Integrated Resource Plan (IRP) Stakeholder Outreach Meeting

AGENDA ITEMS

9:30 a.m. Energy Waste Reduction Workgroup
- Discussion on Upper Peninsula energy efficiency potential
- Review preliminary comments received on CE/DTE potential studies
- Schedule update

10:45 a.m. Demand Response Workgroup
- Update on DR potential studies
- Discuss possible modeling scenarios or sensitivity analysis
- Stakeholder engagement plan update

12:00 p.m. – 1:30 p.m. Break for lunch – on your own

1:30 p.m. Renewables and PURPA Workgroup
- Presentations from Staff, DTE Energy and Consumers Energy
- Discussion

2:30 p.m. Transmission Workgroup
- Transmission considerations within PA 341
- Overview of existing transmission planning processes
- Review comments received from stakeholders
- Discussion

3:30 p.m. Forecasting, Fuel Price and Reliability Workgroup
- Discussion on scenario and sensitivity definitions
- Discussion on other economic indicator outlooks

4:30 p.m. Adjourn

Energy Waste Reduction Workgroup 9:30 am

Workgroup Lead: Pat Poli
Michigan Public Service Commission
517-284-8072
polip@michigan.gov

Integrated Resource Planning Stakeholder Outreach Meeting April 17, 2017

Energy Waste Reduction

Patricia Poli

Michigan Public Service Commission

EWR Workgroup Agenda

- Introductions, Pat Poli
- Upper Peninsula Insight, Art Thayer
- Upper Peninsula Insight, Brandy Brown
- Review of Comments Received, Pat Poli
- Questions and Discussion

Upper Peninsula Considerations

Art Thayer:

Energy Efficiency Programs Director

Michigan Electric Cooperative Association

UP Comparable Potential Studies

Brandy Brown:

Senior Program Consultant

CLEAResult

CLEAResult®

Upper Peninsula:
Comparable Potential Studies

Brandy Brown, Senior Program Consultant

We change the way people use energy™

Agenda

- Our approach
- Selected potential studies
- Electric potential
- Natural gas potential
- Generalizing to the Upper Peninsula
- Questions

Our Approach

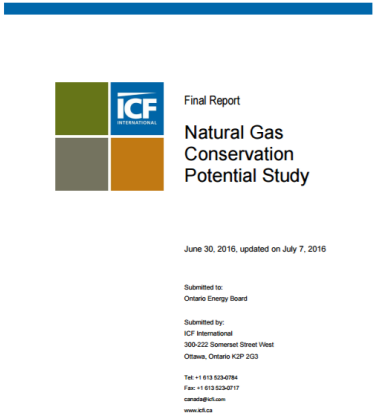
- We accessed the U.S. Department of Energy's Energy Efficiency Potential Studies Catalog
  - https://energy.gov/eere/slsc/energy-efficiency-potential-studies-catalog

- We filtered the studies by the following criteria:
  - Climate zone
  - Timeliness (preference for 2016)
  - Geographical relevance

Selected Potential Studies

1. Ontario IESO Achievable Potential Study: Short-Term Analysis (Nexant, 2016)
   - Provides electric potential in 2020

2. Ontario Natural Gas Conservation Potential Study (ICF, 2016)
   - Provides natural gas potential through 2030

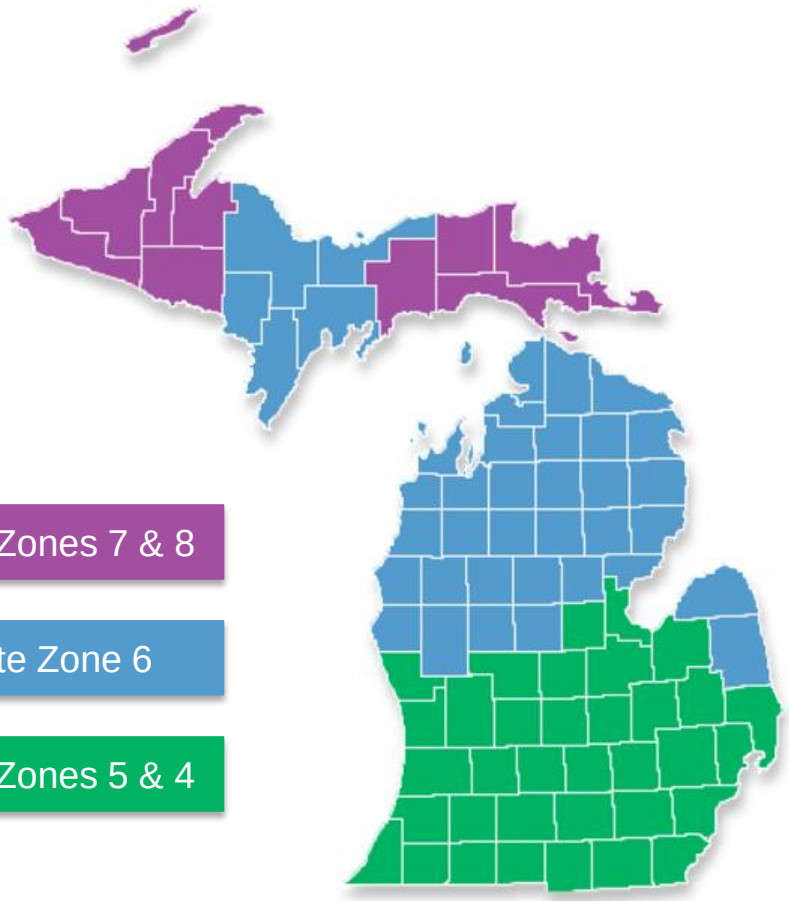


Are they applicable to the Upper Peninsula?

