



Indianapolis Power & Light Company
IRP Public Advisory Meeting
May 16, 2014

Summary

Welcome

Kelly Huntington, President of IPL

Ms. Kelly Huntington welcomed participants to this meeting and to the Old City Hall building. She thanked everyone for attending, because the company couldn't complete a successful Integrated Resource Plan (IRP) without the participation of its stakeholders. The objectives today are to learn about the IRP process and offer input, as well as to discuss IPL's portfolio. Ultimately, IPL will select a portfolio to balance environmental responsibility, cost, and reliability, in accordance with its mission of improving lives by providing safe, affordable energy solutions for its customers.

Ms. Huntington provided some background about the generation fleet, in which there has been a significant change. In 2007 IPL's generation was about 80% coal-fired, and in 2017, it will be changing dramatically to about 55% coal and increased wind and solar to about 10%. IPL continues to make investments in its transmission system, and has made significant strides in environmental investments including installation of about \$600 million in environmental controls. She noted that IPL is a leader in wind and solar generation and because of the Rate REP (Renewable Energy Production) feed-in tariff will have about 65 megawatts (MW) of solar generation by this summer.

Ms. Huntington invited participant comments and questions today and after this meeting. She introduced Marty Rozelle, the facilitator.

Meeting Agenda & Guidelines

Dr. Marty Rozelle, The Rozelle Group Ltd.
(slides 4-7)

Dr. Marty Rozelle pointed out the emergency exits, safety issues of the meeting room, as well as logistics of food and rest rooms.

She explained how the meeting will be conducted today and provided guidance to those who are joining by telephone. She noted that at this meeting IPL will be doing a lot of talking, including several technical presentations and discussions about risk factors and scenarios; there will be more opportunity for stakeholder feedback at the next meeting in July.

Dr. Rozelle provided an overview of the agenda and reviewed the objectives of the meeting - to enhance understanding, to gather comments and feedback, and to continue to build relationships between IPL and stakeholders. She said that at the end of each presentation there will be a short time for questions and conversations. There will be more time for discussion this afternoon. A list will be kept of questions and items that we aren't able to address in this



meeting so responses can be developed later. She invited participants to submit comments and questions via email after this meeting if desired. Finally, for those who need to inquire about confidential information, please contact IPL's attorney, Terry Nyhart, at teresa.nyhart@btlaw.com

Introduction to IPL and Integrated Resource Planning Process

Herman Schkabila, Director of Resource Planning
(slides 10 – 22)

Mr. Herman Schkabila welcomed everyone and showed a map of the IPL service territory, saying it is quite compact compared to other utilities. The locations of the IPL's generating stations were shown and explained that IPL is a member of MISO, the Midcontinent Independent System Operator, Inc. He noted that energy usage in the IPL system is comprised of about half large commercial and industrial consumers and about half residential and small commercial users, even though the large industrial customers represent only about 1% of customers. He explained that the peak loads have been slowly recovering from the recent recession, and are not predicted to reach these previous levels for about 10 years.

Mr. Schkabila described IPL's IRP process, illustrated with a flow chart. He described how IPL evaluates its total resource needs by forecasting future load and subtracting customer-initiated demand-side management offsets (DSM). There also needs to be a reserve margin built in, which IPL calculates at about 14%. These calculations are used to yield the total supply resource needs, which are then compared to projected available resources to see if there is a shortfall.

IPL next evaluates the best way to meet future needs. Mr. Schkabila explained that IPL uses Ventyx, a national vendor, to develop scenarios and model results. This involves defining key risk parameters for modeling and portfolio evaluation. Alternative supply technologies are identified. The *Ventyx Capacity Expansion Screening* model and *Midas Gold Portfolio Simulation Production Cost* model will identify the optimal resource plan with the lowest cost (expressed as present value revenue requirement, or PVRR).

Questions from participants included:

- When you refer to Ventyx are you referring to Ventyx Strategist, which some of the other utilities use?
 - No, we call this one Midas Gold, which is another optimization model. Indiana Municipal Power Agency (IMPA) and Wabash Valley Power Association WVPA use this model.
- A participant noted that he doesn't see an environmental component to IPL's Mission Statement. Is there an environmental component?
 - We do factor environmental issues into our planning process, although it may not be called out directly in the mission statement.

