2026 Integrated Resource Plan (IRP) Update

Stakeholder Working Group Session #3

March 19, 2026

ZEELAND
Board of Public Works

Opening Remarks and Introductions

Andrew Boatright

General Manager

Zeeland Board of Public Works

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Why Are We Here Today?

2026 IRP – Stakeholder Working Group Session #3 Discussions

- The IRP Process and Preliminary Results
- Considerations for Portfolio Evaluation
- Collaboration Opportunities
- Next Steps

Welcome

Robert Mulder

Power Supply & Market Operations Manager / Utilities Manager Designee

Zeeland Board of Public Works

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Agenda

- Safety and Meeting Guidelines
- Overview of the IRP Process & Preliminary Results
- Considerations for Portfolio Evaluation
- Near Term Action Plan
- Coordination and Collaboration with MPPA
- Questions and Discussion
- Next Steps

Safety and Meeting Guidelines

Safety

- Exits
- Muster Point: East Side of Church Street
- AED Location
- Dial “911” in Event of an Emergency

Principles to Guide Today’s Session

- Respectful Dialogue
- Questions and Comments are Public
- Transparency of Questions and Answers
- Refer to list of “Commonly Used Terms” at End of Presentation

IRP Process & Preliminary Results

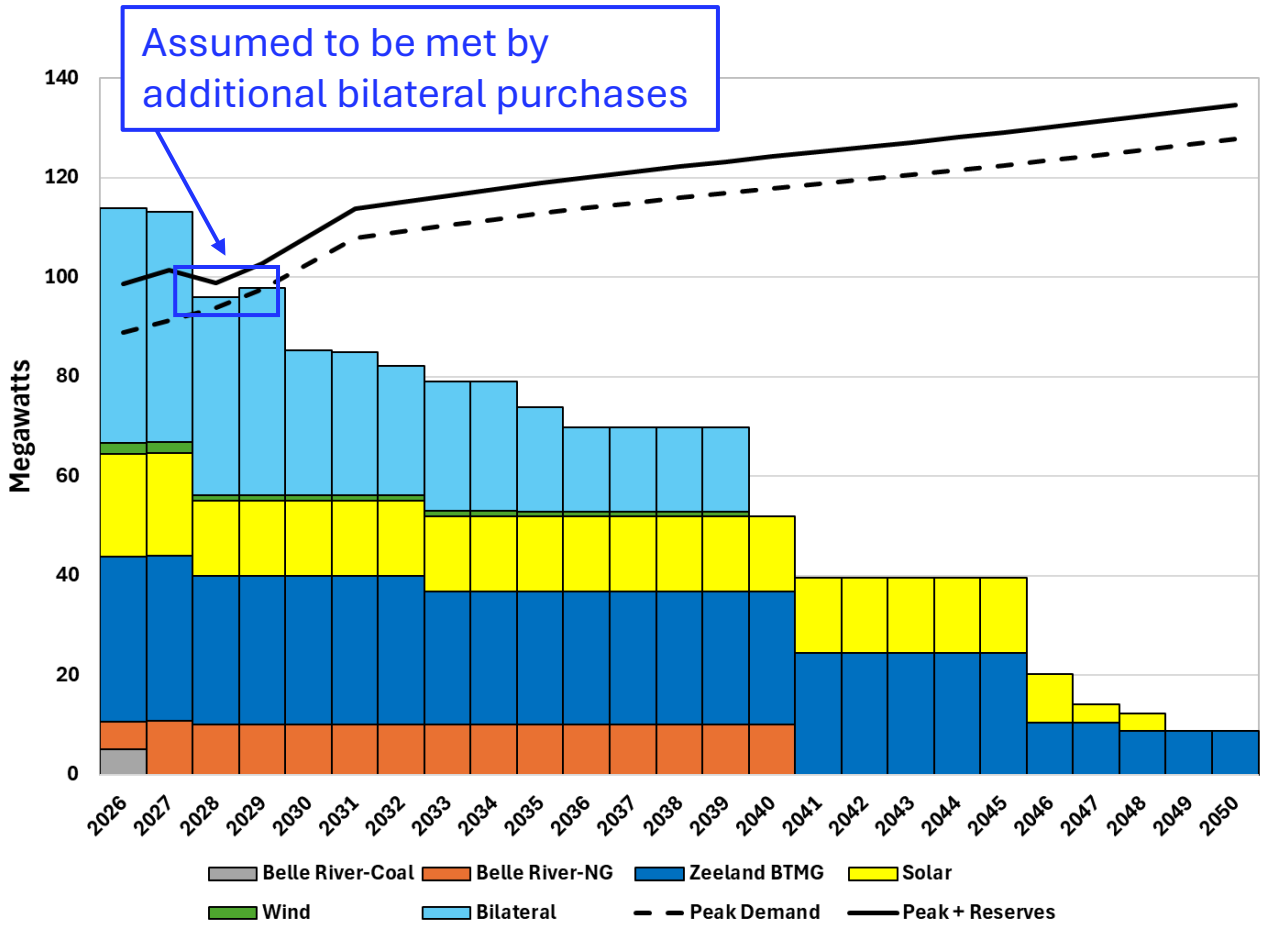
Brad Kushner

Project Manager

nFront Consulting LLC

Capacity Expansion Approach

Projected Capacity Balance – Summer



Model Notes

- Zeeland is assumed to meet its PRM obligations without requiring additional capacity through 2029
- Beginning in 2028-2029, new resources can be added to meet energy needs, including:
  - Local peaking generation
  - Renewables PPAs (Solar, Wind, BESS)
- Larger resources that would require partnership with other utilities are assumed available as soon as 2030

IRP Scenarios and Sensitivities Considered

Scenarios

- **Business-As-Usual (BAU)** - Scenario assuming no change in State requirements pertaining to renewable or clean energy production are in effect throughout the IRP study period

- **Michigan Public Act 235 (PA 235)** - Scenario in which the requirements of the State of Michigan's Renewable Energy Standard and Clean Energy Standard remain in effect over the IRP study period

Sensitivities

- Simulate optimized Portfolios under alternative projections of future variables
- Understand cost impacts of future conditions that differ from those assumed in the optimization
  - Alternative load projections
  - Alternative fuel price projections and associated market prices

IRP Portfolio Strategies

Aid in identifying the most robust, least-regrets resource portfolio across a range of potential future conditions

Economically Optimized

- Identifies the lowest-cost portfolio pathway for Zeeland to pursue

Large Units Available 2035

- Shifts the availability for CC/CT participation from 2030 to 2035
- Latest industry information indicates 2035 as the timeframe for a new CC/CT