- To ensure that we can, with statistical confidence, attempt to generalize these studies to the Upper Peninsula, we need to examine whether they fit the appropriate characteristics.

  For example:
  - Climate Zone
  - Economic Indicators
  - Building Stock

Climate Zone



Climate Zones 7 & 8

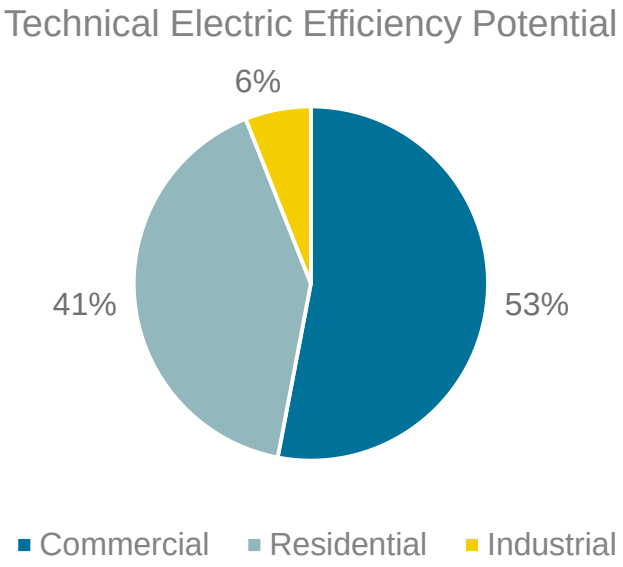
Climate Zone 6

Climate Zones 5 & 4

Ontario IESO Achievable Potential Study: Short-Term Analysis

Technical potential:

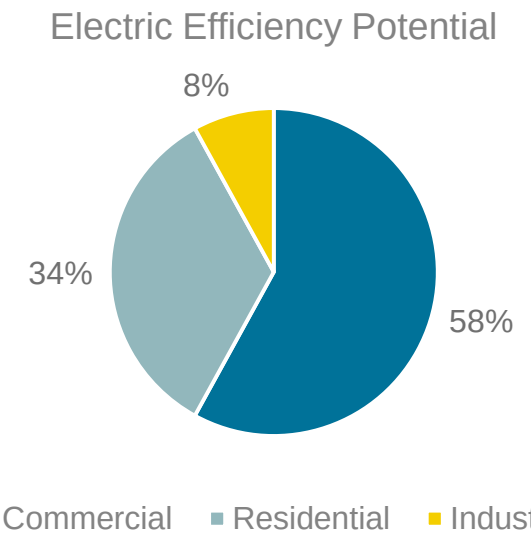
- Estimated annual savings of **33,132 GWH** (or 28% of total electricity use) in 2020.



Ontario IESO Achievable Potential Study: Short-Term Analysis

Economic potential:

- Estimated annual persistent savings of **23,407 GWh** (or 19.5% of total electricity use) in 2020.



Ontario Natural Gas Conservation Potential Study

Exhibit ES 3: Total Technical, Economic and Achievable Potential Annual Savings Relative to Reference Case

Year	Reference Case Use (million m^3/yr.)	Technical Potential		Economic Potential		Unconstrained Achievable Potential		Semi-constrained Achievable Potential		Constrained Achievable Potential	
		Absolute Savings (million m^3/yr.)	Savings Relative to Reference Case (%)	Absolute Savings (million m^3/yr.)	Relative to Reference Case (%)	Absolute Savings (million m^3/yr.)	Relative to Reference Case (%)	Absolute Savings (million m^3/yr.)	Relative to Reference Case (%)	Absolute Savings (million m^3/yr.)	Relative to Reference Case (%)
2015	24,821	5,880	23.7%	5,299	21.3%	267	1.1%	195	0.8%	171	0.7%
2016	25,690	7,211	28.1%	6,096	23.7%	575	2.2%	414	1.6%	362	1.4%
2017	25,518	7,811	30.6%	6,205	24.3%	891	3.5%	631	2.5%	555	2.2%
2018	26,029	8,326	32.0%	6,290	24.2%	1,209	4.6%	859	3.3%	758	2.9%
2019	26,172	8,803	33.6%	6,369	24.3%	1,534	5.9%	1,094	4.2%	969	3.7%
2020	26,306	9,233	35.1%	6,448	24.5%	1,869	7.1%	1,338	5.1%	1,187	4.5%
2025	27,128	11,229	41.4%	6,891	25.4%	3,295	12.1%	2,276	8.4%	1,681	6.2%
2030	27,962	12,896	46.1%	7,409	26.5%	4,973	17.8%	3,468	12.4%	2,510	9.0%

Ontario Natural Gas Conservation Potential Study

Technical potential:

- Estimated annual persistent savings of **9,233** million m^3/year (or 35.1% of total natural gas use) in 2020.

Ontario Natural Gas Conservation Potential Study

Economic potential:

- Estimated annual persistent savings of **6,448** million m^3/year (or 24.5% of total natural gas use) in 2020.

Generalizing to the Upper Peninsula

- To appropriately apply these studies to the Upper Peninsula, we would need to consider:
  1. Population size
  2. Population type (rural vs. urban)
  3. Average sq. ft. of residences
  4. Building stock
  5. Income

- Limitation: Primary data is always preferred. However, existing and comparable high-quality research is the next best thing.

Thank You!

