PA 341 Section 6T IRP Implementation
Stakeholder Kickoff Meeting
March 10, 2017
9:30 am – 12:30 pm

1. Opening remarks (MAE Director Valerie Brader and MPSC Chairman Sally Talberg)
2. High level overview of IRP (Paul Proudfoot)
3. High level presentations from utilities on IRP
   a. DTE Energy (Kevin Chreston)
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7. Closing remarks

Integrated Resource Planning (IRP)

Paul Proudfoot, MPSC

March 10, 2017

MPSC
Michigan Public Service Commission

What is Integrated Resource Planning?

- Historic utility planning prior to the 1980s typically matched the load requirements to the available supply side generation options.
- In the period from about 1945-1970, utilities simply built new base load units of increasing economies of scale.
- The consideration of demand side options started gaining popularity in the 1980s.
- IRP involves the integration of various demand side options in the supply mix during the planning process.

A Little IRP History

- The Northwest Power Planning Council
- Regional organization that develops and maintains a regional power plan and a fish and wildlife program to balance the Northwest's environment and energy needs.
- Created in 1980 when the U. S. Congress passed the Pacific Northwest Electric Power Planning Conservation.
- First use of IRP process.

Demand Reduction Resources

- Energy Efficiency
- Load Management
- Demand Response
- Distributed Generation

Michigan Statewide IRPs

- Michigan Electricity Options Study 1986-87
- Capacity Need Forum 2005-06
- 21st Century Energy Plan 2007

Integrated Resource Plan (IRP)

- An IRP submitted by the utility shall contain:
  - Planning Process and Modeling
  - Forecasts and Supply Resources
  - Demand Reduction Resources
  - Scenarios and Risk Analysis
  - Proposed Course of Action

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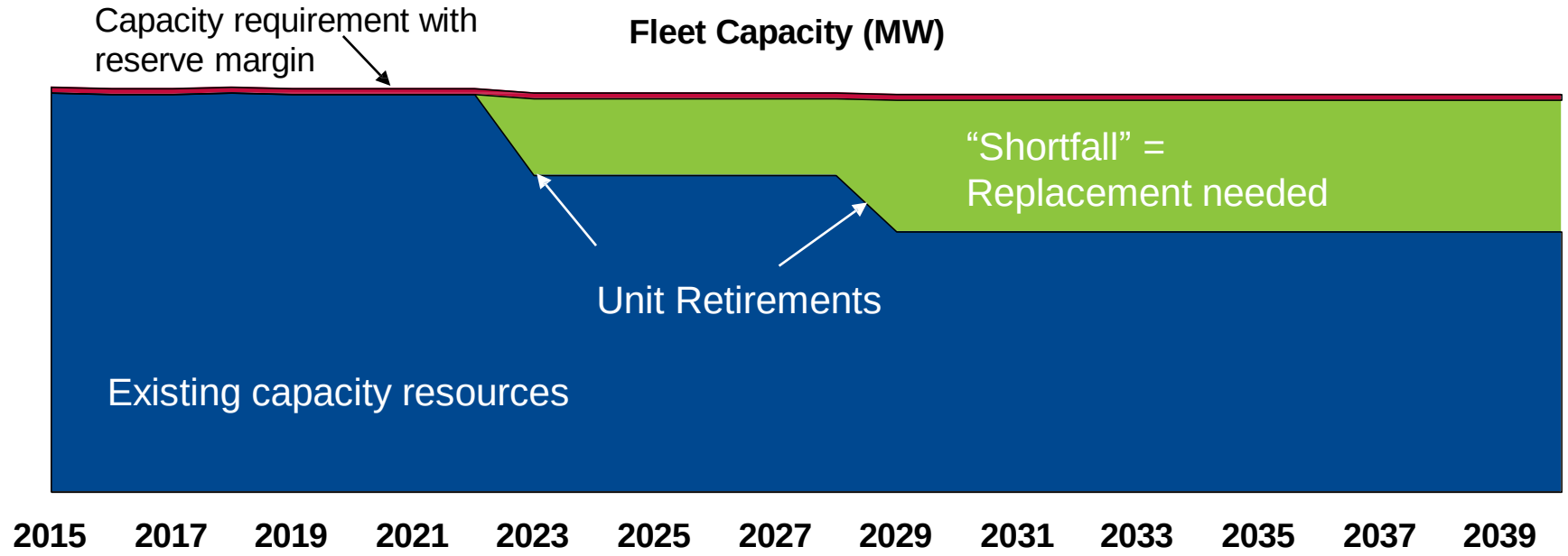
DTE Energy®

MAE/MPSC 6t IRP Kickoff

March 10, 2017

IRP is a planning and selection process[1] for new energy resources that evaluates the full range of alternatives



Capacity options include:

- new generating capacity
- power purchases
- energy waste reduction and demand response cogeneration and district heating and cooling applications
- renewable energy resources

in order to provide adequate and reliable service to its electric customers at the lowest system cost

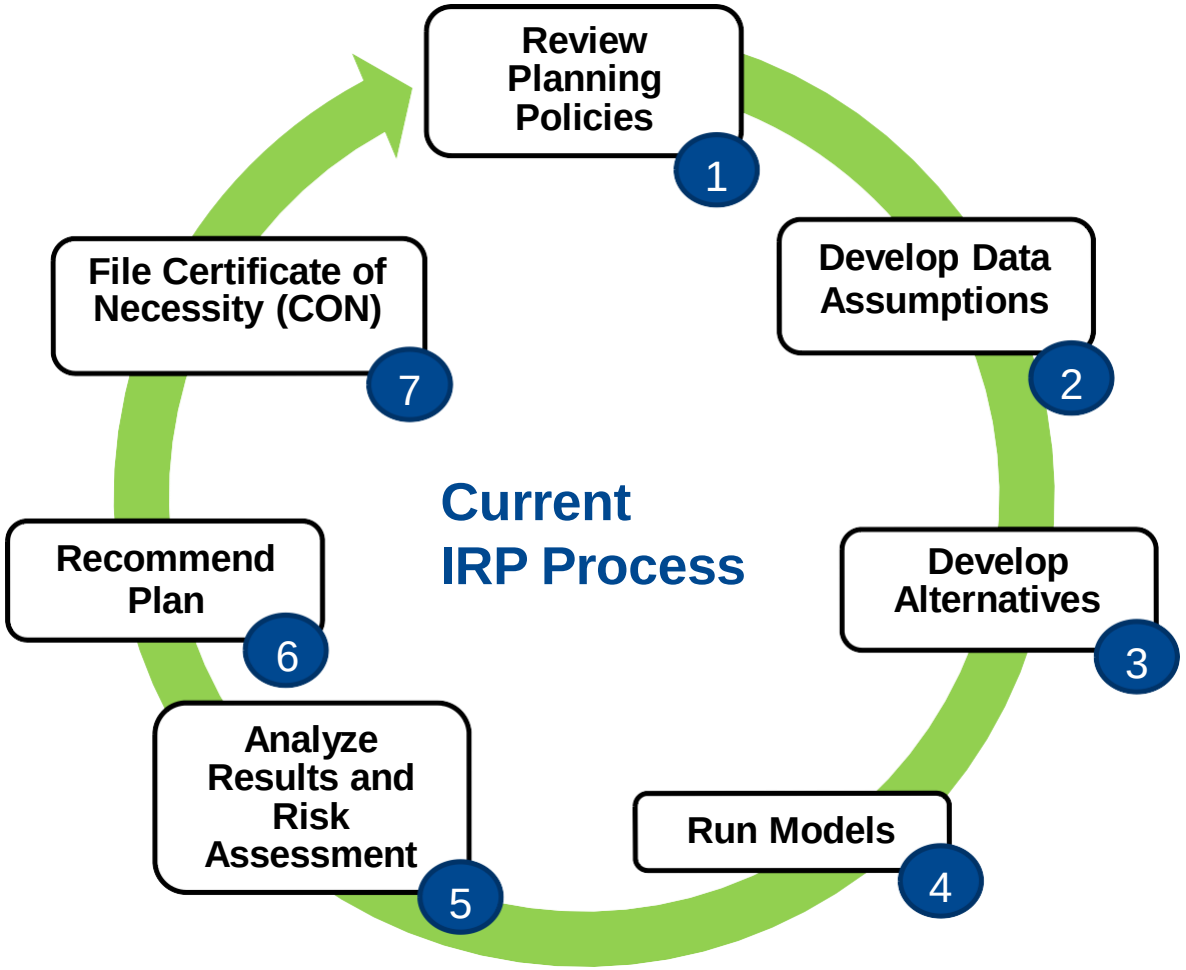
The process shall take into account necessary features for system operation such as:

