2019 SENATE INDUSTRY, BUSINESS AND LABOR COMMITTEE

SB 2322

2019 SENATE STANDING COMMITTEE MINUTES

Industry, Business and Labor Committee
Roosevelt Park Room, State Capitol

SB 2322
2/5/2019
Job #32167

☐ Subcommittee
☐ Conference Committee

Committee Clerk: Amy Crane

Explanation or reason for introduction of bill/resolution:

Relating to net metering of electricity.

Minutes: Att. #1-11

Chairman Klein: Opened the hearing on SB 2322. A quorum was present.

Senator Piepkorn, District 44: testified in support of the bill. Introduced the bill: net metering allows people to generate their own electricity from mainly solar but other sources as well and feed the electricity they do not use back onto the grid. See attachment #1 for proposed amendments to the bill.

Ed Gruchalla, Citizens Climate Lobby: See attachment #2 for testimony in support of the bill.

(11:50)Chairman Klein: You're asking the companies to reimburse you, or let you be part of that program. Wouldn't we have to say that with wind and solar power that already we're moving that direction and we're doing it carefully, making sure the baseloads are still covered? I'm trying to figure out how that is determined in this bill.

Ed: From our perspective, Senator Kreun and I both live in border communities. Minnesota is going crazy with solar power, in North Dakota there is none. We can fix this, we looked at a lot of different areas and picked Utah's bill which this pretty much copies. Something the utilities bought into and their state is pretty conservative like ours but they felt that 25% was a good trade off. We're looking for equal footing because if you go to a utility in western North Dakota or northern North Dakota they'll give you a different price, depending where you go you'll get different prices. The industry doesn't take it up cause there's no sure footing.

Senator Kreun: The 25% we were just talking about, you came up with that out of the Utah bill, would that be because of their infrastructure needs? Does it have a direct effect on what the cost is? Why are the prices different?

Ed: I don't have an answer for you. It just varies a lot.

Dr. Dexter Perkins, Professor of Geology, UND: See attachment #3 for testimony in support of the bill.

(24:15)Senator Piepkorn: Who is your electric provider and what is your deal with them?

Dexter: It's NoDak, I didn't write down the exact numbers but approximately we pay 10 cents per kilowatt hour for electricity, we get slightly less than half of that for whatever we ship to them so it's not a good deal.

Senator Piepkorn: You talk about the irrefutable evidence from the scientific community, in America what is your understanding of the public's understanding or reception to those conclusions of climate change?

Dexter: I haven't see North Dakota surveys but of the national ones I've seen, about half of the people in the country, maybe more, who are not certain that this is a big problem or that it is caused by people. For instance, in class the first thing we do is survey my students about climate change and it's like 50/50. The hardest thing about it is how complicated it is, because the complication leads people to be reluctant to want to focus on it or pay attention to it. As a scientist I am frustrated because scientists are like 98% in the opinion that climate change has been effecting the world for the last 20 years, at least.

Senator Burckhard: Question of the day for me, say 1 million years ago, North Dakota was under a huge glacier. What melted that, there wasn't carbon dioxide from cars and whatever, so what melted that?

Dexter: The last major period of glaciation ended about 10,000 years ago. And the reason it ended was because, primarily, of variations in earth's orbits. Something called the Lankovich cycles, so that we were getting more solar radiation hitting our planet and it ended the ice age. And if you go back historically through geologic time, there have been many ice ages and they all relate almost 100%, to changes in Earth's orbit.

Paul Jensen, Citizens Local Energy Action Network: See attachment #4 for testimony in support of the bill.

Senator Kreun: As we are blessed with all of these energy sources, and to some degree we've been pretty proactive, North Dakota is the cleanest air in the US. We're getting the idea that we're the bad people in the market, but really we're the good guys. Not saying that we shouldn't go further. The other question is what happened to China? They were putting up new coal plants every month. It does work both ways. They're the bad guys and we're gonna charge them as well. We are ahead of some of these countries. Just to keep that in mind. We want to be on a fair level playing field all the way through.

Paul: When you look at per capita emissions, yes we are sinners. We really are. China is also a sinner but they are also making efforts to change that. And that's what the Paris accords was all about. To try to get on common footing where we agree on what to do. But when we say no we don't want to be part of this then we're left alone and everybody else must make a decision for us. We have been blessed with a strong economy and when I grew up, I looked at the US as the engine of the world but that engine has deteriorated because

we're not embracing new technologies. We're not trying to create new markets for ourselves, by stubbornly staying back at what we had, we're losing opportunities for the futures.

Chairman Klein: We're talking now about net metering, we have to determine if this bill before us is gonna be good for North Dakota and if we can compromise and work together with the utilities to do something for North Dakota. I understand the climate issue but I've got to stay focused.

Paul: And I thought that was the intention of our presentation today, we want to collaborate and make it possible for North Dakotans to participate in this, and that's the idea, create opportunity for ourselves.

Mike Williams, Fargo, Former President of North Dakota Alliance for Renewable Energy: testified in support of the bill. I'm gonna take a different perspective. That was a collaboration between people, farmers, businesses, banks, utilities, to do all of the above, strategy that North Dakota embraced. We have resources and when we mix them, they gain value so really we're looking at how can we add value. North Dakota has done a good job this is building on good work from many. The idea is, we always hear about diversifying our portfolio, so whether it's an investment, and our energy portfolio. So Senator Hoeven has led with empower group, a lot of those members, in fact all of them were in the renewable energy alliance, so that is all above us. This is also about opportunity, demand, and economic development. From Fargo, one of our biggest issues is workforce, how do we recruit and retain talented people, what we're finding is, there's demand for integrating renewable energy in how we move around on a daily basis. In 2006 one of the ways we got the renewable energy council, was we had UND do a survey, what did North Dakotans think about renewable energy, is it important to them? 93% of people came back and said yes, because we have resources we want to use right here. We're an energy powerhouse, we produce 36,000 million kilowatt hours a year of electricity, we export more than half of that. Think about the economic development as we transition into new energy age, we can help optimize the grid. We can help coal by helping shave the peaks. So there's no single antidote, it's an idea about how do we combine resources that we have that give people the best opportunity to thrive and succeed, whether they're a farmer, a homeowner, or a business. The value of electricity converting more electricity for fuel since we're such a powerhouse. No other state is going to be able to beat us. We can do huge economic development by leveraging our electric resources and helping to transition into some of these new technologies. Not abandoning coal, it's really helping optimize it. Finding that they really work best together using technology.

Zac Smith, North Dakota Association of Rural Electric Cooperatives: See attachment #5 for testimony in opposition.

50:13 Senator Piepkorn: In your last paragraph, how many or if any of your cooperatives do allow net metering at the current time?

Zac: Over half allowed net billing of some kind.

Chairman Klein: So what I'm hearing is local coops have already made those decisions without a legislative mandate which would come to us. And that should we decide to pass

this, all of a sudden the public service commission is dabbling in your business which they haven't ever had to do?

Zac: Correct, and you'll hear from Carlee that they obviously set the rates for the investor and utilities and they have a great deal of experience doing that. What I'm saying in terms of, and it's not a matter of expertise but in terms of workload, they'd be having 16 new companies dealing with rate making, which they previously have had no hand in doing the rate making for.

Chairman Klein: Well that's been the slippery slope getting the public service commission involved in rural electric coops and trying to keep that division. I want to be clear that you already as individual organizations can provide that opportunity for those particular residents.

Zac: Correct, whether its them working with their locally elected board member or director, they have opportunities there. There is the annual meeting where they have the opportunity to bring forth proposals and bring forth their concerns or working with the local management staff at their cooperative.

Senator Piepkorn: Regardless of the arrangement between the individual who has their own electric generation plant at home and the coop, don't you think, regardless of the terms, don't you think there would be advantages of having a standard agreement throughout the system rather than a checker board thing?

Zac: I don't think that a standard agreement decided at the state or the public service commission, I don't think a one size fits all approach necessarily would work in this concept as there are different rates, different considerations, each distribution system is going to be a little bit different.

Senator Piepkorn: This could be a decision made by your organization, rather that the state or something like that.

Zac: I'm just talking about the mechanics of what's in this bill. I guess maybe that is a concept to consider.

Senator Burckhard: People that generate their own electricity are still on the grid for needing your electricity as well right?

Zac: Correct.

Chairman Klein: Especially on a day like today, we certainly are confident that base load is there to meets the needs of all citizens throughout the state.

Zac: Having the grid in place and being hooked up to the grid is obviously a benefit to the consumer.

Paul Matthys, Vice President of Member and Energy Services, Cass County Electric Cooperative Inc.: See attachment #6 for testimony in opposition to the bill.

Senator Roers: What is your average kilowatt per hour charged to the customer and if someone were to do solar, what would you credit them back?

Paul: I did not read the 25% in the bill. Our average retail rate is 10.8 cents per kilowatt hour, if somebody has a net billing installation with Cass County Electric and they overproduce, we'll buy that back at the avoided price which is 2.8 cents per kilowatt hour. The avoided cost means the cost of fuel at the power plant. So there's still all the infrastructure there, the poles the transmitter, the wires, all the overhead costs that go into bring electricity from the plant to the light switch. In a met metering situation, they would be able to get the retail rate. We ultimately could pay them 10.8 cents.

Senator Roers: No I don't understand. If they are buying electricity from us, the cost is 10.8 to pay our power bill cover our cost, if they are overproducing we would buy that back at 2.8%. That's a 70% discount?

Paul: If they're buying electricity from Cass County Electric, the average retail rate is about 10.8 cents a kilowatt hour. That's what our cost of service study and this is on the residential side, that's what it takes to get the revenues we need, the margins we need to pay our power bill and cover our distribution costs. Now if they had a solar situation, and they were overproducing for what they need and they were producing back onto the line. We would purchase that energy back at the avoided cost which was 2.8 cents a kilowatt hour. Cause that's the cost of fuel. So they're actually producing the energy that's there cost of fuel.

Chairman Klein: How do you control that power coming back in? Does a lineman know that?

Paul: One of two ways, either a two meter set up, a one meter that has a reverse power flow technology so we have an advanced metering system that we can detect any kind of reverse power flow onto our system. If we have an interconnection agreement that members need to sign that has all the interconnections safety policies. The reverse power relays so that if they're producing power its going back on to the line, it's a safety issue for our lineman but we require relays in place to protect them.

Senator Kreun: Is hydro still considered a nonrenewable energy?

Paul: In the state of North Dakota, not nationally. We are 8% hydro so that varies state by state.

Chairman Klein: When I hear the comments that our technology is lagging?

