Draft Director's Report

For Wabash Valley Power Association (WVPA) 2020 Integrated Resource Plan

May 9, 2023

Dr. Bradley Borum
Director of Research, Policy and Planning
on behalf of the Indiana Utility Regulatory Commission

TABLE OF CONTENTS

Draft Director's Report Applicable to WVPA's 2020 Integrated Resource Plan and Planning Process

I. Purpose of IRPs

Wabash Valley Power Association's (WVPA) 2020 Integrated Resource Plan (IRP) was submitted on Nov. 1, 2021. By statute and rule, integrated resource planning requires each utility that owns generating facilities to prepare an IRP and make continuing improvements to its planning as part of its obligation to ensure reliable and economical power supply to the citizens of Indiana. A primary goal is a well-reasoned, transparent, and comprehensive IRP that will ultimately benefit customers and the utility. At the outset, it is important to emphasize that these are the utilities' plans. In the report, the Director of the Research, Policy and Planning Division does not endorse the IRP nor comment on the desirability of the utility's "preferred resource portfolio" or any proposed resource action.

The essential overarching purpose of the IRP is to develop a long-term power system resource plan that will guide investments to provide safe and reliable electric power at the lowest delivered cost reasonably possible. Because of uncertainties and accompanying risks, these plans need to be flexible as well as support the unprecedented pace of change currently occurring in the production, delivery, and use of electricity. IRPs may also be used to inform public policies and are updated regularly.

IRPs are intended to be a systematic approach to better understand the complexities of an uncertain future, so utilities can maintain maximum flexibility to address resource requirements. Inherently, IRPs are technical and complex in their use of mathematical modeling that integrates statistics, engineering, and economics to formulate a wide range of possible narratives about plausible futures. The utilities should utilize IRPs to explore the possible implications of a variety of alternative resource decisions. Because of the complexities of an IRP, it is unreasonable to expect absolutely accurate resource planning 20 or more years into the future. Rather, the objective of an IRP is to bolster credibility in a utility's efforts to understand the broad range of possible risks that utilities are confronting. By identifying uncertainties and their associated risks, utilities will be better able to make timely adjustments to their long-term resource portfolio to maintain reliable service at the lowest reasonable cost to customers.

Every Indiana utility and stakeholder anticipates substantial changes in the state's resource mix due to several factors and, increasingly, Indiana's electric utilities are using IRPs as a foundation for their business plans. Since Indiana is part of a vast interconnected power system, Indiana is affected by the enormity of changes throughout the region and nation.

The resource portfolios emanating from the IRPs should not be regarded as being the definitive plan that a utility commits to undertake. Rather, IRPs should be regarded as illustrative or an ongoing effort that is based on the best information and judgment at the time the analysis is undertaken. The illustrative plan should provide off-ramps to give utilities maximum optionality to adjust to inevitable changing conditions (e.g., fuel prices, environmental regulations, public policy, technological changes that change the cost effectiveness of various resources, customer needs, etc.) and make appropriate and timely course corrections to alter their resource portfolios.

II. Introduction and Background

WVPA is a generation and transmission (G&T) cooperative based in Indianapolis, Indiana, that provides wholesale electricity to 23 members: 19 in the northern half of Indiana, three in Illinois and one in Missouri. In turn, these distribution cooperatives supply electricity to more than 325,000 retail members. Nearly 76 percent of its retail customer base resides in Indiana, with approximately 16 percent in Illinois, and 8 percent in Missouri.

WVPA supplies electric power to six sub-balancing areas through transmission facilities owned by WVPA or by facilities scheduled through the MISO or PJM regional transmission organizations. WVPA plans for requirements holistically to avoid oversupply while also meeting reliability needs.

WVPA recognizes that the electricity markets have transformed considerably since the 2017 IRP. The factors driving change include changing utility resource portfolios, changing commodity prices, corporate sustainability goals, proposed changes to MISO and PJM markets, increasing interests in distributed energy resources (DERs) and electric vehicles (EVs). For this IRP, WVPA modeled the retirement of coal-fired resources Gibson Unit 5 and Prairie State Unit 1, as well as the Wabash River Highland combustion turbine.

