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March 9, 2023

Ms. Lisa Felice Executive Secretary Michigan Public Service Commission 7109 W. Saginaw Highway P.O. Box 30221 Lansing, MI 48909

Re: MPSC Case No. U-21193

Dear Ms. Felice:

Attached for electronic filing in the above-referenced matter, please find the Direct Testimony and Exhibit of Sean R. Brady on behalf of The Michigan Energy Innovation Business Council, The Institute for Energy Innovation, Advanced Energy United, and Clean Grid Alliance. Thank you for your assistance in this matter.

Very truly yours,

Justin K. Ooms

JKO/srd Enclosure

c. All parties of record.

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of)	
DTE Electric Company)	
for approval of its Integrated Resource Plan)	Case No. U-21193
pursuant to MCL 460.6t, and for other relief.)	
)	

DIRECT TESTIMONY OF SEAN R. BRADY

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,

INSTITUTE FOR ENERGY INNOVATION,

ADVANCED ENERGY UNITED,

AND

CLEAN GRID ALLIANCE

1 I. INTRODUCTION AND QUALIFICATIONS

- 2 Q. Please state your name and business address.
- 3 A. My name is Sean R. Brady, and I am Director of Regulatory Advocacy for Clean Grid
- 4 Alliance ("CGA"). Our office is located at 570 Asbury Street, Suite 201, St. Paul, MN
- 5 55104.

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- 7 Q. For whom are you testifying?
- 8 A. I am appearing on behalf of the Michigan Energy Innovation Business Council ("Michigan
- 9 EIBC"), the Institute for Energy Innovation ("IEI"), Advanced Energy United ("United"),
- and CGA, collectively referred to as "Michigan EIBC/IEI/United/CGA."

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- 12 Q. Have you previously testified before the Michigan Public Service Commission?
- 13 A. Yes, I previously testified as an expert witness in Case No. U-21090 (Consumers Energy
- 14 Company's Integrated Resource Plan case).

- 16 Q. What is your background and education?
- 17 A. I worked for nine years at the Illinois Commerce Commission in the general counsel's
- office and as a legal and policy advisor for two commissioners. Since 2009 I have been
- working at CGA on policies that promote the development of wind, solar and battery
- storage in the Midcontinent Independent System Operator, Inc. ("MISO") footprint. For
- 21 ten years, on behalf of CGA, I provided technical and policy comments to MISO on its
- annual transmission expansion plan. For those ten years, I was the sector representative to
- the MISO Planning Advisory Committee for the Environmental/Other Sector. I have a law

1		degree from Chicago/Kent College of Law, a masters degree in public administration from
2		the University of Illinois at Chicago, and a bachelor of engineering degree from the
3		University of Illinois at Urbana-Champaign.
4		
5	Q.	Have you previously analyzed and provided comments on integrated resource plans?
6	A.	On behalf of CGA and its predecessor, Wind on the Wires, I have performed analyses of
7		cost inputs used by utilities in developing their integrated resource plans ("IRP"). I have
8		prepared and submitted comments on IRPs prepared by Ameren Missouri, Consumers
9		Energy Company, Duke Energy-Indiana, Indiana & Michigan Power, Northern Indiana
10		Public Service Company LLC, and in long-term renewable resource plans prepared on
11		behalf of Illinois utilities by the Illinois Power Agency.
12		
13		In addition, I have prepared comments for over ten years of MISO annual transmission
14		expansion plans on a range of issues, including modeling inputs affecting costs.
15		
16	Q.	What is the purpose of your testimony?
17	A.	My testimony reviews DTE Electric Company's ("DTE" or the "Company") modeling
18		inputs for wind, utility-scale solar and solar plus battery storage hybrid resources and
19		recommends changes to how those resources are modeled. Those changes are then
20		incorporated into modeling performed by Michigan EIBC/IEI/United/CGA witness
21		Roumpani.
22		