Paul: We are leaders in technology. With our advanced metering infrastructure, we have two way capabilities with our meter. We have the first community solar ray in the state of North Dakota from a community solar aspect. We have 34% of our capacity is from wind, which is just about leading in the nation. We have the cleanest air. We believe in the all above strategy and we do offer programs for our members if they want to put onsite generation, we do offer that program.

(1:04:00)Tom Raferty, member services and communications manager, Verendrye Electric Coop: testified in opposition to the bill. See attachment #7 for testimony in opposition to the bill.

(1:09:23)Senator Piepkorn: When dealing with federal contracts like the Minot Air force base, do they have certain requirements, do they require a certain amount of what you're providing to come from renewables or any other standards?

Tom: They do have an allocation from the WAPA, Western Area Power Administration, so they get an allocation from the government for hydropower, which is the cheapest power basically on the market.

Carlee McLeod, President, Utility Shareholders of North Dakota: See attachment #8 for testimony in opposition to the bill.

(1:13:00)Brian Kroshus, Commissioner, Public Service Commission: see attachment #9 for neutral testimony.

(1:18:00)Chairman Klein: What I'm hearing is that in order for this to move forward, the language would need to be more specific?

Brian: Correct.

Bruce Bale, Mandan Resident: See attachment #10 for testimony in support of the bill.

1:33:44Chairman Klein: closed the hearing on SB 2322.

See attachment #11 for additional testimony submitted to the committee.

2019 SENATE STANDING COMMITTEE MINUTES

Industry, Business and Labor Committee
Roosevelt Park Room, State Capitol

SB 2322
2/6/2019
Job #32281

☐ Subcommittee
☐ Conference Committee

Committee Clerk: Amy Crane

Explanation or reason for introduction of bill/resolution:

Relating to net metering of electricity.

Minutes: Att. #1

Chairman Klein: Opened the committee work session on SB 2322.

Chairman Klein: Trying to bring it all back together. We'd be better off if we produced more solar power, Senator Piepkorn presented a marked up version of the bill.

Senator Piepkorn: went over changes to the bill made by the proposed amendments see attachment #1.

Senator Piepkorn: Moved to approve the amendment.

Senator Kreun: Seconded

A Roll Call Vote Was Taken: 6 yeas, 0 nays, 0 absent.

Motion Carried.

Chairman Klein: We heard from the industry who had concerns. Do these amendments address, how do they address those concerns provided by the rural electric coops and some of the other investor owned utilities.

Senator Piepkorn: I don't know that they do. I think the industry still has the same concerns and there was the possibility, I know Senator Kreun might have thoughts on this as to replacing this bill, hog housing so to speak, with an interim study. Because I think we agreed that up to a point it was a good discussion for a lot of us, learning about the global warming stuff aside or included, learning about net metering and how it works and we had good credible testimony and one guy has an outfit going up in Grand Forks. To perhaps learn more about it in the interim and see what there is to it and if there is something the companies and the proponents of it could find acceptable because I think this is something that is coming along and more people are going to be interested in it and doing it.

Chairman Klein: We had a bill similar to this three sessions ago, a gentleman in Steele had a wind turbine and he was interested in putting the energy back into the grid but it does raise a lot of concerns and issues. And once again they are providing everyone, irrespective whether they have enough resources to do this to their homes because I sense the repressiveness of what this could do. But maybe a study is worth a discussion.

Senator Kreun: Just a comment on a short conversation, it appeared to me that we really don't have a guidance of how this should take place throughout the state if necessary. That was one of the issues, is it necessary first off. But Nodak which did the most in-depth research, analyzed all of the components that it takes to put into a net metering project and they did that just a few years ago. And my suggestion would be if in fact we think we need to have a study to gather more information, theirs would be the framework to look at on how to go about setting a guideline for net metering. There is no real guideline because each company is gonna be different, the costs are different, the infrastructure is different, the number of people that they have that would potentially be able to do that is different. They took all that into consideration if in fact we need to come up with some guidelines or whatever. But it's not imperative.

Chairman Klein: What I heard is each individual especially as it related to the rural electric coops, they have a plan and a board. They're the ones that call the shots they're the ones that can share amongst themselves, that helps provide that information amongst them.

Senator Burckhard: My notes would suggest that this bill is an intrusion to local governance, that the proposal isn't fair and that the bill is unnecessary.

Senator Piepkorn: So perhaps then a study would not be necessary?

Chairman Klein: I don't want to press any one for a vote but if you want to wait we could.

Senator Burckhard: Moved Do Not Pass As Amended.

Senator Roers: Seconded.

Chairman Klein: Any discussion.

Senator Piepkorn: I would've thought that perhaps a study to get a more in depth look at it. I see there are some details in there that the RECs would have a concern about but I think it's something that we could all use more information and education on and that it will be a growing issue as we move into the future.

Chairman Klein: You make a good point but I still believe that Dr. Perkins is sitting in a great spot cause he's getting a better deal than what we're proposing in the legislation. And he has worked with his local provider and I think that's the message we got and the one that's out there. Work with your local provider and I'll bet you can work some things out that are reasonable.

Senator Piepkorn: The RECs made some good points that to set up this system you have to be fairly well off anyways, so that's an issue and fees for what are you gonna be credited

for at the end of the month. And infrastructure and who's really responsible for that and one of the proponents mentioned I created it in the day and I can use it at night, well there's some discrepancy on that and what kind of storage system you have. So I mean they made some good and valid arguments.

A Roll Call Vote Was Taken: 5 yeas, 1 nays, 0 absent.

Motion Carried.

Senator Burckhard will carry the bill.

19.1110.01001
Title.02000

Prepared by the Legislative Council staff for
Senator Piepkorn
January 30, 2019

PROPOSED AMENDMENTS TO SENATE BILL NO. 2322

Page 1, line 16, after "Exceeds" insert "or offsets"

Page 2, line 1, replace "adjacent to, the premises of" with "within"

Page 2, line 2, replace "customer" with "service territory"

Page 2, line 2, replace "the electric company's" with "its"

Page 2, line 5, remove "of"

Page 4, replace lines 16 and 17 with "described in"

Page 4, line 30, replace "commission approves the requirement for" with "electric company requires"

Page 4, line 31, replace "commission" with "electric company"

Page 5, line 3, replace "interconnection" with "interconnecting"

Page 5, line 4, replace "before" with "and disclose the necessary control equipment needed to interconnect which may not additionally burden the customer"

Page 5, line 11, after "practices" insert "and credit the customer-generated electricity with a value per kilowatt hour no less than seventy-five percent of what the electric company would otherwise have charged per kilowatt hour for electricity supply"

Page 5, line 12, replace "Subject to subsection 4, if" with "If"

Page 5, line 13, remove the underscored colon

Page 5, line 14, replace "a. (1) The" with ", the"

Page 5, line 16, remove "at least avoided cost, or as determined by the"

Page 5, remove lines 17 through 26

Page 5, line 27, replace "b. For another use as determined by the commission" with "no less than seventy-five percent of the regular retail price that would otherwise have been charged per kilowatt hour"

Page 7, remove lines 7 through 12

Renumber accordingly

Date: 2/6
Roll Call Vote #: 1

2019 SENATE STANDING COMMITTEE
ROLL CALL VOTES
BILL/RESOLUTION NO. 2322

Senate Industry, Business and Labor Committee

☐ Subcommittee

Amendment LC# or Description: 19.1110.01001

Recommendation: ☒ Adopt Amendment
☐ Do Pass ☐ Do Not Pass ☐ Without Committee Recommendation
☐ As Amended ☐ Rerefer to Appropriations
☐ Place on Consent Calendar

Other Actions: ☐ Reconsider ☐ _____

Motion Made By Piepkorn Seconded By Kreun

Senators	Yes	No	Senators	Yes	No
Chairman Klein	X		Senator Piepkorn	X	
Vice Chairman Vedaa	X				
Senator Burckhard	X				
Senator Kreun	X				
Senator Roers	X				

Total (Yes) 6 No 0

Absent 0

Floor Assignment _____

If the vote is on an amendment, briefly indicate intent:

Date: 2/6
Roll Call Vote #: 2

2019 SENATE STANDING COMMITTEE
ROLL CALL VOTES
BILL/RESOLUTION NO. 2322

Senate Industry, Business and Labor Committee

☐ Subcommittee

Amendment LC# or Description: _____

Recommendation: ☐ Adopt Amendment
☐ Do Pass ☒ Do Not Pass ☐ Without Committee Recommendation
☒ As Amended ☐ Rerefer to Appropriations
☐ Place on Consent Calendar

Other Actions: ☐ Reconsider ☐ _____

Motion Made By Burckhard Seconded By Roers

Senators	Yes	No	Senators	Yes	No
Chairman Klein	X		Senator Piepkorn		X
Vice Chairman Vedaa	X				
Senator Burckhard	X				
Senator Kreun	X				
Senator Roers	X				

Total (Yes) 5 No 1

Absent 0

Floor Assignment Burckhard

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE

SB 2322: Industry, Business and Labor Committee (Sen. Klein, Chairman) recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO NOT PASS** (5 YEAS, 1 NAYS, 0 ABSENT AND NOT VOTING). SB 2322 was placed on the Sixth order on the calendar.

Page 1, line 16, after "Exceeds" insert "or offsets"

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Page 2, line 2, replace "customer" with "service territory"

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Page 7, remove lines 7 through 12

Renumber accordingly

2019 TESTIMONY

SB 2322

SB2322 2/5/19 Att#1

Sixty-sixth
Legislative Assembly
of North Dakota

SENATE BILL NO. 2322

Introduced by

Senators Piepkorn, Grabinger, Mathern

Representatives Adams, Hager, Schneider

A BILL for an Act to create and enact chapter 49-20.1 of the North Dakota Century Code, relating to net metering of electricity.

BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:

SECTION 1. Chapter 49-20.1 of the North Dakota Century Code is created and enacted as follows:

49-20.1-01. Definitions.

As used in this chapter:

1. "Annualized billing period" means:
   a. A twelve-month billing cycle beginning on April first of one year and ending on March thirty-first of the following year; or
   b. An additional twelve-month billing cycle as defined by an electric company's net metering tariff or rate schedule.
2. "Customer-generated electricity" means electricity that:
   a. Is generated by a customer generation system for a customer participating in a net metering program;
   b. Exceeds or offsets the electricity the customer needs for the customer's own use; and
   c. Is supplied to the electric company administering the net metering program.
3. "Customer generation system":
   a. Means an eligible facility used to supply energy to or for a specific customer that:
      (1) Has a generating capacity of:
         (a) Not more than twenty-five kilowatts for a residential facility; or
         (b) Not more than two megawatts for a nonresidential facility, unless the commission approves a greater generation capacity;

(2) Is located on, or ~~adjacent to, the premises of~~within the electric company's ~~customer~~service territory, subject to ~~the electric company's~~its service requirements;

(3) Operates in parallel and is interconnected with the electric company's distribution facilities;

(4) Is intended primarily to offset part or all ~~of~~ the customer's requirements for electricity; and

(5) Is controlled by an inverter; and

b. Includes an electric generator and its accompanying equipment package.

