said there will be a memo about the market research and updated end-use indices used in future load forecasts. Second, will be a full market potential study for energy efficiency and demand response, and then he stated the key deliverable is the IRP inputs. Jeff noted that GDS does not come up with the load forecast, rather uses the load forecast as an input. There will not be an EV forecast. Jeff stated there was an element of that in the prior IRP, but now there is a more sophisticated model out there that can be utilized. GDS will use the EV and PV forecast as inputs. Jeff said this is similar to the treatment of battery energy storage systems. Jeff stated GDS is not looking at a utility sponsored fuel switching electrification program.

Stewart raised a question from stakeholder Anna Sommer. Anna came out of mute to ask her question. She started by laying out her understanding of the MPS process. She said that the primary use of the load forecast from the IRP for the purposes of the market potential study is to say there is this projection of load, for example in the residential sector, and it is thought that residential load is divided between different end use like heating, cooling, and miscellaneous.

She says this will take that as sort of an indication of how much load we potentially treat with energy efficiency measures that we might study in the MPS. She stated the miscellaneous category is important and as Mike said, is increasing in the residential sector. Anna said without having any sense of what appliances are contained within the miscellaneous category, you might not assign any measures in the MPS to that category. She asked if that was a fair characterization and if so, can Jeff explain how that problem is to be solved. Jeff agreed and said yes, the primary use case is to inform how much of that load you know we can affect. Jeff then discussed the approach to energy savings in residential and commercial sectors. Jeff explained that in the residential case, they use a bottom-up approach. This involves building up the number of households, identifying those that might have a specific piece of equipment, and determining the number of households that can be affected. They then calculate the unit energy savings and the total savings relative to the forecasted load. It is crucial to ensure that the savings do not exceed the forecasted load and to understand the impact of the measures implemented.

Jeff emphasized the importance of having a comprehensive list of measures that target all indices, including heating, cooling, water heating, appliances, and some plug loads. Jeff acknowledged that there might be growing plug loads that cannot be affected if there is no specific measure targeting them. In such cases, behavioral measures, where people choose to conserve energy at different times, can be an option.

In the commercial sector, a top-down approach is used. The load forecast serves as the starting point, and the load is disaggregated. Despite this, there remains a relatively sizable miscellaneous end-use category. Custom measures are developed to target these miscellaneous end-users, even if the specific end-use is not known. The goal is to save a percentage of that load at a typical cost.

Anna Sommer then commented that in Commercial and Industrial (C&I) programs, a dedicated person goes into a facility to identify efficiency improvements. This approach is not feasible on the residential side due to the relatively small savings. Anna asked if there is a way to assign more measures to the miscellaneous category if more load is assigned to it, or if they just stick to the existing measures and their associated potential based on the forecast.

Jeff responded saying that the number of measures is not static from study to study. They start with what is currently being offered and looked at, but as new measures are added to other Technical Reference Manuals, they can pick up additional measures. They also work with the DSM oversight board to discuss emerging technologies that could address some of the miscellaneous loads.

Anna then asked about a saturation study mentioned in a separate meeting and whether it plays a role in identifying appliances that might be treated with potential measures in the miscellaneous category. Jeffrey explained that they conducted an end-use analysis, which involves a short online survey asking about certain types of equipment in households and businesses. This helps understand key appliances but is not an open-ended survey that collects information on everything in a household.

Erik Miller confirmed Jeffrey's explanation, adding that the end-use analysis helps understand saturations and inefficiencies of different equipment in residential and commercial sectors. Anna concluded by thanking Jeffrey and Erik for their explanations.

Jeff then moved onto an overview of the overall project timeline. Jeff mentions that they are currently in the field with the end-use analysis, which is expected to wrap up by the end of the month. They are also in the process of setting up all the data for modeling energy efficiency and demand response. This involves cataloging measures and assumptions, with an opportunity to dig deeper based on feedback. The goal is to produce draft results by the end of March and final results in May, which will be discussed in a subsequent meeting. The final results will be used as inputs for the IRP to be modeled for selection in April and finalized in May.