Energy and Peak Forecasts

Swetha Sundar, Resource Planning Analyst



(slides 25 – 35)

Swetha Sundar described IPL's energy forecast model, a hybrid model that uses econometric, end-use, and weather data as well as historical use data to produce an energy and customer forecast. Another model is used to predict the peak forecast. She outlined the types of data used as model inputs, noting that the main drivers are econometric data and energy efficiency trends. She showed graphs indicating projections of number of households, household income, and regional employment over the next 10 years. The federal energy efficiency standards were also shown.

Based on these analyses, average energy growth rates for the 2014 to 2023 period are projected to be 1.2% for the residential sector, 0.6% for small commercial and industrial, and 0.6% for large commercial and industrial, for a combined total of 0.8%; this does not reflect IPL demand-side management programs.

Questions and comments included the following:

- A participant observed that the graphs are not meaningful without a “Y” axis label, and asked how to interpret them.
 - Unfortunately, providing the “Y” axis label reveals proprietary data.
- If this is a 20-year plan, why are you only forecasting for 10 years?
 - To be consistent with IPL's internal planning processes, which look at a 10-year forecast. For additional years required for the IRP we extrapolate the 10-year forecast. We believe that this gives us comparable results to running the forecast models for the additional years.
- What has been the effect of DSM programs so far?
 - Since we use actual energy as a starting point for the forecast, previous programs have been embedded. DSM is treated separately in future forecasting, as a subtraction from load, as Mr. Schkabla explained. Jake Allen will talk later about specifics of DSM programs.
- Why aren't you thinking about reflecting global warming trends in the forecast?
 - We think this is reflected in the use of the most recent 10-year historical trends.
- What is the increase in total employment attributed to?
 - Mainly to the non-manufacturing service sector - for example, the hospitality industry.
- There was a national report on climate released this week by the federal government. IPL should consider these kinds of data to project into the future using, for example, the IBCC projections or Eastern National projections that are specific to Indiana.
 - We are evaluating using shorter periods to capture warming trends, but we think the 30-year average is reflective of trends at this point. There can be many fluctuations in data from year to year.



- Did you build energy efficiency for the major industrial clients into the projections, for example, in reducing their carbon footprint?
 - Yes, we are using actual consumption and think it reflects these programs. Also, IPL is working with Itron Inc. to get industry-specific efficiency trends.
- What assumptions did you make about electric vehicle stations?
 - The contribution is quite small, only about 700 megawatt hours.

Demand Side Management: Energy Efficiency and Demand Response

Jake Allen, DSM Program Development Manager
(slides 38 – 48)

Jake Allen provided the definition of DSM according to the Indiana Administrative Code which includes conservation, energy efficiency, and demand response programs. The state's IRP rules require that utilities consider alternative methods of meeting future demand for electric service, including consideration of demand-side resources as a source of new supply. He provided details of Indiana's evolving DSM rules and requirements, including a removal this year of statewide DSM targets and an opt-out provision for large (>1MW) customers, who constitute about 26% of IPL's sales. He explained that all DSM programs are evaluated annually by a statewide independent third party (TecMarket Works).

Mr. Allen described IPL's current Demand Response programs, noting that IPL has continued to develop programs over time. IPL offers the state's "Core" Programs as well as a suite of IPL "Core Plus" Programs. In 2013, IPL was very close to meeting the state's targets through its programs. IPL plans to file an updated short-term DSM programs Action Plan for 2015 to 2017 within a few weeks. He described how a DSM forecast for the IRP will be developed, for the 2018 to 2034 time frame.

Mr. Allen assured participants that a key assumption for the IRP is that IPL will continue to develop, offer, and apply DSM programs for its customers despite changing state regulations and policies.

Participant questions and comments included:

- How do you define 1 MW for large customers? How do you estimate how many industrial customers are using DSM programs?
 - We measure demand by meter records over last 12 months. To quantify the effects of DSM, we look at savings from previous participation and make some "guesstimates"; it's not a hard science. IPL will continue to refine these estimates as we get additional information from customers.
- How do you evaluate how DSM is working? For example, why did you drop Energize Indiana?
 - That was a legislative directive, not IPL. We plan to continue to offer similar programs.
- How do you evaluate whether you're meeting targets (slide 44)?