Upper Peninsula Potential Estimate

- Minnesota Power service territory (northeast MN). 2014 EE potential assessment
  - Similar climate and geography
  - Demographics and business sector characteristics
- 21CEP potential study methodology
  - Wisconsin study as base
  - Incorporated Michigan specific characteristics
  - Statewide estimate (though not UP specific)

Review Comments Received

MPSC – initial questions & responses

Stakeholder comments received:

1. NRDC
2. 5Lakes
3. MEEA
4. National Housing Trust
5. EcoWorks-EcologyCenter-NRDC-MEEA-SierraClub-Union of Concerned Scientists

MPSC Questions for CE

- Low-income adoption rate
- Low income measures considered
- Data on marginal line losses
- Clarify administrative costs estimate
- Define programmable thermostats
- Industrial sector growth assumptions
- Industrial measures studied (compared to DTE)

MPSC Questions for DTE Energy

- Impacts from using 2012 CBECs data?
- Clarify Low income measures screening
- Why not included avoided T&D in UCT screening.
- Data on marginal line losses – other proxy data?
- Low-income measures
- Clarify basis for administrative cost estimate

Comments: NRDC

- Define Achievable Potential w/out constraint
- Model incentives @ 100% of incremental cost
- Target incentives (high UCT, large gap in potential)
- Account for changing C/B by rescreening every year (LED troffers 40-75% cheaper)
- Proxy proposal for marginal line loss
- Avoided costs
- Forecasting accuracy
- Emerging technology proxy

Comments: 5 Lakes

Questions (reviewed CE study only)

- Explain Industrial measures: Ach.Pot. = Econ.Pot.
- “Unachievable” Econ. Pot. concentrated in small group of measures. Identify barriers for R/C/I.
- Optimize strategy incentive awards
- Rate design – incorporate from DR study (TOU)
- On Bill Financing opportunities

Comments: MEEA

Additional futures to consider beyond (MISO MTEP 15)

- Mild/med/aggressive EWR = supply side
- PA341/PA342 incentive mechanisms
- MISO Capacity Market – establish EWR value
- High Gas price scenario
- Carbon Pricing scenario

Comments – National Housing Trust

Focus on Low Income housing issues

- Create separate sector for Multifamily
- GDS definition of low-income is unclear
- Commercial vs residential – how accounted for
- Consider emerging tech. and future lower costs
- Set UCT requirement for low-income to zero
- Treat all low-income measures in L-I blgs as L-I
- Consider Non-Energy-Benefits

Comments – Environmental Justice

Affordable Multifamily buildings

- Technical Potential: Include low-income measures
- Economic Potential: ignore UCT for low-income measures (Non-Energy Benefits)
- Achievable Potential: Incorporate growth in adoption rate for low-income

Updated Draft EWR Timeline

April 19	Staff provides GDS with additional scenario runs
May 1	GDS provides results of 1st request
May 8	Staff provides GDS with 2nd request for additional scenario runs
May 22	GDS provides results of 2nd request
May 24	Larger IRP Stakeholder Workgroup Meeting

Updated Draft EWR Timeline

June 1	Final date for stakeholders to provide feedback to staff
June 12	Larger IRP Stakeholder Workgroup Meeting
June 19	EWR proposal submitted to Larger IRP Workgroup
July 7	1st draft of IRP straw man proposal due by IRP Stakeholder Workgroup
August	Commission docket initiated Sept. Public Hearings to take place in east MI, west MI, and UP

Next IRP Stakeholder Meeting

May 1, 2017

9:00 a.m.*	Environmental Policy Workgroup
10:45 a.m.	Lawrence Berkeley National Laboratory
12:00 p.m.	Lunch on your own
1:30 p.m.	Lawrence Berkeley National Laboratory
4:00 p.m.	Adjourn

*The UP Workgroup will be meeting from 9:00 a.m. - 10:45 a.m. in a separate room, using a separate teleconference number.

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Demand Response Workgroup 10:45 am

Workgroup Lead: Dave Isakson
Michigan Public Service Commission
517-284-8285
isaksond@michigan.gov

Integrated Resource Planning Stakeholder Outreach Meeting April 17, 2017

Demand Response

David Isakson

MPSC
Michigan Public Service Commission

Formal IRP Proceeding

Between August 18 - December 18, 2017

- Commission-initiated docket in August
  - Expected to direct Staff to post initial drafts
  - Announcement of Sept 2017 public hearing dates/locations
  - 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 Straw Man proposal by mid-November
  - Expected Commission Order in December

Stakeholder Engagement for DR

- March 17 – discuss and comment on Staff's proposed DR potential study scopes
- March 22 – written comments on scopes due to Staff
- Today– discuss DR scenarios and sensitivities for use in IRP modeling
- May 1 – report workgroup's initial recommendations to stakeholders
- June/July – discuss DR provisions of PA 341 and 342
- September– review results of statewide potential study, adjust IRP recommendations if necessary

Today's Agenda

1. Update on DR potential studies
2. Discuss possible modelling scenarios or sensitivity analysis
3. Stakeholder engagement plan update

Potential Study RFP Update

Thank you for your comments!

Timeline

Buy4Michigan

Requests For Proposals

Modeling Scenarios

DR Scenario Considerations

Business as usual vs. Achievable potential

- Only planned utility programs or results from potential study
- Both?

