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BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power to Establish Export Credits for Customer Generated Electricity	DOCKET NO. 17-035-61

PREFILED DIRECT TESTIMONY OF KATE BOWMAN

ON BEHALF OF

UTAH CLEAN ENERGY

MARCH 3, 2020

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I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Kate Bowman. My business address is 1014 2nd Avenue, Salt Lake City, Utah 84103.

Q. By whom are you employed and in what capacity?

A. I am the Renewable Energy Program Manager for Utah Clean Energy, a non-profit and non-partisan public interest organization whose mission is to lead and accelerate the clean energy transformation with vision and expertise. In my capacity at Utah Clean Energy, I provide expertise to inform programs, initiatives, and policies that support a transition to clean energy.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of Utah Clean Energy.

Q. What is Utah Clean Energy's interest in this docket?

A. Utah Clean Energy prioritizes a cleaner and more efficient energy future. We envision and enable increased utilization of energy efficiency, distributed generation, and utility-scale renewable energy. We further believe that distributed energy resources have great potential to provide valuable services and benefits to the grid, and that they are a critical component of an affordable transition to a clean energy future.

Q. Please review your professional experience and qualifications.

A. I have worked for Utah Clean Energy for eight years where I have managed the development and implementation of programs that facilitate the adoption of clean distributed energy technologies, including installation of solar photovoltaic systems and electric vehicles. I have participated in a research partnership led by the National

Renewable Energy Laboratories to evaluate the role of distributed solar and other distributed energy resources in improving the flexibility and affordability of the grid. Through my work at Utah Clean Energy, I have been involved in a number of regulatory and stakeholder proceedings related to distributed solar, utility-scale solar, innovative distributed energy technologies, and long-term resource planning. I hold a B.A. in government from Dartmouth College.

Q. Have you previously filed testimony with this Commission?

A. Yes. I filed testimony in Phase 1 of the current docket, in which I addressed the Company's Customer Generator Load Research and Analysis Plan. I have also filed testimony in the following instances:

- Docket No. 17-035-40 Application of Rocky Mountain Power for Approval of a Significant Energy Resource Decision and Voluntary Request for Approval of Resource Decision, regarding investments in new and repowered wind resources.
- Consolidated Docket Nos. 17-035-T07 and 17-035-37 regarding the pricing method for qualifying facilities under Electric Service Schedule 37.
- Phase II of Docket No. 16-035-36, in the matter of Rocky Mountain Power's STEP Act Initiatives, regarding advanced substation metering.

Q. What is the purpose of your testimony?

A. As Utah Clean Energy's policy witness, I discuss the importance of the Export Credit Rate and outline principles to be considered in the development of the Export Credit Rate.

Q. Could you please summarize your testimony?

A. First, I show that Distributed Energy Resources (DER) are an emerging category of technologies capable of providing a variety of services that have benefits, both for adopting

customers and for the grid. The growth of rooftop solar is driving customer interest in and adoption of a variety of DER that can improve grid flexibility. While the future potential of DER may not be immediately quantifiable, the benefits of improved grid flexibility resulting from private investments in DER should be a consideration in the determination of the Export Credit Rate. Next, I will demonstrate that rooftop solar adoption has fallen significantly since the implementation of the Transition Program in November 2017. Finally, I make recommendations regarding a just and reasonable rate design for the Export Credit proceeding. Specifically, I urge the Commission to:

- Consider the potential for DER to improve grid flexibility and recognize that the Export Credit Rate is a key factor that will determine whether ratepayers ultimately reap the benefits of DER.
- Develop an Export Credit Rate that is just and reasonable and in the best interest of the well-being of Utah, including consideration of climate and health impacts and the value of jobs and economic development resulting from the growth of rooftop solar.
- Determine that the Export Credit Rate should not be netted more frequently than hourly in order to ensure that it is simple and comprehensible to customers.
- Incorporate gradualism into the implementation of the Export Credit Rate.
- Allow customers who install solar to lock-in the value of the Export Credit Rate current at the time of their interconnection application for 20 years.