- We measure savings from customer participation in various programs.
- Why haven't you met your targets for the last 4 years? How do you plan to meet them in future?
 - We started slowly, so were initially behind in meeting targets, but by 2013 we were very close to meeting targets. IPL management is committed to meeting these goals.
- How does IPL characterize CHP (combined heat and power)? Is there an inventory of sites?
 - John Haselden will detail this in his presentation later.
- Did IPL lobby the legislature to end the DSM requirement?
 - Mr. Allen was not aware of any company actions in this regard.
- What impact will climate change have on your model?
 - This question was previously addressed by Swetha Sundar.
- A participant suggested that DSM will become more attractive to customers over time, in particular in the use of two-way meters and similar new technologies.
 - IPL expects to allocate money to evaluate emerging technologies like this, and we would expect to use such programs in future.
- What is the annual savings from DSM programs expected to be in 2019?
 - We are working with EnerNOC to calculate this and expect that there will be savings.
- In the recent IURC report, utilities were criticized for not evaluating DSM as a resource in their IRP models. It doesn't look like IPL is planning to do that this time either. Are you?
 - Herman Schkabla explained that IPL is working with Ventyx to see how this can be accommodated in the model. DSM generally represents *avoided* capacity and energy costs, which he thinks provides comparability and consistency.
- The Colorado Public Utilities Commission approved a block rate structure for a utility, allowing different seasonal rates. Are we looking at something similar here?
 - There may be a rate case in the future that addresses alternative pricing structures, but rate design will not be addressed in this IRP filing.

Planning Reserve Margin

Herman Schkabla

(slides 51 - 53)

Mr. Schkabla talked about the “unforced” capacity (known as UCAP), which accounts for outages, that is used by MISO to calculate required reserve margins. The installed capacity (ICAP) ratings of the units themselves are used by IPL to calculate the 14% reserve margin they adopt. Wind and solar projects do not receive UCAP credits from MISO; solar does not have network integration capability, which is a MISO requirement. IPL is working on getting the capacity credit for their wind and solar projects. He showed a chart that illustrates how available resources will be used in summer 2014 to meet the reserve margin requirements; these include IPL generation, demand response programs, behind-the-meter generation, and purchases.



- A participant asked if IPL exceeds the reserve margin in any given year. If so, does IPL consider this for sale?
 - There is no cap on reserve margin, and 14% is a minimum. If it's exceeded, it could be available for sale, either through the MISO capacity auction or the company could sell a piece of a unit.
- What is the reserve margin in 2017? Have other resources been planned?
 - Mr. Schkabla doesn't know what the 2017 reserve margin will be. There are no other capacity additions planned before 2017 other than the new Eagle Valley CCGT unit.

Generation Overview

Herman Schkabla
(slides 56 – 61)

In discussing IPL's generation overview, Mr. Schkabla provided a chart showing the green shaded coal fired units that are either being retired or converted to gas, leaving 5 coal units in the IPL system. Oil and gas units were also shown, as were wind and solar units totaling nearly 400 MW. In summary, he showed a graphic that illustrates IPL's projected change in resource mix from 2007 to 2017, demonstrating a reduction in coal dependency from 80% to 55%.

Participant questions and comments included:

- The remaining 5 coal units will need to be addressed at some time in the future; do you have plans for them? Is nuclear on the horizon?
 - We do have to think about that, and we're evaluating the remaining units. They will be addressed in the IRP.
- Can you provide a pie chart showing actual generation versus projected (i.e. energy versus capacity)?
 - Yes, we can do that, and will identify the assumptions we are using. *This will be provided on June 13.*
- As you look at different energy sources, what will be the impact on employment in Indianapolis from changes in the coal stations (i.e. Harding Street)?
 - Greg Fennig, IPL's vice president for Public Affairs, emphasized that IPL values its employees, and hopes to retain all of the existing employees, although some of them may need to move job locations or functions. The new Eagle Valley CCGT unit will require 25 employees, and we expect that any reduction in the existing workforce will result from attrition.
- Do you have goals for contracting minority businesses in solar and wind industries?
 - Mr. Fennig responded that within IPL, we try to engage local firms whenever we can. Our wind and solar resources are contracted with outside providers, so we do not have specific requirements for minority participation. There is a vendors' fair on May 28 to encourage such participation.