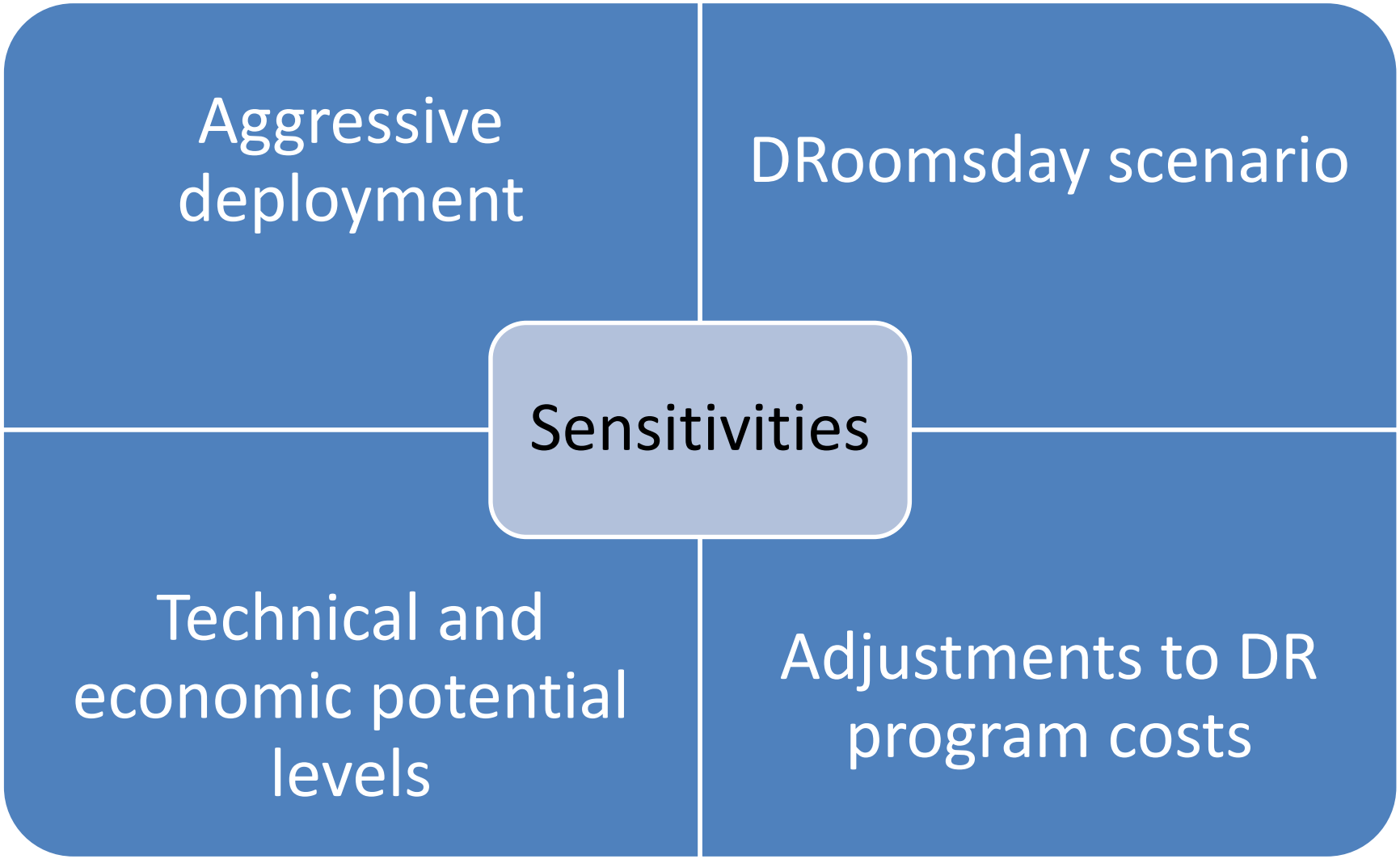
Cap the overall size of DR

- Limit DR to the reserve margin

DR as a resource or load reduction

- Presentation by LBNL will cover this at the May 1 meeting

Modeling Sensitivities



Proposed Future Discussion

Submit more sensitivity or scenario ideas to Staff

Staff will compile and share everyone's ideas with the workgroup

Vote on the best options at the next meeting

Summer Framework Meetings

Accordingly, the Commission, on its own motion in a separate docket, intends to initiate a proceeding to evaluate potential alternatives to the regulatory review and cost recovery approaches for DR. Among other considerations, the proceeding could examine the impact of new energy laws and whether the energy waste reduction program framework or DR practices in other jurisdictions could serve as a model. Therefore, the Commission will issue a separate order, in the second quarter of 2017, to provide additional guidance for this effort.

Sincerely,
The Commission

Thank You

Contact Information:

DR Potential Study Workgroup,
Dave Isakson: isaksond@Michigan.gov

Get Involved:
Michigan.gov/energylegislation

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4:30 p.m. Adjourn

Renewables and PURPA Workgroup 1:30 pm

Workgroup Lead: Jesse Harlow
Michigan Public Service Commission
517-284-8320
harlowj@michigan.gov

Integrated Resource Plan
Renewable Energy and PURPA

Jesse Harlow

MPSC
Michigan Public Service Commission

Renewables in PA 342

- At least the same amount of RECs in 2016-2018 as required in 2015
- 12.5% Interim Renewable Requirement in 2019 and 2020
- 15% Renewable Requirement by 2021
- 35% RE/EWR Combination Goal by 2025
- No 50% PPA requirement
- No more biennial RE Plans
- Renewable planning period still ends in 2029

What Happens After 2021

- The Act is silent as to what is required after 2021.
- Potential options are:
  - The requirement reverts back to PA 295 where the provider must maintain at least the same number of RECs as required in 2015
  - There is no requirement what-so-ever
  - The intent is to maintain at least the 15% requirement.

What Happens in 2021 continued

PA 341 Section 6t (5)(c) states that an integrated resource plan shall include:

"Projected energy purchased or produced by the electric utility from a renewable energy resource. If the level of renewable energy…is projected to drop…the electric utility must demonstrate why the reduction is in the best interest of ratepayers."