Jeff then moved into the scope of work for the end-use analysis. The primary goal is to improve the inputs typically used in AES's load forecast and the GDS market potential study. The end-use survey aims to gather more AES-specific information about key end uses and electric-consuming equipment, their saturations, and potential efficiencies. This information might be used to slightly modify the load forecast to make it more AES-specific.
On the residential side, the focus is on market share, energy consumption, and small commercial and industrial sectors. The research effort also aims to get a better understanding of the distribution of customers by building type and sales by building type. This data will be used to refine estimates by disaggregating the load forecast by building type and end use. The survey is conducted online to keep costs down and expedite the process. Email recruitment is used to gather responses quickly, with survey reminders sent to ensure a good response rate. The data collection elements are limited to items that can be answered accurately by homeowners or business owners. Questions include home ownership, the age and count of equipment, whether the equipment is Energy Star rated, and the presence of smart appliances. Understanding the changes in plug loads and the presence of smart appliances can influence utility load control and demand response programs. The survey also asks about electric vehicles to understand their current saturation beyond what can be obtained from the BMV.

Jeff then said for the non-residential sector, the focus is on key end uses such as lighting, electric cooling systems, heating, ventilation, water heating, and refrigeration equipment. The survey asks about the presence and efficiency saturation of these systems, including the types of controls on lighting or HVAC systems. The goal is to get a better understanding of what businesses have in their facilities.

Jeff mentioned that market research is underway, with both residential and non-residential segments being surveyed. They have segmented between single-family and multi-family homes, aiming for a specific number of total responses. The target is to achieve a significant number of responses to analyze data at an industry-standard level of 90/10 confidence and precision. Jeff noted that they have exceeded their target sample quotas, with over 900 residential responses and between 250 and 300 non-residential responses.

In addition to the primary market research, Jeff mentioned plans to conduct additional research on willingness to participate. This research does not go into the load forecast but is used for the market potential study. It involves asking homeowners or business owners about certain types of equipment and their likelihood of participating in programs given certain parameters, such as incentive or rebate levels. Jeff discussed the previous cycle of surveys where they asked about various energy efficiency equipment and end uses, such as heating and cooling systems, water heating, appliances, and lighting. They have conducted these surveys for a couple of cycles and did not expect to receive significantly different answers this time. Therefore, they decided to pivot and include more questions about demand response programs. They revisited questions about electric vehicles and photovoltaic systems, focusing on barriers and motivational factors to better understand potential adoption rates. Additionally, they included more questions about demand response, particularly in the commercial sector, to gather data on multiple demand response rate options, including interruptible rates, to inform potential adoption rates.

Jeff explained that they tailored some questions to address uncertainties about participation with federal funding, such as the HERO program, which encourages electrification. They aimed to understand if people would be likely to participate if funding sources covered a substantial portion of the cost to switch. They also inquired about the ability to participate in demand response programs across multiple seasons, not just the summer season, as winter peak demand is becoming more important. This additional information will help inform the market potential study.

Moving on from market research, Jeff discussed the process of the energy efficiency market potential study. He presented a graphic illustrating the general process, starting with gathering all the data used as inputs. This includes the load forecast, which is then segmented based on available data from market research and secondary sources, as well as collecting measurement data. Once all inputs are collected, they move into the modeling process, analyzing the technical, economic, and achievable potential. The technical potential represents the hypothetical maximum if everyone purchased and installed efficient equipment. The economic potential is a subset of the technical potential, focusing on what is cost-effective. The achievable potential model's adoption rates are informed by adoption rate research, considering barriers and incentive levels.

Jeff emphasized the importance of aligning the analysis timeframe with the IRP input timeframe needed by AES. They require sales forecast projections, sales by industry codes, avoided costs, economic inputs like inflation and discount rates, line losses, current program offerings, incentive levels, program costs, participation levels, and EM&V results. This ensures consistency with the IRP and accurate quantification of benefits.

Jeff explained the market analysis involves understanding the load forecast, sales, customer counts, and projections. They aim to break down data by residential single-family and multi-family homes, as savings and costs differ across these segments. They also consider market rate and income-qualified customers, as program delivery strategies and economics vary between these groups. For the commercial and industrial sectors, they analyze sales by building type and industry type, factoring eligible sales into the model. They ensure that savings are not attributed to opt-out customers who do not participate in the energy efficiency surcharge.

Jeff provided an illustrative example from the previous cycle, showing opt-out and non-opt-out sales. They also aim to understand consumption by end use, relying on AES-specific data and other sources to estimate unit energy consumption and disaggregate the load and that calibrates back to the load forecast.

