1 **Montana Public Service Commission**
2 **Docket No. 2024.05.053**
3 **Electric and Natural Gas Rate Review**

4

5 **DIRECT TESTIMONY**

6 **OF JEANNE M. VOLD**

7 **ON BEHALF OF NORTHWESTERN ENERGY**

8

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Witness Information

2 **Q.** **Please identify yourself, your employer, and your job title.**

3 **A.** My name is Jeanne M. Vold. I serve as NorthWestern Corporation d/b/a

4 NorthWestern Energy's ("NorthWestern" or "Company") Vice President –

5 Technology.

6

7 **Q.** **Please provide a description of your relevant employment experience**

8 **and other professional qualifications.**

9 **A.** I have worked in the utility industry for 27 years. My undergraduate degree is

10 in electrical engineering from the South Dakota School of Mines and

11 Technology. Early in my career, I performed overhead and underground line

12 construction. My engineering career then forayed into medium voltage

13 systems, control systems, and high-speed manufacturing. I joined

14 NorthWestern in 1999 with a career shift into Information Technology ("IT").

15 Due to the partnership with the business and alignment with business

16 strategy, NorthWestern includes IT under the broader umbrella of Business

17 Technology ("BT"). I have held several leadership positions in the technology

18 area and have led key system implementations for the Company. I have had

19 oversight for NorthWestern's entire BT department since 2007 and assumed

20 my current position in 2021. My experience includes large system

21 implementations and upgrades, control systems, applications and knowledge

22 in data center, networking, and cyber security.

23

1		I am active in several industry associations including Edison Electric Institute,
2		the Western Energy Institute, AGA, and the Institute of Electrical and
3		Electronics Engineers. In addition, I serve on an advisory board for private
4		LTE.
5		

<div align="center">

Purpose of Testimony

</div>

Q. **What is the purpose of your testimony in this proceeding?**

A. The purpose of my testimony is to describe the changes occurring in the technology space that form the basis for NorthWestern's proposal for alternative cost recovery mechanisms for certain BT costs, specifically 1) cloud computing, 2) Software as a Service ("SaaS"), and 3) subscriptions. These mechanisms will better ensure our ability to continue providing technologies that provide the best benefit for our customers and operation of our utility.

<div align="center">

The Changing Technology Landscape

</div>

Q. **What changes are occurring in the technology space?**

A. Our transition from the traditional perpetual licensing model, where we owned and operated software on premise to cloud computing, SaaS, and subscription is inevitable due to the shift in the entire industry. Perpetual licensing where we owned and operated software on premise in our own data centers is no longer the norm. Under this model, we purchased a one-time license to indefinitely use the software and paid a maintenance fee for

1   support and updates. In the environment today, most vendors are only

2   providing solutions which operate in a cloud environment, SaaS, or

3   subscription model, creating a clear and pronounced shift in the composition

4   of technology services from capital (i.e., utility owned) to expense. Our

5   vendors play a critical role in providing technology for the safe and reliable

6   operations and enhanced customer experience. Cloud computing, SaaS, and

7   subscriptions all have critical roles to play in the technology delivery needs of

8   a utility. The shift to cloud computing, SaaS, and subscription means the

9   utility is effectively paying for the right to use the asset, essentially "rent"

10   technology rather than own technology solutions.

11

12   Cloud computing is typically deployed with hyperscalers. Hyperscalers are

13   large cloud service providers that offer computing and storage at enterprise

14   scales, such as Microsoft Azure, Amazon Web Services (AWS), and Google

15   Cloud Platform (GCP). All industries have been going through a digital

16   transformation which was accelerated by the COVID-19 pandemic by

17   leveraging the convenience of hyperscalers which allows for on demand

18   provisioning of the complex underlying infrastructure necessary to deploy

19   software. Cloud computing hyperscalers typically provide Infrastructure as a

20   Service ("IaaS") and Platform as a Service ("PaaS"). IaaS is on demand

21   access to computing resources such as servers, storage, networking, and

22   virtualization. PaaS provides underlying infrastructure as well as complete

23   development and deployment environments for software platforms and

1   applications. Cloud computing provides a scalable, model which can occur in

2   almost real-time, shifting the traditional provisioning of on premise

3   infrastructure to the hyperscaler. Even though expenses are incurred

4   periodically the move to a cloud computing hyperscaler is a long-term

5   strategic decision. The hyperscaler model of "pay as you go" has benefits for

6   the service provider from a revenue perspective, however, the periodic

7   investment does not reflect the long-term value of scalability and efficiency

8   realized by NorthWestern. Scalability is an advantage for NorthWestern

9   because it allows us to only provision what we need at the time we need it

10   and scale up as we need more resources thus allowing us to right-size our

11   resources in near real time. An added benefit of this shift is an avenue for

12   recovery and resiliency because most hyperscalers have redundant data

13   centers in different service areas. All of these benefits are only realized if you

14   stay in the same hyperscaler platform for an extended period of time. In

15   addition, hyperscaler platforms provide a robust solution for advanced

16   analytics, machine learning, and artificial intelligence for which the computing

17   power is so great it is not practical to run in our own data centers.

