CENTER for BIOLOGICAL DIVERSITY Because life is good.

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United States International Trade Commission
500 E Street, SW
Washington, DC 20436

RE: POST-HEARING STATEMENT REGARDING CRYSTALLINE SILICON PHOTOVOLTAIC CELLS INVESTIGATION (NO. TA-201-75)

Dear Chairwoman Schmidtlein, Vice Chairman Johanson, and Commissioners Williamson and Broadbent:

On behalf of the Center for the Biological Diversity (the Center) and our over 1.5 million members and online supporters, we submit this post-hearing remedies statement urging the International Trade Commission (the Commission) to reject import tariffs or any other remedies in its investigation into the import of crystalline silicon photovoltaic cells (No. TA-201-75), per the petition submitted by Suniva, Inc. and joined by Solarworld (Petitioners). This statement is submitted pursuant to 19 C.F.R. § 207.67(b) and the Commission's solicitation in announcing this investigation. *See* 82 Fed. Reg. 25,331, 25,333 (June 1, 2017).

Congress has mandated that, in making its remedy recommendations to the President, the Commission must address the impacts that proposed remedies may have on "on other domestic industries, and on consumers," 19 U.S.C. § 2252(f)(2)(G)(i), and that, in making a final decision, the President must consider whether the proposed remedies will "provide greater economic and social benefits than cost." *Id.* § 2251(a).

As we will explain, in this case, any short-term and highly limited benefits of the proposed tariff remedies are vastly outweighed by the economic, social, and other costs associated with the proposed remedies' exacerbation of the climate crisis.

In the past several weeks alone, we have witnessed and been ravaged by climate-change-driven superstorms devastating entire cities and towns in Texas, Florida, and the Caribbean.[1] These hurricanes serve to echo the destruction of Hurricanes Sandy and Harvey in 2012 and Katrina in 2005. These home-hitting climate events add to the long and growing list of climate change impacts in the United States and on our planet, including but not limited to: increasing sea level rise, extreme weather conditions, food insecurity, and species extinction..

Given the urgent need to reduce greenhouse gas (GHG) emissions in order to fulfill U.S. GHG-reduction commitments in the Paris Agreement[2] – adopted at the 2015 United Nations Framework Convention on Climate Change Conference of the Parties – science shows that the U.S. must transition from a fossil-fuel based economy to a clean energy economy as fast as possible. The wide deployment of solar energy is key to unlocking this country's just transition to clean, renewable energy. Moreover, given how close we are to the tipping point where we can

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[1] For a discussion on the relationship between climate change and the recent hurricanes, *see, e.g.*, Michael Mann, et al., "What we know about the climate change-hurricane connection," Scientific American (September 7, 2017), *available at* https://blogs.scientificamerican.com/observations/what-we-know-about-the-climate-change-hurricane-connection/.

[2] *See* United Nations Framework Convention on Climate Change, Conference of the Parties, Nov. 30-Dec. 11, 2015, Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9, (Dec. 12, 2015), http://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf ("Paris Agreement").

no longer forestall the worst impacts of climate change, it is vital that we undertake this deployment as rapidly as possible.

The import tariff remedies proposed here would have precisely the *opposite* result, destroying the rapid growth in solar deployment we have seen in recent years, and delaying our clean energy transition at the precise time where it is most needed. Petitioners' proposed remedies would obstruct this urgent and necessary shift in energy generation and directly exacerbate the climate crisis—and the social and economic costs associated with climate change, which affects the greater American public. Moreover, the proposed tariffs would lead to direct social and economic harm experienced by domestic industries involved in all aspects of solar photovoltaic (PV) energy development.

As we will discuss, pursuant to its statutory mandates and precedents, the Commission has broad discretion in making its remedy recommendations, even after a finding of injury as the Commission has made in this case. Given the catastrophic and existential threats of climate change, the Center urges the Commission to propose that no remedies be imposed here. In particular, in light of the Commission's obligation to take into consideration the comparative costs of proposed remedies, as well as the effect of the proposed tariffs on other domestic industries and consumers, we urge the Commission to recommend against the proposed remedies in order to ensure the continued and unhindered growth of the domestic solar PV market, and avoid the concrete delays these remedies would impose on the nation's clean energy transition.

Background

A. The Climate Change Crisis And Its Causes

1. The Scientific Consensus that Climate Change is Real

Just a few years ago, the Intergovernmental Panel on Climate Change (IPCC), the leading international body for the assessment of climate change, concluded that:

> Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, [and] [r]ecent climate changes have had widespread impacts on human and natural systems.

(IPCC 2014).

These dire findings were echoed in the United States' own 2014 Third National Climate Assessment (NCA), prepared by a panel of non-governmental experts and reviewed by the National Academy of Sciences and multiple federal agencies. The NCA concluded "[t]hat the planet has warmed is 'unequivocal,' and is corroborated though multiple lines of evidence, as is the conclusion that the causes are very likely human in origin," and "[i]impacts related to climate change are already evident in many regions and are expected to become increasingly disruptive across the nation throughout this century and beyond" (Melillo *et al*. 2014). The United States National Research Council similarly concluded that, "[c]limate change is occurring, is caused largely by human activities, and poses significant risks for—and in many cases is already affecting—a broad range of human and natural systems" (NRC 2010a).