Consistent with the issues discussed above, the Director's report will focus on three broad areas: (1) load forecasting; (2) assessment of demand-side resources broadly defined to include energy efficiency, demand response resources, electric vehicles, and other DERs; and (3) portfolio analysis and the consideration of risk and uncertainty on different resource portfolios.

III. Load Forecasting

Methodology Overview

The load forecast is based on constructing member-specific forecast models that account for long-term structural changes as well as expected population and economic growth. WVPA uses an end-use modeling framework developed by Itron. The approach is to estimate monthly linear regression models that relate system energy and peak demand to constructed end-use variables for heating, cooling, and other use.

The forecast is developed at the member system delivered energy level, then disaggregated into residential, commercial and industrial (C&I), and other (primarily street lighting).

Monthly residential billing data is used to construct residential average use and number of customer models for each member system. These are combined to produce estimates of residential energy sales by member. Other use sales models are estimated with simple linear trend specification.

C&I sales are derived as the difference between total member sales and residential and other use sales forecasts. Pass-Through Loads Customers are large power customers with non-conforming load that require separate forecasts.

Large Customer Load Adjustments

According to WVPA, recent large changes in load due to customer actions will not necessarily be adequately captured in regression models based on historical data. As a result, WVPA uses limited adjustments to a specific customer's energy and demand to account for changes in specific customer business activity. These changes may be the result of business expansion/contraction or

the addition or loss of a major customer. These spot adjustments are provided by member cooperative staff.

WVPA also forecasts Pass-Through Loads. A separate forecast is developed for each Pass-Through Loads customer using regression models and information provided by the customer. Pass Through Loads are not included in the total energy or peak forecast managed by WVPA. However, these large customers are included in WVPA's total planning load because WVPA is ultimately responsible for meeting the large customers' energy requirements and make purchases at market prices to meet the minimum reliability requirements. WVPA works closely with each large customer to purchase defined products for energy from the bilateral market and/or to purchase additional energy, capacity, and transmission from applicable RTO energy, capacity, and transmission markets. These costs are "passed-through" directly to each customer.

Coincident Peak Model

The coincident peak demand model has a specification like that of the energy models. The difference is that the explanatory variables are constructed using monthly coincident peak-day cooling degree day (CDD) and heating degree day (HDD). Peak-day CDD and HDD are developed by finding the average daily temperature on the day of system peak at the weather station assigned to the member based on geographic location.

Sales to System Model

Member sales are based on the member system energy requirements forecast. Historical sales to energy ratios are calculated for each member. A simple regression model is used to project the ratio through the forecast period. Member sales forecasts are then developed by multiplying the member energy forecast by the sales to energy ratio forecast. On average, the sales to energy ratio is 0.958 which translates into a system average distribution loss factor of 4.2%.

Alternative Forecasts

In addition to the base case load forecast, WVPA produced two alternative forecasts using high and low population growth projections. For the high case, WVPA assumed that population grows 50% faster than the base case population growth. Thus, if the base case population growth rate is 0.3% per year, then the high case population growth rate is 0.45% per year. The low case assumes that long-term population growth is 50% lower than the base case. WVPA assumes that the relationship between population and the economic drivers of growth (number of households and GDP) remains the same.

WVPA base case system energy requirements are projected to grow at an average annual rate of 0.8%. Summer coincident peak demand is projected to increase at an average annual rate of 0.8% over the forecast period. In the high growth forecast, energy grows at a 1.0% annual rate and summer peak grows at annual rate of 1.1%. In the low growth case, energy requirements increase an average of 0.6% per year and peak demand by 0.6% per year.

Electric Vehicle (EV) Growth

WVPA prepared a projection of EV growth in the WVPA service territory using U.S. Census Bureau 2018 American Community Survey Tenure by Vehicles Available data. WVPA extrapolated the vehicles available within each occupied housing unit to estimate the number of total vehicles by county. Then they estimated how many of the total vehicles in each county are served by WVPA members by using a ratio of customers to total occupied housing units.