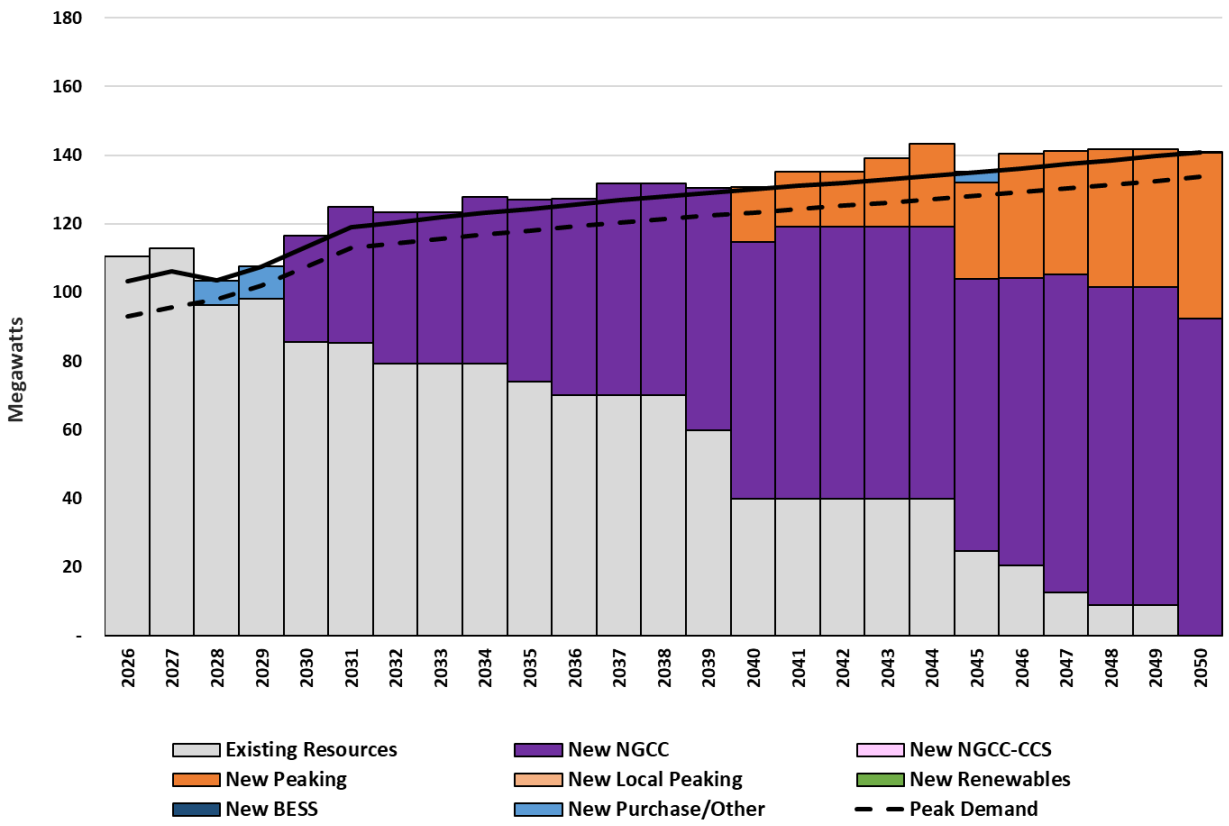
Local Generation Only

- Limits selection to new local resources that are 100% Zeeland-owned
- Maintains the option to contract renewable PPAs

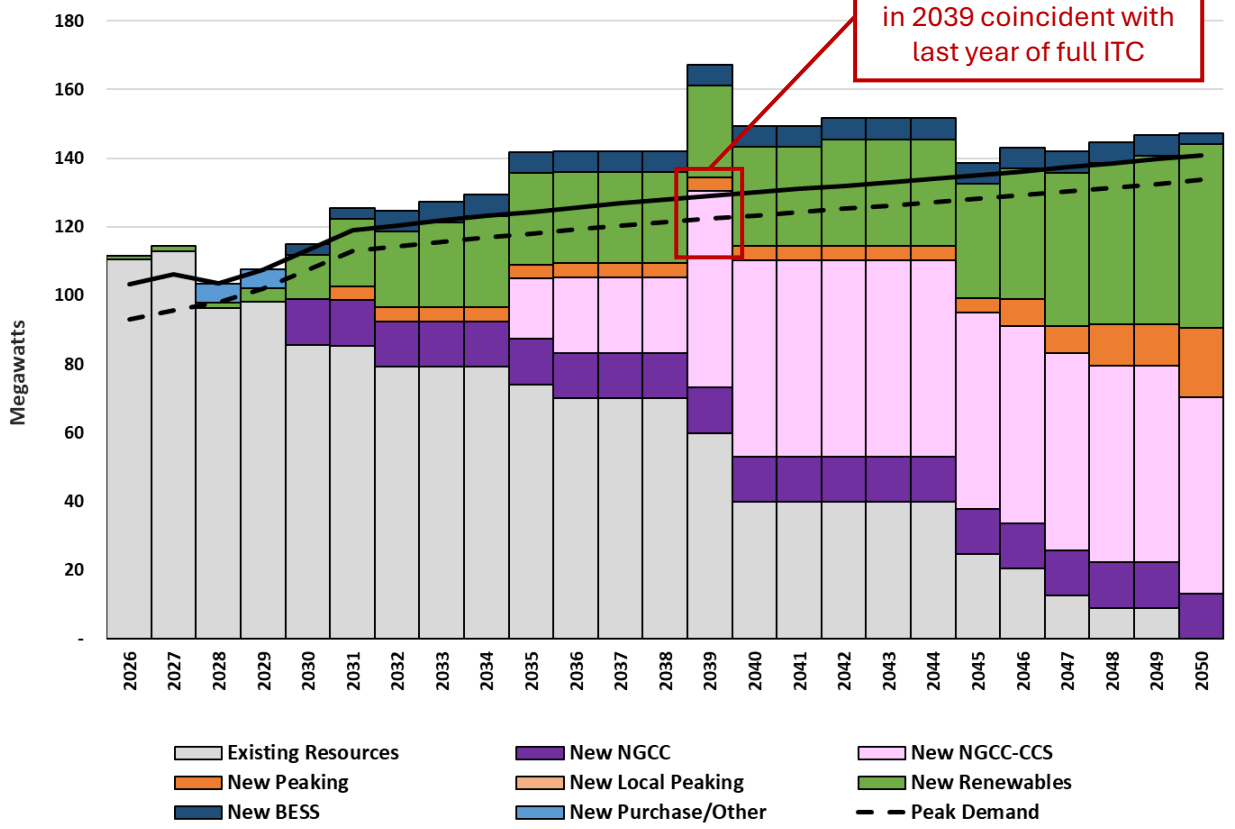
Power Supply Portfolio

Capacity – Economically Optimized Strategy

Scenario: Business-As-Usual



Scenario: PA 235



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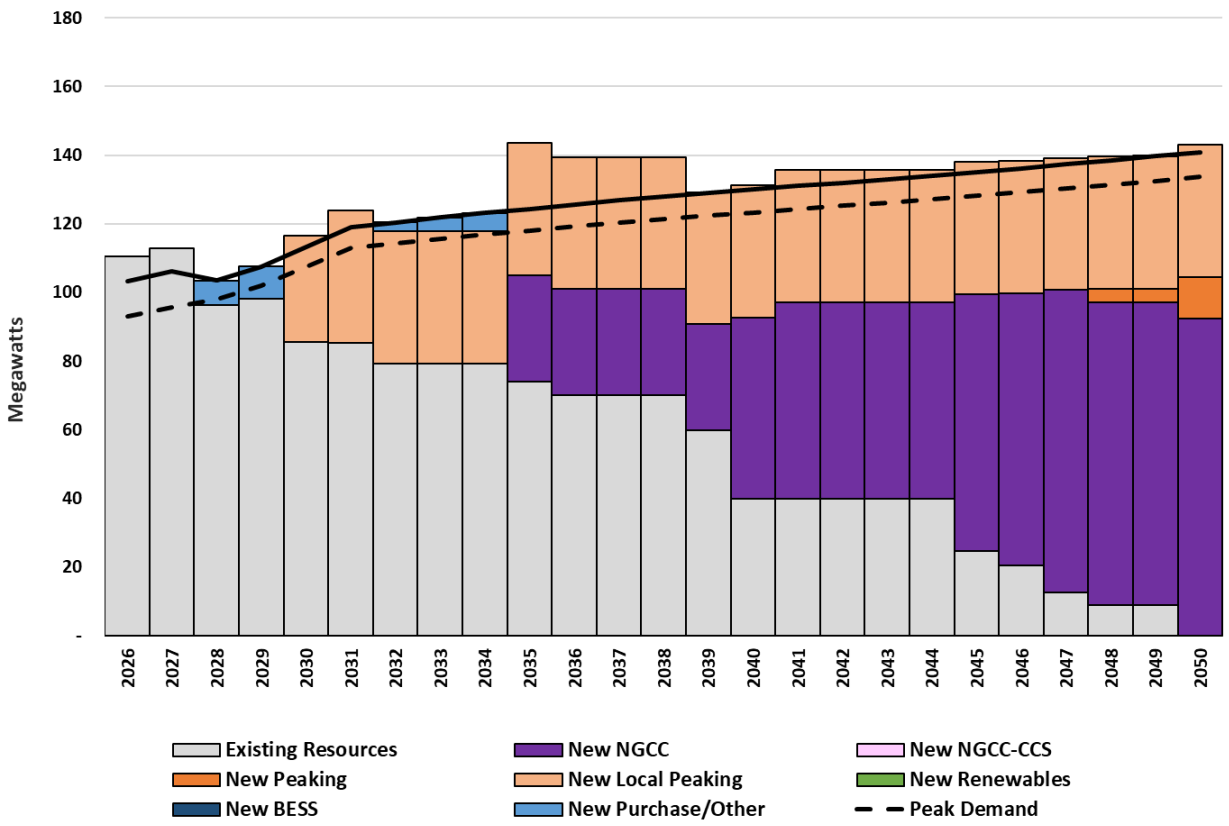
Notes:

- *Capacity values presented on a summer accredited capacity basis*
- *See Slide 47 for a glossary of defined terms*