4. "Eligible facility" means a facility that uses energy derived from one of the following to generate electricity:

a. Solar photovoltaic and solar thermal energy;

b. Wind energy;

c. Hydrogen;

d. Organic waste;

e. Hydroelectric energy;

f. Waste gas and waste heat capture or recovery;

g. Biomass and biomass byproducts, except for the combustion of:

(1) Wood that has been treated with chemical preservatives such as creosote, pentachlorophenol, or chromated copper arsenate; or

(2) Municipal waste in a solid form;

h. Forest or rangeland woody debris from harvesting or thinning conducted to improve forest or rangeland ecological health and to reduce wildfire risk;

i. Agricultural residues;

j. Dedicated energy crops;

k. Landfill gas or biogas produced from organic matter, wastewater, anaerobic digesters, or municipal solid waste; or

l. Geothermal energy.

5. "Equipment package" means a group of components connecting an electric generator to an electric distribution system, including all interface equipment and the interface equipment's controls, switchgear, inverter, and other interface devices.

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6. "Excess customer-generated electricity" means the amount of customer-generated electricity in excess of the customer's consumption from the customer generation system during a monthly billing period, as measured at the electric company's meter.

7. "Fuel cell" means a device in which the energy of a reaction between a fuel and an oxidant is converted directly and continuously into electrical energy.

8. "Inverter" means a device that:

   a. Converts direct current power into alternating current power that is compatible with power generated by an electric company; and

   b. Has been designed, tested, and certified to underwriters' laboratories standard 1741 and installed and operated in accordance with institute of electrical and electronics engineers standard 1547.

9. "Net electricity" means the difference, as measured at the meter owned by the electric company between:

   a. The amount of electricity an electric company supplies to a customer participating in a net metering program; and

   b. The amount of customer-generated electricity delivered to the electric company.

10. "Net metering" means measuring the amount of net electricity for the applicable billing period.

11. "Net metering program" means a program administered by an electric company whereby a customer with a customer generation system may:

   a. Generate electricity primarily for the customer's own use;

   b. Supply customer-generated electricity to the electric company; and

   c. If net metering results in excess customer-generated electricity during a billing period, receive a credit as provided in section 49-20.1-03.

12. "Switchgear" means the combination of electrical disconnects, fuses, or circuit breakers:

   a. Used to isolate electrical equipment and de-energize equipment to allow work to be performed or faults downstream to be cleared; and

   b. Designed, tested, and certified to underwriters' laboratories standard 1741, and installed and operated in accordance with institute of electrical and electronics engineers standard 1547.

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49-20.1-02. Net metering program - Metering equipment - Interconnection agreement.

1. Each electric company shall:
   a. Except as provided in subsection 2, make a net metering program available to the electric company's customers; and
   b. Allow customer generation systems to be interconnected to the electric company's facilities using, except as provided in subsection 4, a kilowatt-hour meter capable of net metering.
2. An electric company may discontinue making a net metering program available to customers not already participating in the program if:
   a. The cumulative generating capacity of customer generation systems in the program equals at least one tenth of one percent of the electric company's peak demand during the previous year; or
   b. The electric company serves fewer than one thousand customers in the state.
3. a. Notwithstanding subdivision a of subsection 2, the commission may establish a higher amount of generating capacity from customer generation systems than ~~one-tenth of one percent of the electric company's peak demand during the previous year before a net metering program may be discontinued under~~described in subsection 2.
   b. Before acting under subdivision a, the commission shall provide public notice of its proposed action and an opportunity for public comment.
4. a. Notwithstanding subdivision b of subsection 1, an electric company may require a customer participating in the electric company's net metering program to use metering equipment other than a standard kilowatt-hour meter if the commission, after appropriate notice and opportunity for public comment:
      (1) Determines the use of other metering equipment is necessary and appropriate to monitor the flow of electricity from and to the electric company; and
      (2) Approves the requirement for other metering equipment, after considering the benefits and costs associated with the other metering equipment.
   b. If the ~~commission approves the requirement for~~electric company requires other metering equipment under subdivision a, the ~~commission~~electric company shall

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determine how the cost of purchasing and installing the other metering equipment is to be allocated between the electric company and the customer.

5. An electric company may require a customer to enter an ~~interconnection~~interconnecting agreement ~~before~~and disclose the necessary control equipment needed to interconnect which may not additionally burden the customer connecting the customer generation system to the electric company's facilities.

49-20.1-03. Charges or credits for net electricity.

1. Each electric company with a customer participating in a net metering program shall measure net electricity during each monthly billing period, in accordance with normal metering practices.

2. If net metering does not result in excess customer-generated electricity during the monthly billing period, the electric company shall bill the customer for the net electricity, in accordance with normal billing practices and credit the customer-generated electricity with a value per kilowatt hour no less than seventy-five percent of what the electric company would otherwise have charged per kilowatt hour for electricity supply.

3. Subject to subsection 4, if net metering results in excess customer-generated electricity during the monthly billing period:

   a. ~~(1) The~~, the electric company shall credit the customer for the excess customer-generated electricity based on the meter reading for the billing period at a value that is ~~at least avoided cost, or as determined by the commission; and~~

   ~~(2) All credits the customer does not use during the annualized billing period expire at the end of the annualized billing period; and~~

   ~~b. As authorized by the commission, the electric company may bill the customer for customer charges that otherwise would have accrued during that billing period in the absence of excess customer-generated electricity.~~

~~4. At the end of an annualized billing period, an electric company's avoided cost value of remaining unused credits described in subdivision a of subsection 3 must be granted:~~

~~a. To the electric company's low-income assistance programs as determined by the commission; or~~

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~~b. For another use as determined by the commission~~no less than seventy-five percent of the regular retail price that would otherwise have been charged per kilowatt hour.

49-20.1-04. Determination of costs and benefits - Determination of just and reasonable charge, credit, or ratemaking structure.

The commission shall:

1. Determine, after appropriate notice and opportunity for public comment, whether costs the electric company or other customers will incur from a net metering program will exceed the benefits of the net metering program, or whether the benefits of the net metering program will exceed the costs; and
2. Determine a just and reasonable charge, credit, or ratemaking structure, including new or existing tariffs, in light of the costs and benefits.

49-20.1-05. Customer to provide equipment necessary to meet certain requirements - Commission may adopt additional reasonable requirements - Testing an inspection of interconnection.

1. Each customer participating in a net metering program shall provide at the customer's expense all equipment necessary to meet:
   a. Applicable local and national standards regarding electrical and fire safety, power quality, and interconnection requirements established by the national electrical code, the national electrical safety code, the institute of electrical and electronics engineers, and underwriters laboratories; and
   b. Any other utility interconnection requirements as determined by the commission by rule made in accordance with North Dakota Administrative Code chapter 69-09-07.
2. After appropriate notice and opportunity for public comment, the commission may adopt by rule additional reasonable safety, power quality, and interconnection requirements for customer generation systems the commission considers to be necessary to protect public safety and system reliability.
3. a. If a customer participating in a net metering program complies with requirements referred to under subsection 1 and additional requirements established under subsection 2, an electric company may not require that customer to:

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(1) Perform or pay for additional tests; or

(2) Purchase additional liability insurance.

b. An electric company may not be held liable for permitting or continuing to permit an interconnection of a customer generation system to the electric company's system or for an act or omission of a customer participating in a net metering program for loss, injury, or death to a third party.

4. An electric company may test and inspect an interconnection at times the electric company considers necessary to ensure the safety of electrical workers and to preserve the integrity of the electric power grid.

5. The electrical function, operation, or capacity of a customer generation system, at the point of connection to the electric company's distribution system, may not compromise the quality of service to the electric company's other customers.

~~**49-20.1-06. Application to out-of-state electric company.**~~

~~An electric company with fewer than five thousand customers in this state headquartered in another state is considered to be in compliance with this chapter if the electric company offers net metering to its customers within the state in accordance with a tariff, schedule, or other requirement of the appropriate authority in the state in which the electric company's headquarters are located.~~

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Net Metering

Ed Gruchalla

Citizens Climate Lobby

February 5, 2019

SB2322

Testimony

Net Metering allows residential and commercial customers who generate their own electricity from solar power to feed electricity they do not use back into the grid. It allows consumers who generate some or all of their own electricity to use that electricity anytime, instead of when it is generated. This is particularly important with renewable energy sources like wind and solar, which are non-dispatchable (when not coupled to storage). Monthly net metering allows consumers to use solar power generated during the day at night, or wind from a windy day later in the month. Annual net metering rolls over a net kilowatt credit to the following month, allowing solar power that was generated in July to be used in December, or wind power from March in August. Many states have passed net metering laws. In other states, utilities may offer net metering programs voluntarily or as a result of regulatory decisions. Differences between states' legislation and implementation mean that the benefits of net metering can vary widely for solar customers in different areas of the country or the State.

Net metering can be implemented solely as an accounting procedure, and requires no special metering, or even any prior arrangement or notification.

Net metering is an enabling policy designed to foster private investment in renewable energy.

Distributed solar and other energy efficiency measures do pose a challenge to electric utilities' existing business models, the benefits of distributed generation outweigh the costs, and those benefits are shared by all ratepayers. Grid benefits of private distributed solar investment include reduced need for centralizing power plants and reduced strain on the utility grid. They also point out that, as a cornerstone policy enabling the growth of rooftop solar, net metering creates a host of societal benefits for all ratepayers that are generally not accounted for by the utility analysis, including: public health benefits, employment and downstream economic effects, market price impacts, grid security benefits and water savings.

Many electric utilities state that owner of generation systems do not pay the full cost of service to use the grid, thus shifting their share of the cost onto customers without distributed generation systems. That's why SB2322 is designed to give the Utility a fair percentage (25%) so they get payed for use of their infrastructure. Some States began their programs with real net metering, or dollar for dollar. Some have backtracked and are adding fees for use of their infrastructure. Twenty five percent is very fair amount and will place North Dakota toward the top in remuneration to the Utility companies.

Net metering provides substantial statewide economic benefits in terms of jobs, income and investment. Net metering increases demand for solar energy systems, which in turn creates jobs for the installers, electricians, and manufactures who work in the solar supply chain. Today, the solar industry

employs more than 250,000 American workers in large part due to strong state net metering policies which have allowed the solar industry to thrive.