The estimated number of total vehicles in each county was used to project how many of the vehicles are EVs. The Energy Information Administration (EIA) Annual Energy Outlook 2019 reference case projected that total plug-in EV sales approach 17% of new sales in light-duty vehicles by 2050. WVPA used the EIA projection as a base adjusted to reflect the assumption that EV adoption in rural areas will be less than urban areas. WVPA categorized each member for speed of adoption of EVs as high, medium, and low. They then multiplied the number of EVs by an assumed annual energy per vehicle of 4,459 kWh from the National Renewable Energy Laboratory's (NREL) Electric Vehicle Infrastructure Projection Tool (EVI-Pro) Lite.

Distributed Generation

WVPA states that customer owned distributed generation has had very little impact on WVPA's load requirements. WVPA continues to monitor technology developments in distributed resources to determine if future load will be impacted by retail customer-owned generation or storage.

DIRECTOR'S COMMENTS – Load Forecasting

Commercial and Industrial (C&I) is still just calculated as the difference between total sales and the sum of Residential and Other. C&I is not modeled so any error in Residential or Other modeling and forecasting will affect C&I as well. WVPA says this is because C&I sales data is only available on an annual basis for many of their members. But WVPA notes that in the last few years, a majority of WVPA members are more consistently providing monthly C&I sales data. WVPA says it "will continue to perform analysis to evaluate how well each Member's forecast by class compares to actual results and consider implementing a bottom-up C&I model for those Members whose individual load may need improvement and for which monthly C&I data is available." *(WVPA IRP, p. 52)*

Despite the helpful discussion, the Director still wonders why, if WVPA has for each member historic total energy by month, historic residential energy by month, and the data needed to forecast "other," then it seems like WVPA could use this information to derive the monthly commercial history. This derived commercial history could then be used in regression analysis to develop projections of C&I energy requirements.

WVPA states on page 52, "Although the small and large commercial revenue classes are not specifically modeled, Member commercial sales forecast are consistent with forecast assumptions." What does "consistent with forecast assumptions" mean? The Director appreciates the discussion trying to explain how WVPA evaluates consistency. It is based on professional or expert judgement which is largely informed by the economic forecast. The Director acknowledges that expert or professional judgement is a critical part of any long-term planning process and WVPA is being explicit about this exercise of judgement.

The load forecast section starts out talking about Commercial and Industrial (C&I) together and then it just becomes Commercial with no explanation of what Industrial is. Is Industrial the "large customer adjustments"? The Pass-Through loads? Both? And if C&I is the difference between total sales and the sum of Residential and Other how are Commercial and Industrial sales split?

On pages 44-45, WVPA states that the Pass-Through loads are modeled with regression models and information from the customers. However, Table 3-15 on page 54 shows the Pass-Through Load forecast as a constant value starting in 2026. This suggests the regression model is only used for the first few years of the forecast. Why? This also means that the forecast never sees any additions or

subtractions from large loads in the future. This may be reasonable in the short term, but probably not in the long term.

The load forecast section has an inconsistency in the use of the terms "sales" and "requirements". The description in the section starts out referring to "sales" and Table 3-2 is even labeled "sales" but the text right above it referring to it says "requirements". Sales and requirements are not the same thing. There is no explanation at that point in the document as to how WVPA goes from sales to requirements, or the reverse in this case. It's not until page 48 that losses are addressed, and it is explained that sales are calculated by multiplying a historical sales-to-energy ratio by the requirements forecast. So, WVPA forecasts requirements and then derives sales. This is not clear from the earlier part of the section that describes everything as sales.

For distribution losses, the text on age 48 states that a "simple regression model is used to project the ratio throughout the forecast period." WVPA then goes on to state that the system average distribution loss factor was 4.2% over the forecast period. Was a regression used, which seems to imply that the loss factor changes over time based on historical trends, or was an average used? If a regression is used, is there a structural reason to believe that value will trend up or down in the future rather than continue to vary around an average? Note that Table 3-16 on page 55 shows 4.2% distribution losses throughout the forecast.