- Diversity
- Reliability
- Dispatchability and other factors of risk

and shall treat demand and supply resources on a consistent and integrated basis

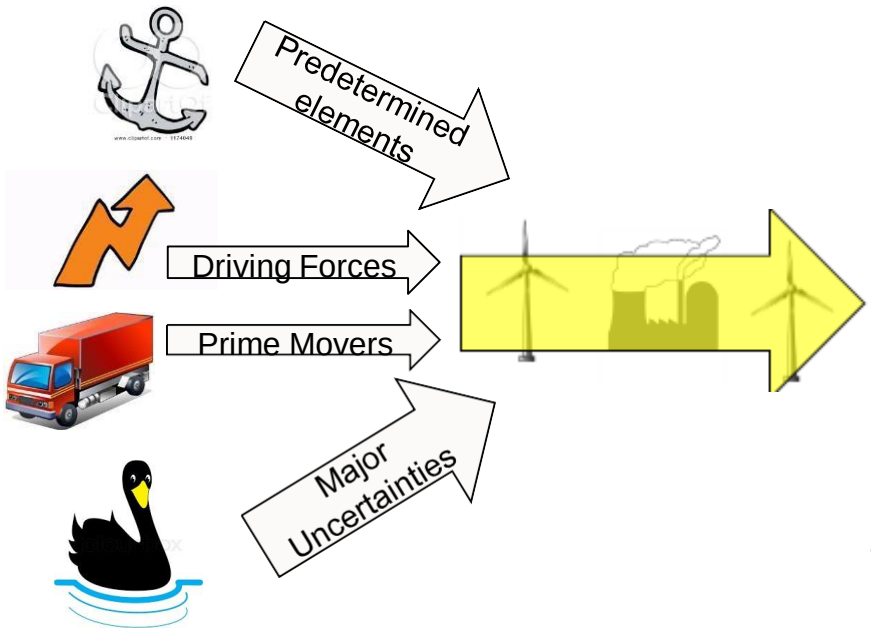
1. The Energy Policy Act of 1992

Development of an Integrated Resource Plan (IRP) is a process with a number of steps



Market scenario development is an important step to ensure diverse, robust conditions to test different strategies to meet the need

INPUTS
Factors that will shape the future



SCENARIOS
Combine inputs into alternative views of the energy future

Examples:

- Environmental Standards adoption
- Solar Energy installation increases

SENSITIVITIES
Smaller “Tweaks” to test individual uncertainties

Energy Waste Reduction Program acceptance

Industrial Load growth

Technology Cost increases

1. Adapted from IHS CERA

Many different resource alternatives are evaluated within the IRP process

Gas Combined Cycle (CC)

Gas CT Peakers

Energy Waste Reduction & Demand Response

DTE Energy's Capacity Options

Solar

Battery Storage

Wind

The process to determine the most viable technology options for the IRP goes from simplistic economic screenings to increasingly more complex analyses

Commercially available Technology alternatives

Preliminary Economic Analysis

- Technologies compared on a cost basis
- Options narrowed down based on economics

Market Valuation

- The cost/benefit for each option is evaluated against the market

Modeling

- Modeling tools are used to select the optimal technologies and develop a series of build plans

Financial Analysis

- The calculation of the customer financial impacts of various alternative capital projects

Multiple customer expectations will be considered within the Integrated Resource Planning process

- An Integrated Resource Plan is a comprehensive road map for meeting a utility's objective of providing electric service to all of its customers

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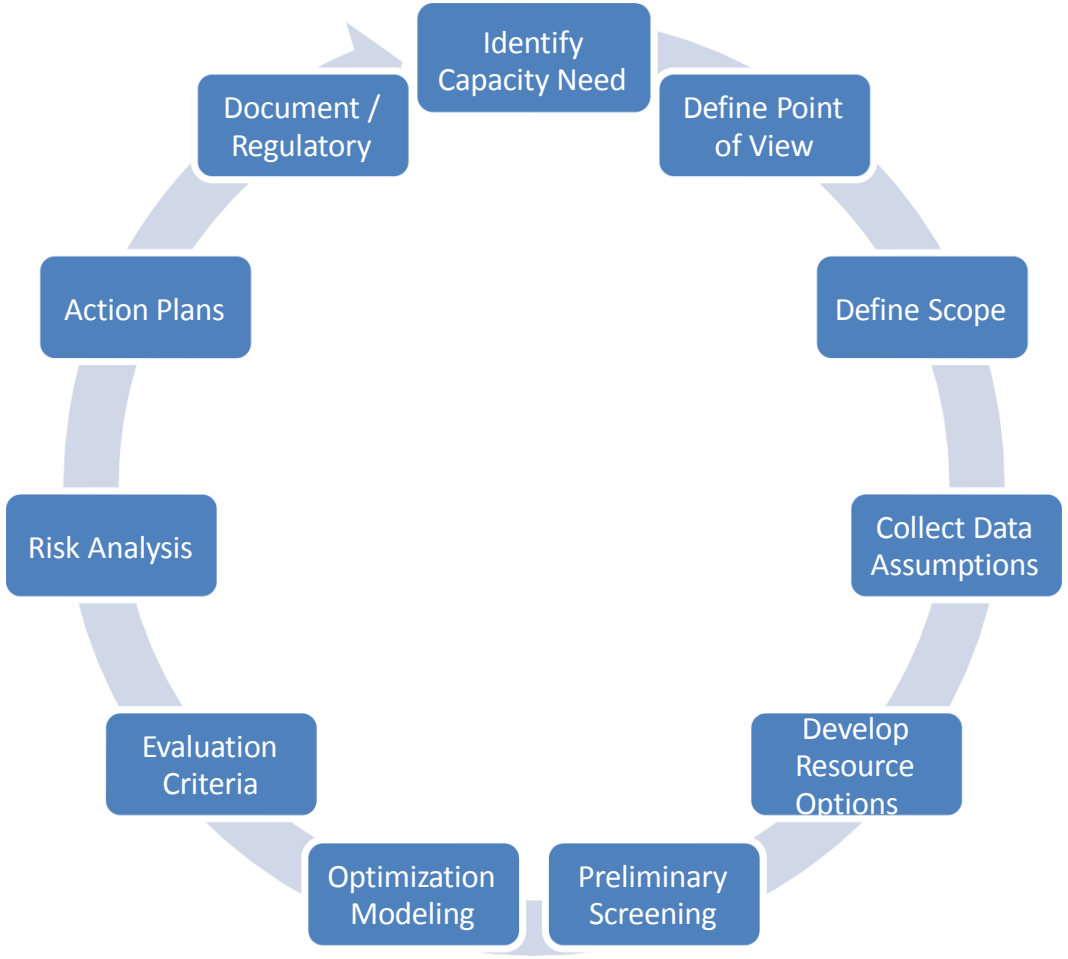
MPSC / MAE IRP Stakeholder Kickoff