Power Supply Portfolio

Capacity – Large Units Available 2035 Strategy

Scenario: Business-As-Usual



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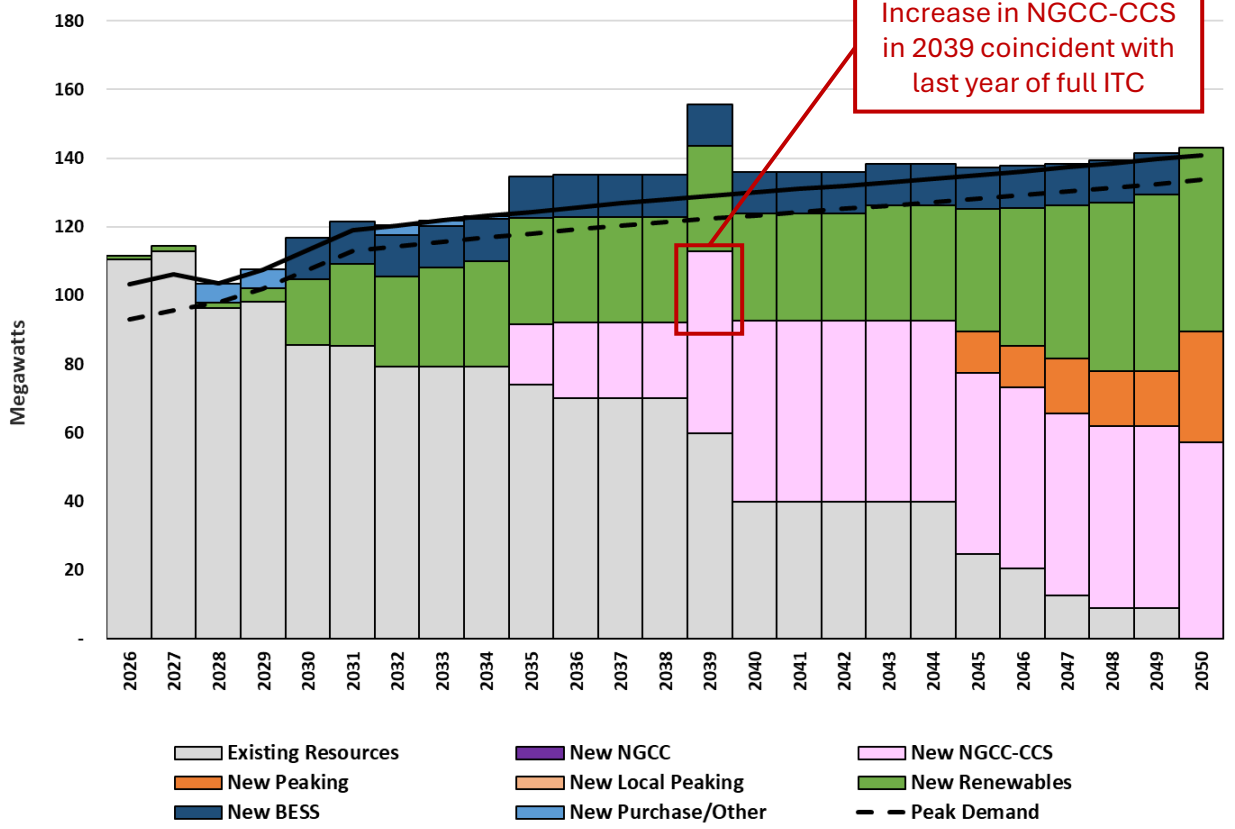

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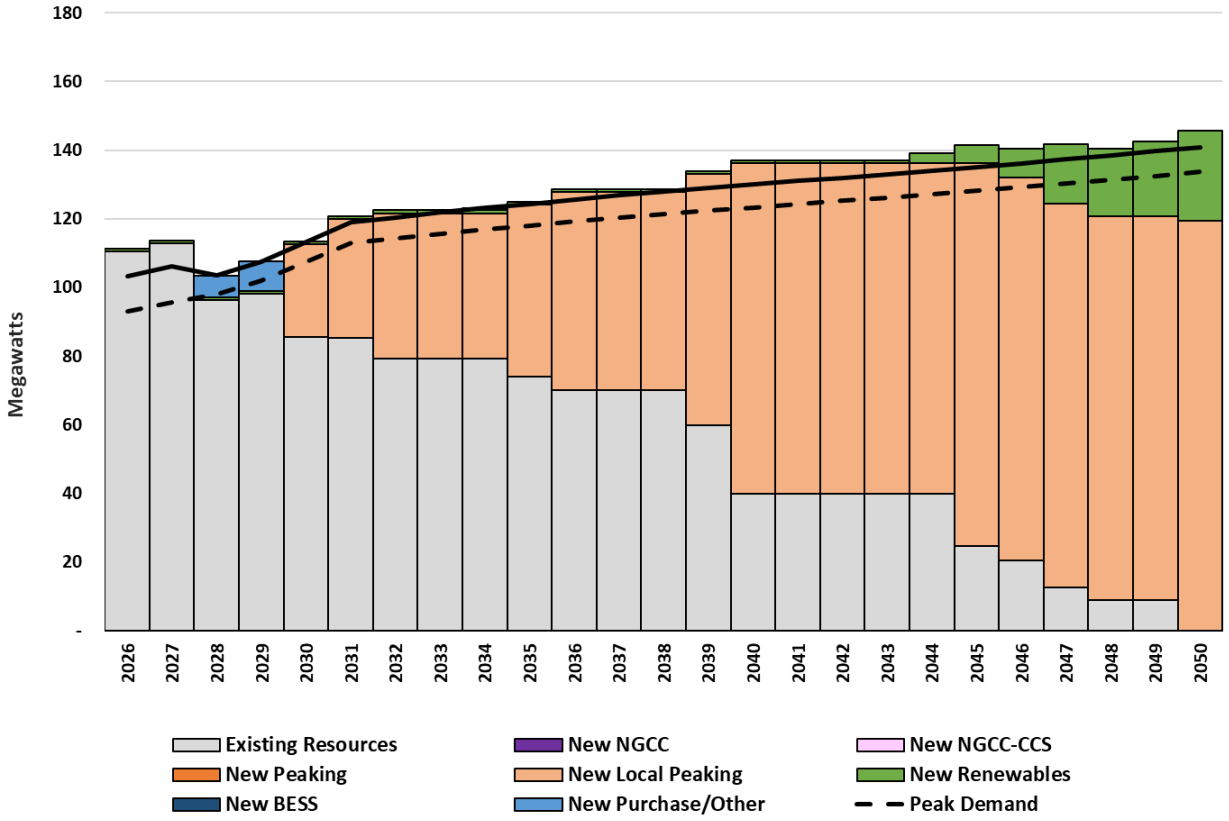
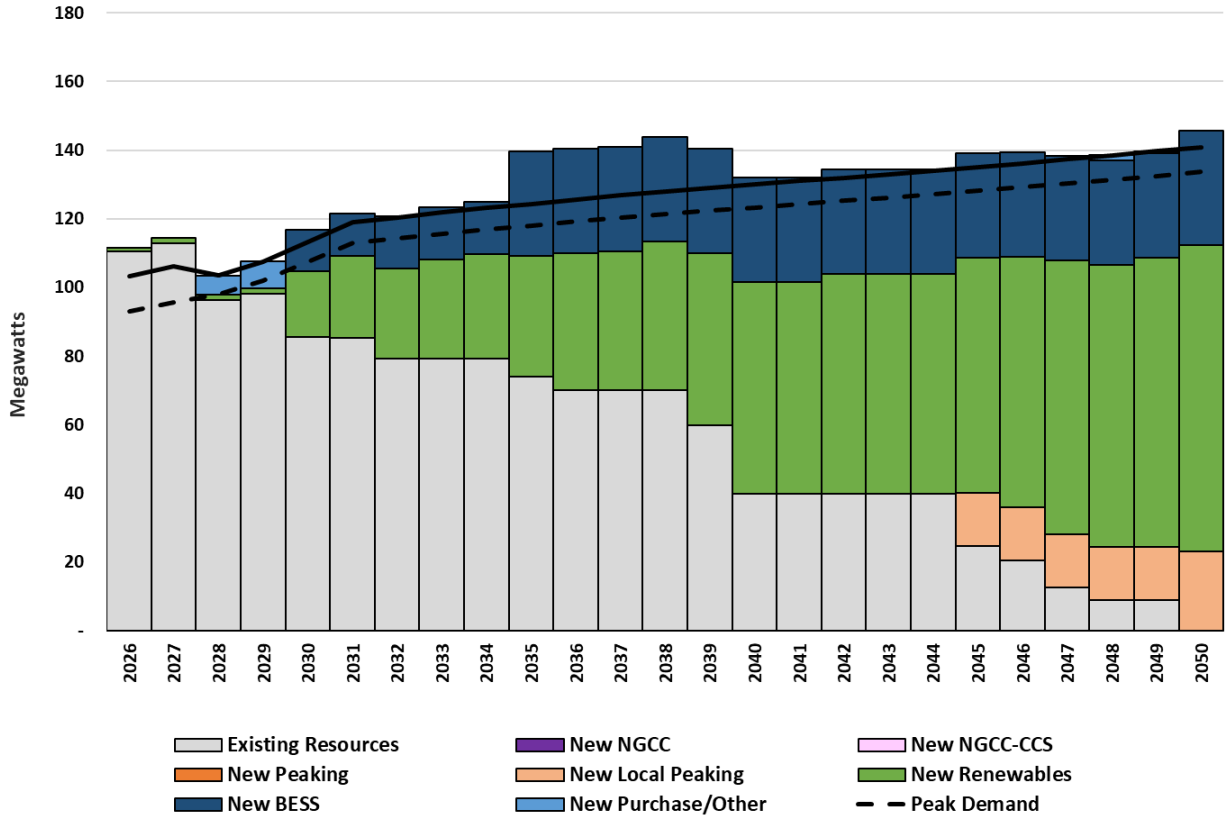
Power Supply Portfolio