The report says that a regression model was used to project member non-coincident peak to member coincident peak. Historical member load data was used to construct a monthly demand ratio of own peak to coincident peak demand. This monthly data was used in a simple regression model to project the demand ratio over the forecast period. A non-coincident peak demand forecast was developed by multiplying the coincident peak demand forecast with the demand ratio forecast. Same questions here as for distribution losses. *(WVPA IRP, pages 49-50)*

IV. Demand-Side Management

Summary and Overview

For WVPA, the process of the planning and evaluation of demand response (DR) and energy efficiency (EE) programs consists in evaluating existing programs, collecting information on program implementation, gaining information on the program's technical and economic potential and customer acceptance of new programs. For the 2020 IRP, like the evaluation process in the 2017 IRP, WVPA states it evaluated demand-side resource options on a comparable basis to the supply-side resources.

Energy Efficiency (EE) Resources

WVPA has both a Retail Programs and Services Committee (RP&S) and Working Group that is comprised of Members' personnel, to recommend residential and C&I EE programs for the WVPA portfolio. Programs were selected based on individual Member's mix of retail customers, energy end-uses and power supply requirements. The Committee develops programs and measurement and verification protocols to evaluate the technical and economic viability of EE programs. EE programs are evaluated by comparing program costs to the expected cost of a market-based resource or option purchase. Same as in the 2017 IRP, primary evaluation, measurement, and verification (EM&V) activities are reviews of satisfaction, impact, and cost-effectiveness. Then, WVPA coordinates centralized marketing and outreach for each EE program.

For the 2021 POWER MOVES® initiative, WVPA determined the costs, characteristics, and other parameters of residential and C&I programs by conducting research into the technology offered.

WVPA takes into consideration each technology's purchase cost, operating cost, minimum efficiency, common application in the market, availability in their markets and ease of implementation among other factors. To determine the costs, WVPA obtains high-level program cost estimates from a condensed study of achievable efficiency potential.

According to WVPA, the results of the scenario optimization modeling for the 2020 IRP showed that the low average total cost of the EE resources prompts their consistent selection across all eight expansion plans. Therefore, the main limit of EE is its achievable potential.

Demand Response (DR) Resources

In the 2020 IRP, the DR process begins with the RP&S Committee evaluating potential DR programs that impact peak demand and capacity requirements. DR programs are evaluated by comparing program costs to the expected cost of a market-based resource or option purchase. Then, the Committee evaluated the technical and economic viability of DR options. The primary objective of DR is the reduction of wholesale power costs to the association.

For the economic valuation process, WVPA incorporates a five-year forward look at the wholesale market because program economics change frequently due to the volatility of the wholesale power markets. An initial evaluation is conducted for determination of individual program benefits and costs. This evaluation is also required for existing programs to maintain efficient program design. The screening is then used to ensure efficient and equitable program design for the retail participant, the Member and WVPA. The program screening process consists of the following steps: identifying DR measures and technologies; determining if measures are consistent with overall goals; determining if there is adequate economic or technical market potential; conducting economic evaluation, securing approval from executive level management and Board of Directors; and implementing programs. This process broadly determines how the program will ultimately affect the participant and non-participant, and the rates paid by all customers. Many internal tests are designed to quantify the impacts of a DR program for a particular group.

The results of the screening process are used, along with forecasts of power supplies and wholesale market power prices to determine if a program should be initiated. If a DR program is beneficial, WVPA provides price signals and works with Members to encourage adoption of the program.

The PowerShift® program (an updated DLC program) is WVPA's DR program with participation by 19 of the 23 Members. For the 2020 IRP, WVPA expanded the program to approximately 65 MW compared to the 55 MW of peak load reduction reported in the 2017 IRP. The PowerShift® program is a registered resource in MISO which determines when the program is called and the compensation WVPA receives. Because of this market participation, the Company receives planning and/or capacity credits for our DR programs in the wholesale market.

DIRECTOR'S COMMENTS - Demand-Side Management

The Director finds the discussion of the methodology used to evaluate EE and DR resources both confusing and lacking in detail. According to WVPA, EE was selected as a resource across all eight expansion plans and that the main limit was the achievable potential of EE. Given this discussion, it appears that EE was included as a resource in the optimization model. But there is no discussion using information that one normally sees in market potential studies. Nor is there any discussion of how the selectable EE resources were organized into selectable resources. Selection in optimization models requires EE savings load shapes for optimization, but this critical information was not discussed.