Reality Check

- Capacity expansion models tend to choose renewable resources only if a constraint is set
- Siting concerns
  - Requires a large footprint and there has been backlash in the Thumb
- Higher cost with respect to natural gas combined cycle plants (NGCC)
- Much lower on-peak unit availability

Reality Check

	NGCC	Wind	Solar
Overnight Cost	$978	$1,877	$2,671
ZRC Basis	$1,076	$3,461*	$4,008*

https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capcost_assumption.pdf

*15.6% Wind 50% Solar MISO ELCC https://www.misoenergy.org/Library/Repository/Report/2016%20Wind%20Capacity%20Report.pdf

Reality Check

- Renewables are a first dispatch energy resource when available.
  - Zero fuel cost and minimal O&M

	NGCC	Wind	Solar
Levelized Cost	$56	$51	$58

- Provide generation resource diversity, minimize reliance on export fuels, clean, etc.

https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf

PURPA Aspect

- IRP may be a good place to determine base avoided cost.
  - Updates to take place on a biennial basis. (Discussion?)
- Our group will not have a primary focus on PURPA

Charge of This Group/Homework

- Develop a Renewable IRP filing requirement template/checklist.
  - Staff would like the renewable components separated to the extent possible.
  - Components to include?:
    - Cost by technology (overnight and levelized)
    - Economic assumptions (handled in Eric's Forcasting group)
    - Capacity amounts and capacity factors
    - Tax credit assumptions
    - Baseline = 15%; High wind? High solar? How high?
    - Other assumptions

  Send me your ideas by Monday, April 24

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Michigan Public Service Commission
Renewable Energy/PURPA Workgroup Staff Lead

Jesse Harlow
harlowj@michigan.gov
517.284.8320

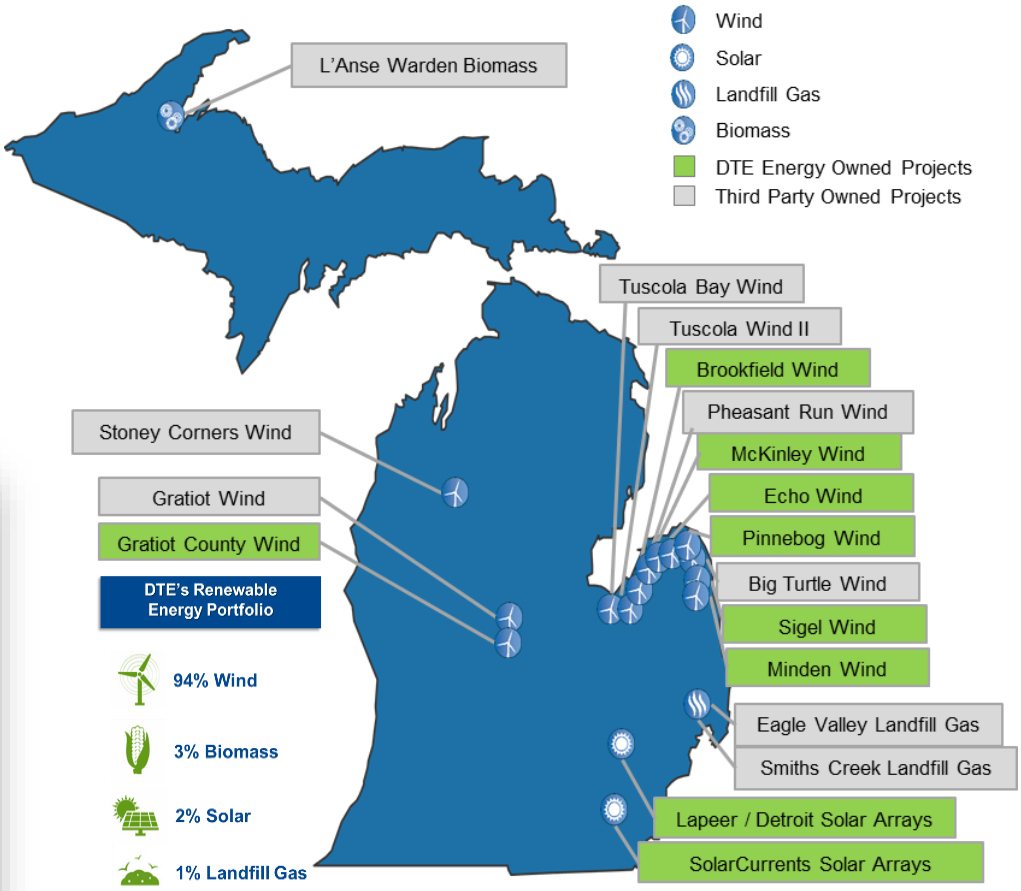
DTE Energy®

MPSC Renewable Energy Workgroup
DTE Energy Update

April 17, 2017

The DTE Renewable Energy Portfolio now includes almost 1,000MW

- DTE has driven investments of over $2 billion in renewable resources since 2008
- In addition to compliance with PA295, these investments have contributed significantly to local build communities through economic development and involvement with local organizations



The latest additions to the DTE portfolio include Pinnebog Wind and Lapeer Solar

Pinnebog Wind Park is DTE's 7th owned wind project

- 51 MW
- 30 GE 1.7 X 100 turbines
- Huron County
- Commercial Operation: December 2016

Lapeer Solar is DTE's 30th solar project

- 48 MW (56DC)
- 200,000 solar panels on 240 acres
- South of Lapeer, MI
- Expected Commercial Operation: May 2017

After meeting the 10% RPS in 2015, DTE filed an amended plan including an additional 336 MW

- In 2016 the MPSC approved an Amended Renewable Energy Plan with the following build plan

	2017	2018	2019	2020
Wind Build (MW)		161.3[1]		150[2]
Solar Build (MW)	5	10	10	

- However, increasingly organized opposition groups have created challenges for DTE and other developers of renewable energy projects in Michigan
  - Local zoning rules for wind and solar are becoming increasingly restrictive
  - Greater wind resource zones are becoming saturated causing new projects to move into lower resource areas

1. Pine River Wind Park – Gratiot & Isabella Counties
2. Filion Wind Park – Huron County (tentative)

DTE is working on plans to fill any remaining gaps to compliance with PA 342

- DTE plans to file a Renewable Energy Plan (REP) to achieve the 15% renewable energy standard by January 31, 2018, as set forth by the commission

- DTE is considering all options for compliance including
  - Existing projects
  - Banked RECs
  - Approved but yet to be built projects
  - New projects

- The 2018 REP will also consider compliance with other key aspects of the 2016 legislation:
  - DTE's ability to reach the 35% energy waste reduction and savings goal
  - Avoiding a drop in renewable energy after 2021 as referred to in PA 341.6t 4.C

    If the level of renewable energy purchased or produced is projected to drop over the planning periods set forth in subsection (3), the electric utility must demonstrate why the reduction is in the best interest of ratepayers.

