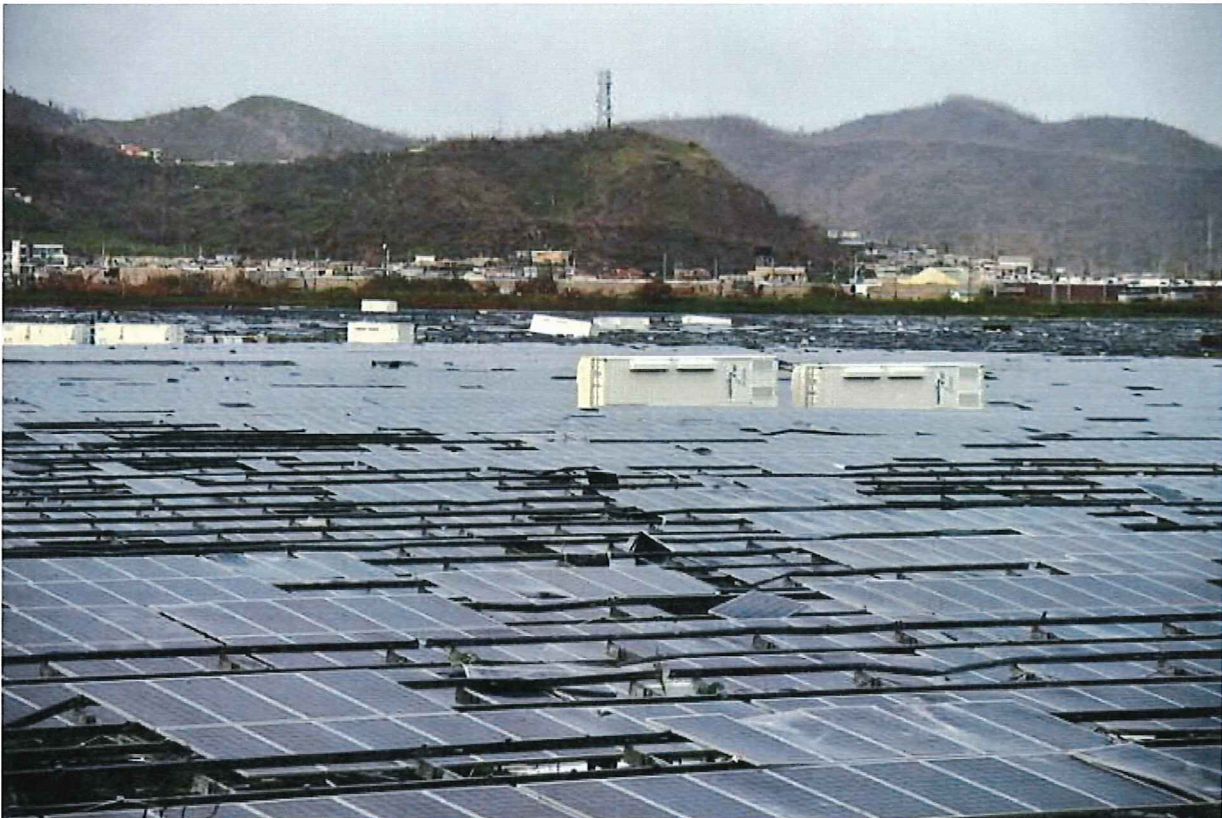


Taken from “**Storm-Ravaged Caribbean Is Eyeing Solar, But It Won’t Come Cheap**”
By Emma Ockerman
Updated on September 28, 2017

Stronger Panels



A damaged solar panel plant in Humacao, eastern Puerto Rico, on Sept. 27. Photographer: Hector Retamal/AFP via Getty Images