It appears that DR was not included in the resource optimization, or, if it was, that it was not selected. The discussion on pages 69-70 indicates that DR is planned outside of the IRP optimization of resources. It is not clear if or how DR is accounted for in the resource optimization. The DR does not appear in Figure 5-5 or the accompanying discussion of resource additions on pages 84 - 85.

- There is a concern related to the methodology used to select the final EE measures that are incorporated as inputs in the IRP's model. It is unclear what type of parameters are used to determine the costs and characteristics of the final EE programs. Also, the pre-screening of these programs seems to reduce the ability of the economic optimization model of selecting a diverse set of EE measures from different bundles or options based on economics.
- Would WVPA consider the use of different cost tiers or vintage EE bundles to be modeled in the IRP? The use of this segmentation may help to better capture the value of EE over different time periods, costs, and load shapes.

In Table 2-12 (Page 32), WVPA presents the EE programs savings (MWh) only for 2020. For future reports, it would be helpful if the savings are reported for the whole IRP projection period. Also, there is no information about their equivalent demand savings (MW). There is no explanation on how the energy savings are converted to demand (e.g., type and source of the programs load shapes) and the amount considered by program. This would provide a better and clearer understanding of the resource selection process.

As stated in earlier Director's IRP Reports for WVPA, the Director understands that EE and DR are more directly the responsibility of the members with support provided by WVPA, but it is still necessary that WVPA clearly discuss how EE and DR are analyzed, modeled, and accounted for in the IRP planning process. The Director also recognizes the challenge for WVPA as a generation and transmission cooperative, but the likely increasing penetration of DERs means actions at the distribution level will increasingly affect bulk power system planning, investment, and operations. WVPA recognizes this circumstance and will hopefully make the necessary assessments in the IRP planning process as circumstances warrant.

V. Portfolio Analysis

Models

WVPA utilized the PLEXOS® model to evaluate supply-side and demand-side resource options on an equivalent basis. PLEXOS® selects resources to reduce the overall portfolio cost. PLEXOS® LP long-term optimization model, also known as "LT Plan®," and the PLEXOS® medium-term simulation model, also known as "MT Schedule®," were used to find the optimal portfolio of future capacity and energy resources that minimizes WVPA's variable and fixed costs over the 20-year plan horizon for each scenario.

WVPA also develops a financial forecast using a custom-built financial forecasting model (the MCR model). Production cost estimates from PLEXOS® are input into the MCR model. The model calculates WVPA's expected revenue requirement based on production costs, capital recovery costs and financial performance targets such as TIER (Times Interest Earned Ratio, DSC (Debt Service Coverage Ratio), Fixed-Charge Ratio, and Equity Percentage.

Method

Two scenarios were considered by WVPA. The Open Technology Options scenario sought to find the least-cost resource plan to serve load requirements allowing natural gas combined cycle

(NGCC), natural gas combustion turbine (NGCT), solar, wind, battery, DR, and EE resource options to compete in the optimization process. The Minimize Carbon Options scenario intended to minimize carbon emissions by excluding NGCC as a resource option.

Four futures were developed in this IRP: Existing Policy, High Growth, Low Growth, and Major Environmental Policy.

The "Existing Policy" future is WVPA's view of the world based on policies in place at the time of the IRP's development. The 'High Growth" future assumes higher economic growth driven by higher population. This scenario also assumes higher commodity prices and greater adoption of EVs. The "Low Growth" scenario assumes lower population and economic growth. The slower rate of economic growth results in lower commodity pricing. The "Major Environmental Policy" future assumes increased state and federal commitments towards environmental regulation. This future also incorporates a high carbon price forecast.

WVPA executed the PLEXOS® LT Plan® and the PLEXOS® MT Schedule® models deterministically under both scenarios for each of the four potential futures. Eight expansion portfolios were developed in total. The base resource portfolio was built on the expected, or most likely, assumptions represented in the Open Technology Options scenario under the Existing Policy future. The other resource portfolios served to provide awareness of how WVPA may need to adapt if these alternate assumptions are realized. Among these was the "Alternate Existing Policy Expansion" developed from the Minimize Carbon Options Scenario and the Existing Policy Future. WVPA focused the rest of the analysis on the Base Existing Policy Expansion and the Alternate Existing Policy Expansion.