- How are you addressing FERC Order 755?
 - No one present knows the response. *This will be provided on June 13.*

Environmental Overview

Angelique Oliger, Director of Environmental Policy
(slides 64 – 74)

Angelique Oliger showed a table listing air quality control installations at IPL's generating units. She noted that all units have electrostatic precipitators, and she outlined the controls on other units like low nitrogen oxide (NOx) burners, catalytic reduction technologies, and scrubbers; units without scrubbers use low sulfur coal.

Ms. Oliger provided details of the suite of current and proposed environmental regulations that apply to utilities. These include additional controls and monitoring to meet Mercury and Air Toxics Standard (MATS) that are expected to reduce mercury emissions by about 80% and to cost about \$511 million to install. There are also new proposed emission limits for water quality associated with the National Pollutant Discharge Elimination System (NPDES) permit program, and IPL is now evaluating compliance options including possible costs.

In the longer term, IPL is looking at EPA's proposed regulations for coal combustion residuals that may significantly change the way fly ash is managed. There is also a proposed rule related to the Clean Water Act associated with impingement and entrainment of fish at the intake structure. A final rule is planned to be released today, but even then IPL may not have a solid idea for compliance since the state would need to develop specific requirements on a case-by-case basis. Greenhouse gas regulations have been discussed for some time, based on the Administration's Climate Action Plan. New performance standards for new sources have been proposed that would require at least partial carbon capture and sequestration for any new coal-fired unit. New source performance standards for existing sources would be administered by states through State Implementation Plans. Also in the area of air quality, changes in the National Ambient Air Quality Standards (NAAQS) may apply to sulfur dioxide (SO₂), fine particulate matter (PM 2.5), and ozone that could require additional control installations. Additionally, the Cross State Air Pollution Rule may be implemented in future, after a series of conflicting legal decisions, but impacts are difficult to predict. She showed a summary of some of the estimated costs associated with installation of environmental controls.

Participant comments and questions included the following:

- Do cost range estimates assume that all needed controls would be installed on coal plants to keep them going? An alternative would be to shut them down.
 - Yes, costs assume addition of controls. There will also be separate evaluations of the best future options for the coal units.
- What units might need the cooling water intakes?
 - Petersburg 1 & 2
- Did the company assume compliance costs with 111D rule?



- Diane Crockett from Ventyx will follow up. *Slides 100 and 102 include the emission markets used in the Fall 2013 Reference Case. Compliance costs for 111D were not included in the base case, but were included in the Ventyx Federal Environmental Legislation scenario.*
- Which data from these ranges will be incorporated into the modeling? Where there is no cost noted (e.g. greenhouse gas emissions), did the company assume that these would cost nothing?
 - We will incorporate the range of costs into our modeling through sensitivities, decision tree analysis, or other methods. Costs associated with potential greenhouse gas regulations will be discussed and addressed by Diane.
- How do you know what the emissions levels are coming out of the stacks?
 - We currently have Continuous Emissions Monitors for certain pollutants in place and we will be installing additional CEMs in the future for MATS compliance.
- Under what circumstances were scrubbers not run or were bypassed in recent events that caused air quality exceedances in April?
 - Harding Street unit 7 was not bypassed during the April SO₂ NAAQS exceedances. Rather, the Unit was on an outage and offline at that time. The scrubber bypass time we have is a result of operational issues that inhibit scrubber use. However, we always maintain compliance with SO₂ limits. Bypass time will be minimized when further upgrades are installed for MATS Compliance.
- Does IPL ever create an environmental policy that exceeds government requirements? Do you consider health effects in addition to costs?
 - IPL's mission is to provide safe, reliable, and affordable power to our customers. Part of providing safe power is providing power that is environmentally responsible. We believe that we are being environmentally responsible by complying with the environmental regulations set forth by those whose mission it is to protect human health and the environment, namely EPA and IDEM.