18   NorthWestern has already leveraged hyperscalers for our Customer

19   Information System, Enterprise Data Platform, and our customer preference

20   center.

21

22   NorthWestern operates our hyperscaler like a micro-domain extension of our

23   network. We secure and operate the infrastructure in the hyperscaler, just

1	like we would secure and operate infrastructure in our own data centers.
2	This strategy brings numerous benefits for customers and employees. As we
3	scale up our cloud platforms customers will enjoy modern interactions,
4	enhanced information for decision-making and more convenient channels of
5	communication. For example, our preference center will be deployed in our
6	hyperscaler for customer notifications, which will provide a modern interface
7	and easy avenue for customers to determine their preferred notification
8	channel. The first phase will provide customers with bill alerts, payment
9	confirmation, safety alerts, energy saving tips, and outage notifications.
10	Future customer deployments from our hyperscaler will include detailed
11	energy usage information from our Advanced Metering Infrastructure ("AMI")
12	meter data which is foundational in empowering customers with more
13	comprehensive data to manage their energy. Our employees will benefit from
14	the ability to use modern technologies for business intelligence, data
15	analytics, machine learning, and artificial intelligence to make informed
16	decisions concerning utility operations. They will also expand their
17	technology skills as they work with modern toolsets.
18	
19	NorthWestern has built out an Enterprise Data Platform on a hyperscaler
20	which allows for business intelligence, machine learning, and artificial
21	intelligence leveraging input from multiple systems including AMI, GIS,
22	ADMS, SCADA, CIS, and SAP. This platform significantly improves the
23	analysis for Operations, Customer Care, and Finance to make informed data

1   driven decisions providing enhanced business outcomes. This "pay as you

2   go" cloud service is another example of system platforms only available as a

3   cloud service but strategic and long-term in value.

4

5   SaaS solutions are typically vendor-managed point solutions accessed over

6   the internet and often deployed by the vendor in their own data center or

7   hyperscaler environment. NorthWestern has numerous SaaS solutions, and

8   they continue to grow. These solutions include our Energy Trading System

9   which manages our energy marketing function, our Learning Management

10   System, which delivers our internal training, and email content filtering which

11   blocks our SPAM. Similar to cloud computing, even though SaaS solutions

12   have periodic payments, the move to a SaaS provider is not a short-term

13   decision but very strategic to delivering a high-quality business solution. The

14   expansion will continue as vendors continue to shift their offerings from an on-

15   premise, license-based model to SaaS.

16

17   The final category of subscription is the transition we are seeing from vendors

18   who provide software we run on premise. As agreements come up for

19   renewal, vendors are converting perpetual licenses (i.e., utility owned assets)

20   to subscriptions. In the subscription model we no longer own the perpetual

21   license but have rights to use the software as we pay the recurring

22   subscription fee. Subscription models replace the traditional perpetual

23   license model of a long-term asset operated on premise in our data centers.

1

Q.   How is NorthWestern managing this technology transition?

A.   NorthWestern has taken a thoughtful and pragmatic approach in managing

the technology transition. As we assess new projects or as renewals arise for

each system, we run them through our software strategy decision tree and

provision accordingly. The high-level strategy is illustrated below and

although appearing simplistic in the depiction it involves a very detailed

analysis of all software solutions to determine how to effectively

operationalize and deliver the most optimal solution for our customers and

employees.

Figure 1: Transition Strategy
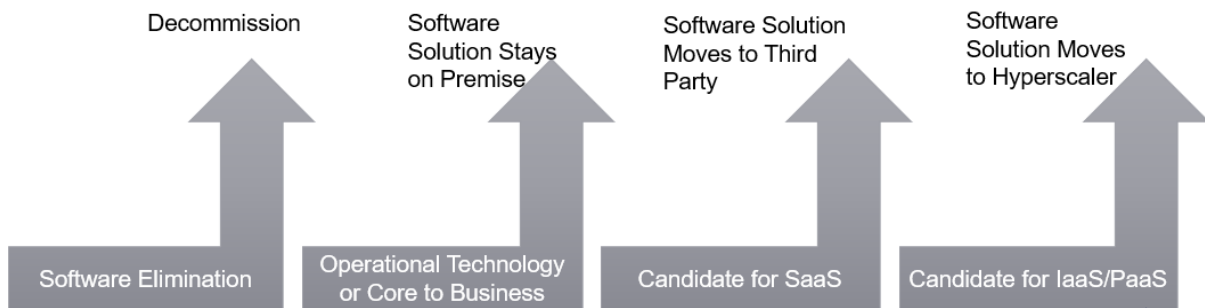
For new software deployments we determine optimum deployment based on