March 10, 2017

Consumers Energy
Count on Us®

IRP Process Diagram



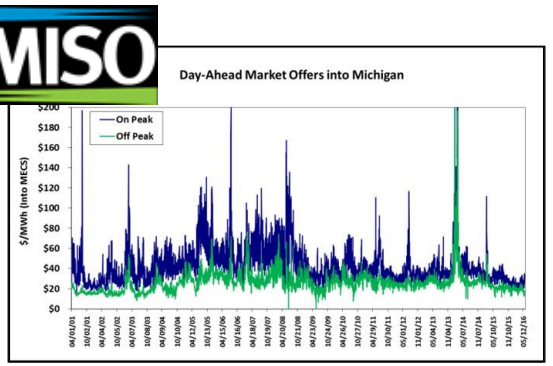
Business Environment

Air

Water

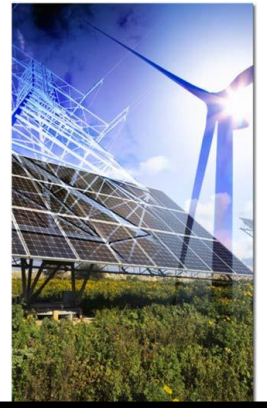
Waste

Environmental Regulations



MISO Market

Existing Fleet



More Renewables

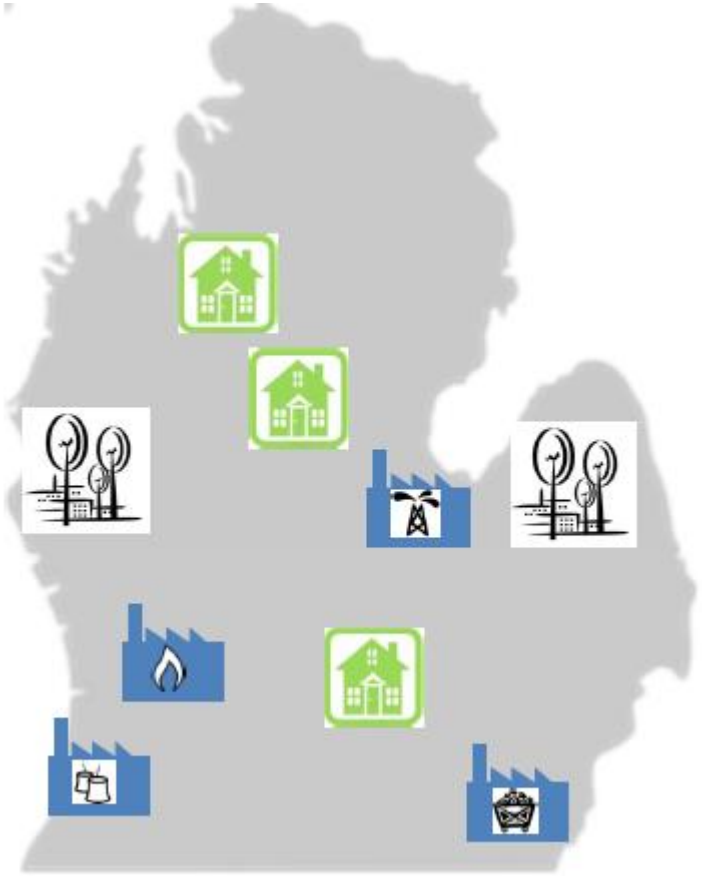
Combined Heat & Power

Customer Desires / Technology Advancements

Probable and potential outlooks drive scenario and sensitivity definitions

Resource Options

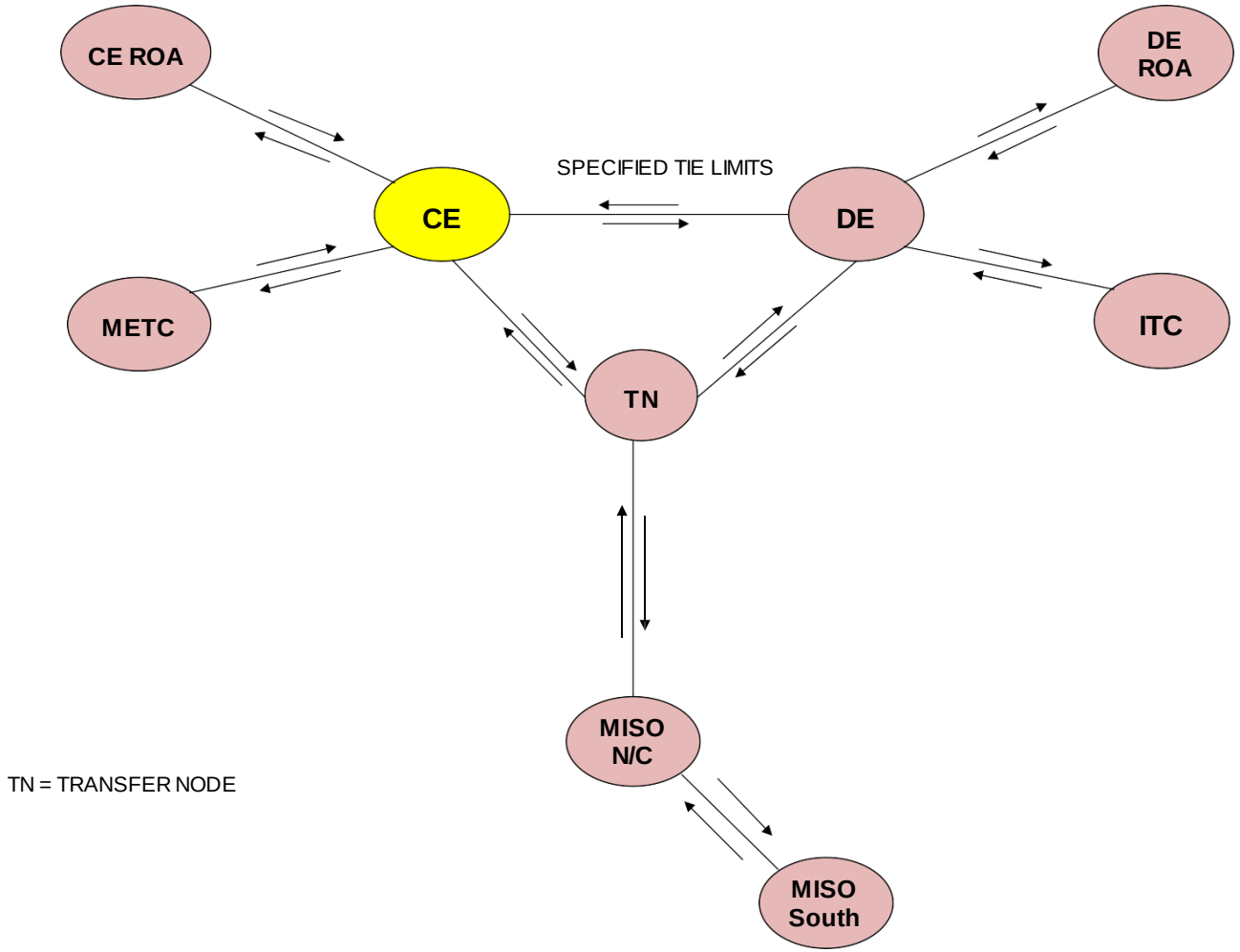
- Supply-side options
  - Purchase new capacity (PPAs)
  - Build new conventional generation (coal, gas)
  - Build new renewables or other non-conventional generation
  - Purchase existing facility
- Demand-side options
  - Energy efficiency
  - Demand response



Modeling Tools

- ABB's Strategist® (formerly owned by Ventyx)
- Study horizon is usually 20+ years (2017-2040)
- Run times vary significantly (<1 hr to days) and depend on factors such as:
  - User-defined optimization constraints
  - Number and size of alternatives available to fill the "gap"
  - Supply and demand growth rate assumptions
  - Planning period horizon
- Current tools and methodologies allow for max 5 scenarios, 10-12 sensitivities within IRP scope

CE Model of MISO Market



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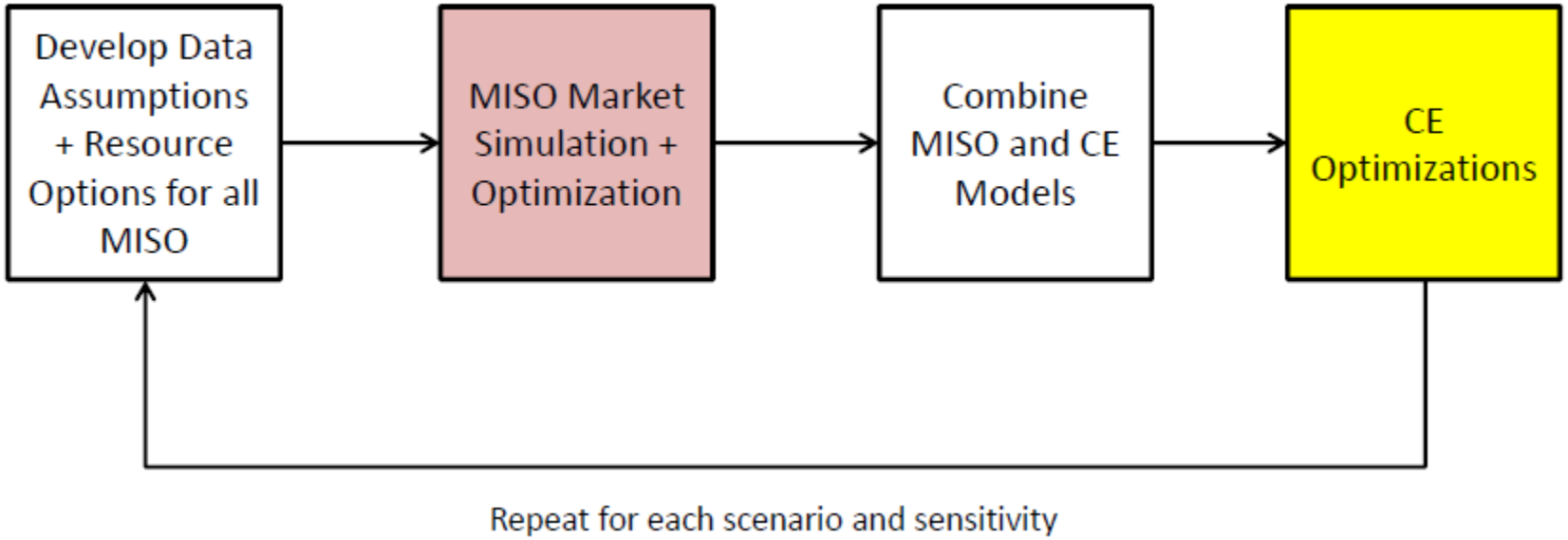