Most recently, in its 2017 "Our Changing Planet" Report, the U.S. Global Research Change Program, an inter-agency body mandated by Congress to research and understand climate change[3] reiterated its findings that:

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[3] *See* 15 U.S.C. § 2921, *et seq*.

> The global environment is changing rapidly. This century has seen 15 of the 16 warmest years since adequate thermometer records became available in the late 1800s; globally-averaged temperatures in 2015 shattered the previous record, which was set in 2014; and 2016 is on track to break the 2015 record. Arctic sea ice extent continues a dramatic, decades-long decline. Many independent lines of evidence show a long-term warming trend driven by human activities, with cascading impacts that may outpace the ability of human and natural systems to adapt to change.

(USGRP 2017 at 1).

Global GHG emissions continue to rise due to the U.S. and other nation-states' failures to adequately address climate change. Carbon dioxide (CO_2) is the dominant GHG driving the observed changes in the earth's climate (NRC 2011a). In March 2015, the monthly global average concentration of CO_2 surpassed 400 parts per million (ppm) for the first time since scientists began tracking CO_2 in the global atmosphere (NOAA 2015). This level is almost one and half times (143%) higher than the pre-industrial level of 280 ppm (Pachauri et al. 2014, NOAA National Climatic Data Center 2015a). The current atmospheric CO_2 level is higher than levels during the past 800,000 years, which have fluctuated between ~174 and 280 ppm (IPCC 2013), and may exceed concentrations during the past 15-20 million years (Tripati et al. 2009). Current annual emission growth rates – at an average of ~2.5% per year – are more than twice as large as in the 1990s, which averaged 1% per year (Friedlingstein et al. 2014), and in 2015, the annual CO_2 growth rate was the highest in the 56-year record (NOAA 2016). The atmospheric concentrations of methane (CH_4) and nitrous oxide (N_2O), two other potent GHGs, are, respectively, 253% and 121% of their pre-industrial levels (WMO 2014).

The average global surface temperature has warmed by more than 0.85 degrees Celsius (1.5 degrees Fahrenheit) since the industrial revolution, most of which has occurred in the past three decades (IPCC 2013). In the U.S., temperatures have warmed by 0.72 to 1.1 °C (1.3 to 1.9ºF) since 1895, with most of this increase occurring since about 1970 (Melillo et al. 2014).

Globally, the decade from 2000 to 2010 was the warmest on record (et al.*id*.), and 2016 was the hottest year on record and the third year in a row that record was broken (NASA 2017). By the end of this century, the average temperature in the United States is expected to increase by 2.2 to 3.6°C (3 to 5°F) under a lower emissions scenario and by 3.9 to 6.1°C (5 to 10°F) under a higher emissions scenario, with the largest temperature increases projected for the upper Midwest and Alaska (Melillo et al. 2014).

2. The U.S.'s Blown Carbon Budget

The United States has committed to the climate change target of holding the long-term global average temperature "to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels" under the Paris Agreement. The United States signed the Paris Agreement on April 22, 2016 as a legally binding instrument through executive agreement,[4] and the treaty entered into force on November 4, 2016. The Paris Agreement codifies the international consensus that climate change is an "urgent threat" of global concern.[5]

The IPCC Fifth Assessment Report and other expert assessments have established global carbon budgets, or the total amount of carbon that can be burned while maintaining some probability of staying below a given temperature target. When accounting for the projected warming effect of non-CO_2 forcing from shorter lived pollutants, total cumulative anthropogenic emissions of CO_2 must remain below about 1,000 gigatonnes ($GtCO_2$) from 2011 onward for a

4 *See* United Nations Treaty Collection, Chapter XXVII, 7.d Paris Agreement, List of Signatories; U.S. Department of State, Background Briefing on the Paris Climate Agreement, (Dec. 12, 2015). Although not every provision in the Paris Agreement is legally binding or enforceable, the U.S. and all parties are committed to perform the treaty commitments in good faith under the international legal principle of *pacta sunt servanda* ("agreements must be kept"). Vienna Convention on the Law of Treaties, Art. 26.

5 *See* Paris Agreement, at Recitals.

66% probability of limiting warming to 2°C above pre-industrial levels, and to 400 $GtCO_2$ from 2011 onward for a 66% probability of limiting warming to 1.5°C (IPCC 2013, IPCC 2014). These carbon budgets have been reduced to 850 $GtCO_2$ and 240 $GtCO_2$, respectively, from 2015 onward (Rogelj et al. 2016a). Every year at current emissions (36 $GtCO_2$)[6] makes meeting this budget less feasible.

Scientific studies have estimated the United States' portion of the global carbon budget by allocating the remaining global budget across countries based on factors including equity and economics. Estimates of the U.S. carbon budget vary depending on the temperature target used by the study (1.5°C versus 2°C), the likelihood of meeting the temperature target (50% or 66% probability), the equity principles used to apportion the global budget among countries, and whether a cost-optimal model was employed. The U.S. carbon budget for limiting temperature rise to well below 2°C has been estimated at 38 $GtCO_2$ (du Pont et al. 2017), while the estimated budget for limiting temperature rise to 2°C ranges from 34 $GtCO_2$ to 158 $GtCO_2$ (Raupach et al. 2014, Gignac et al. 2015, Peters et al. 2015, du Pont et al. 2017). Under any scenario, the remaining U.S. carbon budget consistent with limiting global average temperature rise to 1.5°C or 2°C is extremely small and is rapidly being consumed. In 2015 alone, U.S. emissions totaled 6.5 $GtCO_2eq$ (U.S. EPA, Inventory).