business need, customer need, security and whether it is Operational

Technology ("OT") or core to the business. If it is OT or core, we will deploy

the solution on premise in our data center. If the solution is not core and a

candidate for a third party, we will move it to a SaaS platform. If neither of

these solutions meet the needs of the business or customers, we will deploy

the software in our own hyperscaler.

1

2   As existing solutions come up for renewal, we examine the existing software

3   to determine if it can be eliminated or replaced by technology already

4   deployed thus eliminating technical debt. If the solution cannot be eliminated,

5   we consider business need, customer need and security as we analyze the

6   software solution. If the solution is OT or core to our operations, we continue

7   to operate on premise in our data centers. The next option for software

8   deployment is determining if the system should move to a SaaS provider. If

9   so, we will move the workload to a third party. If the previous three options

10   are not suitable, we will move the software solution to our own managed

11   hyperscaler.

12

13   One very important piece to note here is the care we take concerning the

14   protection, ownership, and preservation of data. Customer, operational,

15   financial, employee, and proprietary data are a precious asset to

16   NorthWestern. We take the obligation of data protection seriously. We are

17   diligent custodians of our customer data and retain ownership of

18   NorthWestern data regardless of where it resides.

19

20   **Q.   Please describe the role of BT to ensure the delivery of essential energy**

21   **services to customers.**

22   **A.**   BT's role to provide safe and reliable services to customers is multifaceted

23   and critical. The 2022 Montana Rate Review was the first time NorthWestern

1   offered testimony related to role of BT in NorthWestern's daily operations. In

2   the 2022 rate review, my BT testimony, along with Sean Cleverly's, focused

3   on the needs to address cyber security threats which had grown dramatically

4   since the COVID-19 pandemic.

5

6   It is impossible for NorthWestern to operate without technology; it is

7   embedded in everything we do. The technology and software platforms

8   required to operate a vertically integrated electric and natural gas utility to

9   deliver safe and reliable energy to customers are vast, complex, and all

10   connected. Business Technology touches every area of NorthWestern's

11   operations, customer service, energy delivery, back office, strategy, security,

12   and planning. It is not possible to run a business in today's world without

13   technology platforms.

14

15   **Q.   Why is technology important to customers and NorthWestern?**

16   **A.**   Our customers are first and foremost in our minds, and a complex ecosystem

17   of technology supports all our customer facing systems. The telephony,

18   contact center technology, AMI, outage management, and customer

19   information systems are all necessary to provide safe and reliable service to

20   our customers. Customers rely on the accuracy of information we provide,

21   and these systems must be available at all times. We continue to invest in

22   our customer experience by building upon our AMI technology as detailed in

23   the direct testimonies of Jason C. Merkel's, Bobbi L. Schroeppel's, and

1   Jonathan R. Shafer. New deployments supporting the customer and

2   leveraging this platform are all on cloud and SaaS platforms. As stated

3   earlier, the most notable deployment underway is the implementation of a

4   preference center in our hyperscaler which will give customers the ability to

5   set preferences for bill alerts, payment confirmation, safety alerts, energy

6   saving tips, and outage notifications.

7

8   **Q.   How has NorthWestern implemented cyber security into its systems?**

9   **A.**   NorthWestern embeds cyber security in our system architecture. We have

10   been using a secure-by-design approach for several years, which means we

11   embed the security in the design phase of any build whether it is on premise

12   or in our own hyperscaler. We have taken great care to ensure control

13   systems are segregated from the corporate network into micro-domains to

14   protect the confidentiality, integrity, and availability of these systems. We are

15   responsible for the architecture, security, and threat hunting on premise and

16   in our own managed cloud services. We vet our SaaS applications and

17   require that certain security and operational standards are met. We no longer

18   have the luxury of a "moat and castle" approach to security but must protect

19   our assets and data in an expansive hybrid environment which consists of on-

20   premise systems, cloud computing, and SaaS.