Puerto Rican Solar Farms Heavily Damaged By Hurricane Maria

September 28, 2017 | Dakota Smith

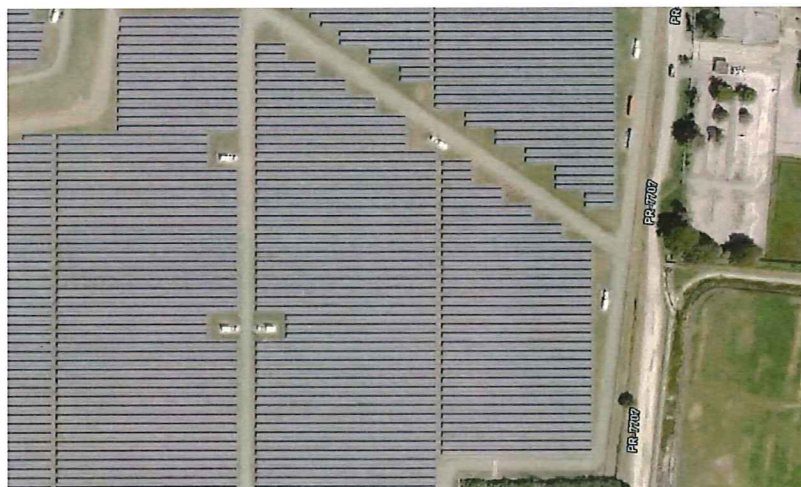
Hurricane Maria's flooding rains and raging winds heavily damaged Puerto Rico's solar farms - an emerging energy source for the U.S. territory.

In the first six months of 2017, solar surpassed wind as Puerto Rico's top producer of renewable energy. This trend comes as several large solar energy projects have found a home in the Caribbean Island in hopes to help solve their energy crisis. It's a trend in jeopardy, though, as new aerial imagery shows several of these farms partially destroyed after Hurricane Maria ravaged the island.

Puerto Rico's second largest solar farm, located in Humacao, took a direct hit from Maria's eyewall. The farm currently accounts for nearly 40% of solar-produced electricity on the island and is currently under expansion to produce even more. Unfortunately, a majority of the newly added solar panels were ripped from their foundation and completely destroyed by Maria's strong winds. These panels are so recent, the "before" image seen below doesn't include the expansion.



Another large solar farm, outside of Guayama, fared a little better but still saw some damage from Maria. This farm, dubbed the "Ilumina Project", was built in 2012 and was the first utility scale solar farm on the island. At one point, the project was the largest solar field in the Caribbean but has since been passed by several other Puerto Rican projects. It is considered one of the main catalysts for Puerto Rico's rapidly growing solar industry.



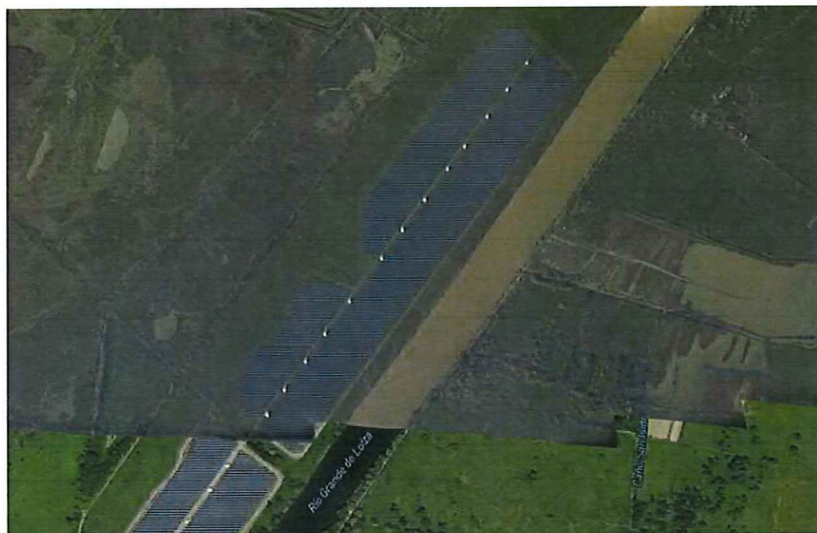
The fates of several other large solar facilities, including the island's largest site, are unknown as aerial imagery has not reached the entire island yet. More imagery is expected as the National Oceanic and Atmospheric Administration (NOAA) performs daily flights to collect aerial footage. This story will be updated as more images become available.

A smaller solar field attached to Humacao's sewage treatment facility was found to be nearly completely destroyed by Maria (below). The demolished solar panels provided the sewage plant with 60% of its energy and was part of a two million dollar private investment approved by Puerto Rican Governor Alejandro Padilla.