Capacity – Local Generation Strategy

Scenario: Business-As-Usual



Scenario: PA 235



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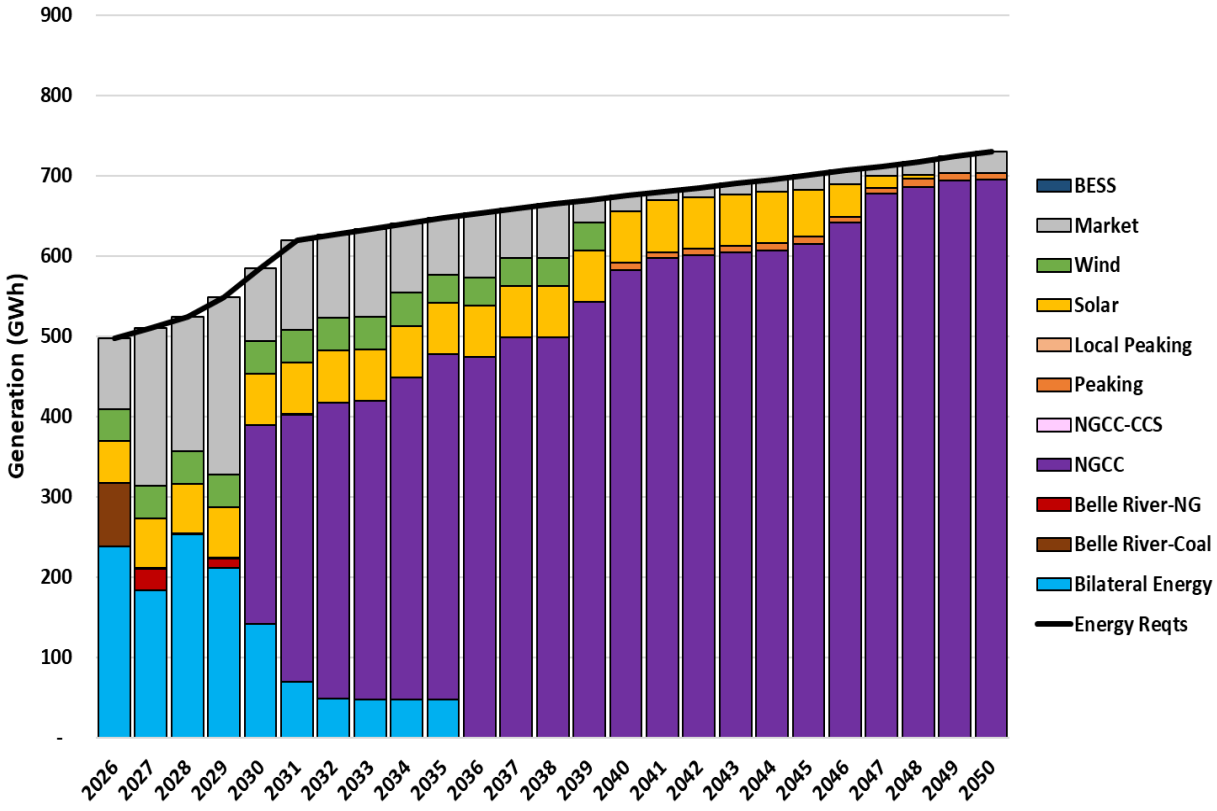
Power Supply Portfolio

Generation – Economically Optimized Strategy

Scenario: Business-As-Usual



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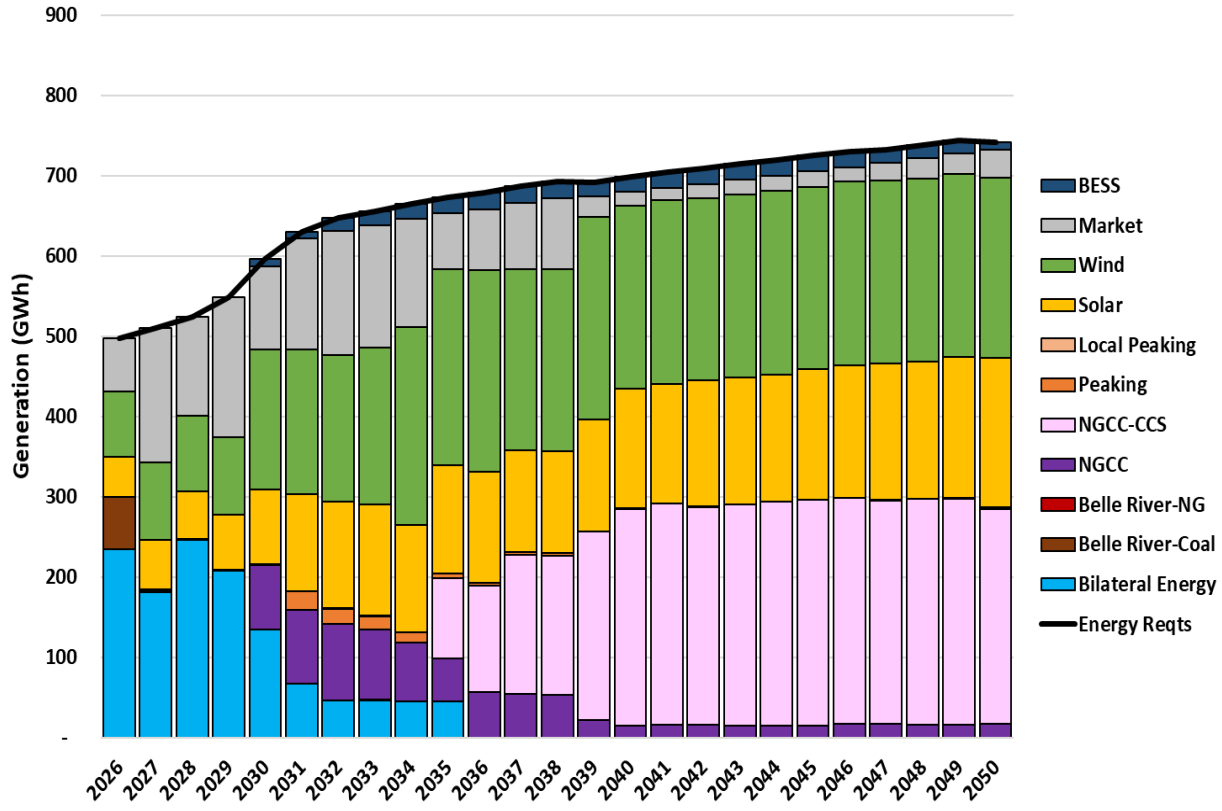

