

**Exhibit:**

**Issues:** Green Button Connect

**Witness:** Michael Murray

**Type of Exhibit:** Surrebuttal

**Sponsoring Party:** Renew  
Missouri

**Case No.:** ER-2024-0261

**Date Filed:** September 17, 2025

**BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION**

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FILE NO. ER-2024-0261

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**SURREBUTTAL TESTIMONY AND EXHIBITS OF  
MICHAEL MURRAY  
ON BEHALF OF RENEW MISSOURI**

September 17, 2025

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1 representatives to a utility's data systems through an Application Programming Interface  
2 ("API")."<sup>1</sup>

3 **Q. DO YOU AGREE WITH MR. LUCAS ABOUT THE "DIRECT CONNECTION?"**

4 A. Not entirely. While of course GBC involves an API connection to the utility, it is not  
5 accurate to suggest that GBC requires unfettered communication with Liberty's underlying  
6 customer information system or meter data management system. In fact, all GBC implementations  
7 I am aware of involve numerous separations of functions, with layers of security between each  
8 function. For example, the server that responds to API queries is separated from the rest of  
9 Liberty's enterprise billing system.

10 Let me explain in more detail. There are two important and related cybersecurity strategies  
11 associated with all implementations of enterprise software, including GBC: "least privilege" and  
12 "defense in depth." Least privilege is the idea that any server, such as the GBC server that provides  
13 APIs, should only be granted the bare minimum access rights needed to fulfill its function. That  
14 means the GBC server does not have open access to customer data, Liberty's customer information  
15 system, billing system or meter data management system. Rather, it has only limited access rights,  
16 such as the ability to send certain defined requests that are subject to customer authorization. All  
17 other communications are prohibited.

18 The second strategy, which is related, is called "defense in depth." This is analogous to  
19 medieval castles, where attackers must pass through independent layers, often concentric rings.  
20 For example, a moat, outer gate, inner gate and a donjon must each be breached in order to reach  
21 the king or queen. Similarly, Liberty's networked infrastructure can and should have its own

<sup>1</sup> *Rebuttal Testimony of Matthew W. Lucas*, 3:3-6.

1 layered defenses consisting of firewalls, discrete network zones and load balancers, each of which  
2 prevents unwanted traffic from penetrating into the network. Penetrating a single layer does not  
3 mean that an attacker has complete access to an underlying system.

4 Together, least privilege and defense in depth are used to regulate and manage network  
5 traffic flows to ensure that requests for data are individually valid and that the underlying systems  
6 are protected. Mr. Lucas's word "direct" does not reflect the layering, nor the restraints on network  
7 traffic imposed at each layer, of the security measures that are used in enterprise software  
8 deployments such as GBC.

9 **Q. IN TERMS OF CYBERSECURITY RISK, HOW DOES GREEN BUTTON**  
10 **CONNECT COMPARE WITH OTHER ONLINE SERVICES LIBERTY PROVIDES**  
11 **TODAY?**

12 A. GBC has a similar risk profile to Liberty's customer web portal today. The customer web  
13 portal is exposed to the internet, which means it needs to have protections against denial-of-service  
14 attacks. It also needs to have layered protections so that a customer paying his or her bill cannot  
15 get access to power plant controls. Finally, Liberty's web portal needs an identity and access  
16 management system so that legitimate customers are given access to their accounts, while  
17 impersonators are denied access.

18 GBC has a very similar profile. GBC requires customer consent, which means that a  
19 customer must be able to login to his or her online account. By using the same identity and access  
20 management system underlying Liberty's website, as well as the same protection against denial-  
21 of-service attacks, GBC does not add new risks in this area. Next, GBC servers fulfilling API  
22 requests are similar to the website servers fulfilling requests from customers such as requesting a  
23 bill in PDF or making a payment. The web server does not have unfettered access to the customer

1 information system or billing system; instead, it routes valid requests to intermediate servers that  
2 are cordoned off from the customer information system or billing system. Just as Liberty's website  
3 is delivered to customers with multiple layers of servers underneath it, GBC is implemented the  
4 same way. With GBC, any request for data that is not agreed to by the customer is denied. Any  
5 attempt to gain control of the GBC server providing API responses would not yield any benefit to  
6 an attacker because, thanks to layered defenses, it has no authority within the network to receive  
7 unconsented data.