Unfortunately, some utilities perceive net metering policies as lost revenue opportunities. In fact net metering policies create a smoother demand curve for electricity and allow utilities to better manage their peak electricity loads. By encouraging generation near the point of consumption, net metering also reduces he strain on distribution systems and prevents losses in long-distance electricity transmission and distribution.

Climate Change

Climate Science: The earth radiates some of its heat out to space naturally, but certain gases – greenhouse gases' – trap a portion of this heat radiation, Carbon dioxide, CO2, is an important greenhouse gas. Even at a very low concentration, CO2 has a powerful effect on the earth's temperature. If there was no CO2 in the atmosphere, we would freeze, but just a little is enough to sustain life. For about 10,000 years, the CO2 level was quite steady giving us a stable climate in which to live and grow. But when we discovered all the things we could achieve with fossil fuels, we started burning them at an accelerating rate. Burning those fuels converts carbon that's been buried for millions of years into C02 that is steadily building up. Scientists discovered the greenhouse effect in the 1850's, but it wasn't until 1958 that we were able to measure C02 in the atmosphere and measure how fast it increases. As of May 2018 it had climbed from 280 to 410 parts per million (ppm). Human activity, mostly fossil fuel burning, currently adds over 1,000 tons of CO2 per second to the atmosphere.

Natural cycles? Volcanoes? The sun? These have all been ruled out. They are either too small, too slow, or going in the opposite direction, **It's us.**

The Scientific Consensus

Seven different research groups looked into this over the last 10 years, examining thousands of papers and/or asking hundreds of scientists directly for their position on climate change. They found that between 91 and 100 percent of published climate scientists agreed, based on the evidence, that human-caused global warming is occurring. The average was about 97 percent. The National Academy of Sciences and their counter parts from 79 other nations also agree, as do all major American member organizations of physicists, chemists, meteorologists, and astronomers. Not a single one claims that human-influenced global warming is in doubt, **NOT ONE.**

Health Benefits of Climate Policy

Climate change and fossil fuel air pollution are intimately linked. Burning fossil fuels harms our health directly by generating pollutants, and indirectly through release of greenhouse gases. Both the direct and indirect costs are often paid for by taxpayers. Cutting back on fossil fuels improves public health in a couple different ways. Cutting fossil fuel use reduces air pollutants that impact our health. The greatest benefit comes from cutting back on coal, which even under stringent pollution rules still emits lung-damaging fine particulates, sulfur gases, and nitrogen oxides (NOx) as well as mercury, a

neurotoxin. Motor fuels also emit particulates, smog-promoting hydrocarbons, and NOx. Natural gas burns cleaner – no particulates, sulfur, or mercury – but still emits NOx.

Air pollution can be reduced with various kinds of scrubbers and catalysts on smokestacks and tailpipes, but most of those treatments don't mitigate climate change. Curtailing the use of fossil fuels can benefit our health by reducing both air pollution and the worldwide effects of climate change.

SB2322 2/5/19 Att# 3

Presentation to The Industry, Business, and Labor Committee
North Dakota House of Representatives

re. SB 2322: A BILL for an Act to create and enact chapter 49-20.1 of the North Dakota Century Code, relating to net metering of electricity.

by Dr. Dexter Perkins, February 5, 2019

My name is Dexter Perkins. I am a Professor of Geology at the University of North Dakota. I have been teaching and doing research there for more than 30 years.

When I was in graduate school, my focus was on minerals and chemistry. Over the past several decades, however, I have become increasingly focused on environmental science, and today I am an expert on climate change and global warming. That is one reason I am pleased to be here today. Because the proposed legislation directly relates to what people can do to help solve the global warming problem that we face.

But, there is another reason why I am glad to have this opportunity to speak to you. A reason that, I think, gives me some special standing. My wife and I just finished building the most energy efficient and environmentally friendly house in North Dakota. We have the only house in the state and the region to receive LEED Platinum designation for energy efficiency and for the natural and sustainable materials that we used.

One key feature of our new home is that we installed photovoltaic panels on the roof. We have a 10-Kilowatt system that, during warm sunny months, produces more electricity than we need. So, we sell our excess to the local power coop. We are the only residential home in Grand Forks to do this - and one of a very few in North Dakota - so the agreement that we have with the coop is a singular one. It is unique for us.

So, I come to you today wearing two hats. On the one hand, I have expertise about global warming and climate change. But, more directly related to the proposed legislation, I am a homeowner who will be affected by this legislation if it passes.

Let me make a few comments about climate change.

Humanity's effect on the Earth system and climate has been profound. Large-scale combustion of fossil fuels -- and the resulting release of carbon dioxide (CO_2) into the atmosphere - -- and emissions of other greenhouse gases -- have significantly altered our planet since early in the 19th century.

Thousands of studies conducted by thousands of scientists around the world have documented the warming that has occurred - and documented the impacts that it has had on Earth's climate. The scientific data is just overwhelming.

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Perhaps there was a time when scientists were uncertain if climate change was occurring. Or if it was caused by people. But, those times are long gone. The Intergovernmental Panel on Climate Change was established in 1988 by the World Meteorological Organization.

The IPCC's first report, issued in 1990, concluded that they were "certain that emissions resulting from human activities are substantially increasing the atmospheric concentrations of the greenhouse gases, resulting on average in an additional warming of the Earth 's surface."

Some non-experts, however, kept arguing. They said that Earth's warming was not happening. Or that it was due to variations in Earth's orbit. Or due to variations in energy produced by the Sun. Or . . . well, they came up with many alternatives.

The IPCC checked them out one-by-one and found that none could explain global warming since the industrial revolution.

But, other climate scientists had figured this out more than a decade before the IPCC. I know, because I regularly attend scientific meetings where climate and climate change have been discussed.

However, let's skip forward - the most recent, 2018, IPCC report was a landmark study written by hundreds of the world's best climate scientists, and they were in unanimous agreement. Most important - they went out on a limb with their predictions - scientists normally do not like making predictions because there are always uncertainties - there were no dissenting voices.

And, the result is the most alarming report to date. Very alarming. The most important conclusion of that report is that we have only one or two decades left to take steps if we are to avoid a worldwide major disaster. For example, the report predicts millions of climate refugees in the next two decades if no strong action is taken.

Most important, the reports conclude that: reducing net emissions of CO_2 is necessary to stop - or even just to slow the climate change that threatens us today. Other greenhouse gases contribute to the problem, but they do not persist as long in the atmosphere. CO_2 is the big culprit and must be gotten under control.

Unfortunately, as of November 2018 the people of the world have done little to reduce emissions of ANY greenhouse gases. The IPCC concluded that we could be headed for very bad times by the middle of the century or sooner. The report was emphatic that we need to take action immediately.

And, that is why my wife and I built the home that we did. Because we believe that we have a duty to do whatever we can to avoid the huge problems predicted by the IPCC and others. We have an ethical and moral obligation.

Since we moved into our house in August, and began generating roof-top electricity with our PV system, we have offset 11,000 pounds of CO_2. That is, if we were using electricity delivered over the grid, there would be 11,000 more pounds of CO_2 in the atmosphere than there is today. We think everybody needs to be encouraged to do the same thing we are doing.

But, uncertainty and economics make this a tough sell to average North Dakotans. Installing our roof-top PV system cost a great deal. And, what is the pay back? With our current contract, we may break even in 20 years. That is a long time. But, there is no guarantee that the current agreements will continue.

That is why this net metering legislation is so important. It will bring order and predictability to an unordered situation and it will allow home owners and builders to invest, and to install photovoltaic systems with confidence.

Right now, the payback is long term. In the future, it may become shorter term. But, most important, North Dakotans need to know what the rules are - so they can plan appropriately. And, the rules need to be standardized across our state.

In summary, I am in favor of the proposed legislation because we want to encourage as many as possible to install PV systems and generate their own electricity.

- From my perspective, and I hope yours, a key consideration is that we just have to reduce CO_2 emissions if we are to get climate change under control.

However, there are other benefits.

- Residential and private net metering PV systems mean that families and businesses can reduce their power costs - paying lower bills than they would have paid otherwise.

- During the day, most systems can generate more power than they need, which means that residential and commercial systems will feed power into the electrical grid.

- Because most of the power is produced at the same time that demand peaks - near midday, increased local power generation can smooth the demand curve for electricity, making things easier for the electrical utility companies.

- Locally generated electricity means there is less power loss during transmission and decreases the need for expanding power distribution networks.

- And, finally, net metering and a growing solar industry can provide significant statewide economic benefits, leading to jobs for electrical contractors, manufacturers, and others in related businesses.

C.L.E.A.N.
Citizens Local Energy Action Network

SB2322 2/5/19 Att#4 p.1

Sunday, February 3, 2019

Dear Commission Members,

I am here today to testify for the benefit of Senate Bill number 2322, proposing improved net metering conditions for renewable energy power generating equipment installed by property owners throughout our state.

Current net metering regulations dates back to the Public Utility Regulatory Policies Act (PURPA) of November 9, 1978, which intended to increase competition within energy markets with power interconnections of up to 80 MW being accepted by default.

When PURPA was passed, these alternative power suppliers were largely represented by independent power participants and the generation, transmission and delivery components of the market were split up to make each more competitive.

PURPA provided for the purchasers of power to pay *avoided costs*[1] to the power generators who sell power into the System Operators networks. This original intention did not consider the unique attributes of renewable energy.

However, the text for the current net metering regulation is based on this premise. The use of avoided cost is no longer a suitable basis for pricing net metering for micro generation, since it allows for very low energy pricing being produced under volume conditions that are not suitable for distributed generation from retail energy subscribers.

SB 2322 introduced by Senators Piepkorn, Grabinger, Mathern, and Representatives Adams, Hager, and Schneider proposes that property owners in our state will receive a more equitable compensation for the energy they produce and consume or inject into the grid. This allows achieving a more reasonable return on investment within an acceptable number of years.

SB 2322 suggests that generators of alternative energy sources should receive a *minimum* 75% of the *retail* price they would otherwise pay per kWh electricity delivered to their meter, including delivery costs, taxes and fees.

This approach follows similar successful programs in many states, like Utah, Minnesota, and Colorado, South Dakota that consider it important to increase distributed renewable energy production as part of State environmental and energy policies.

Avoided cost can vary depending on the mix of generators providing electrons into the grid and fluctuates diurnally and seasonally, adding complexity to the net whole metering solution. Using avoided costs can result in variable and low prices for distributed generators.

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1 The official definition of avoided cost has been around since 1978 = "cost to an electric utility of electric energy or capacity or both which, but for the purchase from a qualifying renewable facility, such utility would generate itself or purchase from another non-renewable source." Avoided cost includes variable operational costs, maintenance, overhead and other costs to generate power. Wholesale power pricing is based on the marginal costs of generating power and the costs of transporting that power to load centers. Retail pricing adds delivery, fees and taxes. The marginal energy cost (in mills/kwh, mill = $0.001), represents an energy-weighted average annual price of power = total cost divided by total generation.