The build-up of CO_2 and other pollutants which have occurred, and are continuing to occur, are principally caused by our GHG emissions. For this reason, the Environmental Protection Agency (EPA) has unequivocally concluded that GHG emissions endanger the health and welfare of current and future generations (EPA 2009). Accordingly, as the Third NCA explains, "reduc[ing] the risks of some of the worst impacts of climate change" will require

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6 *See* Le Quéré, Corrine, et al., "Global Carbon Budget 2016," 8 Earth Syst. Sci. Data 605 (2016), www.globalcarbonproject.org/carbonbudget/16/data.htm.

"aggressive and sustained greenhouse gas emission reductions" over the course of this century (Melillo et al. 2014 at 13, 14, and 649).

3. The Urgency For the U.S. To Swiftly Transition to a Clean Energy Economy

In order to preserve a likely chance of achieving our targets, and per U.S. commitments in the Paris Agreement, scientific assessments have found that global emissions should peak by 2020, decline sharply thereafter, and typically reach zero net emissions by 2050 (Rogeli et al. 2015, Rogeli et al. 2016b, UNEP 2015). Moreover, they must become *net-negative* after 2050 (*i.e.*, more carbon must be *removed* from the atmosphere than is *added*) (*Id.*).

Accordingly, it is absolutely critical that we rapidly transition to renewable energy in order to displace fossil fuel sources and slow GHG emissions as quickly as possible. Every additional contribution to GHG emissions, especially over the next few decades, means that meeting a 1.5°C, much less a 2°C, target becomes less likely, and pushes the earth further toward tipping points that will further aggravate positive feedback loops – which, in turn, will further amplify warming, and increase the probability of the most dangerous levels of changes to our climate.

The single biggest source of GHG emissions in the United States is electricity production (U.S. EPA, Sources). Thus, it is simply indisputable that rapidly transitioning electricity from GHG-emitting sources like coal and natural gas to appropriate renewable resources, like distributed solar PV generation, is critical to addressing climate change.

B. THE POTENTIAL FOR SOLAR POWER TO REDUCE OUR RELIANCE ON GREENHOUSE-GAS-EMITTING ENERGY SOURCES

In order to limit warming to less than 2 degrees C above pre-industrial levels, much less 1.5 degrees C, developed countries – and especially the United States as the world's second-largest emitter – will need to cut its GHG pollution by *at least 80%* by 2050, relative to 1990 emissions levels (Williams et al. 2015, EIA 2017). In order to reduce emissions to this level, clean, renewable energy sources like solar photovoltaic (PV) panels need to be deployed rapidly.

1. The Climate, Environmental, and Social Benefits of Deploying Solar PV Widely

PV solar panels emit virtually no climate change causing emissions or hazardous air pollutants in generation, require no water use for generation, and can be placed on existing infrastructure to avoid additional land use (Freese et al. 2008, IPCC 2011, EIA 2012). If solar energy manufacture and installation cost reductions are permitted to continue until distributed solar power is cost-competitive across the U.S., the country would rapidly reduce its GHG emissions, as well as experience significant environmental and public health benefits by displacing highly polluting fossil-fuel energy sources.

In addition, placing solar PV in or near the already-built environment can result in significant environmental and social co-benefits, or synergies. These include decreased emissions associated with land-use and land-cover change and the potential for simultaneous habitat restoration under or near panels (Macknick et al. 2013). The local economic and social benefits of increased distributed solar generation are also significant. Not only can distributed PV reduce energy demand from the grid during more expensive "peak demand" hours, thereby decreasing the cost of electricity for all grid-connected customers, but increased distributed solar installations can locally reduce the need for costly grid upgrades (Brookings Institute 2016). When paired with storage, distributed PV also has the potential to increase electricity system reliability and resiliency in the face of climate change-exacerbated storms and flooding, increasing its value in terms of both avoided repairs costs and social benefits (NREL 2015).[7]

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[7] *See also* Carla Herreria, "Elon Musk Floats Solar Overhaul Of Puerto Rico Power Grid, Governor Says 'Let's Talk," Huffington Post, Oct. 6, 2017 (discussing potential to rely on solar power to rebuild Puerto Rico's grid after Hurricane Maria).

Finally, distributed PV allows for decentralized power generation, which, when applied with an energy democracy framework,[8] can result in "improved infrastructure, increased wealth and greater political interdependence between communities of color and their neighbors" (Center for Social Inclusion 2010).

2. The Technological and Political Feasibility of Deploying Solar PV Widely

The deployment of solar energy across the country is politically achievable, particularly given the fact that more than three-quarters of Americans across the political spectrum believe that the United States should place more emphasis on producing solar than it does now – a higher percentage than for any other energy source (Gallup Poll data 2015).

Not only is it achievable, but the widespread deployment of solar PVs is also technologically feasible as a stand-alone source fueling America's clean energy transition. America has enough solar energy potential to power the nation multiple times over. Photovoltaic panels could generate 76 times as much as electricity as is used in the United States each year (Environment America Research and Policy Center 2016). Thirty-three U.S. states could generate more than a third of their annual electricity consumption using rooftop solar installations alone. When paired with storage and a fully electrified energy system, clean, renewable energy sources could feasibly produce enough power to support all of the U.S.'s energy needs (Jacobson 2015).