II. BENEFITS OF DISTRIBUTED ENERGY RESOURCES

Q. What are Distributed Energy Resources?

A. The term Distributed Energy Resources (DER) refers to a variety of customer-sited energy technologies that can provide on-site energy generation, but can also reduce overall customer energy usage or shift energy usage from one time period to another. The NARUC Distributed Energy Resources Rate Design and Compensation manual defines DER as:

> *A resource sited close to customers that can provide all or some of their immediate electric and power needs and can also be used by the system to either reduce demand (such as energy efficiency) or provide supply to satisfy the energy, capacity, or ancillary service needs of the distribution grid.*[1]

Common DER that are commercially available and in use today include rooftop solar, battery storage, smart inverters, energy-efficient building technologies or controls, demand response technologies, and electric vehicles with controlled charging.

Q. Why are the benefits of portfolios of Distributed Energy Resources, including distributed solar, germane to setting the Export Credit Rate?

A. The value of the Export Credit Rate will determine the trajectory for the growth of other types of DER. An Export Credit Rate that does not provide customers with an affordable opportunity to invest in rooftop solar could also discourage customer investments in other complementary DER. If customers in Utah cannot afford to install rooftop solar, the market for other DER that are complementary to solar will wither and Utah will not realize the benefits that DER can provide to the grid. An Export Credit Rate that deters Utahns from installing rooftop solar will diminish the opportunity to capture the grid flexibility and resiliency benefits of adoption of new DER.

Q. Why does it matter whether or not Utah electricity customers choose to install DER at their homes and businesses?

[1] NARUC Staff Subcommittee on Rate Design, (2016). "NARUC Manual on Distributed Energy Resources Rate Design and Compensation." Page 8. https://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0.

A. DER resources that improve grid flexibility will help to keep grid costs low as PacifiCorp transitions to more renewable energy resources. Changing market conditions are driving increased investment in new utility-scale renewable energy resources. PacifiCorp's 2019 IRP Preferred Portfolio includes 4,600 MW of new wind resources, 6,300 MW of new solar resources, and more than 2,800 MW of battery storage over the 20-year planning horizon.[2] PacifiCorp projections show that variable renewable energy resources will comprise 50% of the projected energy mix, and 46% of the capacity mix by 2038.[3] PacifiCorp plans to build these renewable energy resources because they have been identified as part of the least-cost, least-risk portfolio that meets the needs of Utah customers. However, to accommodate the continued integration of new utility-scale renewable energy resources while also keeping costs low for customers, the grid of the future will need to be more flexible and responsive. Leveraging private investment in customer-sited DERs is an important tool to this end.