Evaluation of Outputs

- Costs
  - Lifetime NPV
  - Year by year revenue requirements
  - Timing of costs/benefits, cost tradeoffs
  - Rate impacts
  - Capacity vs. energy
- Portfolio Balance
  - Fuel, technology, operational flexibility
- Dependence on capacity market
- Breakeven analysis
- Sensitivity and risk analysis
  - Demand, gas prices, carbon prices, capacity prices
- Other considerations
  - Environmental impact
  - Community impact/jobs
  - Reliability
  - Alignment with corporate strategy
  - Regulatory risk

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INTEGRATED RESOURCE PLANNING

THE CURRENT I&M PROCESS

Indiana Michigan Power
American Electric Power Service Corporation

March 10, 2017
Lansing, Michigan

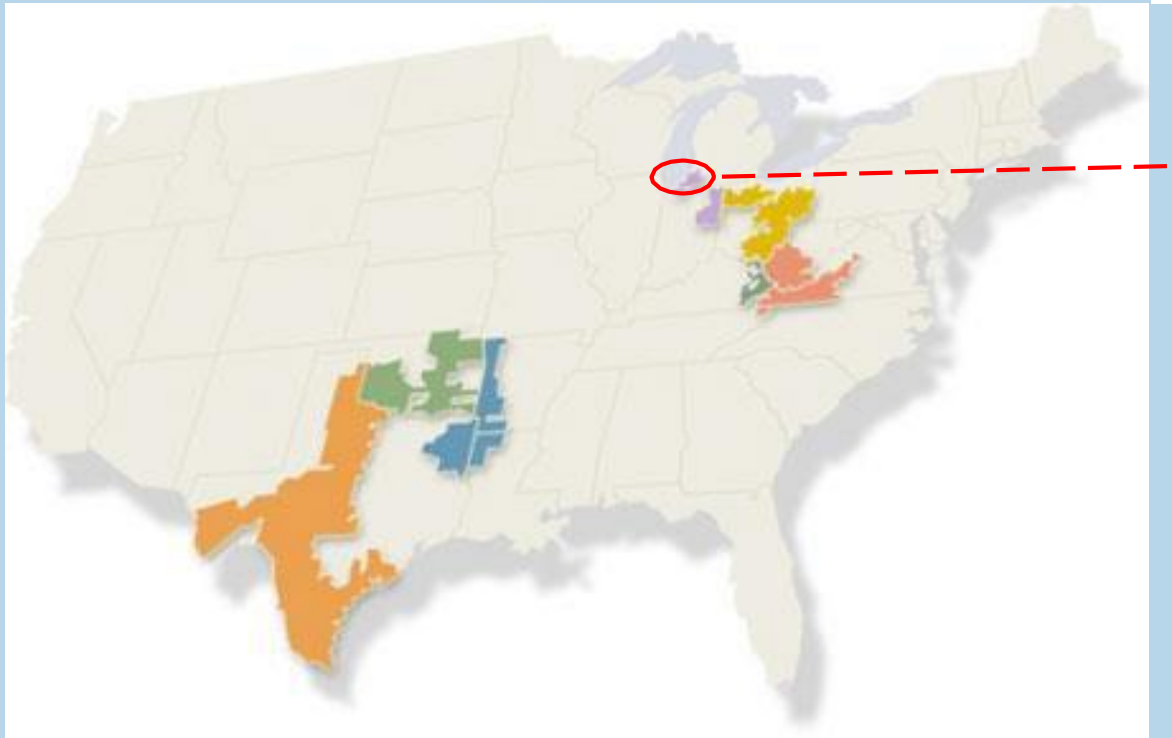
SENATE ENROLLED ACT 437

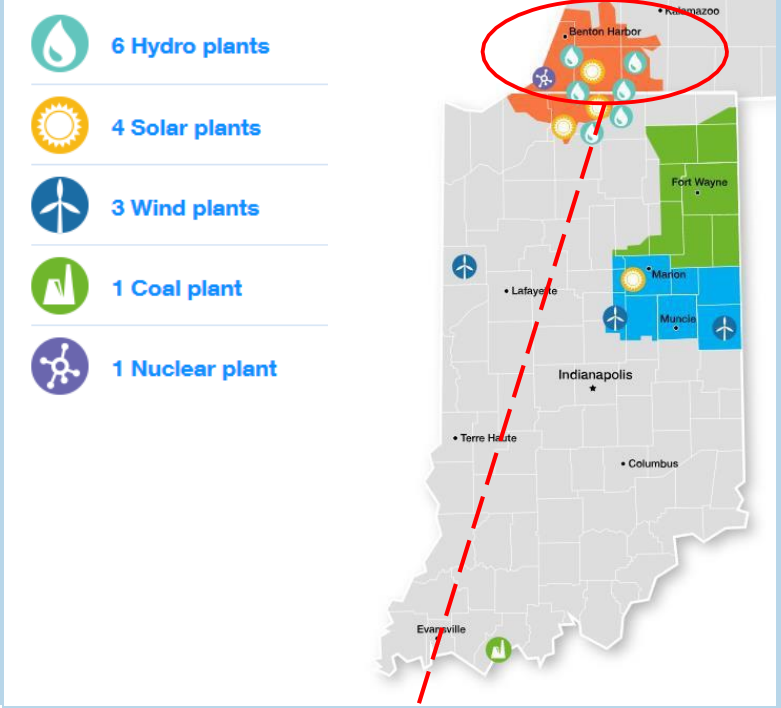
MCL 460.6T(4) provides:

“If an electric utility has filed a multistate integrated resource plan that includes its service area in this state with the relevant utility regulatory commission in another state in which it provides tariff service to retail customers, the commission shall accept that integrated resource plan filing for filing purposes in this state. However, the commission may require supplemental information if necessary as part of its evaluation and determination of whether to approve the plan.”

OVERVIEW OF AEP INTEGRATED RESOURCE PLAN (IRP) OBLIGATIONS

- AEP has 9 Operating Companies with service territories spanning 11 states.
- **SIX** AEP Operating Companies are required to file IRPs in 7 states.
- IRPs are Operating Company and State specific, prepared at varying intervals based on State rules.