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8 Energy democracy refers to a policy framework that transforms neglected and isolated communities – often poor, and communities of color – into energy producers that have access to clean energy resources of the 21st century (e.g., wind and solar) to economically benefit from their use, emphasizing principles of local control and equitable access. See Center for Social Inclusion 2010; see also Institute for Self-Reliance, "Beyond Utility 2.0 to Energy Democracy" (2014), https://drive.google.com/file/d/0B8Hmrr6Ve2pvaWk3 VGhPZXZSMF k/view.

Across the United States, rooftop PV could provide at least 1.1 TW of electrical power and 1432 TWh of annual energy generation, the equivalent of 39% of total electricity sales in 2013 (Gagnon et al. 2016). This does not include the technical potential of solar PV on parking lots or brownfields, which would increase the overall potential of distributed solar generation. Specifically, Researchers from Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory modeled a scenario in which solar energy could reasonably supply 14% of the nation's electricity needs by 2030, and 27% by 2050. Under this scenario, the researchers estimate that solar power would reduce climate change causing emissions and air pollutants by approximately 10% from 2015 to 2050 and provide a discounted present value of *$56–$789 billion climate benefits and $77–$298 billion in air quality and public health benefits* (Wiser et al. 2016). This level of solar power diffusion would also reduce domestic water consumption by 9% (Wiser et al 2016).

The same is true for the potential of widespread solar deployment on a state-by-state level. A study of California's solar energy potential showed that the state could meet its energy demands three to five times over with solar in the already-built environment alone (Hernandez 2015). This same assessment has yet to be performed on a nationwide scale, highlighting the unknown but likely vast potential for solar PV in already-built spaces across the country.

DISCUSSION

A. WHILE SOLAR DEPLOYMENT IS GROWING ROBUSTLY IN THE UNITED STATES, THE PROPOSED TARIFFS THREATEN TO DERAIL THIS VITAL PROGRESS.

The United States is still far from reaching its solar potential, but the domestic solar market growth has increased significantly in recent years. This is in large part due to dropping costs of PV panels, driven by market competition (GTM Research and SEIA 2017, Fu et al. 2017). Indeed, since 2005, the residential solar market has grown by an average of more than

50% every year (Margolis et al. 2017). The country now has well over a million distributed and residential solar systems, and has seen significant penetration in some states, such as Hawaii and California (*Id.*).

To put this in more concrete terms, in 2007 solar power – including both distributed and utility-scale projects – produced 0.03% of America's electricity, or enough electricity to power 120,000 average American homes. By mid-2017, by contrast, the U.S. had enough installed solar PV capacity to power *9.1 million average American homes* (SEIA 2017b). In the second quarter of 2017 alone, the U.S. market installed 2,387 MW of solar PV, an 8% increase year-over-year, and the second largest quarter ever (GTM Research and SEIA 2017).

Moreover, as the Department of Energy (DOE) recently announced, "[i]n 2016, for the first time in U.S. history, solar was the *largest source* of new electricity generation capacity, with approximately 40% of all new generation capacity" (Margolis et al. at 24). More broadly, DOE explained that this represents a shift as the "U.S. has installed approximately 20 GW of new capacity per year in past decade, while retiring approximately 17 GW annually in the past five years" — "mostly [of] gas plants, which are being replaced, and coal plants." (*Id.*). Most recently, through the first half of 2017, 22% of all new electric generating capacity brought online in the U.S. has come from solar (GTM Research and SEIA 2017).

In terms of future growth, in the absence of the enormous obstacle to solar growth being proposed in this proceeding, experts anticipate that, "[t]otal installed U.S. solar PV capacity is expected to nearly *triple* over the next five years, and [b]y 2022, over 16 GW of solar PV capacity will be installed annually." (*Id.*). As the Solar Energy Industries Association (SEIA) has explained, we are on track for solar to provide up to 5% of our nation's electricity in just a few years (Aug. 9, 2017 Pre-Trial Br. of SEIA, at 7). The United States ranks only behind China in the amount of solar being deployed each year (Margolis et al. 2016). However, the U.S.'s clean energy progress still pales in comparison to countries like Denmark and Germany, whose total renewable energy generation made up 56%[9] and 31%[10], respectively, of their total energy generation in 2015.

Thus, while the United States requires an even *faster* transition to a renewable energy economy than it currently is undergoing, this proceeding threatens to upend the critical progress made so far and send us in exactly the wrong direction. As a threshold matter, the Commission must recognize that, as U.S. producers have explained and as discussed in the ITC's Staff Report for this investigation, "the decrease in the price of solar generated electricity has been driven by CSPV [crystalline silicon photovoltaic] market competition and not by falling prices of conventional energy." (Sept, 22, 2017 ITC Staff Rep. for TA-201-75 (Staff Rep.) at V-63). Thus, there is a direct and clear link between the ability of solar companies to produce market-competitive energy and the CSPV prices at issue here, for, as Staff also explained, "the price of CSPV modules is a large factor in the price of solar electricity." (*Id.* at V-58). And as regards [to] those prices, the Staff Report finds that "[b]etween the fourth quarter of 2015 and the fourth quarter of 2016, module prices fell by 35.4%." (*Id.* at V-14).