Distributed Energy Resources

John Haselden, Principle Engineer for Regulatory Affairs
(slides 77 – 87)

John Haselden gave examples of distributed energy resources, including customer-sited emergency generators, combined heat and power, wind, biomass, and solar.

Regarding emergency generators, there have been increasingly strict rules on these units on the amount of time and circumstances under which they can be run, reducing overall generation from 40 MW in 2010 to about 32 MW in 2014.

CHP is usually customer- sited and owned, and can be popular with operations that need steam as well as power; however, the existing steam system in Indianapolis is a barrier to developing these units since it's easier for customers to buy steam than to generate it. There are two



facilities that IPL has had ongoing discussions: the Covanta Resource Recovery Facility and the Perry K steam plant.

Wind generation is hampered by the fact that there are poor wind resources in IPL's service territory. Consequently, combined with other challenges (zoning, noise, intermittent production), there are few installations in IPL's service territory. Despite offering a feed-in tariff rate under Rate REP, there were no takers due to the poor wind resource.

Biomass generation can come from organic combustion such as landfills or from anaerobic digesters for (typically) animal waste products; there is only one landfill in town and the methane it generates is already used for other purposes. Anaerobic digesters have a fuel problem in that there are no nearby large animal feeding operations and transporting manure adds a fuel transportation cost among other issues. A feed-in tariff rate under Rate REP was also offered for biomass generation but there were no takers although developers studied the possibilities of using manure from the Indianapolis Zoo and perhaps the State Fair. Consequently, these types of projects have not occurred in IPL service territory.

A technology that has been somewhat more successful is customer-installed solar photovoltaic, with a few utility-scale installations in IPL's service territory. Solar typically has a low capacity factor of about 15% (compared to 35-40% for wind and 85-90% for thermal generating units). There may also be challenges with intermittent production, particularly in matching daily peaks. In 2012, IPL opened a feed-in tariff, Rate REP, that has resulted in 98 MW of solar PV (53 MW operating as of 5/16/2014) with an associated overall IPL rate increase of 1.8%.

Other distributed energy resources may develop as result of new technologies and will be considered as they mature. These might include micro grids, energy storage, voltage controls, and electric vehicles.

In summary, there is not a one-for-one relationship between thermal generation and distributed generation, which, in the case of solar PV, may provide only about 25% nameplate capacity coincident with IPL's system peak.

Participants had the following questions and comments:

- Since this is a 20-year IRP and the rate contracts are only for 15 years, have you tried to predict what will happen at the end of that contract period? For example, will the customers choose to adopt net metering instead?
 - Most of these projects are connected directly to the IPL distribution system. After 15 years, there will probably not be net metering, but we may continue to purchase this power under a different set of circumstances. Current net metering limits would preclude the larger projects from net metering, even if they were wired to do so, because of the 1 MW nameplate limit.
- Is IPL making a commitment to do whatever it takes to get all 100 MW of planned solar generation on board?
 - We've learned that customers are reluctant to own these facilities. Typically, developers create them and then sell them. In some cases, the developers have had



problems selling the projects and consequently some projects have been slow to get started. No developers of the remaining projects have indicated they were not going forward. Some projects have been slightly downsized as they were finally engineered and built. IPL will continue to work with developers to encourage full production.