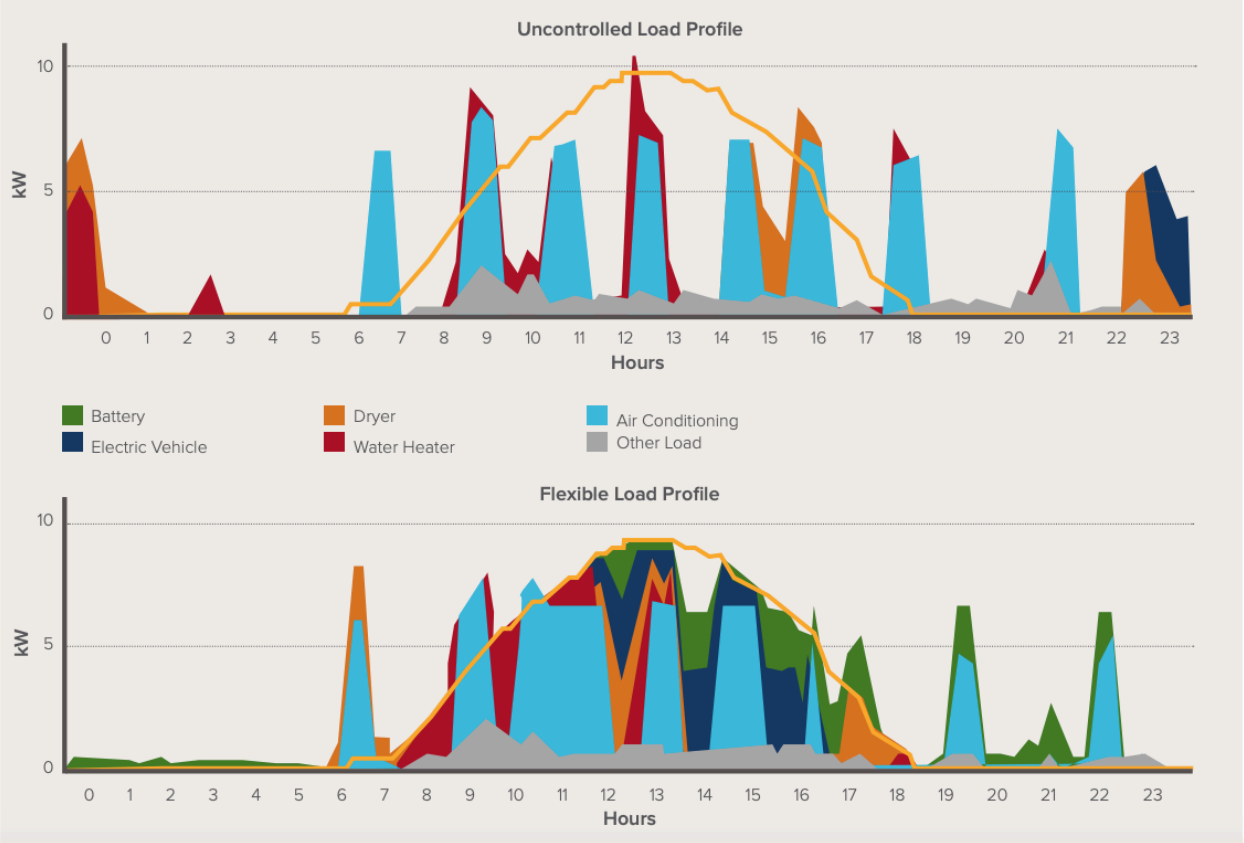
Q. How can DER improve grid flexibility to facilitate the integration of higher penetrations of variable renewable energy resources?

A. Flexible DER can be used to flatten load curves to avoid steep ramp rates, absorb excess generation from renewable energy resources, and maintain voltage and frequency.[4] As demonstrated in Figure 1, a portfolio of distributed energy resources, including managed electric vehicle charging, battery storage, controllable water heating, and rooftop solar, can be used to shape customer energy usage throughout the day. Controllable appliances,

[2] PacifiCorp, 2019 Integrated Resource Plan. Page 7. https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/energy/integrated-resource-plan/2019_IRP_Volume_I.pdf.
[3] *Id*. at 257.
[4] GridLAB, (2018). "The Role of Distributed Energy Resources in Today's Grid Transition." Page 8. http://gridlab.org/works/role-of-distributed-energy-todays-grid/.

including electric vehicle charging, can be deployed strategically to align customer load with times with solar or wind generation is plentiful.

Figure 1: Impact of Demand Flexibility on Residential Load Profile[5]



Q. How will investments in DER today help to keep grid costs low in the long term?

A. Proactive investments in DER that improve grid flexibility can mitigate the need for new infrastructure to meet peak loads or balance variable renewable energy generation, avoiding investments in resources that ultimately become stranded assets.[6] Improved grid flexibility can also avoid renewable energy resource curtailment, increasing the value of utility-scale renewable resources to all customers.

[5] Rocky Mountain Institute, (2018). "Demand Flexibility: the Key to Enabling a Low-cost, Low-carbon grid." Page 2. https://rmi.org/wp-content/uploads/2018/02/Insight_Brief_Demand_Flexibility_2018.pdf.
[6] Rocky Mountain Institute, (2018). "Demand Flexibility: the Key to Enabling a Low-cost, Low-carbon grid." Page 12. https://rmi.org/wp-content/uploads/2018/02/Insight_Brief_Demand_Flexibility_2018.pdf.

Q. Please describe the types of distributed energy technologies that are complementary to rooftop solar and their benefits.