WVPA tested the base and alternate existing policy expansion plans against several combinations of stochastic variables. The stochastic variables included electricity demand, EV adoption, energy prices at the Indiana hub, coal prices, natural gas prices, capacity prices, and carbon prices.

DIRECTOR'S COMMENTS - Portfolio Analysis

While WVPA executed expansion plans for a range of potential futures, most of the discussion and analysis were focused only on the Base Existing Policy Expansion and Alternate Existing Policy Expansion. How each of the eight optimized portfolios will perform under different scenario and future combinations was not evaluated. In addition, the impact of the stochastic variables was only assessed for the Base and Alternate Existing Policy Expansion plans as well. Providing additional analysis and discussion on the different portfolios as well as their stochastic performance gives stakeholders better insight into the IRP process and may result in a better end product that would benefit both WVPA and its customers.

The development of an EV load forecast is an improvement over the 2017 IRP. The EV forecast was not included in the base load forecast or either of the two alternatives. Instead, WVPA added the projected EV load to the high load forecast for stochastic modeling purposes. WVPA noted that by 2040 there is projected to be an additional 48,589 EVs resulting in 216,674 MWhs of additional load. That because this load mostly occurs in off-peak hours, peak load was increased by only 24 MWs.

It is important for WVPA to monitor the penetration of EVs and other DERs. As the penetration of EVs and DERs more generally increases, it will require a more sophisticated analysis.

VI. Stakeholder Comments

(Director's responsive comments are indented and in italics)

Tipmont REMC (Tipmont)

Tipmont has the following five primary concerns with WVPA's 2020 IRP:

1. The IRP overlooks important developments within WVPA's membership, including the potential withdrawal of Tipmont.
2. The IRP presents inconsistent assumptions on avoided costs and future market prices.
3. The IRP presents information that conflicts with WVPA's position before FERC in the matter of setting Tipmont's exit fee.
4. The IRP is inaccurate given known MISO wholesale market developments in recent years.
5. The IRP is incomplete in its assessment of risk of generation ownership and long-term contracts.

Potential Withdrawal of Tipmont

Tipmont notes that its summer peak load in 2020 was approximately 120 MW. With load growth Tipmont's peak load would be nearly 140 MW of unforced capacity in 2025 and approaching 150 MW of UCAP in 2033.

Under the Base Existing Policy Power Supply Expansion Plan, WVPA expects a need for a new 150 MW NGCC by 2026. Tipmont notes that the need for a new NGCC would be materially reduced and deferred if Tipmont were to leave the WVPA system.

Thus, Tipmont thinks WVPA should have evaluated a circumstance assuming the departure of Tipmont in the short-term.

Inconsistent Assumptions on Avoided Costs and Future Market Prices

Tipmont states that WVPA, without providing any sound economic justification, largely ignores the cost-effective opportunity to purchase a portion of its wholesale energy and capacity needs from the market. That by marginalizing the use of MISO competitive markets for energy and capacity, WVPA's resource optimization is performed on a "closed ecosystem" for economic dispatch. Production costs are calculated based on dispatch of WVPA's own supply portfolio against WVPA's own load, with wholesale market purchases modeled as a limited resource.

Tipmont argues these same "closed ecosystem" simulations determine the optimal portfolio of supply resources for the future. As such, Tipmont thinks WVPA ignores the potential benefits from embracing the supply opportunities in the MISO wholesale markets for resource planning purposes.

IRP Information Conflicts with WVPA's Position before FERC

Tipmont asserts that, in litigation before FERC, WVPA has prepared and filed with FERC multiple documents pertaining to its future generation portfolio plans and that the 2020 IRP conflicts with those previous analyses both in terms of input assumptions and the methodology used to evaluate future resource needs.