The tariffs proposed here, by contrast, threaten to dramatically *increase* module prices, thereby significantly reducing solar PV demand. As the Staff Report found, "[b]ased on

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9 Danish Energy Agency, "Danish Energy Statistics 2015: Renewables Now Cover 56% of Electricity Consumption" (2016), https://stateofgreen.com/en/profiles/danish-energy-agency/news/danish-energy-statistics-2015-renewables-now-cover-56-of-electricity-consumption.

10 U.S. Energy Information Administration, "Germany's renewables electricity generation grows in 2015, but coal still dominant" (2016), https://www.eia.gov/todayinenergy/detail.php?id=26372

available information, the overall demand for CSPV products is likely to experience *moderately large to large changes* in response to changes in price." (*Id.* at V-10) (emphasis added).

Indeed, SEIS has explained that the requested tariffs threaten to *double the price* of solar panels in the U.S. (SEIA 2017a). As SEIA explains, "[s]olar projects costs would rise dramatically for both rooftop and utility scale, and solar would become less competitive." (*Id.*) (*see also* Julia Pyper, Suniva, "SolarWorld and Their Opponents File New Trade Remedy Proposals" (GTM Research 2017) (explaining that Petitioners' latest proposals would double panel prices)).

As SEIA has explained, unlike steel or other products on which the Commission has considered tariffs, the market will not simply absorb the increased prices requested by Petitioners. Instead, solar sales will fall if the proposed tariffs are imposed and make fossil fuel energy sources more competitive (Aug. 23, 2017 Post-hearing Br. of SEIA at 3 ("If solar becomes uncompetitive, then today's consumers of CSPV cells and modules will simply stop buying them")); (Sept. 27, 2017 letter from National Grid (explaining the billions invested in energy infrastructure that is at stake and how the proposed tariffs "will have a direct effect on the future growth of solar energy in the United States")). Similarly, as NextEra states, the proposed tariffs threaten "billions of dollars of planned solar infrastructure projects scheduled to be constructed over the next four years and the hundreds of thousands of American jobs that depend on these projects going forward." (Sept. 27, 2016 NextEra Pre-Trial Br. at 2); (*id.* at 12 (explaining the proposed tariffs "will have a significant and potentially catastrophic impact on the domestic solar industry")).

The bottom line is that solar demand is expected *to be reduced by 50% over the next five* years in the event the proposed tariffs are adopted (GTM Research and SEIA 2017).

B. Delaying Our Clean Energy Transition Will Only Worsen The Impacts Of Climate Change, With Devastating Economic, Social, and Other Costs To The U.S. Economy And All Consumers.

At the outset, the Commission by law must take into account the significant adverse impacts that the proposed tariffs would have on domestic industries associated with the sale and installation of solar projects. As other parties have amply demonstrated, the remedies proposed would have enormous adverse impacts on jobs and companies engaged in bringing solar systems to homes and communities across the country. It would also, of course, harm the thousands of consumers who are rapidly moving to adopt solar systems for their homes in order to both reduce their energy costs while also contributing to reductions in GHG emissions. These harms alone should be more than sufficient to demonstrate that the requested tariffs are inappropriate (Sept. 28, 2017 Pre-hearing Remedy Br. of SEIA and Sunpower at 37-49).

However, it is also critical for the Commission, in making its remedy recommendations to the President, to recognize the connection between the proposed remedies and climate change, which risks causing an exponentially *greater* economic and social cost to the U.S. economy, domestic industries and consumers of all goods and services. In short, by making PV solar energy more expensive, the proposed remedies here will yield eminently increased GHG emissions and thus contribute to a host of impacts associated with an exacerbated climate change crisis.

As noted above, in order to limit global warming to the Paris Agreement's goal of 2ºC, much less the Agreement's crucial goal of 1.5ºC, above pre-industrial levels[11] – it is essential that we rapidly transition the U.S. energy economy to be powered fully by clean, renewable

[11] As noted, the Paris Agreement commits all signatories to an articulated target to hold the long-term global average temperature "to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

energy. Without that transition, here and around the world, we will continue to experience and cause worsening impacts of climate change.

Of great concern, the global emission growth rate continues to track the highest emission scenarios used for IPCC projections, the RCP8.5 scenario (LeQuere et al. 2015). As a result, current GHG emissions are resulting in severe and significant climate change impacts which will worsen as emissions rise (Melillo et al. 2014). Key changes include warming temperatures, the increasing frequency of extreme weather events, rising sea levels, rapidly melting glaciers, ice sheets, and sea ice, the global collapse of coral reefs, and acidifying oceans (Melillo et al. 2014, IPCC 2013).

The deleterious impacts of climate change in the United States affect industries, the environment and vulnerable communities and consumers across the U.S. Indeed, as detailed in the recently issued "Economic Case For Climate Action In The United States," the concrete economic harms we can expect from continued fossil fuel production include $*240 billion per year* in economic losses from weather events influenced by human-induced climate change and health damages due to air pollution, a number that will grow to *$360 billion per year* within the next decade (FEU-US 2017). This includes the stark fact that the number of extreme weather events causing at least $1 billion in economic losses has grown from 21 in the 1980s, to 38 in the 1990s, to 92 in the last decade (*Id.* at 2).