A. Newer solar "smart inverters" are equipped with communication and control capabilities that allow the inverter to manage and maintain voltage on the distribution system in response to changes in grid conditions. Smart inverters are better suited to controlling voltage fluctuation than some traditional devices because they can control reactive power more quickly.[7] The new IEEE 1547 – 2018 standard requires smart inverters to have certain capabilities, including voltage control.[8] New solar installations with smart inverters can increase hosting capacity in order to accommodate more distributed solar, even without retrofitting existing legacy rooftop solar installations.[9]

Customer-sited battery storage can provide a variety of services to the grid, including demand response, energy arbitrage, frequency regulation, and voltage support services.[10] Rocky Mountain Power is demonstrating the demand response and load shaping potential of customer-sited batteries through the Soleil Lofts, a 600 apartment development in Herriman equipped with 5.2 megawatts of behind the meter solar and individual customer batteries.[11] Although the batteries are currently only operated for demand response purposes, they are also capable of exporting to the grid, which would allow them to be operated as a "virtual power plant" that can provide energy on demand.

[7] GridLAB, (2019). "Regulating Voltage: Recommendations for Smart Inverters." Page 5. http://gridlab.org/wp-content/uploads/2019/09/GridLab_Regulating-Voltage-report.pdf.
[8] Id.
[9] EPRI, (2017). "APS Solar Program: Research Highlights." Page 9. https://www.epri.com/#/pages/product/3002009779/?lang=en-US.
[10] Rocky Mountain Institute, (2015). "The Economics of Battery Storage." Page 6. https://rmi.org/insight/economics-battery-energy-storage/.
[11] Docket No. 16-035-36 – In the Matter of the Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Plan Act. PacifiCorp Application, March 8, 2019.

Currently, less than 0.5% of light-duty vehicles in Utah are electric,[12] but national forecasts show that electric vehicles could make up 7% of cars and light-duty trucks on the road by 2030.[13] Managed electric vehicle charging is a powerful tool to align electric vehicle energy needs with daytime hours when solar is available and avoid the need for steep ramping of power generation. Strategies to achieve this include the promotion of daytime workplace charging, active management or throttling of electric vehicle charging infrastructure during peak hours (especially higher-powered electric bus chargers), and co-location of electric vehicle charging and distributed solar.

Finally, controllable appliances can be leveraged to provide demand response. Some can even provide services similar to battery storage. For example, utilities are beginning to leverage the benefits of "grid interactive" water heaters that can respond to grid conditions to provide peak shaving and demand response services. By pre-heating during the day or at times when the marginal cost of energy is low, customer-sited water heaters can store energy for use later in the evening. Several pilot projects have demonstrated that water heaters can also provide frequency regulation services in response to signals from system operators.[14]

Q. Are DER technologies predicated on the installation of solar?

A. Some DER technologies are. Most customers are interested in purchasing battery storage to have emergency backup power in the event of a grid outage, so without a viable option to

[12] Auto Alliance, Utah State Facts. Compiled with data as of December 31, 2018. https://autoalliance.org/in-your-state/UT/.

[13] Edison Electric Institute, (2018). "Electric Vehicle Sales Forecast and the Charging Infrastructure Required through 2030." Page 1. https://www.edisonfoundation.net/iei/publications/Documents/IEI_EEI%20EV%20Forecast%20Report_Nov2018.pdf.

[14] Hledik, R., Chang, J., &Lueken, R. (2016). "The Hidden Battery: Opportunities in Electric Water Heating." The Brattle Group. Page 6. https://www.electric.coop/wp-content/uploads/2016/07/The-Hidden-Battery-01-25-2016.pdf.

install rooftop solar affordably, customers are unlikely to install battery storage in isolation. The adoption of smart inverters is also limited to rooftop solar customers.

Other DER technologies are not predicated on the installation of rooftop solar, but are adopted at higher rates by rooftop solar customers. Electric vehicle adoption is not isolated to rooftop solar customers, but electric vehicle drivers are more likely to also have solar compared to the average customer.[15] Rooftop solar customers may be more interested in adopting DER or enabling their demand response capabilities because they are interested in using their on-site solar generation to offset their electricity usage.

