October 13, 2023

Ms. Lisa Felice
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Post Office Box 30221
Lansing, MI 48909

RE: MPSC Case No. U-21500 – In the matter of the application of Consumers Energy Company for approval of an Expedited Pilot Review Workplan and Expedited Pilot Proposals.

Dear Ms. Felice:

Enclosed for electronic filing in the above-captioned proceeding, please find **Consumers Energy Company's Application**.

This is a paperless filing and is therefore being filed only in PDF.

Sincerely,

Digitally signed by Bret A. Totoraitis
Date: 2023.10.13 14:43:07 -04'00'

Bret A. Totoraitis
Phone: 517-788-0835
Email: bret.totoraitis@cmsenergy.com

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of **CONSUMERS ENERGY COMPANY** for approval of an Expedited Pilot Review Workplan and Expedited Pilot Proposals.	)))))	Case No. U-21500

APPLICATION

Consumers Energy Company ("Consumers Energy" or the "Company") requests that the Michigan Public Service Commission ("MPSC" or the "Commission") issue an order approving Consumers Energy's Expedited Pilot Review Workplan filed pursuant to the Commission's February 23, 2023 Order in Case No. U-20898 ("February 23 Order"). In support of this Application, Consumers Energy states as follows:

1. Consumers Energy is, among other things, engaged as a public utility in the business of generating, purchasing, distributing, and selling electric energy to approximately 1.9 million retail customers in the state of Michigan. The retail electric system of Consumers Energy is operated as a single utility system, within which uniform rates are charged.

2. Consumers Energy's retail electric business is subject to the jurisdiction of the Commission pursuant to various provisions of law including 1909 PA 106, as amended, MCL 460.551 *et seq.*; 1919 PA 419, as amended, MCL 460.51 *et seq.*; 1939 PA 3, as amended, MCL 460.1, *et seq.*; 2008 PA 295, MCL 460.1001 *et seq.*; and 2016 PA 342, MCL 460.1001 *et seq*.

3. On October 29, 2020, the Commission issued an Order ("October 29 Order") in Case No. U-20898 launching the New Technologies and Business Models stakeholder workgroup. Broadly stated, the objective of the workgroup was to prepare for "opportunities and challenges associated with the commercialization of new technologies and business models such as electric

vehicles, electric storage, and other technologies still under development, both at customer and utility scale." October 29 Order, page 2. Among other things, the October 29 Order directed MPSC Staff to submit a report detailing the efforts of the workgroup and providing recommendations for the Commission's consideration by September 1, 2021 (later extended by subsequent Commission Order to December 1, 2021).

4. Staff's December 1, 2021 report recognized the need to implement some type of expedited review process to explore the applicability of new technologies or business processes in Michigan, allow for testing and refinement before arriving at solutions that would be effective for Michigan, and provide support for the rapid transformation of the energy system required to meet Michigan's energy goals. See Staff's December 1, 2021 Report, page 112. Staff's report cited programs from other states adopting expedited review processes for pilots to promote innovation in energy delivery and recommended that the Commission adopt an expedited pilot approval process. After accepting and considering stakeholder comments on Staff's proposal, the Commission adopted a voluntary expedited pilot review process in its February 23 Order in Case No. U-20898.

5. The first step in the expedited review process established by the February 23 Order is submission of a Pilot Workplan. The February 23 Order requires each utility choosing to make use of the expedited process to open a new docket for approval of the utility's workplan. The Commission directed that the workplan should "attempt to address up to five areas of exploration" and encourage "robust stakeholder engagement" in the workplan development process. February 23 Order, page 14. Per the Commission's direction, "Information regarding the proposed workplan and how stakeholders may become involved must be made publicly available to interested stakeholders, via the utility's webpage or in another accessible manner." And, the

workplan must "include metrics that provide a measurement of the current state within each identified workplan area."

6. Consumers Energy has engaged in the extensive stakeholder engagement process required by the Commission's February 23 Order and, through that process, has developed an Expedited Pilot Review Workplan for Commission consideration and approval. The Company's proposed Expedited Pilot Review Workplan is attached to this Application as Attachment A. The Company's Expedited Pilot Review Workplan details four broad focus areas that the Company believes will be fruitful for effective pilots to promote innovation in terms of testing and deployment of new technologies or business models to the benefit of customers and the state of Michigan. The Company's proposed focus areas include potential pilots related to: (i) equity, access, and affordability; (ii) grid reliability and resilience; (iii) distributed energy resource ("DER") integration; and (iv) decarbonization. Each focus area identifies metrics that will be used to evaluate the impact of each pilot on outcomes related to that focus area as well as the potential for improvements to customer experience should the pilot results warrant deployment at scale. Consumers Energy reserves the right to include additional metrics or modified metrics as appropriate to the design of specific pilot proposals in future filings. The Expedited Pilot Review Workplan satisfies the Commission's requirements for a pilot workplan as set forth in the Commission's February 23 Order.