1	Q.	Please summarize your findings and recommendations.
2	A.	The annual constraints/limits on the amount of wind and utility-scale solar resources that
3		could be selected unreasonably constrains selection of those resources in creating an
4		optimal portfolio of replacement generation. Changing those inputs impacts modeling
5		results and resources selected to replace Belle River units 1 and 2 and Monroe units 3 and
6		4.
7		
8		This issue, coupled with the issues raised by and incorporated into modeling performed by
9		Michigan EIBC/IEI/United/CGA witness Roumpani, raise a question as to whether DTE
10		can establish that its Proposed Course of Action ("PCA") represents the most reasonable
11		and prudent plan for meeting its future energy and capacity needs.
12		
13	Q.	Are you sponsoring any exhibits?
14	A.	Yes. I am sponsoring the following exhibits:
15		Exhibit EIB-13 (SRB-1) Résumé of Sean R. Brady
16		
17	II.	SUMMARY OF DTE'S PCA AND MODELING APPROACH
18		
19	Q.	Please summarize the Company's Proposed Course of Action.
20	A.	The Company's PCA for large-scale resources is summarized in the table on the following
21		page:1
22		

¹ See Qualifications and Direct Testimony of Joyce E. Leslie on behalf of DTE Electric Company, Case No. U-21193 ("Leslie Direct"), pp. 18–21.

Table 1. Proposed Course of Action for Large Scale Resources

	2023-2027	2028-2032	2033-2042
Solar	800 MW	3,600 MW	2,100 MW
Battery Storage	240 MW	520 MW	1,050 MW
Convert Belle River Units 1 and 2 (coal units) to natural gas	2025 and 2026		
Wind		1,000 MW	7,900 MW
Monroe Units 3 and 4 (coal units)		Retire in 2028 (1,535 MW)	
Monroe Units 1 and 2 (coal units)			Retire in 2035 (1,531 MW)
Retire Belle River Units 1 and 2 (nat gas)			Retire in 2040
Low or zero carbon dispatchable resource(s)			946 MW

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3 Q. Please summarize the Company's modeling approach.

- 4 A. Company witnesses Mikulan and Manning describe the seven interrelated steps DTE used
- 5 to develop and evaluate potential resource portfolios. Those steps include:²
- 6 1. Review planning objectives;
- 7 2. Develop inputs;
 - a. Determine scenarios and sensitivities
- 9 b. Determine capacity position

² See Qualifications and Direct Testimony of Laura K. Mikulan on behalf of DTE Electric Company, Case No. U-21193 ("Mikulan Direct"), p. 8; Qualifications and Direct Testimony of Shayla D. Manning on behalf of DTE Electric Company, Case No. U-21193 ("Manning Direct"), p. 14.

1	c. Develop supplemental modeling inputs
2	3. Develop resource alternatives;
3	4. Conduct and iterate modeling;
4	5. Analyze results;
5	6. Initial synthesis of results and determine preliminary PCA;
6	a. Validate resource adequacy
7	b. Conduct risk assessment
8	c. Conduct environmental justice analysis
9	d. Conduct financial analysis
10	e. Verify grid reliability analysis
11	7. Synthesize results into final proposed course of action.
12	
13	DTE's modeling was an iterative process to optimize a portfolio of resources to meet
14	resource adequacy requirements and provide grid reliability to address six scenarios and
15	their sensitivities. DTE evaluated five portfolios that address the following scenarios:
16	Emerging Technology ("ET"), Environmental Policy ("EP"), Business as Usual ("BAU"),
17	Reference ("REF," which addressed Company assumptions), and a scenario reflecting
18	inputs from stakeholders ("STAKE"). ³ In addition to those portfolios, DTE evaluated the
19	Preliminary PCA portfolio, an additional Reference scenario portfolio ("REF 9A phase"),
20	a "REFRESH" portfolio and the Final PCA Portfolio, for a total of nine portfolios. ⁴
21	

³ DTE Application, p. 5; Leslie Direct, pp. 80–81; Manning Direct, pp. 29–32.