- Has IPL assumed that solar and wind capital costs are fixed over the next 20 years; or, if not, how do they change over time?
 - No. Costs have come down over time; for example, a solar PV project cost about \$7-8 per watt five years ago, and now it's perhaps \$3. Conversely, federal tax incentives have been significant, and are additive to IPL's payment of \$.20 per kilowatt hour. The tax incentives have expired except for the ITC which may not last as well.
- A participant observed that it's clear that electricity will cost more in the future. He appreciates that IPL is moving from coal to natural gas; even gas will require carbon sequestration in future. Storage is a huge component of solar, and to shift from late afternoon to mid-afternoon peak is a challenge.
- Have you considered taking one of the mothballed units and converting it to a synchronous condenser for voltage support?
 - Yes, we look at those options.
- Can you provide more detail of how your planning process takes into account the positive impact of distributed generation on transmission and distribution?
 - If you can locate a generation source close to a load, you can get a reduction of transmission line losses. That's not always the case. For example, a couple of large solar projects in the outer reaches of the county need additional equipment to accommodate their output of power and maintain power quality for neighboring customers who could see voltage fluctuations, lighting flicker or other issues due to the rapid ups and downs of output due to clouds.
- I was told that IPL no longer accepts feed-in tariffs. Will you do so in future? When might you do this again?
 - All contracts needed to have been approved by the Commission by 3/30/13. These projects were limited to a total of 153,000 MWH/year output which worked out to approximately 100 MW. No new projects will be accepted because the rate expired. IPL is still learning about the impacts of these units on the system. In the future, if we need more alternative sources, feed-in tariffs may not be the best vehicle because of the rapidly changing costs. It may make more sense for IPL to own the units and site them where needed. It all depends on the ability to find the "right price" because all customers feel the rate impact.

Proposed Modeling Assumptions

Diane Crockett, Ventyx
(slides 90 – 111)

Diane Crockett said she will be talking about the Ventyx North American Reference Case, and how that applies to IPL. She explained Ventyx's function and role. Ventyx has 5 products. The



relevant one today is the Midwest Region Reference case, which includes 26 utility transaction groups.

She provided an overview of the modeling methodology. The Velocity Suite model provides the data inputs used including loads, generating unit characteristics, gas and coal supply, fuel prices, transmission topology, and environmental rules. The annual energy growth rate for MISO is projected to be 1% for 2014 to 2019, 0.9% through 2024, and 0.8% to 2034. She showed the different supply-side technologies that can be used to meet this load. Diagrams illustrated the North American gas supply forecast, mainly derived from shale gas, and gas demand forecast by sector. Coal price forecasts were also illustrated by supply basin. She listed the environmental assumptions that were included in modeling the Fall 2013 reference case and showed renewable energy forecasts for the 5 regions, with new resources mainly coming from the Western Electricity Coordinating Council (WECC) and the Midwest.

Ms. Crockett described the Reference Case, which includes scenarios for 1) base gas price, 2) low gas price, 3) high gas price, and 4) federal environmental legislation. A chart showed how these various scenarios, for the Midwest, pick an optimal resource mix for each.

She identified the 3 modules that Ventyx will be using as part of the *Midas Gold Model*, including capacity expansion, portfolio simulation, and financial models. She showed gas market prices predicted for MISO-Indiana, which are a major factor in modeling and resource selection. She noted that carbon tax assumptions are also included in the environmental scenario. Critical key risk parameters include fuel and market prices, load growth and DSM/EE, carbon policy, and possibly others based on stakeholder feedback.

Participant questions and comments included the following:

- What's the difference in carbon prices between the base case and the environmental case, understanding that we don't know what will happen with new source performance standards? Why doesn't the base case include any carbon tax?
 - Ventyx considers that it's too speculative to include a carbon tax in a base case, because the base case tries to model what's actually happening in the market today. Ms. Crockett will follow up.

The base case only includes carbon prices for California, Alberta, British Columbia, and the RGGI states in the Northeast. The environmental scenario uses these prices through 2019, and starting in 2020 the national CO2 price is used. The new source performance standards (i.e. new generic units) are met with high-efficiency CCs and depending on the hours of operation of the GT, GT's also meet the standards, so a CO2 tax is not needed. The standards for existing plants are still being discussed and, if available, will be incorporated in the 2014 fall case. While political debate continues at the national level, the EPA, many corporations, municipalities, and states are moving forward with their own plans to reduce GHGs. As a result of the political climate in effect at the time, the Fall 2013 North American Power Reference case did not assume the implementation of GHG legislation during our forecast period.