Co-location of all DER with rooftop solar, combined with controllability, can be used to maximize the benefits of both types of technologies and mitigate the impact of increasing electricity consumption resulting from adoption of new electric technologies. In this way, individual DER can be combined into portfolios that leverage the capabilities of each technology and work together to maximize their value both to the grid and the adopting customer.

Q. How will the Export Credit Rate impact the growth of portfolios of customer-sited DER?

A. A viable market for rooftop solar is important in order to realize the benefits of demand flexibility that come from portfolios of customer-sited DERs. The Export Credit Rate is the primary tool at the Commission's disposal to address the growth of DER as a whole. The Export Credit Rate is also a tool to strengthen customer engagement with the utility. Customers who receive a benefit from exporting energy to the grid are more likely to

[15] 32 – 38% of EV drivers in North American and Canada also have solar panels. *See* CleanTechnica, (2019). "EV Ownership + Rooftop Solar Ownership – New Report & Charts." https://cleantechnica.com/2019/12/25/ev-ownership-rooftop-solar-ownership-new-report-charts/.

respond to price signals that encourage smart and efficient energy use, and therefore more likely to participate in other utility programs. A more engaged customer base is an asset to the utility and ratepayers as we transition to the flexible and responsive grid of the future. Although the future benefits of DER may not be immediately quantifiable in this proceeding, the benefits of improved grid flexibility resulting from private investments in DER should be a consideration in the determination of the Export Credit Rate. Although I do not have a specific recommendation for the value of the Export Credit Rate at this point, in Section IV, I provide recommendations for the design of the Export Credit Rate.

III. ROOFTOP SOLAR UPTAKE UNDER THE TRANSITION PROGRAM

Q. What is the Transition Program?

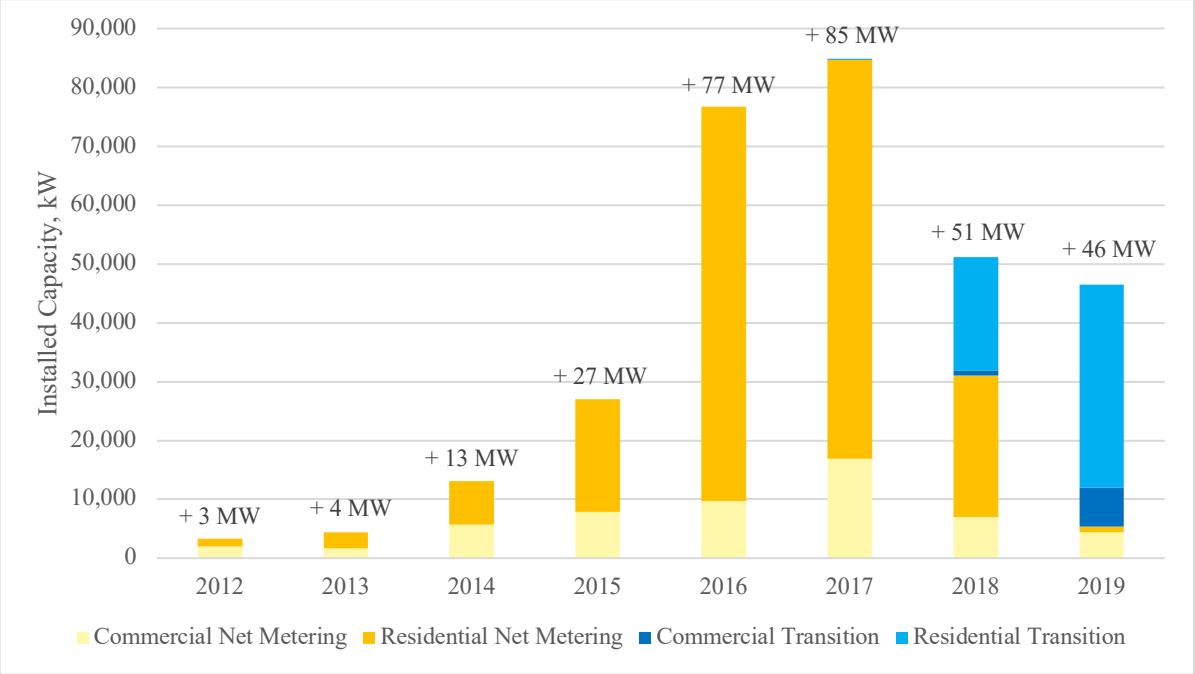
A. The Transition Program was created to resolve Docket No. 14-035-114, Investigation of the Costs and Benefits of PacifiCorp's Net Metering Program. The Commission's September 29, 2017 order in this docket ended the Net Metering Program and created the Transition Program, which replaced net metering bill credits with a bill credit for kilowatt-hours exported to the grid.