Indeed, in the last decade alone hurricanes have cost more than $400 billion dollars (*Id.*) The finding that climate change is causing billions of dollars in economic losses is supported by numerous other scientific studies (Estrada, et al. 2015) (finding as much as $14 billion in losses "attributable to climate change"); (Hsang et al. 2017).[12]

Massive economic losses will also come from increasing drought conditions, which will cost up to $25 billion per year in soybean and corn production alone (*Id.* at 3). At the same time, climate-exacerbated flooding will also continue to take a large economic toll. In 2016 alone, flooding caused $10 billion in damage in Louisiana (*Id.*).

Sea level rise will also cost billions as cities and coastal communities lose real estate and expend massive resources endeavoring to delay the inevitable receding of coastlines (Hinkel, et al. 2014). One scientific study found one Florida county alone stands to lose up to $900 million in real estate value from sea level rise in the coming decades (Fu et al. 2016).

Similarly, ongoing climate-change induced ocean acidification threatens billions in losses to our nations' fisheries in coming years (Cooley and Doney 2009). These and other concrete economic and social costs to the United States must be taken into account in considering the remedies proposed here, and their impact on our clean energy transition.

Moreover, on a more qualitative level, the Commission's recommendations must take into account the following harms coming from climate-change:

1. *Coastal Impacts of Sea-level Rise*

Global average sea level rose by roughly eight inches over the past century (Melillo et al. 2014). Sea-level rise is accelerating in pace and will continue for centuries (Melillo et al. 2014). The Third National Climate Assessment estimated that global sea level is likely to rise by 1 to 4 feet by the end of the century, with sea-level rise of 6.6 feet possible (Melillo et al. 2014), and

[12] *See also* Patricia Cohen, "U.S. Lost 33,000 Jobs Amid Last Month's Hurricanes," New York Times, Oct. 6, 2017.

the National Research Council similarly estimated global sea-level rise at 1.6 to 4.6 feet by 2100 (NRC 2012).

Further, sea-level rise will be exacerbated by increasing storm intensity and storm surge (Little et al. 2015, Wahl et al. 2015). The frequency of high-severity hurricanes is increasing in the Atlantic (Trenberth et al. 2007, Elsner et al. 2008, Saunders and Lee 2008, Bender et al. 2010, Kishtawal et al. 2012), as is the frequency of hurricane-generated large surge events—the offshore rise in water created and pushed ashore by storm winds (Grinsted et al. 2012). The risk of extreme Katrina-magnitude storm-surge events has already doubled, and scientists estimate a twofold to sevenfold increase in the frequency of extreme surge events for each 1ºC rise in global temperature (Grinsted et al. 2013). As sea level rises, storm surge rides on a higher sea surface which pushes water further inland and creates more flooding of the coasts (Tebaldi et al. 2012).

More than half (52%) of U.S. residents live in coastal counties (NOAA 2012c), while an estimated 40% of U.S. endangered species inhabit coastal ecosystems (LeDee et al. 2010), highlighting the threats of sea-level rise to coastal communities. Sea levels on the U.S. East Coast from Cape Hatteras to Boston are rising three to four times faster than the global average, putting major U.S. cities – and thus millions of consumers and domestic industries – at increased risk of flooding and storm surges (Sallenger et al. 2012).

Millions of Americans are at risk from sea-level rise. A nation-wide study estimated that approximately 3.7 million Americans live within one meter of high tide and are at extreme risk of flooding from sea-level rise in the next few decades, with Florida as the most vulnerable state followed by Louisiana, California, New York and New Jersey (Strauss et al. 2012). Another study encompassing the continental United States estimated that 0.9 meters of sea-level rise places a land area projected to house 4.2 million people at risk of inundation, whereas 1.8 meters of sea-level rise affects 13.1 million people (Hauer et al. 2016).

In Louisiana, rising seas are expected to lead to the permanent flooding of the Mississippi River delta and the loss of 10,000 km2 to 13,500 km2 of coastal lands by 2100 (Blum and Roberts 2009). Along the U.S. West Coast, sea-level rise will be greatest off the coast of California, with sea levels expected to increase by as much as 30 centimeters (1 foot) in the next 20 years, 61 centimeters (2 feet) by 2050, and 1.7 meters (more than 5 feet) by the end of the century (NRC 2012). In California alone, a sea-level rise of 1.4 meters would put 480,000 people and $100 billion worth of property at risk of flooding (Heberger et al. 2011). The impacts on domestic industries and consumers will therefore be staggering.

2. *Water Resources*

Climate change is altering the water supply in the United States, placing additional burdens on already stressed water systems (Karl et al. 2009). In the western U.S., mountain snowpack is declining (Hamlet et al. 2005, Mote et al. 2005, Mote 2006, Barnett et al. 2008) and snowmelt is shifting earlier, leading to even lower water supplies in late summer (Stewart et al. 2004). In the southwestern U.S., precipitation has decreased during the summer and fall, and droughts are becoming more severe (Cayan et al. 2010). In the Colorado River Basin, higher temperatures are contributing to significantly reduced Colorado River flows, disrupting the region’s water supply, and temperature-induced flow losses may exceed 20% by mid-century (Udall and Overpeck 2017). All these impacts will continue to have obvious impacts on domestic industries and consumers.