Email: fmcleanaction@gmail.com Non-profit organization incorporated in North Dakota: ID# 42,304,000

C.L.E.A.N.
Citizens Local Energy Action Network

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Sunday, February 3, 2019

For most of the distributed energy producers, a simple method of pricing is needed, that supports investment in renewables with predictable paybacks.

Unless otherwise supported by other investment factors (e.g. Renewable Energy Credits, tax credits), applying avoided cost for renewable energy will not support the needed broad investment in distributed solar PV, Biomass and micro wind energy in North Dakota.

Property owners are currently not being fairly compensated compared to large power plant interconnectors, since they are unable to take advantage of economies of scale. Therefore, we recommend our utilities to develop business plans that embrace distributed generation and furthers local investment and create more jobs in alternative energy source businesses.

We are recommending special consideration be given to biomass sourced power from farming, solar power, wind power and additional battery storage solutions, allowing smaller power users to generate their own energy and receive a reasonable payment for the energy they offset or inject.

We also want to bring you attention to the ever-growing security risks associated with cyber warfare ongoing within and external to our nation. You may all with great concerns have followed recent discussions in Washington DC, based on the most recent report issued by the Office of the Director of National Intelligence.

On January 29, 2019, the Worldwide Threat Assessment of the US Intelligence Community released findings that indicate that China and Russia has the ability to launch cyber-attacks in the United States that cause localized, temporary disruptive effects on critical infrastructure—such as disruption of electricity and natural gas supply for days potentially to weeks.

It becomes clear that it is in the interest of our cooperatives and utilities, to form alliances with smaller independent and distributed micro power generators, such as property owners and farmers throughout our state, in order to reduce overall vulnerability from potential attacks.

Threats to US national security will expand and diversify in the coming year(s), driven in part by China and Russia as they respectively compete more intensely with the United States and its traditional allies and partners. China might be focused on natural gas pipelines, whereas Russia seems to have more ability to interrupt utility grids according to ther eport.

We have in the past experienced serious effects of a significant power interruption during the North East blackout of 2003, because electricity in power lines cannot be stored, and the generation and load always must match up, or the grid enters blackout conditions. An earlier blackout in 1965 lasted for up to two weeks until the transmission and distribution networks was fully restored. I am aware we have come very far in building out energy reliability since then, but the internet interconnectedness of society has increased exponentially over the past decade.

I have personally witnessed the fragility of some power networks in overseas nations, where large power interruptions have taken place in otherwise assumed stable and secure situations. In some places it does not take much interruption to cause major upheaval when served only by centralized energy sources.

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C.L.E.A.N.
Citizens Local Energy Action Network

SB 2322 2/5/19 Att#4 p.3

Sunday, February 3, 2019

Power generation strategies in new networks must build strongly on energy storage and distributed generation, and we must ask our utilities and cooperatives to embrace this form of power reliability and resilience for the future. We are asking you today, to take the first step and not be complacent about future threats.

I ask you on behalf of our members to support distributed private power generation by allowing for a reasonable offset price for the energy produced by land and property owners. We strongly recommend growing a partnership between cooperatives and other centralized utilities with the land and property owners of the state but based on a reasonable price for the power produced.

I am asking you to support this bill.

Paul Jensen

Secretary,

Citizens Local Energy Action Network.

Email: fmcleanaction@gmail.com Non-profit organization incorporated in North Dakota: ID# 42,304,000

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February 5, 2019

To: Senate Industry, Business and Labor Committee – Senator Jerry Klein, chairman

RE: Opposition of HB 1362

From: Zac Smith, communications and government relations director, NDAREC

Chairman Klein and members of the Senate Industry, Business and Labor committee, my name is Zac Smith, and I am testifying on behalf of the North Dakota Association of Rural Electric Cooperatives in opposition to SB 2322. We oppose this bill for two primary reasons. The first is philosophical and the second is economic.

The philosophical reason is that we believe that local, democratically-elected co-op boards of directors are better able to make decisions on rate issues such as net metering than the Public Service Commission. While our electric co-ops are subject to some limited PSC jurisdiction to settle territorial complaints and approve siting of high voltage transmission lines, for example, co-op boards have always had the right and responsibility to set rates and terms of service for their customers. See NDCC 49-02-01.1. The reason for this is simple. Our customers are the owners of our cooperatives. These member-owners democratically elect directors to manage their cooperative. In fact, our 16 member distribution cooperatives together elect a total of 136 directors, almost as many directors as serve in this Legislative Assembly. These directors, who are themselves electric co-op customers, understand the needs and wishes of the cooperative membership. If they don't, like legislators, they don't get re-elected.

Since our cooperatives operate on a not-for-profit basis, electric rates are set just to cover costs and to provide a small margin for operating capital. These margins are later returned to members as the financial condition of the cooperative permits. Not only are co-op boards close to the membership, they are knowledgeable about ratemaking principles. If the board or membership thinks it is a good idea to provide net metering, members can influence the management of the cooperative at a local level. Senate Bill 2322, however, seemingly would put the ratemaking specifically as it relates to net metering under the jurisdiction of the Public Service Commission. Rather than allowing the local board to tailor policy to the needs of their specific cooperative, SB 2322 would throw 16 North Dakota electric distribution cooperatives under the ratemaking authority of the Public Service Commission. A commission which, up to this point, has never played any role in designing the rates of any one of these cooperatives.

In fact, many of our member cooperatives already have policies to net metering. After my testimony, you will hear from Paul Matthys, Vice President of Member & Energy Services for Cass County Electric Cooperative, and Tom Rafferty, Member Services & Communications Manager for Verendrye Electric Cooperative will provide testimony about what their electric cooperatives are doing to address net metering without a state mandate. Our cooperatives developed these policies, not only because of customer requests for net metering, but because of amendments to the Public Utility Regulatory Policy Act (PURPA), passed as part of the Energy Policy Act of 2005, which required state public utility commissions and large non-jurisdictional cooperatives, to consider whether net metering would advance certain goals of PURPA. These goals include 1) conservation of energy supplied by utilities; 2) optimal efficiency of electric

utility facilities; and 3) equitable rates for electric consumers. The point I want to make is simply this. Each local co-op board is in the best position to determine what is efficient, fair and equitable for all of its members. SB 2322 seeks to have the legislature determine just what may be financially advantageous to a select group of members; specifically, those members who have the financial capability to install large distributed generation units that will likely far exceed their own energy requirements.

That brings me to the second reason we oppose SB 2322, which is economics. What this bill proposes to do is establish an obligation for utilities to pay for excess distributed generation, such as solar or wind energy. This is being requested without regard to whether or not this makes any economic sense in a given situation. Basically, the bill encourages the development of alternate energy resources that could potentially supply a large amount of energy that our electric cooperatives may not need at prices that are well above market rates. The wholesale market produces hour by hour prices that provide generators, renewable and non-renewable alike, and consumers with important price signals that reflect real-time values. Energy produced and compensated through net metering, by contrast, is compensated on a basis that lacks foundation in either market or cost. Whatever compensation the Public Service Commission would set via SB 2322 would be out of market because it is a flat price, regardless of when it is produced or, for that matter, fails to reflect that many hours of the day that the sources listed in SB 2322 may produce absolutely nothing. Thus not only are net metering customers not paying their fair share of fixed costs, they are, by the operation of net metering, actually taking revenues away from the entity that actually provides the service. This sets up a situation where most electric customers would pay more for electricity so a few favored

customers could receive an unjustified benefit. Net metering customers have their electricity costs cross-subsidized by their neighbors who completely rely on the grid. Such a result is socially regressive as it effectively transfers wealth from the less affluent cooperative member to the more affluent cooperative member who can afford to install their own generation.

I should point out that SB 2322 would have its greatest impact on electric cooperatives as we serve most of the rural geography of the state where larger distributed wind, solar, and the other type of generation units allowed by SB 2322 would likely be located and where the distribution infrastructure is further spread out. Mandated net metering, which does not value the distribution system and infrastructure used to deliver power, further undervalues and underfunds the distribution system of a cooperative that must travel further and greater distances between meters.

In conclusion, it is our belief that our co-op boards of directors, which are charged by law with the responsibility to manage the business and financial affairs of their co-ops, should continue to be responsible for establishing policies that are fair and serve the best interests of their members. We believe that an individual co-op board, in its discretion, may choose to allow net metering under certain terms and conditions, or choose not to allow net metering. That decision, like all other rate and service decisions, should be left to the elected board members of each co-op to determine based on local conditions, needs and the laws of economics.

That concludes my testimony. I would be happy to try to answer any questions you may have.

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28
- laws of thermodyn
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- 38% wind
17 Energy
Solar

Testimony in opposition to SB 2322
Paul Matthys, VP of Member and Energy Services
Cass County Electric Cooperative Inc.
Fargo, ND

Before the North Dakota Senate Industry, Business and Labor Committee
February 5, 2019

Mr. Chairman and members of the Industry, Business and Labor Committee, my name is Paul Matthys and I serve as the Vice President of Member and Energy Services at Cass County Electric Cooperative headquartered in Fargo, North Dakota. Thank you for this opportunity to appear in opposition to SB2322.

Our position is that decisions regarding policies and practices such as net metering properly belong with a cooperative's board of directors, which is in the best position to determine if such policies are in the best interests of the cooperative and its members. The State of North Dakota has in the past wisely deferred to the local expertise and governance of an electric cooperative's elected board in matters of policy.

Having said that, I'd like to tell you how Cass County Electric Cooperative's board of directors has considered and adopted policies relating to net metering for the purpose of promoting member-owned renewable generation. Our board conducted a thorough investigation and at a public hearing in 2007 adopted a net metering policy. The policy contained some limitations to protect both the cooperative's financial well-being and its physical well-being. One initial limitation was to cap the aggregate amount of net metering at a capacity equal to one tenth of one percent (0.1%) of our highest non-coincidental peak. This limitation was not determined in a vacuum. We researched net metering laws across the nation, and found that the majority of those states that had a cap on net metering set it at this level. In our case, that translated to a cap of about 250 kilowatts. This cap was reached by 2011, and after careful consideration the board increased the cap by 50%, to 0.15% of our system peak. We

have now reached this level and have closed net metering to new applications. Current net metering installations remain on that program.

We didn't, however, simply close the door on interconnection of new member-owned renewable systems. Instead, our board approved a program we called net billing in 2012. It has almost all the same features as net metering, except the ability to "bank" excess energy to be applied to the ~~to apply to future member energy~~member's future energy purchases ~~purchases~~. In a practical sense, the conversion to net billing will encourage members to consider renewable energy systems that are properly sized for their own energy use. One of the unintended consequences of net metering is that it provides an incentive to over-size renewable generation systems.