7. Approval of the Company's Expedited Pilot Review Workplan will provide the Company with another important tool to (i) deepen understanding of market and customer problems, (ii) increase engagement with customers' experiences, and (iii) gain experience, generate data, and develop operational approaches necessary to design more targeted solutions for customers' needs. With the approval of this workplan, Consumers Energy will be able to expedite

efforts to confirm or disprove pilot assumptions more quickly, at a smaller scale, and at lower cost. Approval will help the Company learn fast, by studying expedited pilot results, and apply learnings to adjust the Company's approach for the next pilot iteration.

8. The approvals of the Expedited Pilot Review Workplan requested in this Application will not result in an "alteration or amendment in rates or rate schedules" and "will not result in an increase in the cost of service to customers." MCL 460.6a(3). Thus, the approvals sought in this Application "may be authorized and approved without notice or hearing." See MCL 460.6a(3); *Attorney General v Pub Serv Comm*, 227 Mich App 148; 575 NW2d 302 (1997).

WHEREFORE, Consumers Energy Company requests that the Michigan Public Service Commission issue an order:

A. Approving Consumers Energy's proposed Expedited Pilot Review Workplan;

B. Determining that the relief requested herein should be granted *ex parte* without the time and expense of a public hearing; and

C. Granting Consumers Energy such other and further relief as is just and reasonable.

Respectfully submitted,

CONSUMERS ENERGY COMPANY

Date: October 13, 2023 By: Kelly M. Hall

Kelly M. Hall
Deputy General Counsel and Vice President,
Rates and Regulatory
Consumers Energy Company

Bret Totoraitis

Bret A. Totoraitis (P72654)
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(517) 788-0835

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of **CONSUMERS ENERGY COMPANY** for approval of an Expedited Pilot Review Workplan and Expedited Pilot Proposals.	)))))	Case No. U-21500

VERIFICATION

Kelly M. Hall, being first duly sworn, deposes and says that she is the Deputy General Counsel and Vice President, Rates and Regulatory of Consumers Energy Company; that she has executed the foregoing Application for, and on behalf of, Consumers Energy Company; that she has read the foregoing Application and is familiar with the contents thereof; that the facts contained therein are true, to the best of her knowledge and belief; and that she is duly authorized to execute such Application on behalf of Consumers Energy Company.

Date: October 13, 2023 By: Kelly M. Hall

Kelly M. Hall
Deputy General Counsel and Vice President,
Rates and Regulatory
Consumers Energy Company

ATTACHMENT A

Consumers Energy's Expedited Pilot Review Workplan

Consumers Energy is pleased to submit the below Workplan and Stakeholder Engagement Record in support of the Company's future expedited pilot proposal submissions. The Company looks forward to working with the Commission to ensure this review process is a successful mechanism to increase energy equity and accelerate the pace of innovation in energy across Michigan.

What kind of pilots should employ the expedited pilot review?

Consumers Energy plans to use the expedited review process when Consumers Energy believes that expedited review and approval will be beneficial to the Company and its customers. The expedited review process approved by the Commission in Case No. U-20898 involves increased stakeholder engagement (to push thinking) and faster approval times (to enable quicker iterations). Consumers Energy aims to focus its expedited pilot proposals on work that is more exploratory or uncertain in nature with the potential to be more transformative. These types of pilots typically also carry a higher level of risk. Commensurate with this higher level of risk, the Company will design expedited pilots with the least-cost test in mind to ensure it is developing the requisite learnings and experience in the most efficient manner possible.

Some new technologies or new business processes will not be as well-suited to the expedited review and approval process. Furthermore, because this workplan is deliberately broad, including many potential problem statements, inclusion of a problem statement in this workplan does not necessarily indicate that expedited piloting is the only mechanism by which the company will explore solutions to the problem. The Company reserves the right to pursue multiple approaches to the problems identified in the problem statements below and thus the Commission should anticipate that Consumers Energy may elect not to use an expedited pilot solution to one or more of the problem statements discussed below if another solution or deployment mechanism is more appropriate or may use expedited piloting in conjunction with other solutions.

Given the nature of this work, some piloted technologies or business processes will fail to show promise for further development or deployment. It should not be assumed that all pilots going through this process will inevitably be scaled into a program. All pilots will provide Consumers Energy with valuable learnings to inform future groundbreaking work in subsequent pilots or future rate case filings.