Jeff discussed the importance of using secondary sources and how they undergo routine updates. He highlights that as they progress through studies from one cycle to the next, they revisit and analyze changes. For instance, data from the Energy Efficiency Administration's annual energy outlook shows how the breakdown of electric consumption in residential and commercial sectors has evolved over time. Jeff pointed out that lighting consumption has decreased significantly from 2016 to 2023 projections, both in residential and commercial sectors. This reduction in lighting consumption means that other end uses are growing as lighting decreases, affecting the overall distribution of electric consumption in buildings. Jeff then moved on to discuss the measure data for energy efficiency. They aim to have a comprehensive list of measures targeting various end uses, including different tiers and sizes of HVAC equipment, air source heat pumps, water heating equipment, low flow devices, appliances (both big and small), small plug loads, electronic loads, and behavioral measures. On the commercial side, they look at measures targeting the various end uses in commercial buildings. The savings from these measures are primarily quantified using the Indiana Technical Reference Manual, which provides annual savings, peak demand savings, useful lives, and measure costs (whether full cost for retrofit measures or incremental cost for time-of-sale measures). They also gather AES-specific information on current measure incentives.

Saturation equipment data does not come from technical reference manuals but from market research and other secondary sources, such as the EIA's residential, commercial, and industrial consumption surveys, the annual energy outlook, Energy Star shipment data, and other data sources. Once they have a clear understanding of the market and have collected measurement data, they move into the modeling phase.

Jeff explained the first step in modeling is to analyze the technical potential, which represents the hypothetical maximum if everyone converted to energy-efficient equipment. Jeff noted that there are limitations to technical potential, such as the location of units and whether they can accommodate certain upgrades. The next phase is to analyze the economic potential, which involves assessing whether measures are cost-effective according to the utility cost test (the primary cost test in Indiana). This test considers the energy and capacity benefits over the lifetime of the savings relative to the utility cost, including incentives and programmatic non-incentive costs. Measures that are cost-effective move on to the next phase.

Jeff explained that at the measure level screening, they do not consider non-incentive programmatic costs, allowing more measures to pass through to the economic potential phase. However, they do eventually factor in these costs at the program level to ensure overall cost-effectiveness. The achievable potential phase layers in additional barriers to participation, recognizing that not everyone will adopt measures even with 100% incentives. They consider both short-term and long-term barriers to participation.

Jeff provided a general equation for estimating technical potential, showing both residential and non-residential approaches. The residential approach is bottom-up, starting with the number of households, while the non-residential approach is top-down, starting with sales. Both approaches aim to understand usage, the number of homes with certain equipment, and the potential savings. The industrial approach is also top-down but broader, targeting typical savings for specific end uses rather than individual measures due to the diversity of industrial equipment.

The achievable potential relies on adoption rates, informed by previous and updated research on willingness to participate. Jeff explained that at various incentive levels, they estimate how likely people are to purchase and install equipment. For example, with 100% incentives, they might achieve 80% market adoption over the long term, while 50% incentives might result in 40-60% adoption. The starting point for adoption rates is based on current energy efficiency saturation.

The outputs of the market potential study include energy savings by potential type (technical, economic, achievable), scenarios of achievable potential, gross and net savings, incremental and cumulative annual potential by sector, home or building type, income type, end use, and programs. They also analyze demand savings (summer and winter seasonal impacts), associated incentives, non-incentive costs, benefits, cost-effectiveness screening, top program measures, and opportunities for additional savings from measures not currently offered.
Jeff paused for questions and mentioned that he will be moving into the topic of demand response. There were no questions asked at that time.

Jeff then began providing an overview of the demand response potential. He explained that, similar to the energy efficiency process, they use a graphic representation to illustrate the steps involved. The process starts with gathering inputs, which include identifying the programs to be considered, determining the incentive structures, and evaluating the current strategies and offerings. They also look at adoption parameters, such as whether the program is opt-in or opt-out, current customer engagement, and applicability. Additionally, they gather data on load impacts, both from currently offered programs and similar programs in other jurisdictions, to understand the potential reductions and associated costs, including equipment installation, vendor fees, and incentives.

Jeff emphasized the importance of understanding the hierarchy of demand response programs, as customers may not be able to participate in multiple programs that affect the same indices. Typically, existing programs are prioritized, and the potential for additional programs is assessed afterward. This hierarchy helps prevent double counting and ensures accurate estimation of potential.

Next, Jeff discussed the specific programs being considered for the current market potential study. He highlights the programs currently offered by AES, which are prioritized in the hierarchy, and additional programs being evaluated for future potential.

To estimate potential, they start by identifying eligible customers for each program. For example, direct load control for air conditioning is restricted to homes with central A/C, and smart thermostat programs are limited to homes with or willing to install smart thermostats. They then apply the hierarchy to prevent double counting, subtracting higher priority program participants from the eligible market for lower priority programs. Participation rates are informed by market research, including willingness to participate in surveys and data from similar programs in other jurisdictions. This helps address potential barriers due to unfamiliarity with demand response programs.