I&M – **Michigan** Svc Territory:

- **128,000** Retail Customers
- **2,800 MWh** Retail Sales
  (~ 15% of I&M Total)
- **1,375** approx. sq. miles
  (Three Rivers, St. Joe areas)

IRP FILING REQUIREMENTS FOR AEP OPERATING COMPANIES

Operating Company	State	Filing Cycle	Stakeholder Interaction	Approx Dates Start	File	Order/Closure	Total Process
APCo	VA	Annual	Contested Hearing	1-Jan	1-May	1-Dec	11 months
APCo/WPCo	WV	5 years	Discovery/Comments	1-Sep	31-Dec	7-Jun	9 months
I&M	IN	3 years	Meetings/Discovery/Comments	1-Jan	1-Nov	30-Aug	20 months
KPCo	KY	3 years	Discovery/Comments/Tech Meeting	1-Jul	20-Dec	14-Nov	17 months
PSO	OK	3 years	Comments/Tech Meeting	1-Apr	1-Sep	N/A	5 months
SWEPCO	AR	3 years	Meetings/Stakeholder Report	1-Jan	1-Dec	N/A	11 months
	LA	4 years	Meetings/Draft Report/Comments	2-Jan-17	1-Aug-19	1-Feb-20	24 months
	TX	NA	NA	NA	NA	NA	NA

APCo	Appalachian Power Company	PSO	Public Service Oklahoma
I&M	Indiana MichiganPower	SWEPCO	Southwestern Electric Power Company
KPCo	Kentucky Power Company	WPCo	Wheeling Power

- The IRPs presented in the various states represent an appropriate planning "line-of-sight" to inform and guide future resource decisions by the operating company leadership team.
- The IRPs identify the "Amount", "Timing" & "Type" of long-term resources that may meet customers' needs reliably, environmentally-responsibly, and at the lowest reasonable cost reasonably possible.
- The AEPSC Resource Planning Group provides technical support to I&M and other AEP operating companies and has significant experience in IRP resource modeling, stakeholder engagement and report preparation.
- I&M's IRP is a total company plan that is created to meet the needs of all of its customers, including those in Michigan.

I&M INDIANA IRP STAKEHOLDER PROCESS

I&M invites numerous stakeholders to participate according to the rules of the Indiana Utility Regulatory Commission (IURC)

I&M provides IRP tutorial, pre-reading material, input assumptions

I&M posts IRP related information on its website

I&M conducts initial Stakeholder meeting to identify issues and expectations as to the likely resources to be included in the plan

I&M facilitates subsequent Stakeholder meetings to incorporate Stakeholder feedback into planning assumptions

I&M files final IRP with IURC and responds to Stakeholder comments regarding final plan

IURC issues Draft and Final Director's reports to evaluate utility performance

CONTENTS OF INDIANA INTEGRATED RESOURCE PLAN

- Fundamental Pricing Assumptions
- Load Forecast
- Resource / Technology Options: Cost & Performance Parameters
  - Fossil
  - Renewable
  - Distributed Generation
- DSM/Energy Efficiency Assumptions
- Scenarios and Sensitivity Cases
- Resource Modeling Results
- Developing the Preferred Portfolio

I&M's Indiana IRP is consistent with the requirements of MCL 460.6T(5) and can be supplemented to the extent necessary to support approval.

SUMMARY

The AEPSC IRP group prepares resource plans in multiple jurisdictions and its work product is subject to review and comment from a multitude of interested parties.

The Stakeholder process is well-established, dynamic, and the feedback is well-documented.

I&M's IRP results in a comprehensive plan for meeting customers' needs, including those in Michigan.

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IRP Stakeholders' Meeting

A Municipal Utility's Perspective

Friday, March 10, 2017
Michigan Library and Historical Center

Citizens Advisory Committee Process

- Nine member CAC representing cross section of the community, e.g. business, labor, residential, environmental and utilities
- CAC met 8 times between October, 2015 and April, 2016
- First six meetings were “grounding”
  - Open to the public participation
  - Focus on presentations by subject matter experts
  - Sessions recorded and made available on web site
- Final meetings focused on identifying guiding principles, reviewing model results (eight scenarios), and developing recommendations

Citizens Advisory Committee Members

- Mary Brady Enerson
- James Butler
- Glenn Freeman
- Rory Neuner
- Jeff Pillon
- Derrell Slaughter
- Steve Transeth
- Daniel Voss
- Yvonne Young-McConnell

LANSING BWL
Hometown People. Hometown Power.

Public Engagement

- Customer Survey
  - Reliability, affordability and environmental impact were all key customer considerations
  - Energy independence of community very important
  - The majority of Residential and half of Business Customers would pay more for renewable energy
- Public meetings in different locations included the opportunity for any interested party to make presentation and offer comment
- Third party communications firm to assist in engaging and informing the public
- Web page with schedules and locations of meetings, copies of presentations and documents
- Opportunity to submit written comments at meetings or for posting on web site

Summary of IRP Sessions

- Meeting One: Overview of the BWL generation and distribution system and BWL's role in MISO
- Meeting Two: Forecasts of peak and annual load; fuel costs; market prices; capital costs and resource requirements
- Meeting Three: New generation resource options (with costs); projected retirement of existing units and regulatory requirements
- Meeting Four: Renewable options; energy waste reduction; distributed generation and demand response programs
- Meeting Five: How modeling scenarios and sensitivities are used to manage future uncertainty and risk.
- Meeting Six: Advantages of a balanced portfolio; Local employment impact; energy security and resiliency; Health Impacts and environmental impacts beyond regulations

Portfolio Planning Study Objectives

- What options and directions are desirable or unacceptable?
- Some Examples:
  - Build versus Buy
  - Reliance on the Market
  - Fuel mix
  - Renewables - Energy Efficiency
  - Emission Targets (Clean Power Plan)

CAC's Guiding Principles

- Provide affordable, reliable, secure, and sustainable electricity to customers.
- Continue BWL's leadership in the deployment of clean-energy technologies, such as renewable energy, energy efficiency, and distributed-energy resources.
- Promote further improvement in a healthy environment for customers and the Greater Lansing region.
- Generate and maintain local employment.
- Promote economic development in the Greater Lansing region.
- Be adaptable and mitigate future risks related to resource/fuel availability, technological advances, and cost.
- Emphasize the importance of local control and continue to seek input from the community when making major decisions.
- Prioritize energy self-sufficiency by reducing BWL's reliance on outside energy markets.

Committee Review and Analysis

- BWL modeled 3 initial portfolios:
  - Reference (cost index 100)
  - clean energy (cost index 112.4)
  - market-based (cost index 238.4)
- Market-based Portfolio ruled out due to cost and risk

Committee Review and Analysis

Committee requested additional models:

- Belle River Early Retirement Portfolio
- 85MW Wind Project Portfolio
- Expanded Energy Efficiency Portfolio
- Clean-Energy Goal with 85MW Wind Project Portfolio
- Clean-Energy Goal with 85MW Wind Project & Expanded Energy Efficiency Portfolio

Base Plan Assumptions

Assumption	Value
1 – Modeling Software	Strategist
2 – Study Period	2016 to 2035
3 – Model Region	Lansing, MI
4 – Weighted Cost of Capital	6.18%
5 – Load Growth	1.30%
6 – Energy Optimization Target	1.00%
7 – Demand Response Reduction	0% - 2016 to 2.65% - 2035
8 – Unit Retirements	Eckert 4, 5 and 6 – 2020 Belle River, Erickson – 2030
9 – Natural Gas Price (2015 $/MMBtu)	$3.19 – 2016 to $6.41 – 2035
10 – Coal Price (2015 $/MMBtu)	$2.36 – 2016 to $3.19 – 2035
11 – Gas Conversion, Thermal and Renewable Costs	Gas and Thermal listed in Barr Study $52/MWh – Wind PPA, $65/MWh – Solar PPA
12 – Renewable Capacity Factors	37.5% - Wind 14.2% - Fixed Axis Solar 22.4% - Single Axis Solar
13 – Renewable Capacity Credit	14.7% - Wind, 50% - Solar
14 – Energy Price Forecast ($/MWh)	$30.24 – 2016 to $47.25 – 2035
15 – Annual Capacity Price Forecast	$0.48 – 2016 to $47.25 – 2035
16 – Transmission Cost	$13.25 – Short Term, $6.47 – Long Term
17 – Network Transmission Cost	$3M/year til 2030, $19M/year after 2030

CAC Portfolio Recommendation

Model Results		Supply-side Resources		Demand-side Resources	
Relative Cost Index:	100.8	2018	85MW Wind	Energy Efficiency	41 MW
PV Cost ($000):	$1,693,448	2020	100MW Gas Turbine 40MW Solar	Distributed Generation	7 MW
Clean Power Plan Compliant	Yes	2025-2029	70MW Solar	C & I On-site Generation	15 MW
		2030	150MW Gas Turbine 150MW Combined Cycle 30MW Solar	Residential TOU & DLC Programs	7 MW

LANSING BWL
Hometown People. Hometown Power.