This workplan is organized into two sections: (1) Focus Areas, Problem Statements and Metrics and (2) Stakeholder Engagement.

Overview of Focus Areas

Consumers Energy has organized this workplan based on outcomes the utility seeks to achieve with pilots in each focus area. Future expedited pilot proposals are likely to impact multiple focus areas. Affordability and equity will be a theme considered for all pilot proposals.

Consumers Energy believes that expedited piloting opportunities should be focused in the following four areas:

1) Equity, Access, and Affordability
2) Grid Reliability and Resiliency
3) Distributed Energy Resources (DER) Integration
4) Decarbonization

To ensure the pilots considered for expedited review and approval are effective at improving performance in each focus area, Consumers Energy has included focus area metrics to track success in a consistent manner from pilot to pilot. Where appropriate, future expedited pilot proposals may employ additional pilot success metrics as well as metrics to estimate benefits and of a pilot when deployed at scale.

Consumers Energy thanks the stakeholders for the important role they played in the development of the proposed Workplan. The Company knows these conversations are just the beginning and looks forward to further dialogue as we establish a new precedent for collaborative energy innovation in Michigan.

Section 1: Focus Areas, Problem Statements and Metrics

Focus Area 1: Equity, Access, and Affordability (EAA)

1) Background

Consumers Energy is committed to keeping energy bills affordable for Michigan families and businesses. Consumers Energy believes innovative pilots considered for expedited review and approval should strive to focus on helping customers save money and enable more equitable adoption of cleaner, carbon-free energy to disadvantaged communities.

2) Pilot Problem Statements

A. Many utility incentive programs designed to promote adoption of cleaner and more efficient technologies tend to focus on rebates. Those programs inherently require customers to fund an up-front purchase or qualify for a loan to have access to a rebate. CE could explore new mechanisms by which residential customers, schools or businesses in underserved communities that do not have the ability to pay cash or the credit to qualify for a loan can still have access to energy offerings that improve their energy performance, decarbonize, adopt Electric vehicles and/or assist in enhancing their energy resiliency.

B. Similarly large ticket rebate programs are oriented towards customers who own their residence and are thus motivated to invest in upgrading their property. Many lower-income customers that may not have the means to buy their home do not have a program designed to similarly support or incentivize their interest in more efficient or green technologies. Future pilots may explore ways to develop offerings that make choices including but not limited to EV chargers or electrification of home appliances for rental customers or those who live in multi-unit dwellings.

C. Barriers in accessibility exist for specific communications channels that customers may prefer. Age, educational status, digital literacy, first language barriers and work function can factor into preference. Ex. Email vs. word of mouth vs. text, etc. Pilots could assess these differences and develop solutions that enable more effective communication for all communities.

D. Consumers Energy could conduct pilots to help understand if there are changes in product design and/or messaging approaches for those designs that would be more effective at promoting adoption and

accessibility of greener technologies in underrepresented communities.

E. The system upgrades required to accommodate changes in customer demands on the system should avoid overburdening or underinvesting in underrepresented communities when it comes to restoration times, outage frequencies, upgrading distribution hardware etc. Pilots could test novel tools to help ensure that that the allocation of work and resources appropriately reflect the needs of these communities.

F. Upgrades required may also create upward pressure on rates. Pilots could evaluate alternate, lower cost methods to traditional hardware upgrades, or explore other accessibility pathways to keep rates more affordable for all customers.

G. New technology adoption is often easier to install in newer houses where a reliable 200 amp service can serve as a more robust foundation for technology deployment. New pilots could explore on bill financing or other mechanisms to encourage in home electrical upgrades that provide the foundation for cheaper and more efficient electrical service in lower income communities.

H. Technological advancement in artificial intelligence and data analytics is progressing rapidly, making it difficult to predict all the ways that new technologies will assist the utility in serving its customers. Pilots could explore possible approaches including (but not limited to) the following examples:
    a. The use of more sophisticated preference modeling to help more accurately understand and meet the needs of low-income customers.
    b. The use of advanced climate modeling to help utilities identify future pressures that may uniquely impact disadvantaged communities.

3) Metrics for Equity, Access, and Affordability:

Consumers Energy plans to track the metrics set forth below to measure the impacts of individual expedited pilots, where appropriate, to demonstrate the pilot's impact on incremental progress in equity, access, and affordability for customers. The estimated impact of a scale deployment for each pilot will be calculated, if appropriate, as a part of the individual pilot proposal.