Another significant matter to consider related to net metering is the extent to which it provides a subsidy flowing from those members who don't have these systems to those who do. Net metering essentially provides a retail rate for self-generated energy, reducing that member's contribution to help pay for the installation and maintenance of the utility plant and infrastructure. In other words, a net metering installation gets to use the cooperative's distribution system for a greatly reduced cost while fellow members continue to pay full cost. In the opinion of our board, some subsidization was appropriate in order to help small renewable systems get established in the market. That degree of subsidization for our system is now at about $10,000 each year, which in our board's judgment is high enough.

In summary, Cass County Electric opposes SB 2322 as an unnecessary intrusion into local governance and we urge your DO NOT PASS recommendation.

SB 2322 2/5/19 Att #7 p.1

Verendrye Electric Cooperative

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February 5, 2019

To: Senate Industry, Business and Labor Committee – Sen. Jerry Klein, chairman

RE: Opposition to SB 2322

From: Tom Rafferty, member services and communications manager, Verendrye Electric Co-op

Chairman Klein and members of the committee, my name is Tom Rafferty and I am testifying on behalf of Verendrye Electric Cooperative. We our headquartered in Velva, we have a service center in Minot and outposts at the Minot Air Force Base and in Harvey. We serve around 12,000 accounts with a mixture of rural, urban, commercial and industrial accounts and the Minot Air Force Base. Our annual revenue is around $50 million.

We were started 80 years ago by farmers who did not have the luxury of electricity because of the high costs of serving rural areas. We have worked very hard to keep our rates as low as possible because we are a non-profit cooperative and our members expect it. Over the last several years, our operating margins have been less than $1 million, and as low as $143,000 in 2017. We are very concerned of the financial impact this could have on our cooperative as we strive to keep our rates low.

One of the guiding principles of a cooperative, or any type of utility, is to treat their members, or customers, fairly. This bill would burden the Public Service Commission with the complex task of determining what is fair regarding net metering for cooperatives. We believe such a decision should be made by each cooperative board and not by the Public Service Commission. Verendrye does in fact have a policy for consumer-owned generation. If a member's system is rated less than 5,000 watts we net meter their electricity. These are very small systems where the administrative costs of calculating a rate would not be worth our time. For larger systems the rate decreases and anything over 150,000 watts is analyzed on a case-by-case basis. We have not had one that large. Under SB 2322, systems of

25,000 watts for residential and 2 million watts (2 MW) for non-residential are allowed. For perspective, the wind towers near Minot are rated at 1.5 MW and could power hundreds of homes at full capacity. We would be very concerned about being required to purchase excess power from a system that large without the ability to set the rates. And under the language in this bill, the Commission would be able to approve a project with an even greater generation capacity than 2 MW.

There is other vague language in this bill. Part of the bill allows people to bank energy credits and it states that unused credits must be granted to the company's low income assistance program "as defined by the Commission" or for another use "determined by the Commission." This sounds like the Public Service Commission would also be in the business of setting rules for low-income energy assistance programs and it could actually come up with any system it wanted to allocate unused energy credits.

We have spent 80 years and hundreds of millions of dollars to build and maintain our system and this bill would give members with financial means access to that infrastructure without us having control over the rates they would be paid. Imagine a bill requiring a grocery store to buy produce from local producers and the prices paid would be set by a third party. That would not be fair and neither is this proposal.

We believe it is best to let electric cooperative boards establish their own policies regarding net metering. Cooperatives have a long history of doing what is best for their members. We also have a long history of working closely with our members to help them save money, whether it is advising a rancher on a solar-powered pasture well or installing hundreds of LED streetlights on the Minot Air Force Base.

That concludes my testimony. I am happy to answer any questions you may have.

SB2322 2/5/19 Att#8

USND
Utility Shareholders
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Senate Bill 2322
Testimony in opposition
Industry, Business, and Labor Committee, Chairman Klein
Carlee McLeod, president, USND

Chairman Klein, members of the committee, I am Carlee McLeod, President of the Utility Shareholders of North Dakota (USND), and I come before you to testify in opposition to this bill on behalf of my members, including ALLETE, Xcel Energy, Otter Tail Power Company and Montana-Dakota Utilities.

While we understand the desire of a customer-generator to maximize the worth of his or her generation, the simple fact is that the cost of electricity is comprised of many factors that the customer-generator does not bear, including the cost of fuel, capital costs of the generator, transmission system, distribution system, and administrative costs of metering and billing.

Each investor-owned utility goes through a regulatory process to show the costs of its electricity and justify the rate it may charge customers. The regulatory process aims at keeping the rate paid by each customer as low as possible and fairly assessed across the customer base.

Requiring a utility to pay a customer-generator anything more than the avoided cost of electricity requires other customers to subsidize the difference between the two electricity sources. We believe that is blatantly unfair to all non-generating customers. While this bill provides for avoided costs, it sets that as the minimum. We strong object to anything above avoided costs.

Further, while nothing forces a customer to use any amount of electricity available from a utility, this bill holds a utility captive to take the electricity a customer can produce, potentially at a rate higher than a utility would pay if allowed to purchase alternative sources.

In closing, this bill is unnecessary, as administrative rules promulgated and enforced by the Public Service Commission already provide for net metering programs which strike an appropriate balance between customer-generator concerns and the general good of the non-generating consumer.

For these reasons, we oppose this bill.

SB2322 2/5/19 Att# 9 p1

Senate Bill 2322

Presented by: **Brian Kroshus, Commissioner**
Public Service Commission

Before: **Senate Industry, Business and Labor Committee**
The Honorable Jerry Klein, Chairman

Date: **February 5, 2019**

TESTIMONY

Mr. Chairman and committee members, I am Brian Kroshus, Chair of the Public Service Commission. I am here on behalf of the Commission to provide some background information so that the committee can better understand the status of net billing in the State of North Dakota, and some issues for the committee to consider.

In the early 80s, the Public Service Commission promulgated rules that addressed qualifying facilities and cogeneration as it related to the Public Utility and Regulatory Policy Act and net metering for North Dakota investor-owned utilities under North Dakota Administrative Code chapter 69-09-07. The administrative rules committee objected on the basis that a bill requiring net metering for investor-owned utilities and rural cooperatives had recently failed to pass. At the time, these rules were enacted over the legislative committee's objection.

These rules have been the structure with which the Commission has processed qualifying facilities and cogeneration facilities as required under the federal Public Utilities Regulatory Policies Act. Currently, all three of North

Dakota's rate of return regulated electric utilities have an approved net-metering tariff.

SB 2322 establishes a statutory framework for net-metering that, in many ways, is consistent with what is already occurring in admin rules with our state's investor-owned utilities. However, there are a few notable differences that I will point out.

Our administrative rules defines an "electric utility" as an electric public utility as defined in North Dakota Century Code section 49-03-01.5. By definition, our net metering rules only apply to North Dakota's investor owned utilities. As written, the bill does not define "electric company" and it could easily result in an interpretation that requires Commission regulation of electrical cooperatives. Although the Commission jurisdiction does result in some ancillary regulation of co-ops in areas such as siting and electrical safety, this would result in the commission delving into tariffs, cost of service studies, and other areas of which Commission currently does not have jurisdiction.

SB 2322 allows net metering for a facility up to "two megawatts unless the Commission approves a greater generating capacity." A two-megawatt facility is capable of producing a substantial amount of energy and this may be large for the purposes of net metering. For the purpose of illustration, the Siting Act currently requires the site approval process for a wind energy conversion facility that exceeds one-half a megawatt of electricity. The Commission's current rules apply net metering to facilities of "one hundred kilowatts or less."

Throughout the bill, it is stated that the Commission "shall provide public notice of its proposed action and an opportunity for public comment." The addition of this language may confuse procedures. Note that on page 6, line 19, the procedure uses this phrasing for the purposes of adopting administrative rules. Then in the other three instances, the same language is used for what would normally be an administrative ratemaking proceeding. Since a rulemaking proceeding already requires both a notice and opportunity for public comment, it may be useful to remove "After appropriate notice and opportunity for public comment" on pg. 6, line 9. To provide consistency with the Commission's other statutes and rules, it may also be beneficial to change "notice and opportunity for comment" to "notice and opportunity for hearing and comment" on pg. 4, line 19-20; pg. 4, line 24; and pg. 6, line 1.

Mr. Chairman, this concludes my testimony. Thank you for the opportunity to present this information. I will be happy to answer any questions.

SB 2322 2/5/19 Att#10
1

h/bn SB 2322 ____ **Net Metering *of* Electricity** 2-5-19; Roosevelt Park rm

–is a great tool for encouraging consumer generated renewable energy.

- Start with the end goal in mind. Look ahead, as far down the road as you can see, into tomorrow. Legislating can be tough for the public to fully understand, so fraught with concern or even fear of the unknowns. We have to trust You to *Know* just what's in the bill, including exactly all the effects of what you're deliberating over and voting on.
- Although use of the consumer-generated electricity-accepting program so far may still be fairly small [*California* has the highest adoption rate, at nearly 8/10ths of 1%; yet that's still quite a few households], what are the costs of the potential alternatives, including more nuclear power plants, or disposal of other states' waste – helping them & the nuclear industry's construction arguments by externalizing their unwanted costs?

- What's this bill's purpose? Is it modeled on other states' successful language? Does it come from the utility industry?
- Why does everyone in ND with their own Solar Panels, make their own deal with their Utility?
- Is this doing so well in Minnesota because Net Metering is mandated by law there? Can that be done here? Why or why not?
- *Altho* several states may be *considering* abandoning net metering, What Drivers may be prevailing behind this? Do they include successful *utility* efforts, in this moment of deregulation-happy fever?

A comparative **Table** at Net Metering, in *Wikipedia*, contains all fifty states' net metering rules (only three don't offer it: Miss., SD & TN). The Category columns are: Subscriber limit (as a % of peak); Power Limit – Residential/Commercial; Monthly Rollover (*of credits* – many are Indefinitely); and Annual Compensation – many are at retail rate, for some it varies, & some *are* some form of avoided cost). This is followed by state-by-state thumbnail reporting of those using net metering.