Other Committee Recommendations

- Review and update the IRP (with input from a standing CAC) every four years
- Regularly review the applicability and costs of advancing renewable energy technologies, particularly battery storage
- Continue to explore opportunities to expand BWL energy-efficiency program
- http://lansingenergytomorrow.com/

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Integrated Resource Planning

Public Act 341

Mike Byrne, MI Agency for Energy

Derrell Slaughter, MPSC

MiEnergy
Michigan Agency for Energy

MPSC
Michigan Public Service Commission

Integrated Resource Plans

Sec. 6t of 2016 PA 341 requires all rate-regulated utilities to file IRPs with the MPSC by April 20, 2019, every 5 years thereafter.

IRP Statewide Parameter Setting

- MPSC commences formal, non-contested proceeding *by August 18, 2017*
- In consultation with MAE, DEQ, interested parties:
  - Conduct Energy Waste Reduction/Demand Response Potential Studies
  - Identify environmental requirements
  - Identify reliability requirements
  - Establish modeling scenarios/assumptions
- Solicit written comments and hold hearings to get input from the public
- Publish **proposed modeling scenarios and assumptions** on the MPSC's website *by December 18, 2017*

Modeling Scenarios/Assumptions

Modeling Scenarios and Assumptions developed through parameter setting process to be used by utilities in individual IRP filings

- Any required planning reserve margins and local clearing requirements
- All applicable state and federal environmental regulations
- Any supply-side and demand-side resources that could address the need for additional generation capacity, including (but not limited to):
  - Type of generation technology for any proposed generation facility
  - Projected energy waste reduction savings
  - Projected load management/demand response savings
- Any regional infrastructure limitations
- Projected costs of different types of fuel used for electric generation

IRP Filing Deadlines/Requirements

- All rate-regulated electric utilities must file an IRP no later than April 20, 2019, and no less than every 5 years thereafter.
- The MPSC shall issue an order establishing the filing requirements and filing deadlines.
- For rate-regulated electric utilities with fewer than 1,000,000 customers, the MPSC may establish separate filing requirements, review criteria, and approval standards.
- A rate-regulated utility that serves customers in Michigan and at least 1 other state may design an IRP that covers all of their customers.

IRP Timing and Process

- Individual utility files IRP
  - Include 5-year, 10-year, and 15-year load forecasts
  - Utility may update cost estimates up to 150 days after filing
- MPSC must state whether it recommends changes to a utility's IRP within 300 days of the initial filing
  - Parties given at least 15 days to comment
  - Utility given at least 30 days to consider the recommended changes and submit a revised IRP
- MPSC must issue a final, appealable order within 360 days of a utility's initial filing

Alternatives to Utility Proposals

- Prior to filing IRP, an electric utility shall issue a **Request For Proposals** for any new supply-side capacity resources needed to serve load
  - Results required to be used to inform utility IRP filings
- Existing supplier currently producing 200 MW within same ISO zone may submit proposals directly to the MPSC for consideration as an **alternative to utility proposal** within IRP
  - Supplier has standing to participate in utility IRP proceeding
  - Does not limit the ability for other entities to participate
- Electric utility not required to adopt any alternative proposals
- Each electric utility is encouraged, but not required, to partner with other suppliers in the same local resource zone

IRP and the Certificate of Necessity Process

- If any proposed generation project is 225 MW and above, a CON must also be filed.
- IRP/CON review shall be consolidated
- CON provisions supersede IRP provisions if project is approved

IRP Application Requirements

Forecasting

- Long-term forecast of sales and peak demand under various scenarios.
- Projected impact on rates for the periods covered.
- An analysis of the cost, capacity factor, and viability of all reasonable generation options available to meet projected capacity needs.
- Plans for meeting current and future capacity needs with cost estimates.

Renewable Energy

- Projected renewable energy purchased or produced.
- An analysis of how combined renewable energy and energy waste reduction will compare to the 35% goal.

Energy Waste Reduction

- Plan for eliminating energy waste.

Demand Response

- Projected load management and demand response savings and costs from utility programs.
- Forecast of utility's peak demand and the amount peak reduction it expects to achieve

Environmental Policies

- Plan for compliance with environmental rules, laws, and regulations. Projected costs for compliance must be included.

Transmission Interconnections

- An analysis of new or upgraded transmission options.

Current/Projected Generation and Fuel

- Current utility generation portfolio data
- Project long-term firm gas transportation or storage contracts for any new generation.
- Projected energy and capacity purchased or produced by the electric utility from a cogeneration resource.

IRP Review Criteria

- The MPSC must determine whether an electric utility's IRP is the **most reasonable and prudent** means of meeting energy and capacity needs by considering whether the plan appropriately balances all of the following:
  - Resource adequacy
  - Compliance with applicable environmental regulations
  - Competitive pricing
  - Reliability
  - Commodity price risks
  - Diversity of generation supply
  - Whether the proposed levels of peak load reduction and energy waste reduction are reasonable and cost effective

After MPSC issues final order…

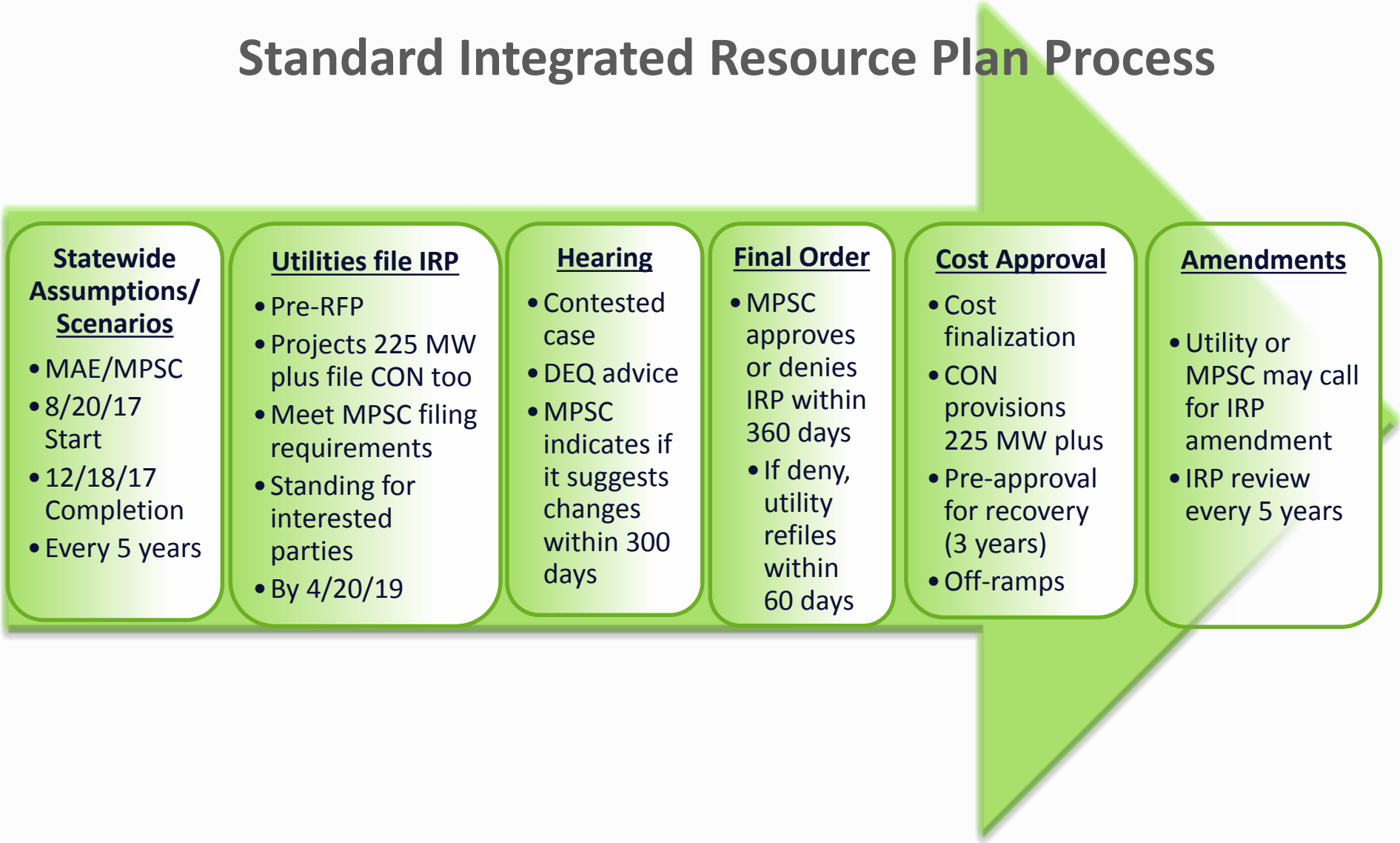
- **Approve** → MPSC cost finalization
- **Deny** → Utility may submit revised IRP within 60 days
  - MPSC has 90 days to review/150 days if proposed changes are substantial
  - Utility may pursue denied projects, even if not approved in IRP
- **Appeal** → Limited to whether order conforms to MI/US Constitutions/laws and is within MPSC's authority
- **Amend** → 90 days/150 days if proposed changes are substantial, or MPSC may order review
- **Review** → no later than 5 years after most recent approved IRP, or upon order of the MPSC or request of utility