Metric/Description	**Units**
MI EJ Score: EGLE EJ metric for all localities involved in the pilot	0-100 score

Pilot customer outreach conversion rate vs. average or comparable benchmark	% of total outreach attempts that result in adoption
Quantifiable or Qualitative Benefits for low-income customer pilot participants	$USD or other appropriate measure
Quantifiable benefits for all non-participating customers	$USD of a pilot that is transferred to non-participating customers
% pilot participants that are LMI customers vs % LMI customers system-wide	%
Overall positivity of customer experience through pilot experience	Varies by pilot

Focus Area 2: Grid Reliability and Resiliency

1) Background

Consumers Energy is dedicated to improving the reliability and resiliency of the electric grid. Resilience is the ability of the system to undergo extreme, non-routine impacts and continue serving customers. Reliability is the ability of the system to serve customers consistently during normally occurring conditions. The Company's dedication drives significant investment and improvement projects to harden and update the Company's energy infrastructure and improve critical capabilities to manage the electrical grid. Consumers Energy's commitment also underpins the belief that innovative pilots considered for expedited review and approval should test new solutions designed to achieve a more reliable and resilient grid.

Maintaining a reliable grid involves balancing electrical supply and demand within the physical constraints of grid infrastructure. This job will become more challenging as the nature of the load the Company serves also changes. More EVs, DERs and electric heating load fluctuation will make higher grid peaks and require more sophisticated communications and response capabilities to operate. Upgrades may be needed to ensure the Company is able to maintain communication and control levels commensurate with achieving a stable grid in the face of these evolving conditions. Pilots considered for expedited review and approval should play a key role helping to improve reliability and resiliency performance by accelerating the adoption of new technology and novel approaches while benefitting the Company's customers and grid.

2) Pilot Problem Statements

A. As intermittent renewables grow to a larger share of power generation mix, the role of storage resources will become more important to balancing grid supply and demand and ensuring resource adequacy. Today battery storage solutions focus on shorter discharge windows to mitigate high price demand peaks across our system. However longer-term energy storage technologies may offer grid operators more flexibility to optimize intermittent production and more reliably cover a broader range of power demand conditions. Pilots could evaluate performance and cost of these longer duration storage options and their efficacy at enhancing reliable grid supply.

B. Some customers, such as data centers, hospitals, or homes with medical equipment, prefer extremely high levels of resiliency due to the particular nature of their energy needs. For these customers, utilities could explore reliability offerings that operate multiple battery use cases during normal conditions and revert to customer resiliency use cases whenever there is disruption in grid electric supply. Future pilots could identify which use cases are the most optimal and how to value and co-optimize between resiliency and other use cases.

C. Consumers Energy sales forecasting and planning tools incorporate complexities such as weather and economics to predict the demand for energy. The Company's supply and distribution teams then use the forecasts to deliver energy safely and reliably to customers. As climate change makes forecasting more challenging, pilots could explore innovative ways to more robustly accommodate the emerging impacts that climate change will have on energy generation and use in Michigan.

D. Residential battery storage systems may improve resiliency for customers while testing additional use cases. Pilots could evaluate what novel approaches are possible to increase customers' access to resiliency products.

E. Imagery & video are powerful tools to help understand the current state of the electric grid, especially when coupled with machine learning and artificial intelligence. Pilots could evaluate different methods of image & video capture to understand the most cost-effective options for capturing, storing, and then analyzing this data. Pilots may also evaluate how analysis of this data can improve prioritization of work that directly impacts resiliency & reliability.

F. Consumers Energy believes a grid that can effectively incorporate artificial intelligence could achieve higher reliability and resiliency. Pilots could help the Company understand the best ways to leverage data and develop capabilities in the application of artificial intelligence to improve reliability performance.

G. Burying portions of our distribution infrastructure underground is an approach to improve system reliability. Future pilots could explore novel ways we can use technology to reduce the cost per mile of undergrounding.

H. When operating battery storage microgrid systems in islanding mode, there is still much efficiency loss involved in balancing supply and demand to create a true uninterruptable supply. Pilots could help the company test more efficient ways to island microgrids as tools for increased customer reliability.

3) Metrics:

Consumers Energy plans to track the metrics set forth below to measure the impacts of individual expedited pilots, where appropriate, to demonstrate incremental progress in reliability and resiliency. The estimated impact of a scale deployment for each pilot will be calculated, if appropriate, as a part of the individual pilot proposal.