In 2016, the National Association of Regulatory Utility Commissioners (*NARUC*) published the Manual on Distributed **E**nergy **R**esources Compensation, to help states decide on rate structures dealing with homes and businesses that generate their own power and send excess power back to the electric grid. The intention behind the manual is to "provide a consistent framework for evaluating rate design decisions in the age of distributed energy resources." When the NARUC president commissioned the manual, he said his instructions to the committee writing it were to write a "practical, expert *and most importantly* ideologically *neutral* guide that offers advice" to states. A draft of the manual was released in July, 2016, which generated more than 70 public comments from stakeholder groups. After reviewing those comments, the manual's final version was designed. The updated manual covers various issues *that* state regulators have been struggling with, including net metering, the value of solar energy, and cost shifting from DER to non-DER customers. DER is being integrated into the national grid at a rapid pace, and the system of electricity generation, delivery and use are constantly changing with new technology.

Phil Moeller of the Edison Electric Institute said, "We want to [implement] Distributed Energy Resources [DER] but we want to make sure the rate structure is right to minimize cost shifts." Moeller is a former member of the Federal Energy Regulatory Commission (FERC), a federal government regulatory agency. Sean Gallaher of the Solar Energy Industries Association said, ✓ "There seems to be an assumption that revenue erosion from DER results in an inadequacy of cost recovery for the utility and therefore a shift of costs to non-participating customers. You can't just assume that."

Both associations supported the Manual, with the main contention between utility companies and the solar industry *remaining* the question of whether distributed generation systems represent cost shift from those with systems (people with solar panels) to those without them (everyone else who uses electricity). "& after all, isn't that what the fighting's all about?"

Sixteen states – the only states to receive an "A" rating from Freeing the Grid (in 20*15*) – are considered the most favorable states for net metering: AZ *(heavily involved)*, CA, CO, CN, DE, MD, MA, NH, NJ, NY, OH, OR, PA, UT, VT, & WV.

At one point, *I* followed Laurel and Hardy's lead, & ventured Way Out West, landing once again in Lewis and Clark's footsteps. After some internal auditing, I worked as the first accountant for a large, diversified wood ducts company's new energy complex, which burned its wood waste hog fuel to generate steam & electricity the various plant sites there, and sold its net excess electricity to Washington Water Power Company. (I got to divvy up the kilowatt hours, million-BTU's & apply the unappreciated, ever-varying billing rates.)

I may be misreading it, but at first blush, to me much of this bill *looks* like a preemptive, defensive effort to protect private (or public) utility demand and profit growth, and the status quo? Or at least favor utilities by severely limiting participation by consumer-generators, and reimbursing them at a very low rate, plus terminating unused credits at the end of every year?

for their productive generating costs & efforts with the reward of

As homeowners and small businesses across the country add ever-cheaper yet more efficient solar and other electrical generation capabilities to their homes, we can have at least the *beginnings* of a broadly decentralized energy grid, with added redundancy *PLUS* cheaper electricity costs. This can reduce the need for building more, large, costly coal- and gas-fired or NUCLEAR-powered generating plants, and the related pollution, greenhouse gas and rate increases. Also, consumer-generators may be quite willing to bear much of the costs of the added generating capacity and contributions, also saving on costs and rates.

utility

Particularly: 1) The utility ("electric company?") would pay the consumer the "least avoided cost." How does that encourage participation, what tiny incentive is that? In my experience with *co*generation, I *believe* each party – the co-generator *and* the utility – paid the other at the same rate, as broadly done I think, in many states.

2) The "program" under the proposed bill's language – is that *utility-by-utility*, or is it for the *entire state* gram? – would be *closed* to new consumer generators once the miniscule participation of 1/10th of 1% of the r year's peak demand is reached. Is that clear from the wording of the language used? C'mon – Are you kidding? (Is this written with one or two lone (large) Generators in mind?) Rather it *should* be on at least an annually increasing participation rate of: maybe 2 or 3% the first year, 5% the 2nd, 7 ½ the third, 10% the 4th year, and so on.

The level of its supply Dependability can be readily determined from other, similar states' experience. And ND's own, unfolding, unique experience level can quite likely be gauged and rates adjusted over just the first, very few, years.

Third, as generation fuel sources for an otherwise potentially very CLEAN technological *solution*, it troublingly allows (*therefore*, "promotes"?) unfiltered, "dirty" burning, of: 4d.) organic waste; 4g.) biomass combustion; 4h.) burning wood – "woody debris;" 4i.) ag. residues; and 4j.) dedicated energy crops, including maybe fast-growing wood species like poplar (also used in paper-making), plus hemp, cornstalks and the like. This is merely more wholly unregulated releases of CO_2 from carbon storage right into the atmosphere, where we need it the Least. North Dakota is already doing plenty enough of that.

This seems like a formula guaranteed to add greenhouse gases and accelerate already rapidly oncoming, destructive climate change – already well upon us. (Does this state have a global death wish?)

In Arizona (where many North Dakotans retire), while they've been changing their *net metering* laws, Federal and State tax credits for residential solar installation come to something like $7,000 and $5,000, I believe, per for one-time, per-project installations. Among other things, there's a great, environmentally friendly reason this. Meanwhile, in Nevada, as of the very recent past I believe, the then newly-elected governor (or A.G.?) quashed incentives for solar installation and selling to the grid. And he *came* from the employ as something like general counsel for the largest Nevada utility. (Doing the company's bidding?)

When living in Minnesota, I learned of the Burnsville homebuilder who was wrapping his new homes in a nearly impermeable air barrier. No one had ever seen this before, and many ridiculed, or at least wondered about, him. *Now*, Do we ever *see* a new home going up *without* Tyvek?

been an unprecedented 50° across the entire Australian continent and neighboring locales over the past week* (*loc*), wreaking havoc, from its always arid interior to its usually lush, tropical coastal regions. *Meanwhile*, at least across the north and northeast, we're experiencing the life-threatening, bitter cold of yet *another* harsh polar vortex – possibly influenced by warming conditions there, as the jet stream patterns change over a polar ice cap and region that's warming – including releasing its CO_2 and methane-releasing permafrost (containing material similar to peat moss) – at an even *faster* rate than the rest of the planet's alarming greenhouse warming.
frozen (Undue scientific investigation & inquiry/study)

At the same time, the next snow dump dropping on us now is coming from a system passing through Santa Barbara County, generating winds gusting from 80 to 90 mph, and pouring deluges of rainfalls filling California streets and sewers there, and dumping 5 to 6 foot instant snowfalls over the nearby mountains. And the fast *runoff* from this is endangering newly burned, vulnerable soil, risking dangerous, costly, destructive landslides, from this summer's *also* unprecedented, raging wildfires across the climate-dried landscapes – reducing whole cities, like Paradise, to ashes. (I've *been* to Paradise; it was lovely. As we all know, its ashes now.)

* The unprecedented 50° across the entire Australian continent? That's in *Celsius*. In Fahrenheit it's about 122°, drying up wildlife watering holes, & leaving the Australians grouchily cooped up, hiding out in their homes, cranking up their A/C's, putting more demand on coal-fired generating plants (I believe they recently built another large one near their northeast coast), and also risking greater wildfires.

Children born this year, 2019, will be 81 in the year 2100. What are we wisely leaving for them? And what would they ask of us, now – before it's too late?

the important issues, concerns, growth, public welfare and private assistance, and government operations that this and our other 49 legislatures, plus Congress, are addressing, may be for naught, if we can't resolve our manmade climate dilemma, with useful "silver buckshot" like enabling solar and other consumer-generated electricity.

...

With the onslaught of work ND's citizen-representatives carry, a line from a "light classical" orchestra plays in the background, and "I Can't Get it Out of My Head:" "Robin Hood & Lancelot & Ivanhoe & William Tell – they don't envy ... *you*." ... Or *us*.
(Appropriately, it's by the Electric Light Orchestra.)

Nevada Solar Industry Collapses after State Lets Power Company Raise Rates
Jan 13, 16 the Guardian.com
Governor Sandoval / NV Energy 18¢ charged / 13¢ paid

Introduced by: Sen's Piepkorn, Grabinger & Mathern; & Repr's Adams, Hager & Schneider

SB 2329 2/5/19 Attached

English

Citizens' Climate Lobby

Basic Science of Climate Change

Laser Talk

This page was updated on 05/06/18.

Question: What's the actual science behind global warming?

Answer: The earth radiates some of its heat out to space naturally, but certain gases – 'greenhouse gases' – trap a portion of this heat radiation. Carbon dioxide, CO_2, is an important greenhouse gas. Even at a very low concentration, CO_2 has a powerful effect on the earth's temperature. If there was no CO_2 in the atmosphere, we would freeze, but just a little is enough to sustain life.

For about 10,000 years, the CO_2 level was quite steady, giving us a stable climate in which to live and grow. But when we discovered all the things we could achieve with fossil fuels, we started burning them at an accelerating rate. Burning those fuels converts carbon that's been buried for millions of years into CO_2 that is steadily building up.

Scientists discovered the greenhouse effect in the 1850's, [1,2] but it wasn't until 1958 that we were able to measure CO_2 in the atmosphere and measure how fast it increases. [3] As of May 2018, it had climbed from 280 to 410 parts per million (ppm). [4]

That amount of CO_2 accounts for about *half* of the fossil carbon we've burned in modern times. [5] What happened to the rest of it? Most of it has gone into the ocean, causing the water to become more acidic, which is detrimental to important marine life. [6]

Human activity, mostly fossil fuel burning, currently adds over 1,000 tons of CO_2 *per second* to the atmosphere. [7]

Natural cycles? Volcanoes? The sun? These have all been ruled out. [8] They are either too small, too slow, or going in the opposite direction. It's us.

Related: Where Scientists Stand on Climate.

SB 2322 2/5/19 Attach 2

1. "The Discovery of Global Warming." American Institute of Physics (Feb 2018).
2. "Meet the woman who first identified the greenhouse effect." *Climate Home News* (9 Feb 2016).
3. "Charles David Keeling." Wikipedia (1 Apr 2018).
4. "Global Climate Change: Vital Signs of the Planet." NASA (accessed 6 Apr 2018).
5. Gonzalez, R. "NASA'S CO2-tracking satellite deconstructs earth's carbon cycle." *Wired* (12 Oct 2017).
6. "Ocean Acidification." NOAA Fisheries (28 Jun 2017).
7. Ritchie, H. and M. Roser. "CO_2 and Other Greenhouse Gas Emissions." *Our World in Data* online (2018).
8. Roston, E. and B. Migliozzi. "What's Really Warming the World?" *Bloomberg Business Week* (24 Jun 2015).

English

Citizens' Climate Lobby

Where Scientists Stand on Climate

Laser Talk

This page was updated on 05/31/18 at 12:04 CDT.

Question: Don't a lot of scientists still disagree that climate change is caused by humans?

Answer: No. There are only a very few, and even fewer who have scientific backgrounds relevant to climate science. Many individuals who pose as "experts" in media sources are not scientists at all, or else have no real background in climate science.