21

22   **Q.   Is technology optional for a utility?**

1 **A.**   No. Late last year, over 80 employees across all facets of NorthWestern

2   participated in GridEx, which is a bi-annual, two-day North American exercise

3   sponsored by the North American Electric Reliability Corporation to address

4   grid security and reliability. Through this tabletop exercise, we took down

5   several public and private networks and quickly learned how reliant we are on

6   information technology to ensure the delivery of energy to our customers.

7   The exercise impacted all our operations, customer care and back office. We

8   quickly demonstrated what we already knew: We can no longer operate

9   without technology. Systems have become so integrated and automated over

10   the years, and we have increased our dependency upon them so much there

11   is now no way to go back to a manual process. We must continue to focus on

12   recovery and resiliency in all operations. Business Technology provides the

13   backbone, highways, security, and applications enabling the business to

14   function.

15

16   This complex ecosystem includes an expansive system of networks

17   throughout Montana, SaaS services, cloud services, data centers, end-user

18   computing, cyber security, and numerous applications. The Technology

19   model is evolving, and many products are no longer available to us as

20   system assets. The unprecedented pace at which we need to deploy

21   technology to meet customer and employee expectations will be met by

22   leveraging cloud computing and SaaS.

23

1   The cost models of technology acquisitions have rapidly changed, and in

2   many cases it is no longer possible to own computing assets. As we migrate

3   to a "pay as you go" model in platforms such as Azure and AWS, they provide

4   a convenient and prudent avenue for growth which is matched by the costs

5   associated with using the resources in these clouds. Companies across all

6   industries are being moved to these models. As vendors offer technology

7   solutions, many will only allow the use of the technology from their own cloud

8   infrastructure, and they will not sell it to companies to operate in their own

9   data centers.

10

11 **Q.   What are your challenges?**

12 **A.**   The growing need for technology is not slowing down. The testimony of Mr.

13   Merkel provides excellent insight into the important role it plays in our

14   operations. Leveraging technology to solve business problems is not new,

15   but the mechanisms through which we deliver solutions have been completely

16   transformed. This transformation drives exponential growth in expense costs,

17   while our opportunity to own solutions diminishes. Even though the pricing of

18   these models is a periodic expense, the technology decisions are not short-

19   term decisions. NorthWestern will use technology in a hyperscaler, SaaS,

20   and subscription model for many years, essentially operating them as long-

21   term assets. This imbalance of ownership of assets coupled with the change

22   in business model requires a shift in approach. Our customers and

23   employees have an expectation for modern technology, and most of these

1   solutions are delivered via cloud computing, SaaS, or subscription. The

2   periodic expense model does not reflect the long-term value we are delivering

3   for our customers and employees.

4

5   **Q.   Are there specific proposals related to Business Technology in this rate**

6   **review?**

7   **A.**   Yes. The direct testimony of Crystal D. Lail presents NorthWestern's proposal

8   to capitalize certain BT costs, specifically 1) cloud computing, 2) Software as

9   a Service (SaaS), and 3) subscriptions and direct testimony of Cynthia S.

10   Fang on Regulatory Priorities presents NorthWestern's proposal for a

11   Business Technology Balancing Account associated with that proposal.

12

13   **Q.   What specific Business Technology costs is NorthWestern asking for**

14   **recovery of through capitalization and accounting treatment?**

15   **A.**   NorthWestern is asking for the ability to capitalize costs associated with cloud

16   computing, SaaS, and subscriptions for technology related utility operations

17   on a going forward basis. In 2023, total costs of these categories were about

18    $9.8 million. This is discussed further by Ms. Fang.

19

20   **Q.   Do you have any data to support the increase in these expenses?**

21   **A.**   A growing portion of our expense costs has gradually morphed into cloud

22   computing, SaaS, and subscription costs. Just as all vendors introduced

23   maintenance agreements into their pricing structures beginning in the 1980's

1   and 1990's, vendors are now moving to a pricing model to "rent" the use of

2   what we would have traditionally held as an asset. As stated above, even

3   though pricing is periodic, our decisions are strategic and long-term. We work

4   very hard to negotiate favorable multi-year agreements. Renewals can range

5   from one to five years but more often than not we negotiate new terms and

6   renew the agreements as they expire. Figure 2 below illustrates year over

7   year cloud computing, SaaS, subscription, and maintenance costs. In 2023

8   cloud computing, SaaS, and subscription costs represent about 62%, or

9   roughly $9.8 million of the $15.8 million depicted below.