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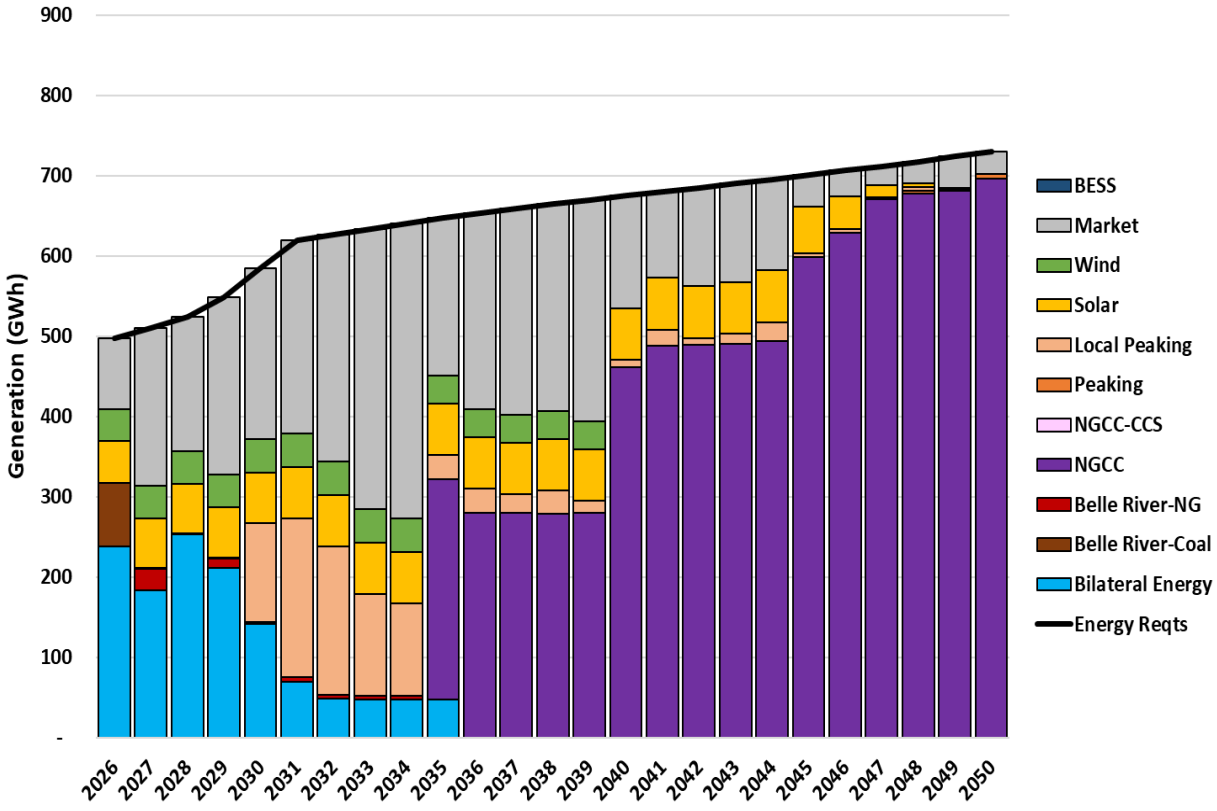
Power Supply Portfolio

Generation – Large Units Available 2035 Strategy

Scenario: Business-As-Usual



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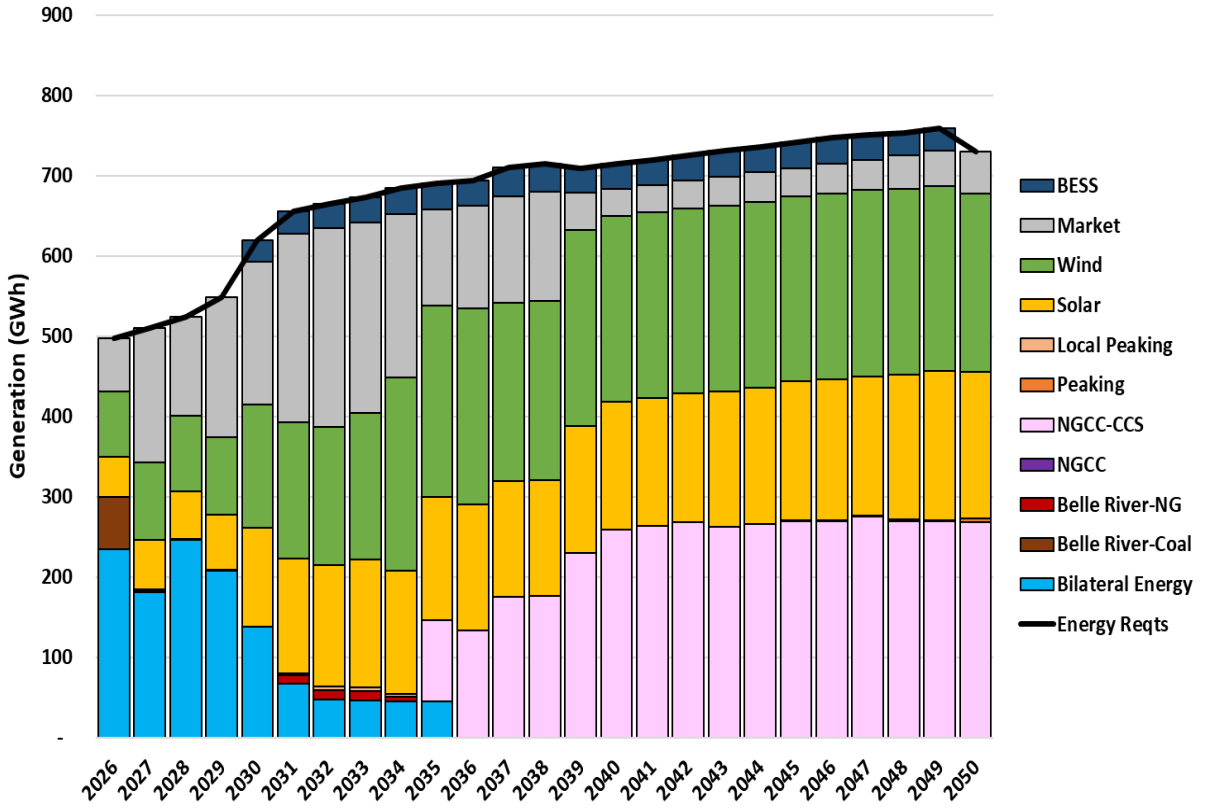

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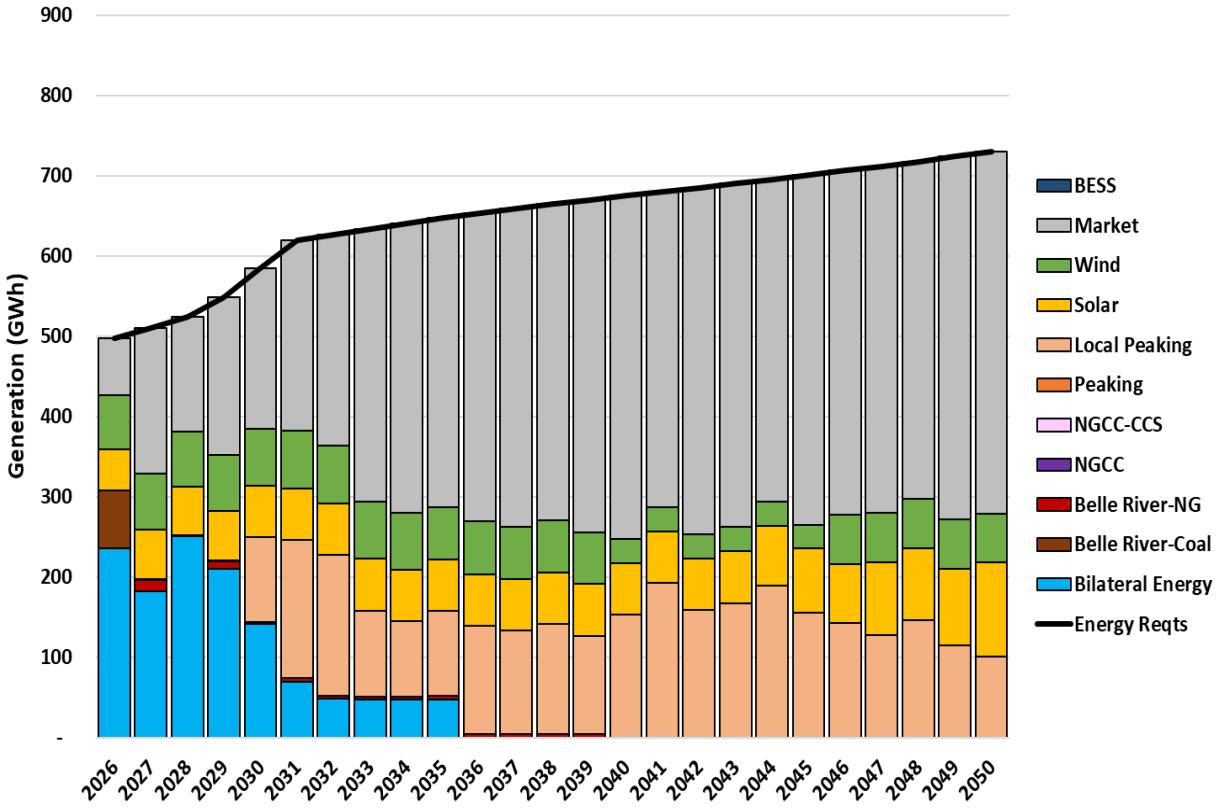
Power Supply Portfolio