Metric	**Units**
Circuit level SAIDI with MED System Average Interruption Duration Index inclusive of Major Event Days	Minutes
System- level SAIDI with MED	Minutes
Total # of customers who experience an outage in pilot	# of accounts
Incidence of >24-hour restoration time	# of outage incidents
Customers experiencing more than six outages per year	# of customers

Focus Area 3: Distributed Energy Resources (DER) Integration

1) Background

DERs such as batteries, smart water heaters, or other load control devices are becoming more common. The number of interconnection applications for home and commercial solar and batteries is also increasing. DERs are a unique resource on the grid due to the multiple functions that they service. For example, EVs provide transportation but may be able to provide other services to the grid. It will be beneficial for the entire energy system to unlock multiple use cases and the potential associated benefits that DERs can provide. The entire system benefits when all functionalities of the available resources are utilized. Utilities have a lot to learn on how to maximize the value from the DERs while helping both participants and non-participants realize the benefits that these technologies can provide.

Consumers Energy seeks to build capabilities to enable the coordination of DERs on the grid. The Company also wants to explore ways that its involvement in the market can create win-win approaches for both the utility and the companies that supply and sell these technologies to customers.

2) Pilot Problem Statements

A. As requests for DER interconnection onto our grid increase, the utility needs to ensure it is processing these requests and quickly understanding the risks and benefits associated with attaching these assets to the system. Pilots could explore more efficient ways to assess impacts of new DERS towards processing interconnection requests more quickly.

B. Microgrids in the Company's service territory tend to focus on single customers or single meters. Using a larger battery, the utility could explore models to share battery benefits across multiple participating accounts. Such an approach could explore how customer benefits of the battery such as resiliency or peak shaving could be shared among customers.

C. Most new pilots today tend to test batteries that are newly installed. The utility could test what learnings it might uncover more quickly by activating and running tests on the battery fleet that is already installed today.

D. As inverter-based production becomes more prevalent, CE seeks to understand how the grid may need to adjust. Among other challenges, the Company wants to understand how to manage fault current detection when the grid is powered solely by inverter-based sources. Pilots

could simulate and directly test existing equipment in these specific conditions to ensure safe grid operations.

E. In the future, load volatility may increase due to climate change, electrification of heat and DER adoption. The utility will need more sophisticated tools to forecast, detect, measure and control assets to ensure consistent reliable operations. Currently each individual DER that the utility manages has a separate operating system. Pilots could develop and test operational and cyber options for a centralized and/or portfolio-wide capabilities to manage many different types of DERs and use cases.

F. As CE develops capabilities to integrate DERs, such as batteries, into the distribution system, it needs to ensure that the detection, communication, and control systems that are employed to execute time sensitive use cases have sufficient capacity, capability, and speed to execute those use cases. Pilots could assess technologies, cost, and capabilities of current and emerging tools.

G. As more DERs, such as residential batteries, come onto the Company's system, the Company can explore different ways for these DERs to achieve potential benefits to the grid and to the customer. Pilots can explore different use cases, operating systems, cyber security approaches, ownership, control, and incentive models towards lowering the cost, improving cyber and grid security, enhancing the adoption, and improving the experience of these technologies for participating customers.

H. A reliable and wide-scale public charging infrastructure would be beneficial to EV adoption in Consumers Energy's service territory. New pilots could focus on novel business models and novel technologies that meet customer and market needs more effectively, more equitably or at a lower cost than current options.

I. Commercial customers who decide to invest in the installation of public charging often end up incurring large demand charges on their power bill when they install chargers. These demand charges can impede the economics of charger installation. Pilots could evaluate business models or project structures might help commercial customers who want to support EV deployment to avoid this barrier.

J. As more EVs come online, bidirectional charging has the potential to unlock a large dispatchable load to help manage the grid. The Company does not know today how it would detect, measure, or control these

loads to the benefit of the electric grid. Pilots could help the utility better understand the nature and uses of this dispatchable load resource.

K. As EV charging loads increase, Consumers Energy is interested in ensuring that charging is as capital efficient as possible. Pilots could explore how managing the ramp up of charging in highly concentrated areas could impact the level of distribution investment costs required to accommodate charging loads.

L. As new bidirectional EV charging infrastructure becomes available over the next few years, adoption will be contingent upon a viable business model for customers, owners, and the utility. The additional cost of bi-directional infrastructure needs to also create additional value. Pilots could test what use cases are viable and what performance is realistic when employing bidirectional charging stations as potential grid resources as well as how the potential use case value compares to the potential additional costs.

M. Early adopters of EVs trend towards those with higher economic means. However, the cost savings of EV adoption over the life of the vehicle could be beneficial to lower income community members. Future pilots could further explore how to enable better access to electrified transport and supportive charging infrastructure in economically disadvantaged communities.