You want proof? Seven different research groups looked into this over the last 10 years, examining thousands of papers and/or asking hundreds of scientists directly for their position on climate change. They found that **between 91 and 100 percent of published climate scientists agreed, based on the evidence, that human-caused global warming is occurring. The average was about 97 percent.** [1] Not only that, but the National Academy of Sciences and their counterparts from 79 other nations also agree, as do all major American member organizations of physicists, chemists, meteorologists, and astronomers. Not a single one claims that human-influenced global warming is in doubt. Not one. [2]

This is important, because when people learn how strong the scientific agreement really is, they are more inclined to transcend political affiliations and support public policy solutions to climate change. [3]

Feel free to bring this message, which has been found to act as a gateway belief, to your community: **97 percent of climate scientists are convinced, based on the evidence, that human-caused global warming is happening.**

Click here for supporting graphics.

Related: Basic Science of Climate Change.

1. "Scientific consensus: Earth's climate is warming." NASA Global Climate Change. (accessed 25 Jan 2018).

SB 2502 2/5/19 Att #4 p. 4

2. "List of Worldwide Scientific Organizations." Governor's Office of Planning and Research, State of California. (accessed 25 Jan 2018).
3. "Scientific Consensus on Climate Change as a Gateway Belief." Yale Project on Climate Change Communication.

SB 2322 2/5/19 Attach 5

English

Citizens' Climate Lobby

The Latest IPCC Report Laser Talk

This page was updated on 01/04/2019 at 22:20 CST.

Question: What have we learned from the latest IPCC report?

Answer: In 2016, the 195 nations who signed the Paris Agreement asked the Intergovernmental Panel on Climate Change (IPCC) to study the implications of a 1.5°C global temperature target. Their report, entitled *Global Warming of 1.5°C*, was released in October 2018. [1]

This report clarifies the benefits of holding the modern-day rise in global average temperature to 1.5°C rather than 2.0°C. It also explores possible pathways to stay within these limits, including the role of carbon pricing.

Some key takeaways:

- We now can assess the risks of warming beyond 1.5°C, because some regions have already reached that level and experienced "profound alterations to human and natural systems … linked in turn to rising migration and poverty."[2]
- If warming exceeds 1.5°C, climate risks will increase in magnitude and could *possibly* set in motion irreversible changes like polar ice sheet collapse and the loss of all coral reefs. [3]
- Staying below 1.5°C requires cutting fossil GHG emissions at least 40 percent by 2030 and near 100 percent by 2050, and will likely also require some removal of CO_2 from the atmosphere through extensive reforestation, large-scale agricultural changes, and bioenergy with carbon capture. These measures carry the risk of land use conflict, but the more we overshoot 1.5°C, the more of them we will need. [4,5]
- Under any circumstances, high prices on GHG emissions will be necessary to cost-effectively stay below 1.5°C – prices 3 to 4 times higher than those required to stay below 2°C.

The IPCC report underscores the importance of quickly adopting strong carbon pricing. Most importantly, the emissions targets spelled out in the **Energy Innovation and Carbon Dividend Act** would meet the IPCC's recommended targets to stay below 1.5°C through 2040.

SB2392 dtd 1/31/19 AH#11 p.10

1. *Global Warming of 1.5°C.* Special Report SR1.5 from the Intergovernmental Panel on Climate Change (Oct 2018).
2. Allen, M., *et al.* "Chapter 1: Framing and Context." Part of Special Report SR1.5 from the Intergovernmental Panel on Climate Change (Oct 2018).
3. Hoegh-Guldberg, O., *et al.* "Chapter 3: Impacts of 1.5°C global warming on natural and human systems." Part of Special Report SR1.5 from the Intergovernmental Panel on Climate Change (Oct 2018).
4. Allen, M. *et al.* "Technical Summary." Part of Special Report SR1.5 from the Intergovernmental Panel on Climate Change (Oct 2018).
5. "Characteristics of Four Illustrative Model Pathways." Part of Special Report SR1.5 from the Intergovernmental Panel on Climate Change (Oct 2018).

SB 2329 2/5/19 Att #11 p. 7

Citizens' Climate Lobby

Jobs: Fossil Fuels versus Renewables

Laser Talk

This page was updated on 01/11/19 at 19:50 CST.

Question: Won't making fossil fuels more expensive kill jobs?

Answer: Renewable energy actually creates more jobs than an equivalent amount of fossil energy. Fossil fuel jobs have shrunk mainly because of mechanization, not regulation. For example, in 1980, producing a ton of coal per hour required 52 miners; by 2015 that number dropped to 16, even though more coal was being mined. [1]

In 2016, there were over *three million* jobs in non-fossil energy and energy efficiency, compared to only about *one* million in fossil energy. [2] Even without a price on carbon, installers and service technicians for solar and wind are in such demand that those jobs are growing 13 to 15 times faster than the U.S. average. [3]

Our country will still need energy, whether it comes from low- or zero-carbon sources or from the old polluting sources of the past. Today, the energy technologies of the future create more jobs per energy dollar spent than those of the past, and will likely continue to do so even as the new technologies mature. [4] Not only is wind power already cost-competitive with electricity from fossil fuels, [5,6] it creates 50 percent more jobs for the same amount of energy. [7]

And it's not just renewable energy jobs! The REMI economic study we commissioned in 2014 [8] found that with a carbon fee and dividend policy, job losses in mining and drilling would be outweighed by job gains in almost every other category, including manufacturing, education, construction, finance, retail trades, and even health care.

Related: The REMI Study.

SB2322 2/5/19 Att#11 p.8

1. Saha, D. and S. Liu. "Increased automation guarantees a bleak outlook for Trump's promises to coal miners." Brookings.edu (25 Jan 2017).
2. S. Department of Energy. "U.S. Energy and Employment Report." (Jan 2017).
3. "Where clean energy jobs are growing the fastest." CBS News Money Watch (27 Oct 2017).
4. Kats, G. "How many jobs does clean energy create?" *GreenBiz* (5 Dec 2016).
5. "Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2018." U.S. Energy Information Administration (Mar 2018).
6. "Levelized Cost of Energy and Levelized Cost of Storage 2018." Lazard Insights (8 Nov 2018).
7. Wei, M., S. Patadia, and D.M. Kammen. "Putting renewables and energy efficiency to work: How many jobs can the clean energy industry generate in the US?" *Energy Policy* **38**, 919-931 (2010).
8. Nystrom, S. and P. Luckow. "The Economic, Climate, Fiscal, Power, and Demographic Impact of a National Fee-and-Dividend Carbon Tax." Regional Economic Models, Inc. and Synapse, Inc. (9 June 2014).

SB2322 2/5/19 Att#11 9

Citizens' Climate Lobby

English

Health Benefits of Climate Policy

Laser Talk

This page was updated on 05/13/18 19:53 CDT.

Question: How does reducing fossil fuel use benefit health?

Answer: Climate change and fossil fuel air pollution are intimately linked. Burning fossil fuels harms our health *directly* by generating pollutants, and *indirectly* through release of greenhouse gases. Both the direct and indirect costs are often paid for by taxpayers. Cutting back on fossil fuels improves public health in a couple different ways.

Cutting fossil fuel use reduces air pollutants that impact our health. The greatest benefit comes from cutting back on coal, which even under stringent pollution rules still emits lung-damaging fine particulates, sulfur gases, and nitrogen oxides (NOx)[1,2] as well as mercury, a neurotoxin. [3] Motor fuels also emit particulates, smog-promoting hydrocarbons, and NOx. Natural gas burns cleaner – no particulates, sulfur, or mercury – but still emits NOx. [4]

Reducing fossil fuel use also reduces greenhouse gases. Although CO_2 is not inherently toxic, it is the major cause of climate change, which has its own slate of public health impacts. These include heat stress, more powerful storms, extremes of drought and flooding, spread of infectious disease, and even nutritional deficiency. That's why the EPA found in 2009 that CO_2 from burning fossil fuels is dangerous to human health. The impacts of climate change have been acknowledged as the major public health challenge of the century. [5] All fossil fuels contribute to global warming if we discharge their emissions into the atmosphere.

Air pollution can be reduced with various kinds of scrubbers and catalysts on smokestacks and tailpipes, [6] but most of those treatments don't mitigate climate change. Curtailing the use of fossil fuels can benefit our health by reducing both air pollution *and* the worldwide effects of climate change.

SB 2322 2/5/19 Att #11 p.10

Citizens' Climate Lobby

1. "Criteria Air Pollutants." U.S Environmental Protection Agency (accessed 1 Feb 2018).
2. "NAAQS Table." U.S Environmental Protection Agency (accessed 1 Feb 2018).
3. "Health Effects of Exposures to Mercury." U.S Environmental Protection Agency (accessed 1 Feb 2018).
4. Deru, M. and P. Torcellini. "Source Energy and Emission Factors for Energy Use in Buildings." NREL Technical Report NREL/TP-550-38617, Tables 8-11 (Jun 2007).
5. Watts, N., *et al*. "The *Lancet* Countdown on health and climate change: from 25 years of inaction to a global transformation for public health." *The Lancet* **391** 10120, 581-630 (10 Feb 2018).
6. "Emission control technologies." EPA Base Case v410 Documentation, Chap. 5. U.S. Environmental Protection Agency (Jul 2015).

SB 2322 2/6/19 Att #1

19.1110.01001
Title.

Prepared by the Legislative Council staff for
Senator Piepkorn
January 30, 2019

PROPOSED AMENDMENTS TO SENATE BILL NO. 2322

Page 1, line 16, after "Exceeds" insert "or offsets"

Page 2, line 1, replace "adjacent to, the premises of" with "within"

Page 2, line 2, replace "customer" with "service territory"

Page 2, line 2, replace "the electric company's" with "its"

Page 2, line 5, remove "of"

Page 4, replace lines 16 and 17 with "described in"

Page 4, line 30, replace "commission approves the requirement for" with "electric company requires"

Page 4, line 31, replace "commission" with "electric company"

Page 5, line 3, replace "interconnection" with "interconnecting"

Page 5, line 4, replace "before" with "and disclose the necessary control equipment needed to interconnect which may not additionally burden the customer"

Page 5, line 11, after "practices" insert "and credit the customer-generated electricity with a value per kilowatt hour no less than seventy-five percent of what the electric company would otherwise have charged per kilowatt hour for electricity supply"

Page 5, line 13, remove the underscored colon

Page 5, line 14, replace "a. (1) The" with ", the"

Page 5, line 16, remove "at least avoided cost, or as determined by the"

Page 5, remove lines 17 through 26

Page 5, line 27, replace "b. For another use as determined by the commission" with "no less than seventy-five percent of the regular retail price that would otherwise have been charged per kilowatt hour"

Page 7, remove lines 7 through 12

Renumber accordingly