- We look forward to the feedback of this group as we integrate that into our plan models

IRP – Renewable Energy

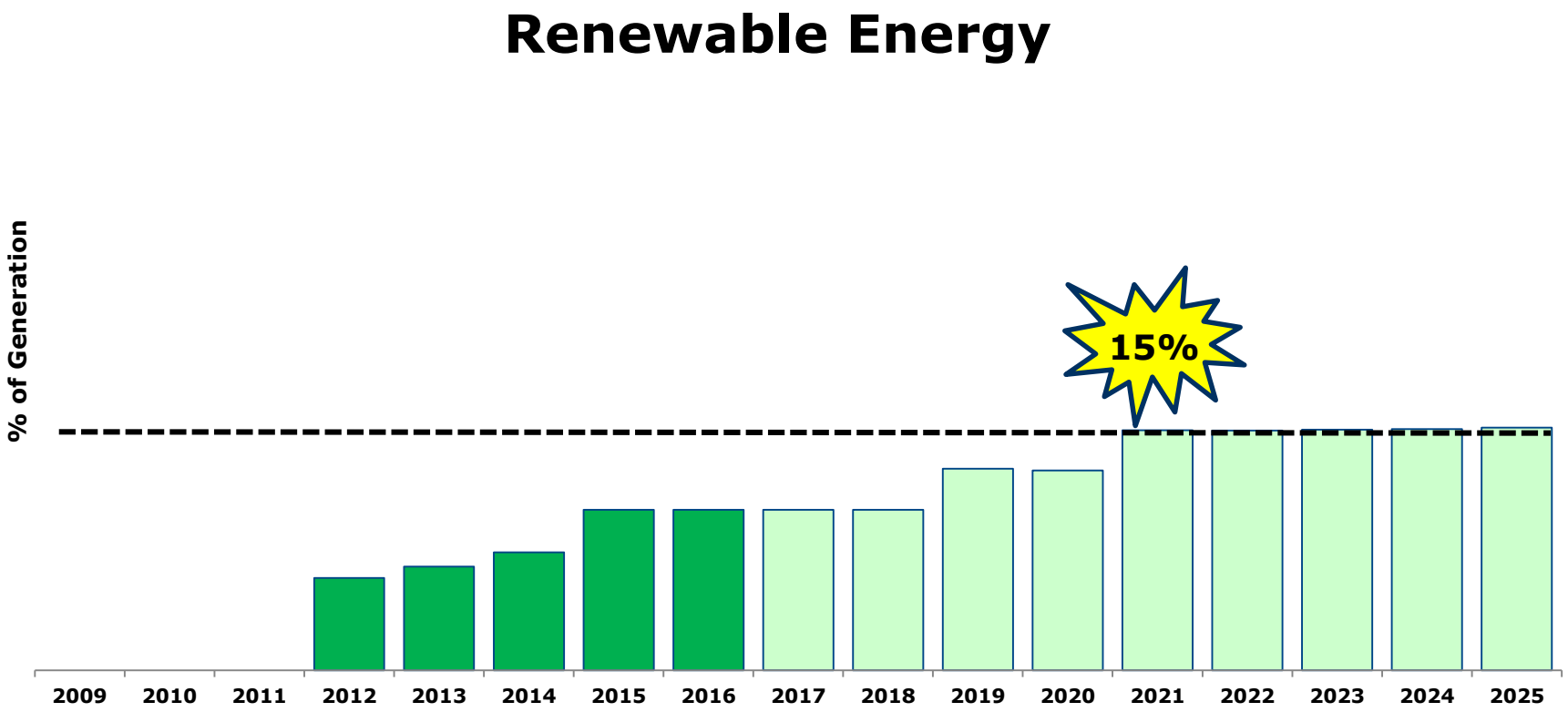
April 17, 2017

Consumers Energy
Count on Us®

IRP - RENEWABLES

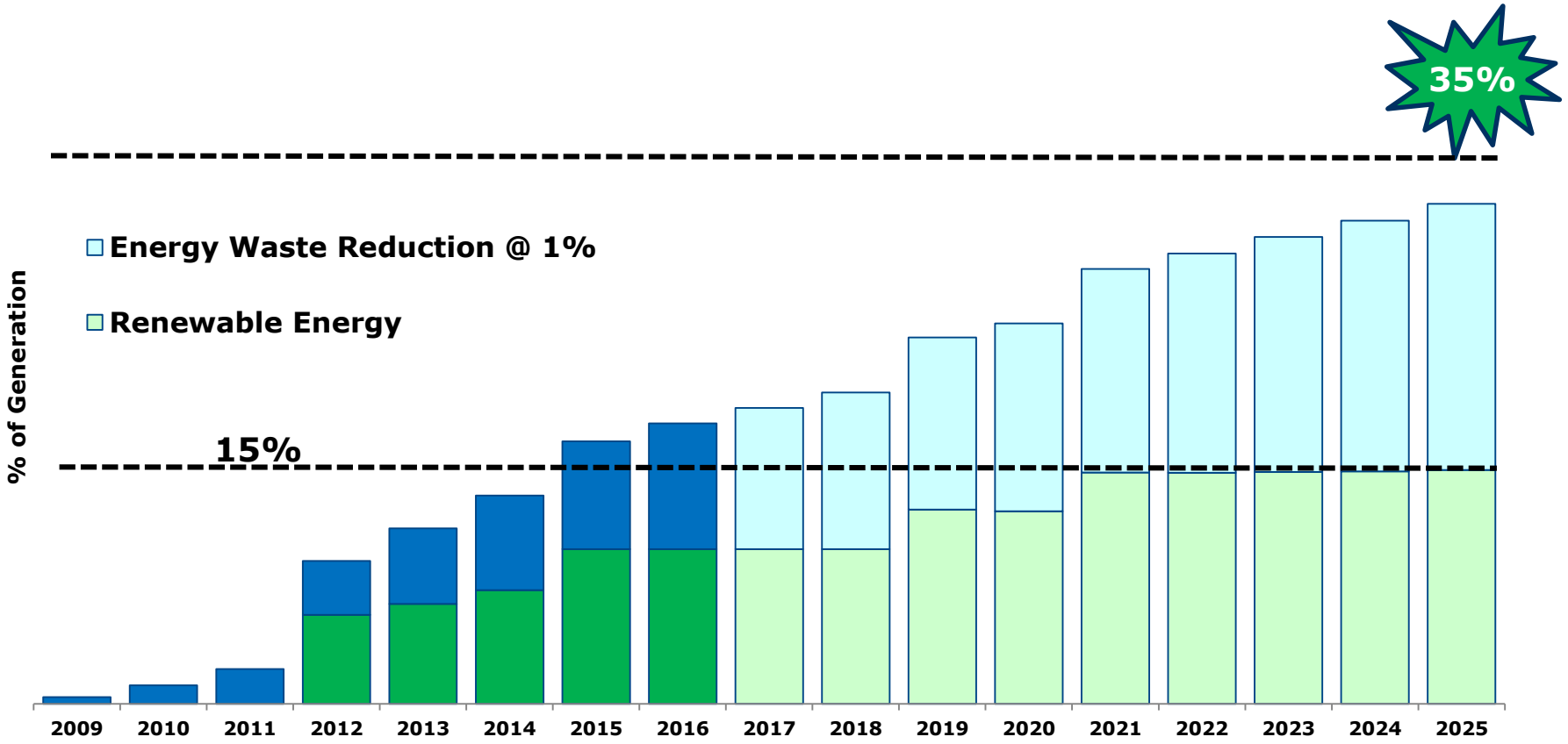
- PA 342 of 2016
  - Goal - Not less than 35% of Michigan's electric needs should be met through a combination of energy waste reduction and renewable energy by 2025
  - 2016-2018 maintain renewable energy credit (REC) portfolio of at least the same level as 2015
  - 2019 & 2020 REC portfolio of at least 12.5%
  - 2021 REC portfolio of at least 15%

2021 RENEWABLE ENERGY GOAL



Evaluation of renewable energy strategy underway

ACHIEVEMENT OF 2025 STATEWIDE GOAL



Of options which enable achievement of statewide goal

Transmission Workgroup 2:30 pm

Workgroup Lead: Naomi Simpson
Michigan Public Service Commission
517-284-8248
simpsonn3@michigan.gov

Transmission Workgroup:
Including Transmission in IRP

Today's Agenda

- Introductions
- Overview of transmission considerations within PA 341
- Overview of existing transmission planning processes
  - MISO
  - PJM
- Review of preliminary remarks submitted by stakeholders
- Open Discussion and solicitation of formal comments
  - Moving forward with a cohesive and transparent process
  - Stakeholder engagement

History of IRP with Transmission Consideration

PA 286 instituting 460.6s

10/6/2008

U-15896

CON & IRP Filing Requirements

12/23/2008

PA 341 amending 460.6s and instituting 460.6t

12/21/2016

U-15896

Updated IRP Requirements

12/2017

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PA 341

Section 6s. (4)(d) The existing or proposed electric generation facility or proposed power purchase agreement represents the most reasonable and prudent means of meeting the power need relative to other resource options for meeting power demand, including energy efficiency programs, electric transmission efficiencies, and any alternative proposals submitted under this section by existing suppliers of electric generation capacity under subsection (13) or other intervenors.