N. Consumers Energy anticipates that lower installation costs, increased efficiency and policy support will drive acerated growth in the adoption of more efficient electric appliances in the future, including heat pumps and electric water heaters among other technologies across our service territory. Pilots can explore business models to ensure that the addition of this load is done in a way that equitably incorporates participation from historically underserved communities and that improves air quality and efficiency by displacing heat from kerosene, fuel oil or propane. Pilots can also explore offerings that employ smarter management control and optimization of these new sources of load to minimize stress on the distribution system in a manner that also enables costs savings to participating customers. This may include better co-optimization of heat pumps with furnaces.

O. In order to successfully integrate DERs into the grid, CE must develop and test systems to process and analyze complex data sets involved at the grid edge. Pilots will be essential to enable the Company

to quickly test and discern the capabilities and tools that are most effective to integrate big data into grid management.

3) Metrics:

Consumers Energy plans to track the metrics set forth below to measure the impacts of individual expedited pilots where appropriate to demonstrate incremental progress in DER integration. The estimated impact of a scale deployment for each pilot will be calculated if appropriate as a part of the individual pilot proposal.

Metric	**Units**
Use case performance as a % of technical max (load reduction, etc.)	%
Cost/kW to participating and non-participating customers	$/kW
Benefit Cost Analyses as appropriate for each pilot (i.e., Utility Cost Test, Customer Impact Test, etc.)	$ Benefits /$ Costs
Total load reduced or shifted off-peak	kW/kWh
Uptime	% availability
Customer Opt-Out Rates	% or # of times customer selects to not participate in a pilot event

Focus Area 4: Decarbonization

1) Background

The state of Michigan has committed to 100% carbon neutrality by 2050. Consumers Energy has committed to a net zero electrical supply (including Consumers Energy generation and purchases) by 2040 and a net zero emissions in the Company's natural gas business by 2050. Expedited piloting will help ensure the Company deploys the right technologies at scale to progress the state's transformation of its energy systems while also ensuring secure supply of affordable energy for all.

Beneficial electrification will be an important mechanism by which we can achieve decarbonization in the state in the shorter term. Other technologies to decarbonize beyond electrification may require the advancement of less commercially ready technologies in the future including but not limited to Hydrogen, CCUS, distribution technology and digital capabilities.

2) Pilot Problem Statements

A. Across the country there is growing interest in 24/7 renewables offerings or accounting for carbon emissions on an hourly rather than annual accounting basis. Consumers Energy could pilot technologies to help understand its carbon footprint on an hourly basis and to identify what operational changes should be made in order to support a partial or completely 24/7 renewables offering.

B. As the penetration of intermittent renewable resources increases across the Company's generation mix, inverter-based resources create an environment with lower system inertia. Despite these lower inertia conditions, Consumers Energy must still maintain grid voltage and frequency standards. Pilots could focus on testing grid forming technologies in order to more effectively manage a lower carbon grid with more inverter-based resources in the future.

C. Hydrogen could play a role in decarbonizing hard to abate sectors. New government incentives have the potential to bring down the cost of hydrogen to the level where Consumers Energy may have beneficial uses cases for deploying projects. Continued monitoring of advancements in electrolyzer manufacturing and production efficiencies as well as developments in peer utility hydrogen development strategy (utilization of solar, wind, nuclear, hydro, or CCS) is required to determine timeline for

utility use cases. Desktop studies with simulations and small-scale pilots could test the overall efficacy of technology to deliver these use cases and/or business models that value them.

D. As Consumers Energy maps its path to decarbonization there is a potential role for newer technologies such as carbon capture and sequestration, gravity storage, thermal storage, small nuclear, networked geothermal, among others. Desktop studies with simulations, and small-scale pilots could evaluate the efficacy of these technologies as a potential addition to CE's plans for decarbonization.

E. CE has committed to transforming its energy grid in service of its decarbonization goals. Additional mechanisms to forecast, capture, store and analyze data, will be required to assess, and successfully deploy decarbonization solutions. CE can design pilots to specifically develop data capabilities that unlock new strategies for decarbonization.