⁴ This was a Refresh of the Reference Portfolio, incorporating updated natural gas prices, wholesale electricity prices and the Inflation Reduction Act ("IRA"). DTE Application, p. 5; see also Leslie Direct, pp. 80–81; Mikulan Direct, p. 82.

1		The nine portfolios were then evaluated through five separate risk analyses or assessments.
2		From those assessments DTE justified its selection of the Final PCA portfolio. ⁵
3		
4	Q.	What is a portfolio?
5	A.	A portfolio is an optimal collection of resources (supply-side and/or demand-side) that a
6		model selects after DTE provides market assumptions, resource alternatives, and other
7		model inputs and constraints. ⁶
8		
9 10 11 12	III.	DTE'S ANNUAL CONSTRAINTS ON WIND AND SOLAR RESOURCES IMPEDED THE SELECTION OF THE LEAST COST RESOURCES THAT COULD REPLACE BELLE RIVER UNITS 1 AND 2 AND MONROE UNITS 3 AND 4.
13		
14	Q.	What Company materials have you reviewed regarding the inputs and assumptions
15		for wind, solar, and solar plus storage resources?
16	A.	I reviewed the testimony, exhibits, workpapers, model inputs, working models, and
17		discovery responses of a number of Company witnesses, primarily those of Manning,
18		Mikulan, Hernandez, Goyanes, and Carden.
19		
20	Q.	Do you have concerns with the Company's modeling?
21	A.	I have concerns with the constraints or limits DTE used for EnCompass' selection of wind
22		and utility-scale solar resources. I will review those inputs and then recommend changes.
23		

⁵ Mikulan Direct, pp. 100–103. ⁶ Manning Direct, pp. 5, 15–16.

Q. Please describe the modeling constraints DTE applied to both wind and utility-scale

2 solar resources?

A. DTE witnesses Hernandez and Manning describe modeling constraints or limitations for the megawatts of wind and utility-scale solar resources EnCompass selects. DTE witness

Hernandez describes the constraints for wind and utility-scale solar as:⁷

Table 2. Limits on Wind and Utility-Scale Solar Described by DTE Witness Hernandez

Hernandez	Limit of Incremental MW That Can be Added Annually					
Interval	Utility-scale Solar Wind					
2023-2027		0 MW				
2023-2028	400 MW per year					
2028-2034		200 MW per year				
2029-2034	800 MW per year					
2035-	1,000 MW per year combined					

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DTE witness Manning also described constraints limiting the combined amount of wind and utility-scale solar resources eligible to be selected by EnCompass when optimizing resources:⁸

Table 3. Constraints on Wind and Utility-Scale Solar Described by DTE Witness Manning

Manning	Limit of Incremental MW That			
Can be Added Annually				
Intonvol	Utility-scale Solar and Wind			
Interval	Combined			
Prior to 2026	500 MW per year			
2026-2040	1,000 MW per year			

⁷ Qualifications and Direct Testimony of Vielka M. Hernandez on behalf of DTE Electric Company, Case No. U-21193 ("Hernandez Direct"), p. 26.

⁸ Manning Direct, p. 28.

 A.

Q. What is your opinion regarding the modeling constraints for wind resources that are

proposed by DTE?

While I understand the Company is limiting the selection of wind resources so that the EnCompass model does not choose "more wind resources than would likely be feasible," DTE's limitation has the impact of preventing any wind resources from being selected even though there is wind supply in the MISO queue that can feasibly be placed into service prior to 2026. MISO's generation interconnection queue has approximately 925 MW of wind resources in Michigan. The table below summarizes the amount of wind in the MISO queue by study cycle (year in which they submitted an application to interconnect to the MISO grid).