PA 341

Section 6s. (11)….An integrated resource plan shall include all of the following:

(g) Electric transmission options for the electric utility

The sister component:

6t. (5) An integrated resource plan shall include all of the following:

(h) An analysis of potential new or upgraded electric transmission options for the electric utility.

PA 341

6t. (5) An integrated resource plan shall include all of the following:

(j) Plans for meeting current and future capacity needs with cost estimates for all proposed construction and major investments, including an transmission or distribution infrastructure that would be required to support the proposed construction or investment, and power purchase agreements.

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MISO Transmission Planning Process (MTEP)

- MTEP stands for Midwest Transmission Expansion Planning
- It is a Bottom Up / Top Down process
- Projects submitted to MISO for 2017 MTEP by September 2016
- MISO & stakeholders review projects through 2017
- Final 2017 MTEP report will be approved in December 2017
- MTEP report has two Appendices where projects are documented
  - Appendix A : Verified need, vetted solution – Approved for construction
  - Appendix B : Verified need, final solution not determined
    - Multiple alternatives that need further review in future a MTEP cycle
    - Valid generation re-dispatch alternative identified by MISO for shutdown plus contingency (at off peak loads) driven project

MISO Coordination

Roles and Responsibilities

- **MISO – Planning Authority**
  - The responsible entity that coordinates and integrates transmission facilities and service plans, resource plans, and protection systems.
  - Approval authority over transmission projects as part of Annual Plan.