3. *Food Security*

Climate change affects food security through a number of complex pathways, both direct and indirect, including the reduced ability of crops to thrive, increased threats to livestock, climate-related contamination of food supplies, and an alteration in land use patterns and availability. Higher levels of warming and extreme weather events such as droughts and flooding are expected to negatively affect the growth and yields of many crops (Karl et al. 2009). Changes in winter chill conditions by the middle to end of the 21st century will no longer support some of the main tree crops currently grown in California (Luedeling et al. 2009). Warming is likely to benefit many weeds, diseases, and insect pests, increasing stress on crop plants and requiring more pest and weed control (Karl et al. 2009).

Increasing CO_2 concentrations are also expected to lead to declines in forage quality in pastures and rangelands for livestock, while increased heat, disease, and weather extremes will increase livestock mortality (Karl et al. 2009). Temperature increases, changes in rainfall, and extreme weather events are projected to increase the incidence and intensity of food-borne diseases and food contamination, jeopardizing food security (Tirado et al. 2010). Ocean warming and ocean acidification will threaten marine food resources by disrupting marine communities, promoting harmful algal blooms and the spread of some diseases, and increasing contaminants in fish and shellfish (Tirado et al. 2010). For example, future ocean and weather patterns are likely to bring longer seasons of Harmful Algal Bloom outbreaks in Puget Sound, which could translate to longer fishery closures and threaten the state's $108 million annual shellfish industry (NOAA 2011). The coming adverse impacts on domestic industries and consumers are therefore both palpable and severe.

4. *Public Health*

Climate change is a significant threat to human health and well-being (Luber et al. 2014, Watt et al. 2015, USGCRP 2016). The health impacts of climate change include harms from increasing heat stress and other extreme weather events, increases in air pollution, the spread of vector-borne diseases, food insecurity and under-nutrition, changing exposure to toxic chemicals, displacement, and stress to mental health and well-being (Sheffield and Landrigan 2011, Luber et al. 2014, Watt et al. 2015, USGCRP 2016).

Moreover, other extreme weather events are striking with increasing frequency, most notably heat waves and precipitation extremes such as droughts and floods (Coumou and Rahmstorf 2012, IPCC 2012, Melillo et al. 2014, Herring et al. 2015). Summertime heat extremes[13] which covered much less than 1% of Earth's surface during 1951-1980 now cover about 10% of the Earth's land area (Hansen et al. 2012).

Although everyone is vulnerable to health impacts from climate change, certain groups are particularly vulnerable to climate change-related health harms such as children, the elderly, low-income communities, some communities of color, immigrant groups, and persons with disabilities and pre-existing medical conditions (Sheffield and Landrigan 2011, Luber et al. 2014, Watt et al. 2015, USGCRP 2016). The 2015 Lancet Commission on Health and Climate Change highlighted that climate change is causing a global medical emergency, concluding that "the implications of climate change for a global population of 9 billion people threatens to undermine the last half century of gains in development and global health" (Watt et al. 2015).

Climate change-driven health impacts are already occurring in the United States, particularly due to morbidity and mortality from extreme weather events which are increasing in

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[13] Summertime heat extremes are defined as more than three standard deviations (3σ) warmer than the climatology of the 1951–1980 base period.

frequency and intensity (Luber et al. 2014, Watt et al. 2015, USGCRP 2016). Heat is already the leading cause of weather-related deaths in the United States, and extreme heat is projected to lead to increases in future mortality on the order of thousands to tens of thousands of additional premature deaths per year across the United States by the end of this century (USGCRP 2016). Extreme precipitation events have become more common in the United States, contributing to increases in severe flooding events in some regions (Luber et al. 2014). Floods are the second deadliest of all weather-related hazards in the United States and can lead to drowning, contaminated drinking water leading to disease outbreaks, and mold-related illnesses (Luber et al. 2014).

Air pollution components, specifically ozone, air particulates, and allergens, are expected to increase with climate change (USEPA 2009, USGCRP 2016). Climate-driven increases in ozone will cause more premature deaths, hospital visits, lost school days, and acute respiratory symptoms (USGCRP 2016). Projected climate-related increases in ground-level ozone concentrations in 2020 could lead to an average of 2.8 million more occurrences of acute respiratory symptoms, 944,000 more missed school days, and over 5,000 more hospitalizations for respiratory-related problems (UCS 2011).

Risks from infectious diseases are also increasing as climate change alters the geographic and seasonal distribution of vector-borne diseases (USGCRP 2016). Climate change favors the spread of some pathogen-carrying vectors. Lyme disease is the most common vector-borne disease in the United States, with 25,000–30,000 cases reported to the CDC per year, with the highest incidence among children between ages 5 and 9 (Bernstein and Myers 2011).

The risk of human exposure to Lyme disease is expected to increase as ticks carrying Lyme disease and other pathogens become active earlier in the season and expand northward in response to warming temperatures (USGCRP 2016). Rising temperatures and changes in rainfall have already contributed to the maintenance of West Nile virus in parts of the United States, and climate change is expected to increase suitable conditions for the mosquitoes that transmit West Nile virus, increasing human exposure risk to the disease (Harrigan et al. 2014, Paz 2015).