- Have you been talking to engineers at the units to understand what kinds of environmental improvements can be made at the plants to increase efficiency?
 - Ms. Olinger responded that IPL might expect a 2-3% reduction in emissions with efficiency measures. We will look into this more after seeing the EPA guidelines on June 1.
- One of the Commission's notes on last year's IRP processes was that utilities did not have enough scenarios. Please consider adding more scenarios to account for a wider range of potential risk.
- Are fuel prices nominal or real?
 - Nominal.
- Have you compared them to EIA's annual energy outlook?
 - Yes, we always do that.
- After the EPA rules are issued, will the carbon prices be made public?
 - Only those prices that are published by the EPA. Any additional assumptions for Ventyx carbon prices will remain confidential.
- A participant believes that reference case supply side technology options noted on slide 96 are flawed; there is no way these timeframes can be realistically met, particularly the nuclear line. Another participant noted that these should all be checked, because if one line is incorrect, they all may be.
 - We will check these. *This will be provided on June 13.*
- Also, on this slide, where is the geothermal steam supposed to occur in the Midwest?
 - This is a generic chart, and may not apply to this region. We'll check. *Geothermal steam will be removed from the revised chart that will be provided on June 13.*
- You said the environmental scenario includes a lot more wind, but in Iowa today they are generating 20-40%, so this doesn't look like much.
 - We want to meet a federal renewable energy portfolio (RPS) to comply with the 2050 carbon reduction, so this does that.
- Why is there not much variation in the resource mixes shown on slide 104?
 - For each scenario, the loads remain constant so the capacity that is built to meet each transaction groups reserve margins will be approximately the same. The only difference is the different technologies that the model selects to build except for in the Environmental Scenario. It includes additional renewables that have planning factors less than one which requires additional capacity to meet the reserve margins.
- A participant suggested that the environmental scenario is the most likely one to happen, so that high gas prices and high carbon prices will go together.



Group Exercise:

The facilitator asked participants to look at the worksheets and fill them out individually, indicating the risk factors most important to you. Then they discussed their thoughts among those at their table to see what everyone's ideas are. We aren't looking for consensus, but ideas.

Participants were asked to identify up to 5 of the following risk factors that they thought were most important in influencing scenario development:

- Amount and cost of energy generated by natural gas
- Amount and cost of energy generated by coal
- Amount and cost of energy generated by wind turbines
- Amount and cost of energy generated by solar facilities
- Amount and cost of energy generated by other renewable sources (biomass, landfill gas, geothermal, etc.)
- Amount and cost of consumer-initiated energy generation ("rooftop solar" / net metering)
- Level of federal "carbon tax" imposed on power plant emissions
- Level of government environmental regulations for air and water quality
- Level of consumer energy conservation through voluntary programs (energy efficiency, etc.)
- Load forecast
- Cost of electricity delivered to the consumer (\$ / megawatt hour)
- Other _____

The various groups offered the following summaries of the risk factors they thought were most important:

Table 1 – Gas, coal, voluntary programs, carbon tax, consumer-initiated generation

Table 2 – Other renewables, consumer-initiated generation, conservation, load forecast, cost of electricity

Table 3 – Carbon tax, other renewables, consumer-initiated generation, level of environmental regulations, load forecast (concern about loss of industrial customers)

Table 4 – Consumer-initiated generation, carbon tax, wind, coal prices

Table 5 – All of them are important, noting carbon tax. This group added another risk factor: weather calamities.

Table 6 – This group added: water/energy nexus – availability of water to generate electricity. They also noted that mining and fracking are both water-intensive, and that climate change causes water stress.



Table 7 – Gas & coal prices, renewables, environmental regulations, cost of electricity

Table 8 – All are important, noting consumer-initiated generation, solar (both rooftop and utility scale). A recent national report for Indiana shows that the price of corn and soybeans increases with water cost, so we need to encourage carbon-neutral sources of energy – everything ultimately goes back to climate.

Table 9 – This group added: health effects of burning coal. They also wondered what would happen if rates changed in a way that would affect more conservation, for example, high-energy-users charged more.

Discussion included the following items:

- Are these questions being recorded somewhere?
 - Yes, we are taking notes, and to capture phone-in questions we're using the email submission rather than the WebEx.
- What is the model going to produce? Portfolios, scenarios? What will be presented at the next meeting?
 - For the next meeting in July, Ventyx will run these scenarios through the optimization model, develop portfolios, and identify least-cost one. We can then create additional portfolios based on stakeholder input, modify them, or add additional scenarios.
- Will participants be able to see least cost as well as the amount of environmental impact?
 - Ventyx can identify environmental factors from the model. We've heard what some of the main concerns among participants are today. You can send a note after this meeting, as well, and we'll address it as well as we can.