3) Metrics:

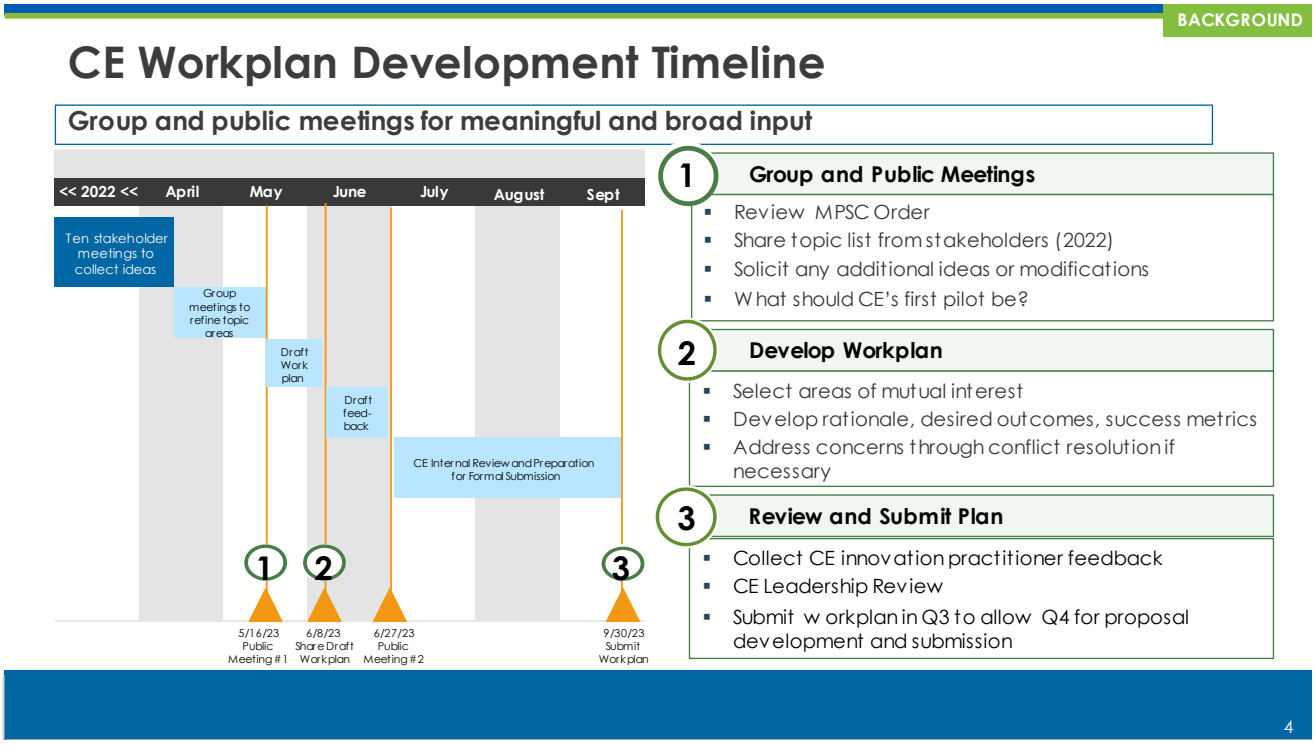
Consumers Energy plans to track the metrics set forth below to measure the impacts of individual expedited pilots where appropriate to demonstrate incremental progress in decarbonization for the Company's customers. The estimated impact of a scale deployment for each pilot will be calculated if appropriate as a part of the individual pilot proposal.

Metric	**Units**
Cost per CO2eq reduction	$/tonne
Pilot total CO2eq reduction	tonnes CO2
Best guess of total reductions that this technology could achieve at scale.	Tonnes
Type of baseline energy that technology offsets	fuel type

Section 2: Stakeholder Engagement

When the MPSC issued the Order creating the expedited pilot review process, there was clear direction that utilities participating in the review should initiate multiple, iterative stakeholder conversations to explore and design potential expedited pilots focused on areas of aligned interest. As Consumers Energy initiated the creation of its workplan, the Company designed a deliberate engagement strategy to ensure that it maximized public understanding and alignment on the priorities to develop this workplan. The Company plans to continue conducting proactive stakeholder engagement as the Company develops and proposes pilots through the expedited pilot review process.

1) **Process followed for Stakeholder Engagement**
   Step 0: Develop approach to create workplan and review with MPSC staff.
   Step 1: Individual, Group, and Public Meetings
   Step 2: Develop Workplan
   Step 3: Review and Submit Plan



2) **Outreach approach and methods:**
   The engagement approach for this workplan is one of inclusion. Many of the

problem statements included in the workplan are direct suggestions of external stakeholders.
Consumers Energy conducted stakeholder engagement through phone calls, email, in person meetings, group calls and public meetings.

3) External Stakeholders Consulted

Consumers Energy sincerely appreciates the time and energy that stakeholders have contributed to the meetings, calls and comments that facilitated the development of this workplan. For reference, below are two appendices.

a. Appendix 1: complete list of stakeholders from whom the utility requested comments or who had registered for a utility hosted public session.
b. Appendix 2: a meeting log listing dates, goals, and outcomes of each external encounter supporting the Consumers Energy Expedited Pilot Review Workplan.