While the future of Puerto Rico's energy industry is the last thing on anyone's mind, Maria has undoubtedly setback one the island's fastest growing energy sources.

Update: After going through more NOAA imagery, I found some good news. The giant solar field built by TSK Solar (originally falsely said "Canadian Solar") (below) came out relatively unscathed after facing harsh winds from Irma and Maria. These panels are specifically designed to outlast hurricanes. Each panel is built several meters off the ground to avoid floods and reinforced to withstand winds of category 5 hurricanes (156mph).



(Imagery provided by the [National Oceanic & Atmospheric Administration](#). Energy data provided by the [U.S. Energy Information Administration](#))

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Tornado hits MN Guard's Camp Ripley

Jay Knoll, KARE 11:27 PM. CDT September 08, 2016



(Photo: Staff Sgt. Anthony Housey, Public Domain)

LITTLE FALLS, Minn. - The National Weather Service now says it was a tornado that caused extensive damage at the Minnesota National Guard's Camp Ripley.

A line of storms packing heavy winds rolled through Morrison County after 10 p.m. Wednesday. The National Weather Service reports an EF-1 tornado, with winds up to 90 miles-per-hour, touched down at approximately 10:34 p.m. It was about 50 yards wide and was on the ground between 7 and 8

miles.

“ Tornado hit central MN Wednesday night, including Camp Ripley. #mnwx (<https://twitter.com/hashtag/mnwx?src=hash>) pic.twitter.com/HtZuWfJ58i (<https://t.co/HtZuWfJ58i>)— NWS Twin Cities (@NWS Twin Cities) September 9, 2016 (<https://twitter.com/NWS Twin Cities/status/774058571495514112>)

The tornado caused major damage to Camp Ripley housing, training and maintenance facilities. There was also major damage to the 10-megawatt solar array that was set to be dedicated next week.



Camp Ripley received damage to multiple buildings including parts of the 60 acre solar field, built in cooperation with Minnesota Power, during a storm Sept. 7, 2016. (Photo: Staff Sgt. Anthony Housey, Public Domain)

"It was a complete surprise to us when it came," said Colonel Scott St. Sauver, who is Camp Ripley's post commander. "As you come down and see this kind of damage you say, 'Oh my goodness, it really was a shock'."

SKY 11 Storm damage at Camp Ripley



St. Sauver, who is the only person who lives full time on the grounds, said there was no warning. Several dozens of soldiers and civilians were sleeping in the impacted areas as tornado rolled through. No was injured, he said.

Storms hit Camp Ripley



Staff Sergeant Tanya Tschida was on the first floor of a two story building that was damaged when a portion of the roof blew off and landed close to her car. She said she didn't hear it.

"I actually happened to be sleeping in my bed," she recalled. "I looked out my door and saw two inches of water."

Her car was damaged, along with the vehicle next to hers. Camp Ripley staff members say another car was picked up and dropped several feet away.

As far as the solar array, it will be Minnesota Power's first solar power plant, according to the company. A company spokesperson told KARE 11 they are in the planning stages on how to fix it.

"This project was coming to an end and we were going to have a ribbon cutting next week," said Staff Sergeant Anthony Housey. "It took out everything in its path."

Now the cleanup and repair is underway.

"No one knew this was going to produce this kind of surgical storm," said St. Sauver.

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AUGUST 15, 2012

BIG DESERT SOLAR PROJECT HIT BY WIND, FLOOD

Wind-whipped downpours in late July at the site of an under-construction government-backed utility-scale solar project in the desert of southeastern California caused extensive damage, according to preliminary documents (http://www.energy.ca.gov/sitingcases/genesis_solar/compliance/submittals/July-31-2012_Flood_Event/) released by the California Energy Commission.

An inspector from the commission, in an email included among the documents released, said estimated damage to NextEra Energy's Genesis Solar Project was \$3 million, and said work on the project would be delayed about one month.