The facilitator asked if participants wanted to talk about what their ideal scenario might look like. Several said they would like to think about that after the meeting, consult with their constituents, and submit ideas in writing.

The group discussed whether any technologies were missing from the list of potential resources that may be included in IPL's resource plan. The following suggestions were made:

- Science Daily reported that a German firm had begun testing carbon nanotube-based transmission lines.
- "Distributed storage" should be evaluated; for example, electric vehicles, house batteries. In the future, everyone will be producing, accepting, and storing power. IPL needs to ensure that's there's always a grid available to us all, and only IPL can network it all together.
- Energy efficiency. A recent State Utility Forecasting Group (SUF) report stated that demand is flat right now, which presents an opportunity for EE.



Additional Feedback and Comments

Marty Rozelle

- Can you elaborate on the MISO requirement for reserve margins and sales and how it's changed in the last few years?
 - Pre-MISO, utilities were responsible for determining the correct reserve margins, which tended to be higher than they are today. The difference with MISO is that they look at the entire region and can rely on resources across a wider region to meet reserves. Even MISO estimates have risen somewhat, as well, over time. If one assumes that all resources have perfect availability, one can assume 7.4% as an adequate reserve margin, but the real world is not perfect; hence the higher requirements.
- Have NERC reliability requirements impacted reserve margins in recent years?
 - Not that we know of.
- Sierra Club thanks IPL for this meeting. They noted that more than 20 organizations have signed a petition asking IPL to retire the Harding Street coal plant by 2020.
- A participant suggested that for the next workshop, we should have a summary of the intergovernmental panel on climate change and national climate assessment. It wouldn't have to be long, but just an assessment of implications for IPL.
- A phone participant noted that it was difficult to hear the conversation in the room.
- How is wind being considered in the assumptions (cost, capacity factors, etc.), and are there plans to consider wind imported from other regions with higher capacity factors than can be found in the Indianapolis area? *This will be provided on June 13.*
- Clean Line is developing direct current transmission lines to deliver wind energy to market, including Indiana. We would be happy to discuss these projects with the IRP team and the data we've received from wind generators, indicating capacity factors above 50% and delivered costs around \$40-45/MWh, including transmission.
- Consider DSM in optimization, not as a fixed resource.
 - IPL is currently working with Ventyx to see how this can be incorporated into the model.
- Carbon costs should be included in the base case. Sec.111 (d) will not cost \$0 to comply with.
- Environmental compliance costs should be comprehensive; you cannot ignore those that are uncertain.
- Capacity prices have not been mentioned. How much excess capacity is IPL building and able to sell over the 20-year period? *This will be provided on June 13.*



- Off-system sales from excess generation available have also not been mentioned. Does the least cost plan assume that off-system sales revenues are passed on to ratepayers, and does this comport with how they're currently handled? *This will be provided on June 13.*

Meeting Recap and Next Steps

Marty Rozelle

Dr. Rozelle presented a slide outlining next steps and dates for comment submission and future meetings. These are:

May 23, 2014	Public Advisory Meeting #1 Notes Posted to IPL Website
**May 30, 2014	Deadline to Submit Comments/Questions
June 13, 2014	IPL's Response to Comments/Questions Posted to IPL Website
July 2014	Public Advisory Meeting #2
September 2014	Public Advisory Meeting #3
Oct 31, 2014	Submit IRP Document to the IURC

To submit ideas and comments, please email:

IPL.IRP@aes.com

****In response to an audience request, IPL agreed to extend the deadline for submitting comments on scenario development to mid-June, and to evaluate opportunities for stakeholder input between the second and third public advisory meetings. Please still have your questions submitted by May 30.**

Bill Henley, Vice President of Regulatory and Government Affairs, thanked everyone for coming today. He noted that one of their core competencies is to be market facing and understand what their customers want, so this has been a very helpful meeting.