Appendix 1: Stakeholder List

Organization	Name
MPSC	Joy Wang Anna Schiller Jennifer Callahan Kirk Forbes Lacie Latimore Julie Baldwin Olivia Li Szilagyi Sarah Mullkoff Stephanie Haney Jon DeCooman Paul Proudfoot Michael Byrne Nick Evans Karen Gould Roger Doherty Naomi Simpson Lauren Fromm Al Freeman
Michigan Energy Innovation Business Council	Laura Sherman
City of Grand Rapids	Alison Sutter
SunPower Corporation	John Albers
Dimension Renewable Energy	Joe Henri
Kohler	Benjamin Crawford
Voltus	J. Worthington
Driftless Energy	Ryan Kroll
NRG	Malcolm Ainspan
Quanta Technology	Donald Hall
SEE LLC	Sean Reed
Utility API	Nate Kinsey
Elevated Engagement	Tanya Paslawski
Cadmus Group and Midwest Energy Efficiency Alliance	Amalia Hicks
Virtual Peaker	Kirsten Millar
Utilidata	Angela Kassahun, Morgan Steacy
Ecology Center	Charles Griffith
Union of Concerned Scientists	James Gignac Guillermo Pereira

Vote Solar	Will Kenworthy Boratha Tan
Environmental Law and Policy Center	Daniel Abrams, Bradley Klein
Michigan Environmental Council	Charlotte Jameson
Ad Hoc Group	Brian Kooiman, Anjana Agarwal Ian Rinehart
Clarkhill	Rod E. Williamson
Quantalux	Joe Tesar
5 Lakes Energy	Doug Jester
DTE	Katelyn Ross Brian Dantas Nate Bennett Chandler Medaugh
Michigan Electric and Gas Association	Dan Dundas
General Motors	Monica Walker Rebecca Tody Jordyn Kreucher Priya Machi Amber Dorner Trevor Wilson Lindsay O'Neill-Caffrey Danette Butcher Rob Threlkeld
Citizens Utility Board of Michigan	Amy Bandyk

Appendix 2: Stakeholder Meeting Log

This log includes external stakeholder meetings which Consumers Energy conducted to directly inform the development of the Company's Expedited Pilot Review Workplan.

Date	Meeting Description	Attendee	Organization
3/22/2023	Video call to discuss workplan development process/stakeholder engagement	Joy Wang	MPSC
3/30/2023	Video call to review initial problem statements and discuss workplan development process	Laura Sherman	MEIBC
4/19/2023	Video call to review initial problem statements and discuss workplan development process	James Gignac	Union of Concerned Scientists (UCS)
	Video call to review initial problem statements and discuss workplan development process	Boratha Tan	Vote Solar
	Video call to review initial problem statements and discuss workplan development process	Will Kenworthy	Vote Solar
	Video call to review initial problem statements and discuss workplan development process	Charles Griffith	Ecology Center
4/19/2023	Call to brainstorm ideas for residential storage pilots	Laura Sherman	MEIBC
4/24/2023	Video call to discuss workplan development process/stakeholder engagement approach	Joy Wang Paul Proudfoot Julie Baldwin Nick Evans Karen Gould Roger Doherty Naomi Simpson Lauran Fromm Sarah Mulkoff	MPSC
5/16/2023	Public Virtual Meeting #1 Video Call to share overall approach to workplan development, review benchmark workplans from other states/previous efforts and solicit input of ideas and other discussion.	40 registrants from appendix 1 stakeholder list	Many
5/17/2023	Call to discuss concerns related to residential pilot ideas in workplan	Laura Sherman	MEIBC
6/2/2023	Call to brainstorm residential pilot ideas that we would include in workplan	Laura Sherman	MEIBC
6/13/2023	Call to select the residential pilot ideas we want to focus on more concretely.	Laura Sherman	MEIBC
6/21/2023	Call to develop more attributes of desired pilot.	Laura Sherman	MEIBC
6/27/2023	Emailed draft workplan document to distribution list with request for written comments on the draft workplan.	All 66 registrants of both Public Meetings	Various
6/28/2023	In Person meeting to review workplan comments and discuss	Joe Tesar	Quantalux
6/29/2023	Public Meeting #2 Distributed initial workplan draft and solicited comment on document. Discussed structural approach to organization of workplan.	37 registrants from Appendix 1 stakeholder list	Many
6/30/2023	Call to discuss potential LMI storage pilot idea for inclusion in the workplan	Laura Sherman	MEIBC