WVPA's IRP is Inaccurate given Known Wholesale Market Developments

Tipmont notes that the MISO wholesale power markets have undergone significant developments in recent years. The influx of renewable generation resources and the evolving resource portfolio has caused MISO to rethink both its transmission planning process and market design. MISO is also looking at reforming its resource adequacy construct.

According to TIpmont, WVPA's IRP does not sufficiently examine how these market developments and reforms could impact WVPA's existing and planned future supply portfolio. It is notable to Tipmont that the IRP is mostly silent on how MISO regional transmission plans will impact WVPA. Regional and local transmission investment should be integrated with the planning of supply portfolio investments. The IRP does not offer any insights into the transmission implications of WVPA's planned supply expansion.

Finally, WVPA has ignored the impact of changing capacity resource accreditation rule changes in MISO's resource adequacy construct, which may leave WVPA short on UCAP in the future given its reliance on intermittent resources as part of its existing and future supply portfolio.

Assessment of Risks of Generation Ownership and Long-Term Contracts

In Tipmont's opinion, WVPA is purposefully creating and expanding its supply portfolio through analyses that minimize wholesale energy and capacity market transactions. Even if WVPA entered into long-term power purchase agreements (instead of ownership), there are important tradeoffs that need to be evaluated compared to shorter term market purchases. Many of WVPA's long-term contract decisions have turned out to be costly.

Tipmont notes that, although market prices can be volatile, long-term contracts at fixed prices and generation ownership come with their own set of risks. Owned assets carry operational risks and additional financing burdens that market purchases do not. In sum, WVPA has ignored many risks of ownership and long-term contracts in its IRP.

> *Director's Response: The Director thinks that Tipmont has a basic misunderstanding of the purpose of the IRP planning process. The basic principle is that the Preferred Portfolio and the Candidate Portfolios provide information regarding the potential timing to acquire additional resources and the types of resources most likely to be "least regrets" choices in the short-term given the risks created when the future is unknowable. The IRP should also provide information on the sensitivity of potential resource choices to key variables such as gas prices, load growth, and changes in government policies.*
>
> *About the lack of attention devoted to changes in RTO market structures, especially resource adequacy and resource accreditation, the Director acknowledges the importance of including these changes in the planning process. WVPA was faced with a difficult decision, as were other Indiana utilities submitting IRPs in the 2020 – 2021 time frame, with how to deal in the IRP with the potential changes being developed and proposed by MISO. WVPA acknowledged the possible changes but chose to defer the inclusion of these MISO market structure changes to the next iteration of the IRP. One can disagree with this choice. However, other Indiana utilities struggled with how best to account for these potential market changes. The Director anticipates that WVPA's next IRP will include the revised MISO market processes, especially the seasonal resource adequacy construct and the changes to resource accreditation. The implications of the market changes will evolve over time as experience is gained and market participants learn. The lessons learned over time will be reflected in future IRPs.*

Regarding Tipmont's concern that WVPA unreasonably restricted consideration of resource choices involving greater reliance on shorter-term market choices for both energy and generation capacity, the Director appreciates that WVPA's judgements are clearly stated in the IRP. WVPA acknowledges the IRP is prepared based on the idea of building or acquiring resources to meet WVPA's energy needs and not sell excess energy into the spot market. WVPA states this is done to eliminate acquiring resources based on speculation as opposed to minimizing risks. (WVPA IRP, p. 96) *WVPA says the IRP is prepared with minimal reliance on RTO markets and a focus on resources WVPA believes can reasonably be relied upon to meet long-term resource requirements.* (WVPA IRP, p. 71) *These restrictions do not appear to be that different from those imposed by other Indiana utilities in their IRP development processes to evaluate a broad range of possible resource choices while balancing numerous other considerations such as various types of risks and economics.*

The Director also recognizes that an IRP is done at a point in time and needs to be reevaluated regularly, especially when the environment is uncertain and there is a likely need to acquire resources in the next few years. It is incumbent on a utility to obtain the best market information available to inform specific resource choices through the issuance of requests for proposals. It is during this process that a utility can weigh consideration of various long-term resource commitments with shorter-term options. Also, it is during the evaluation of specific resource proposals that the transmission-related costs and risks can be thoroughly reviewed since location is critical.