All of these public health threats have obvious negative implications for domestic industries and consumers.

5. *Ocean Acidification*

The ocean's absorption of anthropogenic CO_2 has already resulted in more than a 30% increase in the acidity of ocean surface waters, at a rate likely faster than anything experienced in the past 300 million years, and ocean acidity could increase by 150% to 200% by the end of the century if CO_2 emissions continue unabated (Orr et al. 2005, Feely et al. 2009, Hönisch et al. 2012). Ocean acidification negatively affects a wide range of marine species by hindering the ability of calcifying marine creatures to build protective shells and skeletons and by disrupting metabolism and critical biological function (Fabry et al. 2008, Feely et al. 2009, Kroeker et al. 2013). The adverse effects of ocean acidification are already being observed in wild populations, including reduced coral calcification rates (De'ath et al. 2009), reduced shell weights of foraminifera in the Southern Ocean (Moy et al. 2009), and mass die-offs of larval Pacific oysters in the Pacific Northwest (Barton et al. 2012). These impacts will have concrete effects on domestic industries associated with, and consumers of, our ocean's bounty, including the tourism and food industries.

6. *Biodiversity*

Climate change is harming life on the planet at all scales from genes to entire ecosystems, and it is increasing the extinction risk for many species. Climate change is already causing changes in distribution, phenology, physiology, genetics, species interactions, ecosystem services, demographic rates, and population viability: many animals and plants are moving poleward and upward in elevation, shifting their timing of breeding and migration, and experiencing population declines and extirpations (Parmesan and Yohe 2003, Root et al. 2003, Parmesan 2006, Chen et al. 2011, Maclean and Wilson 2011, Warren et al. 2011, Cahill et al. 2012).

Climate-related local extinctions are already widespread and have occurred in hundreds of species, including almost half of the 976 species surveyed, across climatic zones, clades, and habitats (Wiens 2016). Nearly half of terrestrial non-volant threatened mammals (47% of 873 species) and nearly one-quarter of threatened birds (23% of 1,272 species) may have already been negatively impacted by climate change in at least part of their distribution (Pacifici et al. 2017). A recent meta-analysis concluded that climate change is already impacting 82% of key ecological processes that form the foundation of healthy ecosystems and which humans depend on for basic needs (Scheffers et al. 2017).

Because climate change is occurring at an unprecedented pace with multiple impacts, climate change is predicted to result in catastrophic species losses during this century: 15%-37% of the world's plants and animals committed to extinction by 2050 under a mid-level emissions scenario (Thomas et al. 2004); the potential extinction of 10% to 14% of species by 2100 if climate change continues unabated (Maclean and Wilson 2011); and one in six species threatened with extinction under the current emissions trajectory (Urban 2015). As summarized by the 2014 National Climate Assessment, "landscapes and seascapes are changing rapidly, and species, including many iconic species, may disappear from regions where they have been prevalent or become extinct, altering some regions so much that their mix of plant and animal life will become almost unrecognizable" (Melillo et al. 2014: 196).

C. Because These Harms Greatly Outweigh The Purported Harms To Petitioners, The Commission Should Recommend The President Deny Any Relief in This Case.

Given the foregoing, there can be no legitimate dispute that the relatively minor potential impacts on Petitioners – two producers of CSPV cells and modules in the U.S. – of denying relief in this proceeding are exponentially trumped by the adverse social, economic, and other costs that would be imposed by the proposed tariffs' impacts on solar deployment across the country. Raising solar cell prices, and thereby dramatically slowing our transition to clean energy, can only further exacerbate the dire risks climate change poses to our nation.

Petitioners are two companies that seek redress for their inability to compete. However, these injuries, by any calculation, are grossly outweighed by the social and economic costs that the proposed tariffs will themselves cause. Due to the tipping point of widespread solar deployment in this country, the proposed tariffs threaten to make such solar deployment cost-prohibitive and, at the very least, stall the urgent clean energy transition necessary for the country and the climate.

On the other side of the coin, the benefits of *not* imposing the proposed tariffs will help maintain solar market competition, which will result in continued decreasing solar panel prices and increasing deployment. Wider solar PV deployment, in turn, will continue to provide invaluable environmental, public health, and climate mitigation and adaptation benefits, as discussed above.

Accordingly, the Commission can – and must – recommend that the President *deny* Petitioners' request for relief in this case, an outcome consistent with the approach taken in other cases where, as here, the costs of the proposed remedies greatly outweigh the purported benefits. *See, e.g., Nonrubber Footwear Import Relief Determination*, 50 Fed. Reg. 35,205 (1985) (rejecting proposed tariffs on the grounds that "import relief would place a costly and unjustifiable burden on U.S. consumers and the U.S. economy"); *see also Stainless Steel Flatware*, Inv. No. TA-201-30, USITC Pub. 884 (1978).

CONCLUSION

We urge the Commission to deny Petitioners' narrow request for relief in this case due to the extraordinary costs associated with obstructing solar PV deployment in the U.S. The remedy's purported benefits are limited to the interests of two companies. These minor benefits are unquestionably outweighed by the economic, social, and existential costs and risks associated with obstructing the country's solar PV deployment, stalling the country's clean energy transition, lengthening the country's dependence on dirty fossil fuels, and exacerbating the climate crisis.

[*Signatures to follow*.]

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