Table 4. Wind Resources in Michigan in MISO's Generation Interconnection Queue (by Definitive Planning Phase ("DPP"))

	DPP 2019		DPP	2020	DPP 2021		
	# of		# of		# of	NAVX7	
	Projects	MW	Projects	MW	Projects	MW	
wind	2	343	3	315	2	268	

As of the filing of this testimony, MISO is anticipating it will finish its generation interconnection analysis for the projects in all of the study cycles through DPP 2022 by the end of 2023. Therefore, 925 MW of wind resources should be available by 2025 and 2026.

⁹ Hernandez Direct, p. 27.

¹⁰ See Manning Direct, p. 27, Table 1. Witness Manning's Table 1 lists the years in which resources can be selected for generation expansion. Wind can be selected as early as 2026.

Data from MISO's Interactive Queue portal as of 2/9/2023. Available at https://www.misoenergy.org/planning/generator-interconnection/GI_Queue/gi-interactive-queue/.

Q. What is your recommendation for resolving the constraint on wind resources?

A. Michigan EIBC/IEI/United/CGA recommends two changes to the constraints DTE proposes for wind: (1) allow wind resources to be added and considered operational as early as 2026 and (2) increase the wind limits in 2031 and 2032 to 300 MW.

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Michigan EIBC/IEI/United/CGA recommends wind resources be allowed as early as 2026 because there are sufficient wind resources in the MISO queue to meet that need. The second change would give the EnCompass model the flexibility to select additional wind resources in the years prior to the retirement of Monroe. Incrementally increasing the wind capacity constraint gives the model the flexibility to select a wind resource if it helps DTE meet its capacity needs when MISO is moving toward seasonal capacity approach. In addition, wind resources are a clean energy complement to standalone battery storage. Wind predominantly generates power off-peak. To the extent that wind power is not used when generated, it can be stored in standalone battery storage resources and used during peak hours and other times. The slight increase in the wind resource constraint acknowledges the possibility of a marginal increase in the amount of Michigan wind resources between now and 2030. The slight increase in the wind resource constraint also gives the EnCompass model marginally more flexibility to optimize a lower-cost portfolio of clean resources to replace Belle River and Monroe, as further described in the Preferred Portfolio prepared by Michigan EIBC/IEI/United/CGA witness Roumpani.

The table below is a comparison of the Michigan EIBC/IEI/United/CGA proposal for wind annual limits/constraints against what was presented by DTE witnesses Hernandez and Manning:

Table 5. Comparison of Michigan EIBC/IEI/United/CGA Proposed Constraints on Wind Resources to DTEs Proposed Constraints

	Limit of Incremental MW that can be Added Annually for Wind					
Year	DTE Proposed Limits (MW) Michigan EIBC/IEI/United/CGA Proposed Limits (MW)					
2023	0	0				
2024	0	0				
2025	0	0				
2026	0	200				
2027	0	200				
2028	200	200				
2029	200	200				
2030	200	200				
2031	200	300				
2032	200	300				
2033	200	200				
2034	200	200				
2035	1,000 MW per year combined solar + wind					

- Q. Please describe why DTE is constraining the annual incremental amount of utilityscale solar resources that are selected.
- A. DTE reduced the amount of utility-scale solar the EnCompass model can select because of uncertainty in the delivery of solar modules and equipment from China that may affect the deployment of utility-scale solar resources.¹²

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- Q. What is your opinion regarding the modeling constraint DTE imposes on new utility-scale solar resources?
- 9 A. From a modeling perspective, this constraint is arbitrary. It has the unreasonable, and impractical, effect of limiting the analysis of resources available as a replacement for Belle River units 1 and 2 and Monroe units 3 and 4.