Jeff provided an example to illustrate the calculation process. If there are 1,000 residential customers and 80% have central A/C, then 800 customers are eligible. If 100 customers participate in a higher priority program, the pool is reduced to 700. With a 10% adoption rate, they might get 70 participants in the program for that year.

The demand response model requires numerous inputs, including the number of customers, overall load, percent reduced load, useful life, cost information, and utility-specific avoided costs. These inputs help determine cost-effectiveness and achievable potential. Potential savings are modeled for each season, considering per participant reduction estimates and eligibility. For instance, a smart thermostat program might have higher participation in summer than winter due to differences in heating and cooling systems.

Jeff then transitioned to discussing electrification. He clarified that their approach to electrification is not a full market potential study and does not involve utility intervention. Instead, they focus on updated economics of electrification for key building technologies, excluding EVs, which are handled separately. The goal is to assess the cost-effectiveness of switching from non-electric to electric heating, water heating, and some limited appliances. They use a diffusion curve to estimate a range of possible adoption outcomes and understand the potential impacts over time. This analysis helps determine if adjustments to the load forecast are needed to account for naturally occurring electrification.

Jeff then explained that the projections of electrification are used to understand whether any adjustments are necessary for the load forecast used in the IRP. Jeff presented a slide that has some illustrations of what happened in 2022 when there was a low, medium, and high scenario. Over the 20-year period one can see it's relatively modest ranging from 1.3 to 4.4% above the AES base forecast.

Jeff then compared the current study with other national studies, such as the National Electrification Futures Study. He noted that the reference case in that study models about 1% growth over a base forecast by 2042, focusing on residential and commercial sectors without including industrial sectors.

Jeff then discussed energy efficiency and demand response. He explained that the outputs of the market potential study need to inform inputs for DSM (Demand-Side Management) into the IRP (Integrated Resource Plan). Having gone through two cycles, they have learned how to structure these inputs better. Based on prior feedback from the DSM Oversight Board for AES, they propose that DSM inputs be divided into energy efficiency and demand response and further categorized by sector. This includes residential DSM bundles, an income-qualified sector bundle, and a non-residential sector bundle.

Jeff explained the residential and non-residential bundles are considered selectable resources. The income-qualified sector is treated as a "going-in" resource or a pre-selected resource off the top of the load forecast. These programs often have high incentive levels and administrative costs, making them costly and at risk of not being cost-effective or selected. However, they are valuable programs for AES customers and are treated as going-in resources. The larger suite of programs is likely cost-effective and has a high likelihood of selection in the IRP.

Jeff mentioned that they will likely develop three vintages of bundles: one for 2027-2029, another for 2030-2032, and the final years of the IRP. The first two years align with the DSM program planning cycle, providing a sense of what is being selected and how programs should look. The last group of years allows for course correction as needed.

The achievable potential will be based on realistic achievable potential, generally aligned with current incentive levels, or an enhanced realistic achievable potential. This involves working with the oversight board to define ways to gather additional savings by increasing incentives for low-cost measures with low uptake. The inputs are based on net savings, netting out free riders who would participate without utility programs. These free riders are likely included in the load forecast, so the focus is on net savings beyond them.

Jeff explains the costs included in the IRP are utility incentive and non-incentive costs. There is an adjustment to account for the benefit of energy efficiency that is not captured in the IRP capacity expansion model for transmission and distribution. This benefit is calculated as a lifetime benefit, rolled back into a single-year value, and deducted from the cost to capture the benefit in resource evaluation.

Jeff stated ultimately, the IRP includes hourly savings numbers rather than annual savings numbers. For each year and each bundle, there will be an 8760 or hourly shape of savings based on the distribution of end uses within the bundle. If a bundle is primarily lighting, the 8760 shape follows the lighting end use. If it includes various end uses, it will be a weighted average of those end uses, predicting 8760 impacts year over year.
Jeff concluded by summarizing that today's discussion focused on what they are doing and welcomes feedback. In the next IRP setting, Jeff said he be will discussing the results of the market potential study, including the identified savings potential for energy efficiency and demand response, and what will be modeled in the IRP.

Final Q&A and Next Steps

Stewart Ramsay, Managing Executive, Vanry & Associates
Erik Miller, Director, Resource Planning, AES Indiana
(Slide 122-124)

Stweart thanked Jeff for his presentation and opened up the meeting for questions. Stakeholder Ray Wilson stated he would like to ask a question. Ray Wilson stated he has participated in many Integrated Resource Plans over the years and emphasizes the importance of utilizing solar energy, which he states is free and abundant. He highlight the potential for solar panels to be installed on warehouses, homes, and parking lots in the Indianapolis/AES Indiana territory, which would enhance the resilience of the utility. Despite repeatedly bringing up this idea, he felt it has not been seriously considered in previous IRPs.