Generation – Local Generation Strategy

Scenario: Business-As-Usual



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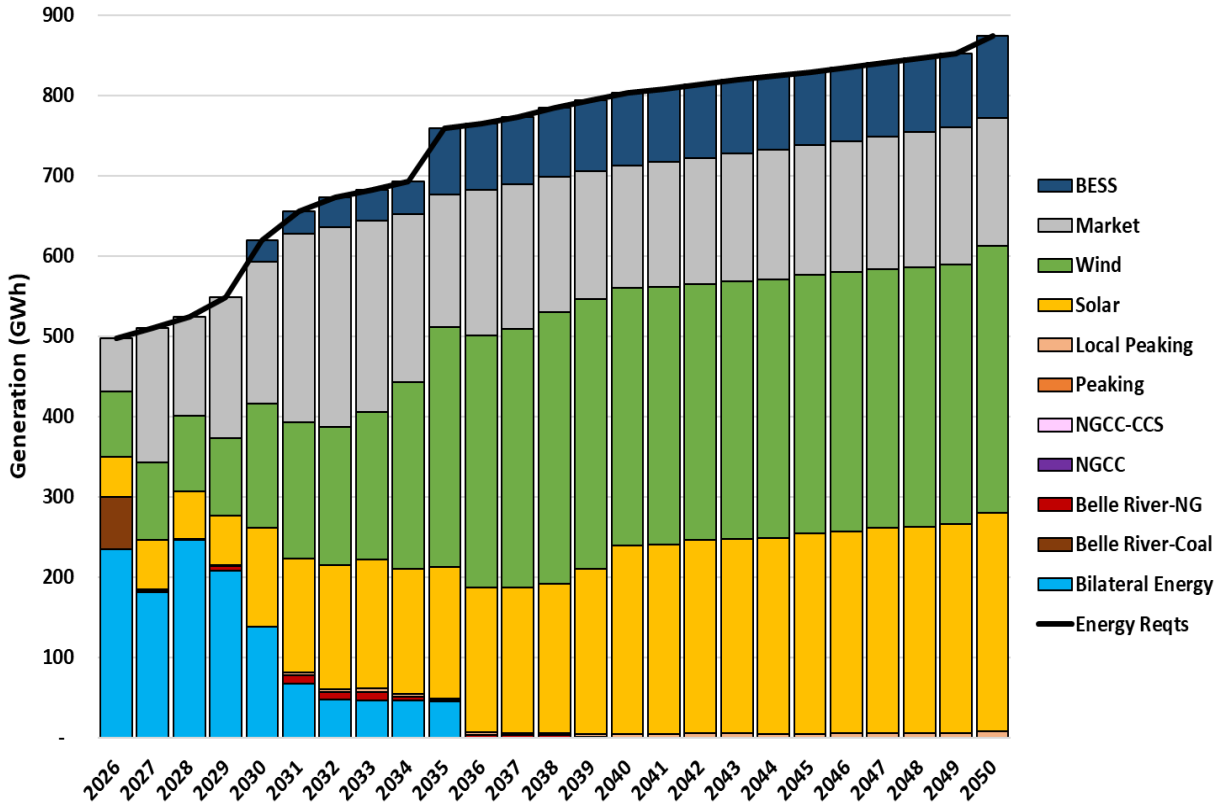

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Capacity Mix Table

Zeeland's open capacity position provides the flexibility to effectively pursue viable pathways as future conditions evolve

Resource	Nameplate Capacity Additions (MW)					
	Business-As-Usual			Public Act 235		
	Economically Optimized	Large Units Available 2035	Local Generation	Economically Optimized	Large Units Available 2035	Local Generation
New NGCC						
• 2030-2034	55	-	-	15	-	-
• 2035-2040	30	60	-	-	-	-
• 2041-2050	20	45	-	-	-	-
New NGCC-CCS						
• 2035-2040	-	-	-	65	60	-
• 2041-2050	-	-	-	-	5	-
New NGCT						
• 2030-2034	-	-	-	5	-	-
• 2035-2040	20	-	-	-	-	-
• 2041-2050	40	15	-	20	40	-
New Peaking						
• 2026-2029	-	-	-	-	-	-
• 2030-2040	-	25	65	-	-	-
• 2041-2050	-	-	15	-	-	15
New SMR						
• 2035-2050	-	-	-	-	-	-
New Solar						
• 2026-2029	-	-	-	5	5	-
• 2030-2040	-	-	-	45	50	115
• 2041-2050	-	-	55	55	50	60
New BESS						
• 2026-2030	-	-	-	5	20	20
• 2031-2040	-	-	-	5	-	30
• 2041-2050	-	-	-	(5)	(20)	5
New Wind						
• 2026-2030	-	-	10	50	40	40
• 2031-2040	-	-	-	30	40	85
• 2041-2050	-	-	10	-	-	5

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- Participation in larger NGCC units has value, provided the NGCC is equipped with CCS under PA 235

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- Local-only strategies rely more heavily on renewables and peaking resources

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- Participation in larger NGCC units has value, provided the NGCC is equipped with CCS under PA 235
- Local-only strategies rely more heavily on renewables and peaking resources
- Local peaking generation is not selected in any portfolio prior to 2030
- New renewable resources are not a focus under BAU

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Capacity Mix Table

Zeeland's open capacity position provides the flexibility to effectively pursue viable pathways as future conditions evolve

- Participation in larger CC units has value, provided the CC is equipped with CCS under PA 235
- Local-only strategies rely more heavily on renewables and peaking resources
- Local peaking generation is not selected in any portfolio prior to 2030
- New renewable resources are not a focus under BAU
- Wind is showing as the more economical renewable resource option in the near-term

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Portfolio Evaluation Considerations

Reliability	• Resource portfolio must reliably serve load requirements
Affordability	• Identify the most economic resource portfolios
Control of Resource Participation	• Local control vs. reliance on other entities for available resource options
Portfolio Resiliency	• Fuel price resiliency • Load growth responsiveness
Renewable Energy & Decarbonization	• Resource portfolio CO2 emissions
Regulatory Flexibility	• Regulation of Public Act 235

Portfolio Evaluation
Economic Evaluation

Levelized Cost (2026 $/MWh, 2026-2050)	Levelized ($/MWh)	Incremental Cost ($/MWh)*
Business-As-Usual		
Economically Optimized	$70.04	($6.12)
Large Units Available 2035	$76.16	$0.00
Local Generation	$85.41	$9.25
MI Public Act 235		
Economically Optimized	$97.75	($0.11)
Large Units Available 2035	$97.85	$0.00
Local Generation	$109.06	$11.21

**Incremental costs are relative to the Large Units Available 2035 portfolio strategy.*

Observations

- Participation in large units offers significant value under both BAU and PA 235 scenarios
- Prioritize participating in large units as early as possible
- Reliance on only local generation is the consistently higher cost portfolio

Levelized Costs are inclusive of variable operating costs and incremental capital and fixed costs to meet load requirements over the 2026-2050 period.

Portfolio Evaluation
Economic Evaluation

Power supply portfolios that meet the requirements of Public Act 235 adds roughly 30%-40% to power costs over the study period

Levelized Cost (2026 $/MWh, 2026-2050)	BAU	PA 235	Incremental Cost ($/MWh)
Economically Optimized	$70.04	$97.75	$27.71
Large Units Available 2035	$76.16	$97.85	$21.69
Local Generation	$85.41	$109.06	$23.65

Levelized Costs are inclusive of variable operating costs and incremental capital and fixed costs to meet load requirements over the 2026-2050 period.