Q. Has solar growth slowed under the transition program?

Yes, the growth of rooftop solar has slowed dramatically under the Transition Program, as illustrated in Figure 2 below. While the total amount of interconnected rooftop solar capacity grew by 104% in 2015 and 146% in 2016, capacity only grew by 65% in 2017, 24% in 2018, and just 15% in 2019.[16]

[16] As reported in VoteSolar Data Request 9.8.

Figure 2: Rooftop Solar Capacity Annual Growth in Utah, 2012 - 2019[17]



Q. Are there other factors that will influence rooftop solar adoption going forward?

A. Yes, the State and Federal Tax Credits for rooftop solar are both scheduled to step down in the next few years. The Federal Investment Tax Credit, initially set at 30%, has already stepped down to 26% in 2020 and will phase out in 2022. The Utah Residential Renewable Energy Systems Tax Credit has already stepped down from $2,000 to $1,600 and will continue to step down in value until its expiration in 2024. The phase-out of these tax credits will increase the cost of installing solar for many Utahns.

Q. How does solar generation compare to annual retail sales in RMP's service territory in Utah?

A. Rooftop solar generation, as a percentage of retail sales, is low and is likely to remain that way. Compared to PacifiCorp's reported 2018 annual retail sales in Utah of 24.5 million

[17] As reported in VoteSolar Data Request 9.8.

megawatt-hours,[18] rooftop solar generation equals approximately 1.9% of annual retail sales.[19] Assuming that approximately half of customer solar generation is used onsite, rooftop solar generation exported to the grid equals roughly 0.8% of annual retail sales.

IV. RECOMMENDATIONS FOR THE EXPORT CREDIT RATE

Q. Does Utah Clean Energy have a proposal for the Export Credit Rate?

A. No, we do not propose a specific rate at this time. I plan to review other parties' testimony and provide a response to their proposals. We do recommend that the following principles are considered in the design of the Export Credit Rate:

- The Export Credit Rate should be just and reasonable and in the best interest of the well-being of Utah
- The Export Credit Rate should be simple and comprehensible to customers
- If the new Export Credit Rate is lower than the current Transition Program credit, I recommend that gradualism be employed
- Customers who install solar should be locked into the Export Credit Rate that is current at the time of their interconnection application for 20 years

Q. What types of considerations may the Commission include when determining a "just and reasonable" rate?

A. Utah Code Title 54 Chapter 3 Section 1 specifies that "All rules and regulations made by a public utility affecting or pertaining to its charges or service to the public shall be just and

[18] PacifiCorp FERC Form 1, 2018/Q4. Page 304.1.
[19] Vote Solar Data Request 9.8 reports 312,662 MW of rooftop solar. Total solar output is estimated assuming 1,493 MWh/MW/year, based on PV Watts forecasts for a south facing system in Salt Lake City. This estimate does not account for degradation in systems over time.

reasonable."[20] Title 54 Chapter 3 Section 1 further states that "the scope of definition "just and reasonable" may include, but shall not be limited to," the following factors:

- the cost of providing service to each category of customer
- economic impact of charges on each category of customer, and on the well-being of the state of Utah
- methods of reducing wide periodic variations in demand of such products, commodities or services
- and means of encouraging conservation of resources and energy. [21]

Q. How should these factors be considered when determining the Export Credit Rate?

A. The Commission's determination of a just and reasonable Export Credit Rate should reflect consideration of each of these factors. The Export Credit Rate should be informed by an assessment of the value of the costs and benefits associated with exported generation, including consideration of the future benefits associated with private investments in DER that improve grid flexibility. The Export Credit Rate should also reflect consideration of the economic impact of the Export Credit as a rate making tool, and its impact on the market for rooftop solar in Utah, and the well-being of the state as a whole. This consideration should include climate impacts that affect health and well-being in Utah. It should also include consideration of the value of jobs and economic development resulting from rooftop solar, which, as shown above, is clearly affected when the value of exported solar generation changes.