Ray requested that AES Indiana commit to developing a robust study plan over the next year to explore the potential of solar energy and battery storage. He expressed skepticism about the inclusion of small modular nuclear reactors in the IRP, citing their high costs and unavailability in the country. Instead, he advocated for filling any gaps in the IRP with solar and battery solutions, which are known to be cheaper and have zero fuel costs.

Finally, Ray asked if AES Indiana can continue to lead efforts in reducing carbon emissions, despite the current actions or inactions of national and state governments. Ray sought feedback on his suggestions and hope for a commitment to doing the right thing for the environment and the community.

Erik Miller then acknowledged the importance of solar energy and mentions that AES Indiana is in the process of implementing 500 megawatts of solar power across various projects, including Hardy Hills, Pete Energy Center, and REP Solar. He said AES Indiana expects to have this capacity by the end of 2025. However, Erik highlighted a significant challenge with solar energy: it receives almost no capacity value from MISO (Midcontinent Independent System Operator) during the winter season, which complicates capacity planning.

Erik explained that while solar alone faces challenges in winter, solar plus storage projects look much better from a modeling perspective. He mentioned ongoing hybrid projects like Pete Energy Center and Crossvine (pending approval), which include both solar and storage components.

Regarding the study plan, Erik stated that the IRP is the current study being conducted, and he emphasizes the need to work closely with stakeholders to understand the challenges solar energy faces in collaboration with MISO.

On the topic of small modular nuclear reactors, Erik acknowledged the concerns raised and agreed that there hasn't been one built yet. He mentioned that it is a first-of-its-kind technology with a wide range of potential costs, which will be captured in their planning. Despite the cost challenges, Erik stated he believes it is worth considering due to the attention it is receiving in Indiana.

Finally, Erik emphasizes that when making decisions for customers, AES Indiana is required to consider the five pillars of electric service: affordability, reliability, resiliency, stability, and sustainability. Erik assured that sustainability is an important pillar and will be considered in their evaluations.

Ray thanked Erik and stated that he will be keeping an eye out on this topic. He followed up with stating that he has solar power at his home and sends extra electricity back to the grid even in winter.

Next, Stewart called attention to stakeholder Emily Pointek who had raised her hand to ask a question.

Emily Piontek, representing Clean Grid Alliance, asked about the process of developing scenarios for the IRP. She wanted to know if the scenarios would be developed with stakeholder input or if they would be created behind the scenes and then presented to the stakeholders.

Erik Miller responded by explaining that they are in advanced discussions with data center customers, but the specific load from these customers is still uncertain. He mentioned that there are two types of scenarios: load scenarios, which involve different levels of load, and environmental regulation scenarios, which range from minimal regulation to a renewable portfolio standard. AES Indiana aims to cover a wide range of potential future regulations and create extreme scenarios.

Erik Miller stated that the process would likely involve developing "straw man" scenarios internally and then presenting them to stakeholders for input in future meetings. He continued with saying stakeholders would have the opportunity to provide feedback, which could be incorporated into the scenarios or at least receive an explanation if their suggestions are not adopted.

Stewart Ramsay clarified that they would not be running all the scenarios but rather framing and describing them to stakeholders. This approach allows for input and adjustments before finalizing the scenarios to be run.

Erik Miller confirmed this and added that the presentations for the meetings would be posted one week in advance, as required by the rules. This allows stakeholders to review the materials and come prepared with detailed questions, leading to more productive meetings.

Stewart Ramsay mentioned that AES aims to ensure sufficient time for discussions in each meeting, even if it means finishing early. He emphasized the importance of not shortchanging any discussions and ensuring that critical components are covered.

Erik Miller concluded by outlining the schedule for the next public advisory meetings. The second meeting is expected to take place in March or April, with an invite sent out by the end of February. The third meeting is likely to occur in June or July. The next meeting will cover high and low load forecasts, DSM (Demand-Side Management), and the scenario framework. Erik stated that AES Indiana will shed any new light on data centers when possible and appropriate. He continued by saying June/July is the time for meeting three. August/September for meeting four and then conclude in October with meeting 5 and file November 1st. He again reminds folks of the materials being posted to the IRP website. He concluded by saying AES Indiana is looking forward to a good planning year and working with all the stakeholders.