IRP Cost Recovery Provisions

- **MPSC specifies costs to comply with approved IRP**
  - Cost finalization for large generation projects
  - 225 MW+ follow CON provisions
- **Costs incurred within 3 years** to comply with IRP are considered reasonable and prudent for cost recovery purposes, and are **pre-approved for recovery in rates**
  - Costs incurred in excess of those authorized by MPSC must be proven to be reasonable and prudent
  - MPSC shall disallow costs incurred as a result of fraud, concealment, gross mismanagement
  - Off-ramp if assumptions underlying an approved project have materially changed or if the MPSC believes it is unlikely that a project will become commercially operational

IRP Process

Standard Integrated Resource Plan Process



Next Steps

- "Pre-work" (2nd quarter 2017)
  - Filing Requirements/Schedule
  - Prepare for Parameter Setting
- Statewide Modeling (3rd & 4th quarters 2017)
  - Draft Proposal
  - Public Input
- Individual Utility IRPs (2018/19)

Thank you!

michigan.gov/mpsc

michigan.gov/energy

michigan.gov/deq

PA 341 Section 6T IRP Implementation
Stakeholder Kickoff Meeting
March 10, 2017
9:30 am – 12:30 pm

1. Opening remarks (MAE Director Valerie Brader and MPSC Chairman Sally Talberg)
2. High level overview of IRP (Paul Proudfoot)
3. High level presentations from utilities on IRP
   a. DTE Energy (Kevin Chreston)
   b. Consumers Energy (Priya Thyagarajan)
   c. Indiana Michigan Power (I&M) (Scott Weaver and Marc Lewis)
   d. Lansing Board of Water and Light (Mark Matus)
4. 15 minute break
5. Presentation of the contents of PA 341 Section 6T (Mike Byrne and Derrell Slaughter)
6. Presentation of plans moving forward (Cathy Cole and Bonnie Janssen)
   a. Formal Proceeding August – December
   b. Pre-collaborative stakeholder engagement to develop a strawman draft between now and June
   c. How to become involved – workgroups, tentative meeting schedule, who to contact
   d. Circulate sign-up sheets
7. Closing remarks

MAE, MPSC, and MDEQ PA 341 Section 6T Implementation Plans

Cathy Cole, MPSC
Bonnie Janssen, MI Agency for Energy
Mary Maupin, MI DEQ

March 10, 2017

MPSC
Michigan Public Service Commission

Statewide Parameter Setting 6T(1)

Formal Proceeding (but not a contested case)

- Commencing within 120 days of the effective date of the Act and every 5 years thereafter
- 120 day timeline
  - To complete everything in Sec 6T(1A) – 6T(1I)

    * Most will need to be developed early in the 120 day process in order to allow for comments and public input *
  - Before issuing the final modeling scenarios and assumptions
    - Receive written comments
    - Hold public hearings to solicit public input
    - Post to website

Expected Formal Proceeding

- Commission-initiated docket in August
  - Expected to direct Staff to post initial drafts
  - Announcement of public hearing dates and locations in September, 2017
    - East Michigan, West Michigan, Upper Peninsula
  - Expected deadline for written comments in the docket through the end of October
  - Expected to direct Staff to file a report summarizing written and verbal comments and making any recommended revisions to the initial strawman proposal by mid-November
  - Expected Commission Order in December

Stakeholder Engagement

GOAL: Develop a strawman proposal with as much consensus as is possible prior to the formal proceeding

When: Between now and June

How:

- Divide into workgroups populated by subject-matter experts
- Workgroups will develop recommendations for and receive feedback from the larger stakeholder group (all of you)
- Workgroups may revise recommendations based upon stakeholder feedback
- MPSC Staff will assimilate all of the workgroup recommendations and combine into a strawman proposal that would be available for review and comment by stakeholders in July (PRIOR to the formal proceeding)

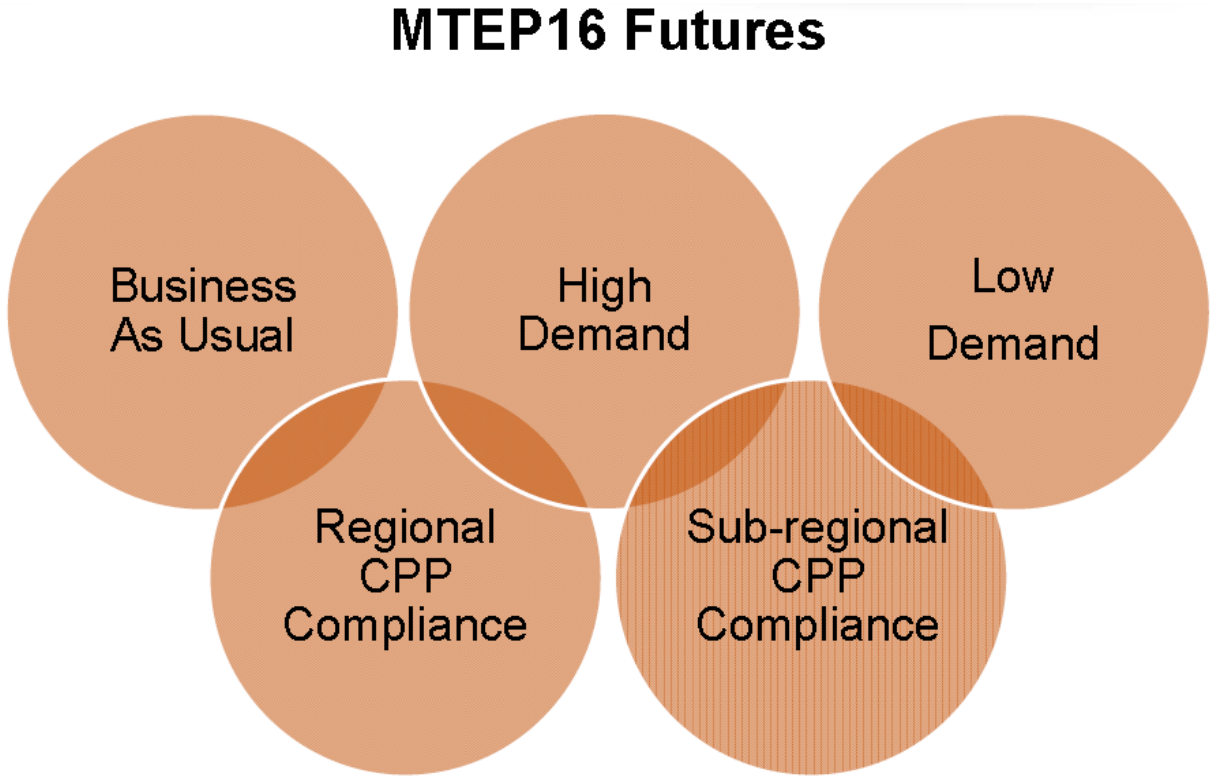
Workgroups

- Environmental Policies – Federal/State/Local/Tribal (Rules and Regulations)
- Energy Waste Reduction (EO, EE, EWR)
- Demand Response (DR, DRR, EDR, LMR, btmg)
- Renewables and PURPA (Hydro, Pumped Storage, Wind, Solar, Other)
- Forecasting, Fuel Prices and Reliability (Markets, Generation Information, Economic Forecasts, Capital, O&M, Fuel, Capacity, Resource Adequacy and Reliability)
- Transmission*
- Upper Peninsula (Zone 2)*
- Other Market Options (Energy Storage, IPP, BTMG)
- Filing Requirements (including smaller utilities)

*The FERC, MISO, PJM Workgroup has been narrowed to Transmission and the Upper Peninsula (Zone 2) Workgroup has been added based on feedback received at the meeting.