Q. What other economic impacts will the Export Credit Rate have on the economic well-being of Utah?

A. Increasingly, companies are setting their own corporate renewable energy goals and are interested in locating in states that provide opportunities to meet those goals. As of 2017,

[20] Utah Code Ann. § 54-3-1.
[21] *Id.*

63% of Fortune 100 companies have set goals to increase their clean energy and/or energy efficiency efforts, and 48% of Fortune 500 companies have clean energy and/or greenhouse gas emission reduction targets.[22] Although many commercial entities do not have sufficient space on their roof to fully offset their energy consumption with solar, rooftop solar is an important step, demonstrating a commitment to their goals in a way that is highly visible to the community and their employees. With abundant solar resources and a business-friendly environment, Utah is an obvious choice for companies who are concerned about meeting corporate clean energy goals. An Export Credit Rate that supports a market for rooftop solar sends a signal that Utah welcomes these companies and their investment in the state.

Q. Why should the Export Credit Rate be simple and comprehensible to customers?

A. Simplicity and comprehensibility to customers are two of the fundamental criteria of a sound rate structure enumerated in James Bonbright's "Principles of Public Utility Rates, Second Edition." According to Bonbright, rate design should consider "the related, practical attributes of simplicity, certainty, convenience of payment, economy in collection, understandability, public acceptability, and feasibility of application."[23] Put simply, rates should be easy to implement, and customers should be able to understand the charges and credits on their bill. Customers will use the Export Credit Rate to decide whether or not to install rooftop solar based on their anticipated utility bill savings. Customers may also make decisions about specific characteristics of their system (for example, the system size

[22] World Wildlife Fund, (2017). "Power Forward 3.0: How the largest SU companies are capturing business value while addressing climate change." Page 12. http://assets.worldwildlife.org/publications/1049/files/original/Power_Forward_3.0_-_April_2017_-_Digital_Second_Final.pdf?1493325339&_ga=1.78441875.660951573.1493325843.

[23] Bonbright, J. C., Danielsen, A. L., & Kamerschen, D. R. (1988). "Principles of Public Utility Rates," Second Edition. Page 384.

or aspect the system is facing) based on rate design, or make decisions about how and when to use energy based on the design of the Export Credit Rate.

Q. Why do you propose that the Export Credit Rate is not netted more frequently than hourly?

A. A simple, comprehensible Export Credit Rate should allow customers to calculate their estimated savings with rooftop solar and understand how their energy use and exports relate to the credits and charges on their bill. Monthly netting, as is the case with net metering, is the simplest for customers to understand and evaluate. As the netting interval increases, so does the complexity for customers. Hourly netting is more difficult for customers to evaluate than monthly netting, but still aligns with the time increments used in other customer rates. For example, Time of Use rates include on-peak and off-peak periods based on hours of the day. Netting of energy use and exports over a period of less than an hour is complicated and difficult for customers to understand and does not allow customers to reasonably estimate the impact of rooftop solar on their utility bill.

Q. What is the principle of gradualism, and why is it important for the design and implementation of the Export Credit Rate?

A. Gradualism, or rate stability, is a rate making principle employed to avoid sudden changes to rates that can have adverse impacts. Gradualism is also identified in Bonbright's list of fundamental criteria of rate structures. Specifically, rate design should consider "Stability and predictability of the rates themselves."[24] This principle protects customers from

[24] Bonbright, J. C., Danielsen, A. L., & Kamerschen, D. R. (1988). "Principles of Public Utility Rates," Second Edition. Page 384.

unanticipated or unpredictable changes to their utility bills, and protects economic stakeholders that rely on the stability of electricity rates.