Portfolio Evaluation
Fuel Resiliency

Scenario: Business-As-Usual

Portfolios	Average Levelized Power Costs ($/MWh)		
	Medium Fuel Price	Low Fuel Price	High Fuel Price
Economically Optimized	$70.04	$60.67	$82.62
Large Units Available 2035	$76.16	$66.45	$85.87
Local Generation	$85.41	$76.40	$91.24

Range of Fuel Cost Uncertainty ($/MWh)	
Economically Optimized	$21.95
Large Units Available 2035	$19.42
Local Generation	$14.84

Scenario: PA 235

Portfolios	Average Levelized Power Costs ($/MWh)		
	Medium Fuel Price	Low Fuel Price	High Fuel Price
Economically Optimized	$97.75	$93.36	$102.15
Large Units Available 2035	$97.85	$94.22	$101.77
Local Generation	$109.06	$108.50	$109.47

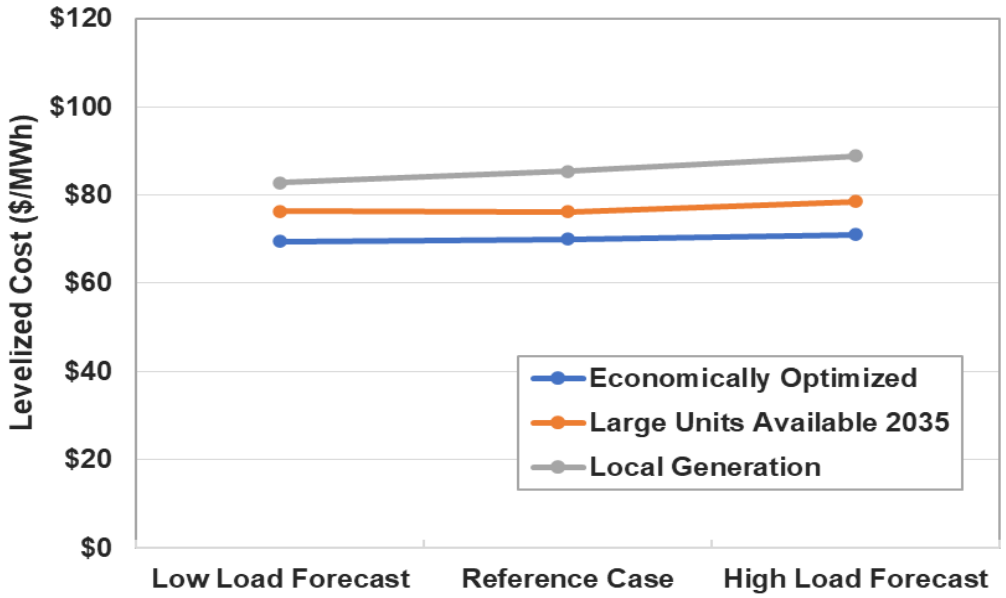
Range of Fuel Cost Uncertainty ($/MWh)	
Economically Optimized	$8.78
Large Units Available 2035	$7.55
Local Generation	$0.97

Examine how a portfolio strategy responds to changes in fuel prices

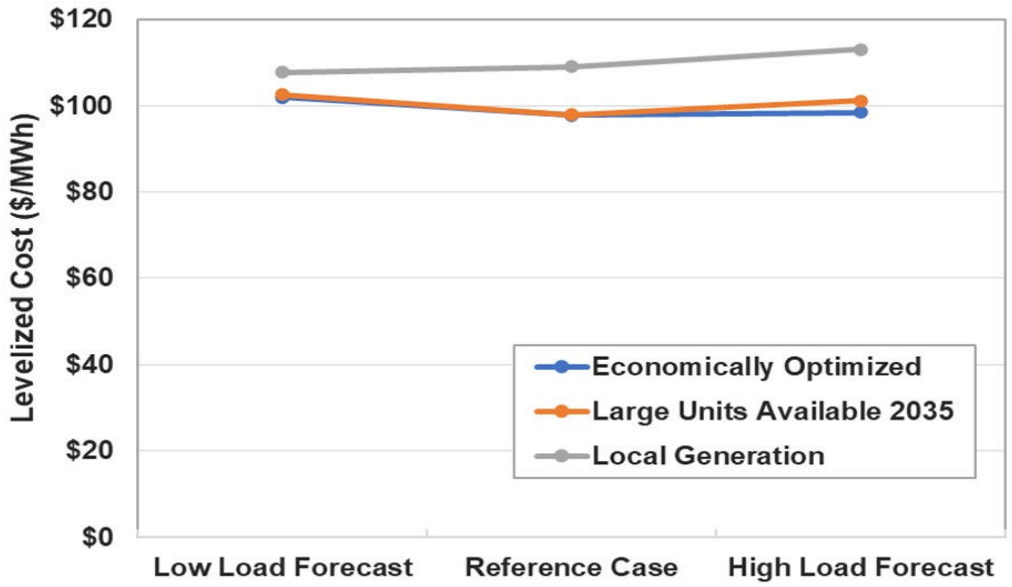
- While the Economically Optimized portfolio is the most sensitive to fuel price, the strategy remains the lowest cost option under both BAU and PA 235 scenarios
- While the PA 235 scenarios are more resilient to changes in fuel prices, the resource portfolios needed to meet PA 235 requirements remain higher in cost

Portfolio Evaluation
Load Growth Responsiveness

Scenario: Business-As-Usual



Scenario: PA 235



Examine how a portfolio strategy can adapt to changing load requirements

- Portfolios with large frame units show lower overall costs and are less sensitive to load
- Portfolio strategies under PA 235 are less sensitive to load than the BAU portfolios

Portfolio Evaluation Ranking Table

Key:
1=Highest
3=Lowest

Identify the most robust Portfolio Strategy within each respective Scenario

Portfolios	Reliability	Affordability	Control of Resource Particpation	Fuel Cost Resiliency	Load Growth Response	CO2 Emissions	Weighted Average
Business-As-Usual							
Economically Optimized	1	1	3	3	1	3	1.6
Large Units Available 2035	1	2	2	2	2	1	1.7
Local Generation	1	3	1	1	3	2	1.9
MI Public Act 235							
Economically Optimized	1	1	3	3	1	3	1.6
Large Units Available 2035	1	2	2	2	2	2	1.7
Local Generation	1	3	1	1	3	1	1.8
Weights	30.0%	30.0%	15.0%	10.0%	10.0%	5.0%	

Economically Optimized

- The most robust portfolio
- Indicates that Zeeland should prioritize participating in large units as early as possible

Large Units Available 2035

- Indicates that Zeeland should make near-term decisions that preserve the ability to participate in a future large resource

Local Generation

- Presents the most control of future resources decisions, but is the highest cost portfolio and is not responsive to changes in load growth

Portfolio Evaluation
Regulatory Uncertainty for PA 235

What is the certainty that PA 235 will carry through as currently written?

- Although Michigan Public Act 235 took effect in 2024, several aspects of regulatory compliance remain unclear, and the phase-out of IRA tax credits introduce additional considerations

Evaluating the regulatory uncertainty though a “What-if” analysis

- Zeeland’s open capacity position provides the flexibility to adjust future strategy as regulatory and economic conditions shift
- Early decisions may have long-term implications if the future regulatory environment differs from current expectations
- The “What-if” analysis helps isolate how a portfolio strategy is able to respond to changes in the assumed future regulatory environment

Portfolio Evaluation
Regulatory Uncertainty for PA 235

	Portfolio Response to Regulatory Uncertainty
What-If Scenario: Early renewable additions but PA 235 is altered • **Initial Decision** – Aggressively pursue renewables in the near-term in preparation of PA 235 requirements • **Regulatory Future** - PA 235 is altered • **Portfolio Flexibility** - What are the implications of that initial decision?	**Higher Incremental Cost**
What-If Scenario: Early local RICE resources built but PA 235 is fully enforced • **Initial Decision** - Delay decision on renewables and pursue local RICE in the near-term to meet capacity needs • **Regulatory Future** - PA 235 is fully enforced • **Portfolio Flexibility** - What are the implications of the initial decision?	**Lower Incremental Cost**

Delaying the decision to aggressively pursue renewable resources reduces cost exposure considering the uncertainty around regulation of PA 235