Workgroup Assignments

- Start by evaluating MISO's MTEP Futures Scenarios - details available at www.misoenergy.org
- Developed in a stakeholder process; updated annually
- Should Michigan require any of the MTEP Futures?
- Modified MTEP Futures?
- Is anything missing?



Dig Deeper into MTEP futures

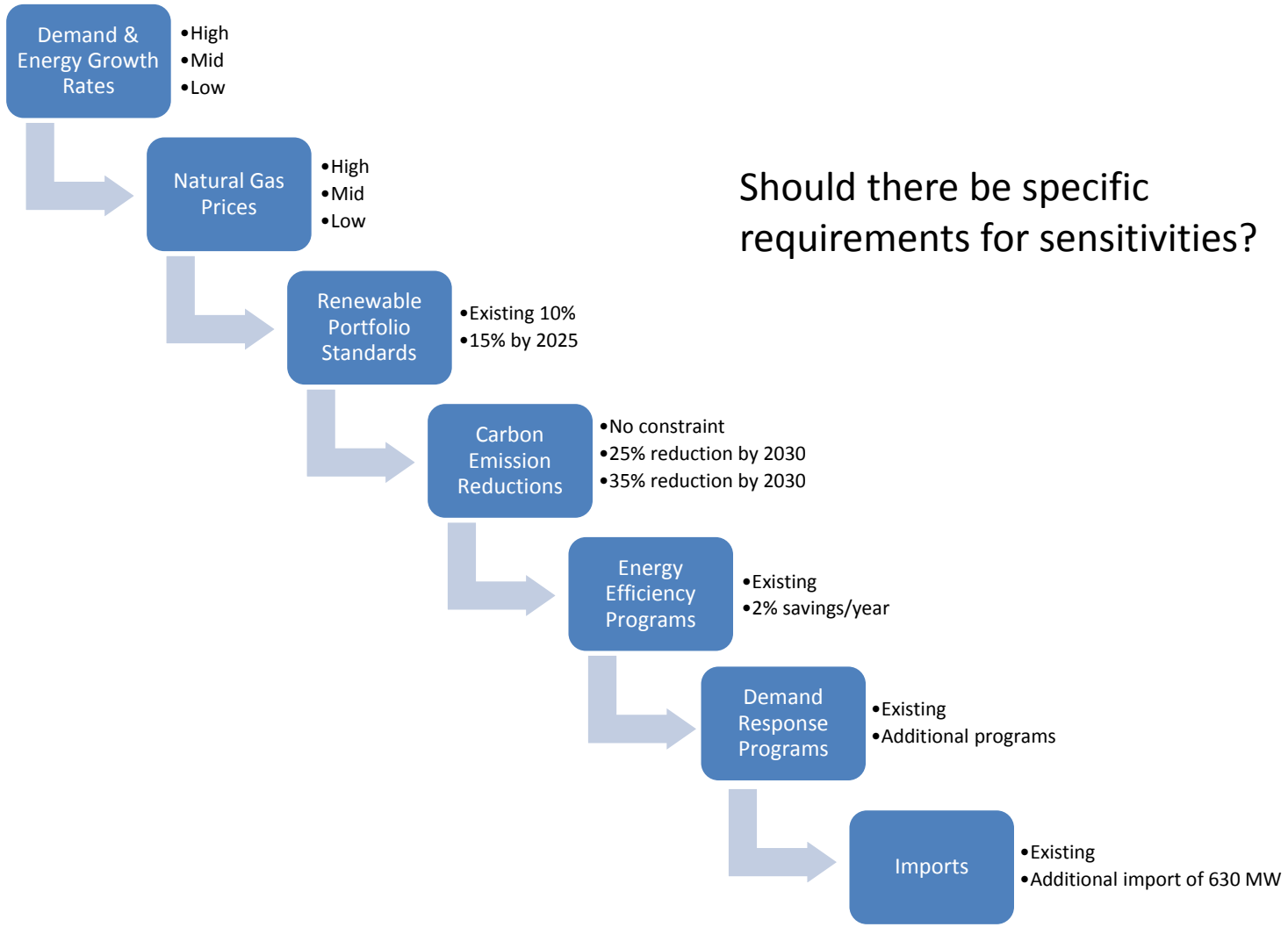
MISO

MTEP16 Futures Matrix

Future	Baseline Demand / Energy Growth (20-year)	Retirement Level* (GW)	Inflation	Peak Natural Gas Price (2015 $/MMBtu)	Incremental Renewables (GW) N/C: North/Central S: South	CO_2 Cost (2015 $/ton)
Business as Usual	0.75% / 0.82%	No Additional	2.5%	$4.11	N/C: 4.2 Wind/ 1.4 Solar S: 0 Wind/ 0 Solar	N/A
High Demand	1.55% / 1.61%	Age-related	4.0%	$4.11	N/C: 7.2 Wind/ 1.6 Solar S: 0 Wind/ 0 Solar	N/A
Low Demand	0.11% / 0.19%	Age-related	2.0%	$3.29	N/C: 2.4 Wind/ 1.3 Solar S: 0 Wind/ 0 Solar	N/A
Regional CPP Compliance	0.75% / 0.82%	14 GW coal + age-related	2.5%	$4.93	N/C: 4.2 Wind/ 1.4 Solar S: 0 Wind/ 0 Solar + cost maturity curves	$25 / ton
Sub-Regional CPP Compliance	0.75% / 0.82%	20 GW coal + age-related	4.0%	$4.93	N/C: 4.2 Wind/ 1.4 Solar S: 0 Wind/ 0 Solar + cost maturity curves	$40 / ton

*12 GW of MATS related coal-retirements are assumed in all Futures
Age-related retirement assumption applies to non-coal, non-nuclear generation only

Consider Sensitivity Requirements



Should there be specific requirements for sensitivities?

Workgroup Assignments

- Workgroups report status and/or propose initial recommendations to larger stakeholder group May 1st
- Workgroups meet together to make any consensus revisions based on stakeholder feedback
- Final workgroup recommendations due to Staff by June 19th
- Staff to assimilate and prepare 1st draft of strawman proposal by July 7th for one last round of informal comments before the commencement of the formal proceeding

Tentative Meeting Dates

Located at MPSC / MAE offices, 7109 W. Saginaw Hwy, Lansing, MI

WebEx / Call in options will be made available

- March 17
- March 30
- April 17
- May 1

  * Status report from workgroups due to stakeholders

- May 24
- June 12

How to get involved

- Workgroup sign up sheets are circulating
- Email Lynn Beck beckl12@michigan.gov
- Check www.Michigan.gov/mpsc or www.Michigan.gov/energy for IRP website and sign up
- Attend workgroup meetings
- Provide informal and formal comments at proper times

Next Meetings

- March 17 – 9:00 am – 12:00 pm
  - Energy Waste Reduction Workgroup
  - Demand Response Workgroup
- March 30 – 9:00 am – 4:30 pm
  - 9:00 – Environmental Policy Workgroup
  - 10:00 – Renewables and PURPA Workgroup
  - 11:00 – Other Market Options and Advanced Technologies Workgroup
  - 1:30 – Pricing and Reliability Workgroup
  - 3:30 – Filing Requirements Workgroup (small utility considerations)

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Integrated Resource Plan (IRP) Stakeholder Outreach Meeting

Friday, March 17, 2017; 9:00 a.m. – 12:00 p.m.
Lake Michigan Hearing Room, Michigan Public Service Commission (MPSC)
Map to MPSC at 7109 W. Saginaw Hwy., Lansing, MI 48917

Phone-In: (877) 366-1831, Access Code 9382920
Webinar: www.connectmeeting.att.com,
Meeting no. 8773661831, Access Code 9382920

DRAFT AGENDA ITEMS

9:00 a.m. Energy Waste Reduction Potential Study

- Brief history of 2013 Statewide Energy Efficiency Potential Study
- Current findings of individual company energy efficiency studies by GDS
- Other potential scenarios based on current studies
- Comments from stakeholders regarding additional inputs or
- Assessment of information from all potential studies, additional scenarios, and comments from stakeholders

10:15 a.m. Break

10:30 a.m. Demand Response Potential Study

- Brief history of demand response proceedings and Commission activity
- Current plan for two part study
- Stakeholder engagement plan