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DTE's proposal seems arbitrary in light of the MISO generation interconnection queue, which has well over 17,000 MW of solar resources in Michigan. The table below summarizes the amount of Michigan solar in the MISO queue by study cycle (year in which they applied to interconnect to the MISO grid).¹³

Table 6. Utility-scale Solar Resources in Michigan in MISO's Generation Interconnection Queue by Definitive Planning Phase ("DPP")

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1	9

	DPP 2	019	DPP 2020		DPP 2021		DPP 2022	
	# of Projects	MW	# of Projects	MW	# of Projects	MW	# of Projects	MW
solar	4	495	14	2,352	29	4,727	58	9,493
solar+storage	0	-	1	499	8	1,275	4	819

¹² Hernandez Direct, pp. 25–26.

¹³ Data from MISO's Interactive Queue portal. Available at https://www.misoenergy.org/planning/generator-interconnection/GI_Queue/gi-interactive-queue/.

As of the filing of this testimony, MISO is anticipating it will finish its generation interconnection analysis for the projects in all of the study cycles through DPP 2022 by the end of 2023.

A.

Q. What is your recommendation for resolving the modeling constraint DTE has placed on utility-scale solar resources?

The constraint on solar resources from 2025 through 2028 should be increased to 500 MW per year and then 1,000 MW per year from 2029 through 2034. These increases allow EnCompass to select solar and other resources as potentially more economic capacity replacements for Belle River units 1 and 2 and Monroe units 3 and 4. Similar to wind resources, in developing an alternative to the PCA, solar resources are needed as a clean energy complement to stand alone battery storage, but it has the added benefit of being a significant capacity resource. Solar resources can produce power prior to the peak, through the peak and into the net peak hours. To the extent that solar power is not used when generated, it can be stored in stand-alone battery storage resources and used during peak and other times or combined with storage as a hybrid resource. Slightly increasing the maximum amount of solar resources that the EnCompass model can select allows the model to optimize a lower-cost portfolio of clean resources to replace Belle River and Monroe, as presented by witness Roumpani.

The table below is a comparison of the Michigan EIBC/IEI/United/CGA proposal for solar annual limits/constraints against what was presented by DTE witness Hernandez:

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Table 7. Comparison of Michigan EIBC/IEI/United/CGA Proposed Constraints on Utility-scale Solar to DTEs Proposed Constraints

	Limit of Incremental MW that can be Added Annually for Solar		
Year	DTE Proposed Limits (MW)	Michigan EIBC/IEI/United/CGA Proposed Limits (MW)	
2023	400		
2024	400		
2025	400	500	
2026	400	500	
2027	400	500	
2028	400	500	
2029	800	1,000	
2030	800	1,000	
2031	800	1,000	
2032	800	1,000	
2033	800	1,000	
2034	800	1,000	
2035	1,000 MW per year combined solar + wind		

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IV. CONCLUSION

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- 7 Q. Please summarize your findings and recommendations.
- 8 A. The Company's decision to convert Belle River units 1 and 2 to natural gas plants is based 9 on flawed resource expansion modeling.

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Based in part on my analysis and findings, Michigan EIBC/IEI/United/CGA prepared an alternative PCA that includes the following changes to the EnCompass model:

Sean R. Brady – Direct Testimony – Page 14 of 14 – Case No. U-21193

1		a)	Constraint on annual incremental additions for wind resources should be	
2			200 MW per year from 2026 to 2030, 300 MW per year in 2031 and 2032,	
3			and then resume 200 MW per year thereafter.	
4		b)	Constraint on annual incremental additions for solar resources should be	
5			500 MW per year from 2025 through 2028, and 1,000 MW from 2029	
6			through 2034.	
7		c)	Constraint on annual incremental additions for wind and utility-scale solar	
8			combined should be 1,000 MW per year from 2035 through the end of the	
9			study period.	
10				
11	Q.	Does this con	aclude your testimony?	
12	A.	Yes it does.		
13				
14	4869-1068-1941, v. 5			

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of)	
DTE Electric Company)	
for approval of its Integrated Resource Plan)	Case No. U-21193
pursuant to MCL 460.6t, and for other relief.)	
)	