- **Transmission Planner**
  - The entity that develops a long-term (generally one year and beyond) plan for the reliability (adequacy) of the interconnected bulk electric transmission systems within its portion of the Planning Authority area. (Typically Transmission Owners)
  - Has primary responsibility to work with Stakeholders/Customers

MISO Future Studies

MISO Regional Transmission Overlay Study (RTOS)

- RTOS is a multi-year process to position the grid in support of changing resource mix.
- Goal is to identify regional needs and develop indicative long term overlay roadmaps for a broad set of policy and economic driven futures.
- Performing a comprehensive value assessment ensures robustness of developed plans.

PJM Transmission Planning Process (RTEP)

- Regional Transmission Expansion Plan (RTEP) refers to PJM's transmission planning process, as well as the product of that process.
- The main groups of activities within the RTEP cycle are:
  - Develop assumptions and models
  - Perform planning analyses
  - Identify system needs
  - Solicit and evaluate project solution options
  - Recommend and approve projects

PJM Transmission Planning Process

- The RTEP process occurs on 12-month[2] and 24-month cycles.
- The study portion of the process includes development of assumptions and models, analysis, and identification of system needs.
  - The 12-month cycle looks out 5-15 years and tends to identify reliability violations.
  - The 24-month cycle looks out 7-15 years and identifies both reliability and market efficiency needs.

2. Due to expanded planning activities, PJM has recommended lengthening the annual 12-month planning cycle to an 18-month annual (overlapping) cycle.

PJM Coordination

Roles and Responsibilities

- **PJM – Planning Authority**
  - Provide open access transmission service over their collective facilities
  - Direct the operation of and coordinate the maintenance of TOs facilities including approving, denying or rescheduling any outage deemed necessary to ensure reliable operations.
  - Administer the PJM Tariff
  - Prepare the Regional Transmission Expansion Plan and administer the regional planning process
- **Transmission Owners**
  - Build, finance, own, acquire, sell, dispose, retire, merge or otherwise transfer or convey all or any part of their assets, including any Transmission Facilities
  - Take whatever actions they deem necessary to fulfill their obligations under local, state or federal law.
  - Each TO: “will physically operate and maintain all transmission facilities that it owns consistent with, among other things, applicable reliability principles, guidelines and standards of the Applicable Regional Reliability Council and NERC, and Good Utility Practice”

Today's Agenda

- Introductions
- Overview of transmission considerations within PA 341
- Overview of existing transmission planning processes
  - MISO
  - PJM
- Review of preliminary remarks submitted by stakeholders
- Open Discussion and solicitation of formal comments
  - Moving forward with a cohesive and transparent process
  - Stakeholder engagement

Summary of Preliminary Comments

- LSEs that do not own transmission voiced a reliance on outside parties including ISOs, TOs, and engineering consultants.
- Consideration of *all resource options* on equal footing.
- Consider transmission system efficiencies and non-wire solutions, ex. Dynamic line ratings.
- Specific modeling inputs
  - Import/export limits
  - Generic interconnection & network upgrade costs
  - Analysis of specific system ties that may expand the ability to import power.

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Open Discussion

The Goal: Provide a recommendation that will ensure transmission alternatives are fully considered in a utilities IRP.

- Understand the regional differences within our State and the different existing transmission planning processes.
- Recommend a framework that will work for everyone.
- Identify specific modelling expectations or parameters that can contribute to alternative scenarios or sensitivities.

Stakeholder Engagement for Transmission

- Today – Background and preliminary comments related to the inclusion of transmission in the IRP process.
- May 1 – written comments are due to the Transmission Workgroup Co-chairs. Work group update at 5th IRP Implementation Meeting.
- Mid-May (17) – The draft proposal will be distributed to all Transmission Workgroup Stakeholders for review and comment. Co-Chairs will develop a draft proposal/recommendation based upon May 1st written comments received.
- Late-May (24) – Transmission Workgroup open discussion about the draft proposal. Where is there consensus? Where do we need to refine to find common ground?
- June 1 – Final comments due on draft proposal.
- Early June – Work group conference call if needed.
- June 19 – Final Transmission Workgroup recommendations submitted to Staff.

Contact Information

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Forecasting, Fuel Price and Reliability Workgroup 3:30 pm

Workgroup Lead: Eric Stocking
Michigan Public Service Commission
517-284-8245
stockinge@michigan.gov

Market Options and Advanced Technologies Workgroup Meeting

April 18, 2017

1:30 p.m.	Introductions
1:40 p.m.	5 Lakes Energy Presentation – CHP Technology Roadmapping and Modeling
2:10 p.m.	Discuss and organize list of options and technologies
2:50 p.m.	Break
3:00 p.m.	-Continue to discuss and organize list of options and technologies -Discuss modeling scenarios and assumptions
3:50 p.m.	Next steps and schedule next meeting
4:00 p.m.	Adjourn

Next IRP Stakeholder Meeting

May 1, 2017

9:00 a.m.*	Environmental Policy Workgroup
10:45 a.m.	Lawrence Berkeley National Laboratory
12:00 p.m.	Lunch on your own
1:30 p.m.	Lawrence Berkeley National Laboratory
4:00 p.m.	Adjourn

*The UP Workgroup will be meeting from 9:00 a.m. - 10:45 a.m. in a separate room, using a separate teleconference number.

Please note: There may be other workgroup meetings taking place that are not in combination with these all-inclusive IRP stakeholder workgroup meeting dates. Look for updates from your workgroup chair on additional meeting dates.