- Build RICE units to meet near-term capacity requirements
- Delay the procuring renewable resources until compliance of PA 235 is clarified

Observations and Conclusions

- Zeeland's open capacity position provides the flexibility to shift strategy as economics and policy evolve
- Delaying the decision to aggressively pursue renewable resources to meet PA 235 presents the least incremental cost exposure
  - Considering the uncertainty in how PA 235 may ultimately be implemented, Zeeland should structure its portfolio to provide flexibility and mitigate cost exposure
- Participation in large generating units offers strong value
  - Prioritize participating in large generating units as early as possible
  - Make near-term decisions that preserve the ability to participate in a future large resource
- Reliance on only local generation is the higher cost portfolio strategy
- Power supply portfolios that meet the requirements of Public Act 235 adds roughly 30% - 40% to power costs over the study period

Near Term Action Plan

Robert Mulder

Power Supply & Market Operations Manager / Utilities Manager Designee

Zeeland Board of Public Works

ZEELAND
Board of Public Works

Near Term Action Plan

Perspectives / opportunities we must consider as we refine the path forward

1. **Ensure Resource Adequacy to Maintain Reliability**
   - Evaluate opportunities to add local generation, primarily as a capacity resource
   - Explore joint development opportunities with MPPA and other partners

2. **Participate in Larger Generation Project(s) Where Economies of Scale Exist**
   - Large units likely provide the lowest cost for meeting our long-term energy and capacity needs
   - Seek out collaborative projects with MPPA or other utilities

3. **Monitor PA 235 and Potential Policy Changes**
   - Plan for compliance with current requirements while advocating for a more measured approach
   - Continue pursuing renewable resources when they are available and cost-effective

MPPA will continue to be a key partner as Zeeland evaluates and develops future energy and capacity opportunities.

Michigan Public Power Agency

- Power Through Joint Action -

Steve Donkersloot

Director of Strategic Energy Resources & Services

Michigan Public Power Agency

Michigan Public Power Agency (MPPA)

- Founded in 1978, MPPA is a not-for-profit project based joint action agency that works collectively with municipally-owned utilities to share energy supply and related service.
- MPPA is comprised of 22 Full Members (including Zeeland) and 12 Associate Members. MPPA's Full Members account for 85% of the public power electric load in the State of Michigan.
- MPPA provides economies (scale & scope), expertise, and shared development opportunities that individual municipal utilities cannot easily achieve alone.
- Translates into opportunities for Members to lower costs, reduce risk, leverage expertise, and facilitate implementation.
- Most Full Members rely on MPPA to manage and/or make recommendations for their power supply portfolio (energy & capacity, short and long-term).

MPPA
Michigan Public Power Agency

Resource Adequacy Focused…But Why?

Forecasted Capacity Deficit & Associated Risks:

- On June 1, 2030, MPPA Members are forecasted to have a capacity deficit of ~215 MWs, increasing annually thereafter.
- Acting now to address this projected shortfall is essential given the time and complexity of developing power supply projects. Doing otherwise poses significant risk (financial, reliability, regulatory / compliance, and reputational) to MPPA and its Members.

Market Conditions:

- The bilateral capacity market, historically a primary option for most Members, is fragile (i.e., few sellers, low supply, price volatility) and costs have escalated. This could be further challenged by:
  - Retirements of large, baseload resources (Campbell, several Monroe units, etc.).
  - Load growth (potential data centers, electrification, etc.).

Resource Adequacy Focused…But Why?

Regional Transmission Operator ("RTO") Rule Changes:

- MISO and PJM's new power supply resource capacity accreditation rules are creating greater uncertainty (particularly with renewable resources) regarding the amount of reliability these resources will provide in the future.

Transmission-Connected Project Development Challenges:

- Building new transmission-connected generation is increasingly difficult
  - Lengthy RTO queues
  - Expensive studies
  - Transmission Upgrades
  - Permitting challenges
  - NIMBYism
  - EPC cost and availability

Addressing Resource Adequacy Head On

In 2025, MPPA initiated a multi-year, multi-phase resource adequacy objective:

- Phase I - Assessment of individual Members' **interest and capability to install behind-the-meter generation ("BTMG")** – natural gas and/or Battery Energy Storage Systems ("BESS") – within their service territories, connected to their distribution system.

This objective is essential to:

- Help address the forecasted **capacity deficit** starting in Planning Year/Delivery Year ("PY" or "DY") 2030/2031.
- Meet **PA 341's Capacity Compliance Demonstration** Requirements, for PY 30/31, in March 2027
- Address (mitigate or eliminate) risks previous highlighted.

MPPA's Position:

- Investments **in and/or contracts for new thermal and BESS power supply capacity** resources will be **required** to help meet our future resource adequacy needs and compliance requirements.
- **Locating power supply capacity** resources in our **Member communities** is a logical strategy that leverages our assets & control.

MPPA / Zeeland Collaboration Opportunities

MPPA BTMG Project Timeline

- **Phase I (2025): Member Interest & Capability in BTMG Projects**
  - Identified **numerous sites** across Member communities with a potential capability to install **over 200 MWs**
- **Phase 2 (2026): BTMG Projects & Power Supply Portfolio Analysis; BTMG Project Ownership Structure; Member Engagement, Feedback & Direction**
  - Currently Evaluating Technologies and Vendors for potential BTMG Projects (RFI)
  - Economic Modeling & Power Supply Resource Fit and Portfolio Analysis to Follow
- **Phase 3 (2027): BTMG Projects Approval and Development Implementation**
- **Phase 4 (2028-2030): BTMG Project Development and Commercialization**

Questions and Discussion

Brad Kushner

Project Manager

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Next Steps

Robert Mulder

Power Supply & Market Operations Manager / Utilities Manager Designee

Zeeland Board of Public Works

ZEELAND
Board of Public Works

Next Steps

1. Complete the IRP Process

- Finalize IRP model analysis & review, incorporating changes as necessary
- Prepare final report
- Present to the BPW Board, City Council, and the public at an upcoming meeting

2. Evaluate Potential Implementation Pathways

- Assess potential project siting opportunities, including On-System options
- Evaluate individual and potential joint projects with MPPA: On & Off-System
- Consider the mix of resources that could best meet Zeeland's portfolio requirements based on:
  - *Availability, Economics, Portfolio Risk, Fuel Supply, Flexibility, Community Priorities, etc.*
  - *Potential value of on-system generation to BPW customers and the community*
- Identify possible project development pathways and timing considerations

On-Going Review and Adaptation

- Maintain resource adequacy and system reliability
- Monitor regulatory changes and compliance requirements
- Evaluate market opportunities to maintain a competitive, cost-effective portfolio
  - Participation in large projects for economies of scale
  - Measured, forward-looking approach while managing risk
- Align decisions with customer priorities:

  October 2025 BPW Survey Results

  1. Reliability
  2. Affordability
  3. Customer Service
  4. Fiscal Responsibility
  5. Renewable Energy & Decarbonization
- Continuously improve service and deliver customer value

In Closing…

Questions and comments can be sent to:

irp@zeelandbpw.com

Meeting summary and other materials will be posted and made available at:

https://zeelandbpw.com/power-plan/

Any questions we haven't answered today?

Thank You!

We would like to hear from you about your experience at this session.

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Commonly Used Terms

Term	Definition	Term	Definition
AEO	Annual Energy Outlook	**MW**	Megawatt (1,000 kW)
BESS	Battery Energy Storage System	**MWh**	Megawatt-Hour (1,000 kWh)
BTMG	Behind the Meter Generation	**NG**	Natural Gas
BTU	British Thermal Unit	**PA 235**	Public Act 235 (State of Michigan)
CC	Combined Cycle	**PTC**	Production Tax Credit
CCS	Carbon Capture Sequestration	**PRM**	Planning Reserve Margin
CT	Combustion Turbine	**PPA**	Power Purchase Agreement
DLOL	Direct Loss of Load	**PV**	Photovoltaic
DSM/EE	Demand-Side Management/Energy Efficiency	**PY**	Planning Year
HHV	Higher Heating Value	**RICE**	Reciprocating Internal Combustion Turbine
ITC	Investment Tax Credit	**REC**	Renewable Energy Credit
kW	Kilowatt	**SMR**	Small Modular Reactor
kWh	Kilowatt-Hour	**UCAP**	Unforced Capacity
MISO	Midcontinent Independent System Operator	**Wind**	On-Shore Wind