[\[http://d2r42o2f7hk334.cloudfront.net/wp-content/uploads/2012/08/genesis-flood-5.jpg\]](http://d2r42o2f7hk334.cloudfront.net/wp-content/uploads/2012/08/genesis-flood-5.jpg)
Damaged parabolic trough solar collector. (image via NextEra Energy)

In an Aug. 7 email – a week after the July 30 and 31 rains – Mike Conway wrote: “Things are actually pretty good after the storm, they were back to work yesterday. 90% of the problems were related to earthen berms they constructed for temporary access. The berms caused most of the flooding and severe damage. The channels and dissipation structures worked as they were designed.”

How much money can a solar roof save you in your state?



Profit from your roof space: find local deals on solar in your area, eliminate your power bill, and join the solar revolution.

Your Zip Code

Calculate My Savings!

The storm toll did include damage to some 195 mirrors on the parabolic troughs the power plant will use to collect the sun's energy.

Alexander C. Stern
Associate General Regulatory Counsel

Law Department
PSEG Services Corporation
80 Park Plaza – T5G, Newark, New Jersey 07102-4194
tel: 973.430.5754 fax: 973.430.5983
email: alexander.stern@pseg.com



June 28, 2013

In The Matter of the Petition of
Public Service Electric and Gas Company
for Approval of Changes in its
Electric Green Programs Recovery Charges
and its Gas Green Programs Recovery Charges
“2013 PSE&G Green Programs Cost Recovery Filing”

BPU Docket No. _____

VIA ELECTRONIC MAIL & OVERNIGHT MAIL DELIVERY

Kristi Izzo, Secretary
Board of Public Utilities
44 South Clinton Avenue
CN 350
Trenton, New Jersey 08625-0350

Dear Secretary Izzo:

Enclosed please find an original and ten copies of Public Service Electric and Gas Company’s (PSE&G, the Company) filing in the above-referenced matter.

A CD containing electronic workpapers is being provided to your office and those shown below.

Very truly yours,

A handwritten signature in blue ink that reads "Alexander C. Stern".

Attachment

(Hard Copy and CD)

C Elizabeth Ackerman
Jerome May
Alice Bator
Stacy Peterson
Michael Winka
Caroline Vachier
Stefanie Brand (2)

1 total gross revenue from sales of \$2,533,666. The net proceeds of these auctions are credited
2 to ratepayers. The table below provides a summary of the Solar 4 All SREC auction activity
3 through March 2013.

Solar 4 All - SREC Auctions Payments December 2012 – March 2013

Auction Period	SREC Energy Year (EY)	Total SRECs Sold	Auction Payment
March 2013	EY 2013	22,620	\$ 2,533,666
Grand Total		22,620	\$ 2,533,666

4
5

Emission Reductions

6 Schedule TJM-S4A-6 shows the estimated emissions reductions by segment
7 under the Program.

8 **Reporting**

9 PSE&G began filing monthly capacity reports in December 2009. At the
10 request of BPU Staff, an enhanced monthly report has been recently developed. The first
11 filing of this enhanced report (“Solar 4 All Monthly Program Activity Report”) was issued on
12 June 1, 2012, for the period ending April 2012.

13

14 **C. Solar 4 All Expenses**

15 The total Solar 4 All expenses in this filing are based upon actual costs for the
16 period December 1, 2012 through March 31, 2013 and projected costs through September 30,
17 2014. For Segment 1, the total actual Administrative Costs for the period December 1, 2012
18 through March 31, 2013 were \$1,318,691. For Segment 2 the corresponding amount was

1 \$513,159. Additional detail, including forecasted costs through 2014, is contained in
2 Schedule TJM-S4A-8.

3 In accord with the Board's December 15, 2011 PSE&G Green Programs cost
4 recovery Order at BPU Docket No. ER10100737 from program inception through 2013, the
5 total operating expenses for Solar 4 All (including O&M costs, administrative costs, rent and
6 insurance), are capped at \$23.3 million. Schedule TJM-S4A-8 shows the actual annual
7 administrative costs through March 31, 2013 and forecasted administrative costs for the
8 balance of 2013. The current projection is that the Program will be below the allowed cap.
9 Accordingly, the GPRC Administrative Costs shown in Schedule TJM-S4A-7 have been
10 incorporated into the revenue requirements contained in the testimony and supporting
11 schedules of Stephen Swetz.