8 **Q. IS IT POSSIBLE TO HAVE ZERO CYBERSECURITY RISK?**

9 A. For any networked system, no, it is impossible to bring the risk to zero.

10 **Q. CAN CYBERSECURITY RISKS ASSOCIATED WITH GREEN BUTTON**  
11 **CONNECT BE SUCCESSFULLY MANAGED?**

12 A. Yes, absolutely. The electric utility industry has ten (10) years of experience with secure  
13 implementations of GBC. Tens of millions of customers nationwide have the ability to share their  
14 energy usage and account information today. Over the past decade, there has never to my  
15 knowledge been a single instance of a cybersecurity breach affecting a utility that is in any way  
16 connected with GBC.

17 **Q. WHAT ELSE DID STAFF STATE REGARDING GREEN BUTTON CONNECT?**

18 A. Mr. Lucas cites Liberty's new billing system called Customer First. Given that Liberty has  
19 not been able to accurately bill customers, Mr. Lucas states that any labor dedicated to GBC at this  
20 time would mean an inappropriate of resources away from repairing the billing system.<sup>2</sup> Mr. Lucas

<sup>2</sup> *Id.* at 3:20-4:11.

1 also states that the GBC tariff I proposed should be considered after, not before, the infrastructure  
2 for GBC is in place.<sup>3</sup>

3 **Q. WHAT IS YOUR RESPONSE?**

4 A. Liberty's ongoing issues with its billing systems strongly support the Commission's  
5 consideration of the GBC tariff. While I agree that GBC implementation should be sequenced after  
6 the billing system is stabilized, it is important for the Commission to set performance expectations  
7 for GBC at the outset. For Liberty to contract with its vendors to offer GBC, it needs to know what  
8 the Commission's requirements are. Reversing this order would limit the Commission's oversight  
9 in this area because the Commission could only address performance expectations *after* the system  
10 design, architecture and support expectations were established and contracted. Even if it were even  
11 possible to make modifications at that point, they would most likely add unnecessary costs.

12 I strongly agree with Mr. Lucas that Liberty's billing system must be promptly fixed. But  
13 in the meantime, the Commission should set performance expectations for GBC. Once the  
14 improvements to the billing system are complete, then Liberty will be well-positioned to begin  
15 offering GBC with a high level of confidence and accuracy. I note that Section (e) of the tariff  
16 specifically addresses data quality and integrity. It requires Liberty to provide customer data via  
17 GBC that meets a "best available" standard, meaning that it (1) applies to the correct customer in  
18 question, (2) is correct and accurate to the best of the utility's knowledge at that time, and (3) is  
19 transmitted in a timely manner to third parties. Certainly, customer bills should meet this standard.  
20 But so should GBC. The best way to ensure that outcome is for the Commission to take up the  
21 tariff and make determinations about performance expectations while the billing system  
22 improvements are underway.

<sup>3</sup> *Id.* at 6:12-16.

1    **III.    CONCLUSION**

2    **Q.    DOES THIS CONCLUDE YOUR TESTIMONY?**

3    **A.    Yes.**

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**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

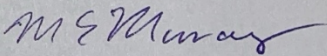
In the Matter of the Request of The Empire	)	
District Electric Company d/b/a Liberty for	)	<b><u>File No. ER-2024-0261</u></b>
Authority to File Tariffs Increasing Rates	)	Tracking No. JE-2025-0069
for Electric Service Provided to Customers	)	
In its Missouri Service Area	)	

**AFFIDAVIT OF MICHAEL MURRAY**

STATE OF WASHINGTON       )  
  )  
COUNTY OF OKANOGAN    )       ss

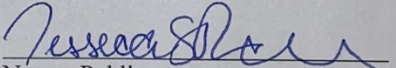
COMES NOW Michael Murray, and on his oath states that he is of sound mind and lawful age; that he prepared the foregoing surrebuttal testimony; and that the same is true and correct to the best of his knowledge and belief.

Further the Affiant sayeth not.

  
\_\_\_\_\_  
Michael Murray

Subscribed and sworn before me this 10<sup>th</sup> day of September 2025.

NOTARY PUBLIC  
STATE OF WASHINGTON  
JESSECA S REECE  
MY COMMISSION EXPIRES  
JANUARY 18, 2029  
COMMISSION # 189859

  
\_\_\_\_\_  
Notary Public

My commission expires: 01/18/2029