EXHIBIT OF SEAN R. BRADY

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,
INSTITUTE FOR ENERGY INNOVATION,
ADVANCED ENERGY UNITED,

AND

CLEAN GRID ALLIANCE

SEAN R. BRADY

PROFESSIONAL EXPERIENCE:

Clean Grid Alliance
Director of Regulatory Advocacy

St. Paul, MN

1/2023 - Current 9/2009 - 12/2022

Regional Policy Manager and Senior Counsel

- Develop and manage strategy, outreach, advocacy and lobbying of state regulators and legislators related to
 energy issues that increase demand for utility-scale wind, solar, and battery storage resources on issues such
 as: competitive procurement of new energy resources, tax policies, siting policies, green tariffs, long term
 resource plans, and transmission policies in IL, IN, MI and MO.
- Sector Representative to MISO's Planning Advisory Committee for 10 years.
- Led and coordinated transmission planning and advocacy at MISO for multiple environmental NGOs and renewable energy developers.
- Work with MISO and other stakeholders in revising or adding new provisions to MISOs tariffs and business practice manuals.

State of Illinois -- Illinois Commerce Commission

Chicago, IL

Legal and Policy Advisor to Commissioners Lieberman & Elliott

10/2006 - 9/2009

- Evaluated and recommended courses of action to Commissioners concerning complex policy and legal issues on energy and telecommunication matters at both state and federal level.
- Represented Commissioner(s) in meetings with Staff experts, federal regulators, generation companies or utilities on various matters.
- Drafted responses, on behalf of Commissioner, to questions from the U.S. House of Representatives Sub-Committee on Energy and Commerce, explaining Commissioner's position on advanced metering infrastructure and demand response.
- Worked with Commissioners from Ohio and representatives from Duke Energy and Ameren Illinois to develop
 a proposal to account for price responsive demand resources in the wholesale electric market.

State of Illinois -- Illinois Commerce Commission

Chicago, IL

Special Assistant Attorney General/Staff Counsel

9/2000 - 10/2006

• Litigated and managed cases on behalf of state agency involving state and federal utility/telecommunication laws.

Other Professional Work Experience:

Crawford, Murphy & Tilly Inc., Aurora, IL Senior Transportation Engineer Professional Engineer's License

1/1991 - 8/1997 1996 - 2017

EDUCATION:

Chicago-Kent College of Law, Illinois Institute of Technology, Juris Doctor

Chicago, IL May 1999

University of Illinois,

M.A. in Public Administration

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M.A. in Public Administration

May 1994

B.S. in Civil Engineering

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 Areas of concentration were transportation facilities (analysis, planning, and design), construction management, and geotechnical engineering.

STATE OF MICHIGAN BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of ELECTRIC COMPANY for approva integrated resource plan pursuant to 460.6t and for other relief.	al of its)				
<u>]</u>	PROOF OF SERVICE				
STATE OF SOUTH CAROLINA					
COUNTY OF BERKELEY) ss.				
Summer R. Dukes, the unders	signed, being first duly sworn, deposes and says that she is a				
Paralegal at Potomac Law Group PLLC and that on the 9th day of March, 2023 she served a copy					
of the Direct Testimony and Exhib	oit of Sean R. Brady on behalf of The Michigan Energy				
Innovation Business Council, The In-	stitute for Energy Innovation, Advanced Energy United, and				
The Clean Grid Alliance, upon those individuals listed on the attached Service List via email.					

Summer R. Dukes

Case No. U-21193 Service List

Administrative Law Judge

Honorable Sharon Feldman feldmans@michigan.gov

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^{*}Signed Nondisclosure Certificate under the Protective Order for this case.

^{**}Signed both Nondisclosure Certificate and Nondisclosure Certificate and Certificate for Critical Electric Infrastructure Information under the Protective Order for this case. 4872-3288-7637, v. 1