Q. How do you propose that the principle of gradualism or rate stability is manifest in the Export Credit Rate?

A. First, if the Commission approves a value for the Export Credit Rate that is lower than the Transition Program rate, I propose that the Export Credit Rate steps down gradually over time. Second, I propose that individual customers who receive the Export Credit Rate are locked into the rate that is effective on the date of their interconnection for 20 years.

Q. Why is a gradual transition to the Export Credit Rate in the best interest of customers and the well-being of Utah?

A. A gradual transition is important for two reasons. First, as I have shown, the Transition Program has already significantly impacted adoption rates for rooftop solar. A dramatic reduction in the Export Credit Rate has the potential to bring Utah's rooftop solar market to a standstill. As discussed previously, rooftop solar is one of a suite of DER that can work together to provide benefits to the grid and ratepayers. An Export Credit Rate that brings the rooftop solar market to a halt will prevent Utah ratepayers from reaping the benefits associated with private investments in DER.

Second, a sudden transition to a lower Export Credit Rate will have adverse economic impacts. Solar companies make business decisions based on rate design applicable to solar customers as set by the Commission. Companies have already made decisions about hiring, inventory, and even whether or not to locate in Utah based on a projection of Utah's solar market. Although solar companies could have known that changes may be coming to rates for solar customers for some time, they cannot anticipate

how those rates will affect their business or business practices until the rate is known. A gradual transition to the new Export Credit Rates will ensure that solar companies have sufficient time to update their marketing materials and provide training to employees to reflect the new Export Credit Rates. This will allow solar companies to provide clear and accurate information to customers, who can then make reasoned decisions about whether or not to purchase solar. Immediately implementing a lower Export Credit would impose adverse consequences on Utah customers looking to adopt rooftop solar, as well as on Utah's solar market. It is in the best interest of Utah customers to implement the Export Credit Rate gradually in order to maintain stability in Utah's solar market and ensure that the transition to the Export Credit Rate is orderly and understandable to potential customers.

Q. Why is it reasonable that individual customers who receive the Export Credit Rate are locked into the rate that is effective on the date of their interconnection for 20 years?

A. In order to evaluate the financial feasibility of rooftop solar, customers must have certainty about the period of time over which they will receive a given rate. As an extreme example, if a customer knows that they will receive an Export Credit Rate value equal to 80% of their average retail rate for one year, it is impossible for that customer to realistically estimate the long-term savings from installing their system. Rooftop solar customers do not expect to accrue enough utility bill savings to offset the upfront cost of their solar in the first year, or even the first five years. Most solar panels have a warranty for 25 or more years, and so customers evaluate how solar will affect their utility bills over the anticipated lifetime of their system. Allowing customers to lock in the value of the Export Credit Rate

that is current on the date of their interconnection is essential to provide customers with enough certainty to evaluate the long-term financial impacts of installing solar.

V. CONCLUSION

Q. Please summarize your conclusions.

A. Rooftop solar is one of a collection of Distributed Energy Resources that can provide a variety of services both to the adopting customer and to the grid. The Export Credit Rate will impact the market for rooftop solar and other DER, and whether Utah ratepayers ultimately realize the benefits of private investments that improve grid flexibility. In light of the role rooftop solar plays to advance the paradigm of a more flexible and responsive grid, I provide recommendations for a just and reasonable rate design for the Export Credit Rate. Specifically, I urge the Commission to:

- Consider the potential for DER to improve grid flexibility and recognize that the Export Credit Rate is a key factor that will determine whether ratepayers ultimately reap the benefits of DER.
- Develop an Export Credit Rate that is just and reasonable and in the best interest of the well-being of Utah, including consideration of climate and health impacts and the value of jobs and economic development resulting from the growth of rooftop solar.
- Determine that the Export Credit Rate should not be netted more frequently than hourly in order to ensure that it is simple and comprehensible to customers.
- Incorporate gradualism into the implementation of the Export Credit Rate.
- Allow customers who install solar to lock-in the value of the Export Credit Rate current at the time of their interconnection application for 20 years.

368 **Q. Does that conclude your testimony?**

369 A. Yes.