10   **Figure 2**

Technology Maintenance, Cloud Computing, SaaS and Subscription Costs
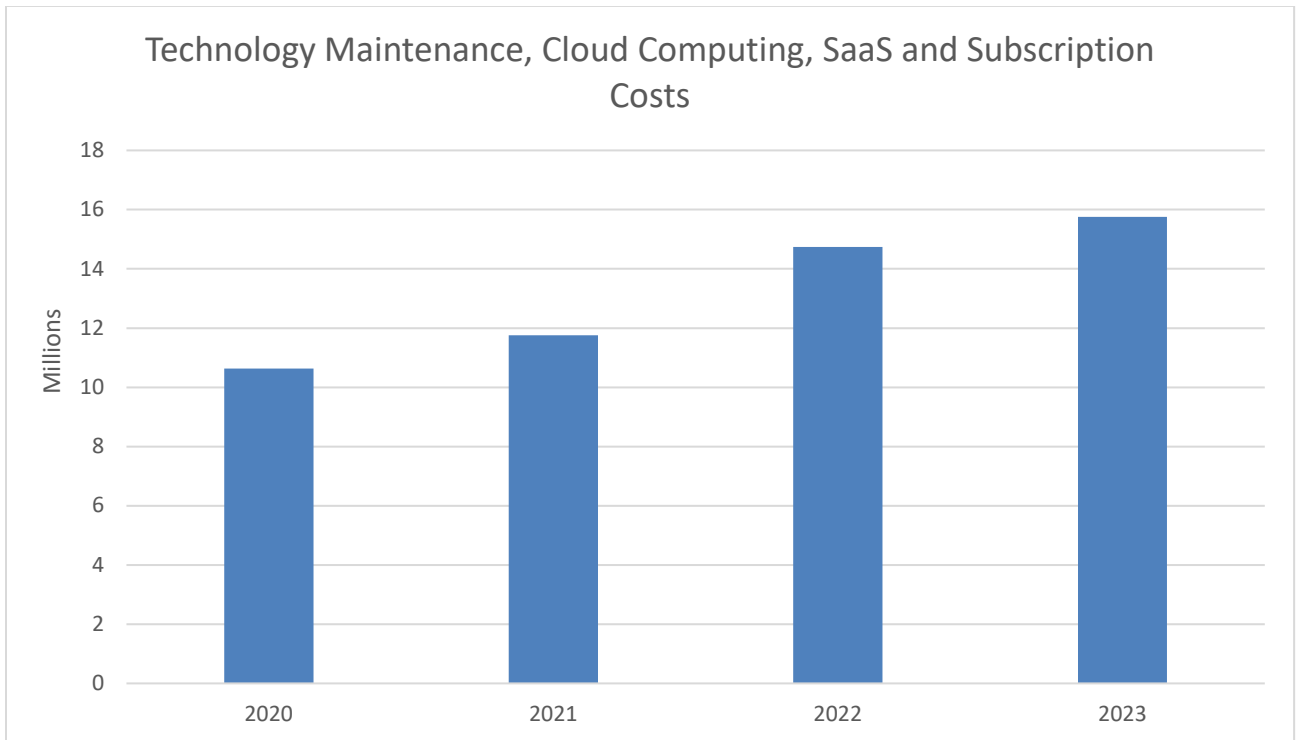
11

12

13   <u>**Conclusion**</u>

14   **Q.**   **Please summarize your testimony.**

1   **A.**   NorthWestern faces significant challenges related to the treatment of our

2   technology costs. Through my testimony, I explain this ecosystem, its

3   complexity, and how it is all connected. NorthWestern has been prudent in

4   the money it has spent to ensure technology serves customers with safe and

5   reliable service and provides employees with the tools they need to do their

6   jobs. All of us used to be able to buy a disk for Microsoft Office with a license

7   key and we could use it for years. In this example, we paid for the license

8   once and possessed a tangible asset. This is no longer the case, and we all

9   pay an annual subscription fee for the right to use the software from Microsoft

10   for the term of the agreement while relying on it for product enhancements

11   and cyber security updates. In simple terms, this is what we face for most of

12   our technology now. The continued transition to cloud computing, SaaS, and

13   subscription models is inevitable. The trends due to external drivers we are

14   experiencing today are expected to continue and likely result in a technology

15   system built on a foundation largely "rented" rather than utility owned. We are

16   asking for cost recovery mechanisms that better reflect the value of these

17   services to customers as further discussed by Ms. Lail and Ms. Fang.

18

19   **Q.**   **Does this conclude your direct testimony?**

20   **A.**   Yes.

21

1

2 **<u>VERIFICATION</u>**

This Direct Testimony of Jeanne M. Vold is true and accurate to the best of my knowledge, information, and belief.

/s/ Jeanne M. Vold
Jeanne M. Vold