12

13 **D. Issues & Discussion**

14 Within Segment 1, five solar plants sustained significant damage from storm
15 surge, winds, and lightning due to Superstorm Sandy. The sites were 1) Linden, 2) Bayonne,
16 3) Raritan Center, 4) Central HQ, and 5) Mill Creek. Additionally, several other sites
17 sustained minor damages to exterior fences, solar panels, racking, cable trays, and trees. As
18 of March 31, 2013, all but one of the plants has been returned to full capacity. For Segment
19 2, approximately 300 panels were damaged due to utility poles coming down during the
20 storm. No pole attached units were blown off racking as a result of the storm.

21 Through March 2013, Solar 4 All storm-related expenses have totaled
22 \$247,592. PSE&G currently estimates that the cost of all Solar 4 All storm-related repairs

1 will be \$3,194,786 and has included this additional amount in the forecast period. These
2 costs are accounted for separately from the electric and gas distribution storm costs reported
3 in Docket AX13030196.

4 The solar facilities are insured by Lloyds of London with a deductible.
5 PSE&G is interacting with the carrier pursuant to its insurance policy and is seeking
6 reimbursement of costs incurred to restore the solar facilities to pre-storm conditions and
7 operations. PSE&G is currently estimating that, net of deductibles and other non-
8 reimbursable expenses, the insurance payments will total \$2,994,785.79, which has been
9 included in the forecast. Additionally, PSE&G is seeking reimbursement of lost revenue
10 attributable to business interruption from the insurance carrier.

11 The following is a summary of the damage to the five solar plants.

12 **Linden**

13 Linden suffered damage as a result of flooding from the storm surge
14 submersing the entire solar array and equipment pads under brackish water. Inverters,
15 combiner boxes, solar panels, racking, cables, monitoring equipment, meters, and electrical
16 connectors suffered damages and have been replaced. Restoration efforts also included
17 cleaning and testing switchgear and transformers, and commissioning the facility upon full
18 restoration.

19 **Bayonne**

20 The Bayonne solar facility suffered damage from flooding (storm surge)
21 impacting the equipment pad housing inverters, switchgear, monitoring equipment, and

1 transformers. Inverters and monitoring equipment were replaced, and the switchgear and
2 transformers were cleaned.

3 **Raritan Center**

4 The Raritan Center solar facility suffered damage from flooding (storm surge)
5 impacting the equipment pad housing 2 of the 5 inverters, DC and AC disconnects,
6 switchgear, and transformer. Inverters, and disconnects were replaced and switchgear and
7 transformers were cleaned. Electrical cable trays were twisted, and roof damage was
8 sustained by high winds and has been fixed.

9 **PSE&G Central Division Headquarters**

10 Central HQ sustained roof damage due to high winds, and solar panels and
11 combiner boxes required replacement and repair caused by those winds.

12 **Mill Creek Solar**

13 Mill Creek sustained damages from wind which dislodged solar panels from
14 racking and from a lightning strike which damaged DC cables and combiner and re-combiner
15 boxes. Equipment, cables, and combiner boxes have been restored.

16 Additionally, the following sites sustained minor damage:

Site	Damage
Silver Lake	<ul style="list-style-type: none">• Twenty feet (20') of fence damaged by fallen trees• Trees cut and cleared
Yardville	<ul style="list-style-type: none">• 2 Panels dislodged from racking and were damaged• Sections of racking replaced and repaired• 3 trees blown over exposing and destroying the root system
Matrix Stults Road	<ul style="list-style-type: none">• Solar Panel wind shields and racking damage
Rider	<ul style="list-style-type: none">• Approximately 300 feet of fence wrap replaced and repaired

17

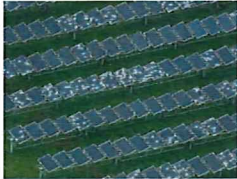
18

A matrix of Minimum Filing Requirements is included in Appendix A-S4A.

19

Alamo 2 solar farm damaged by Tuesday's hail storm

Jeremy Baker, KENS 11:18 AM. CDT April 10, 2017



(Photo: KENS)

Homeowners continue to estimate the staggering damage from Tuesday's big hail storm including the cost of ruined solar panels. But a solar farm on the northeast side may have the most panels cracked and crushed.

After the storm, a bird's-eye view shows damage to what looks like close to a quarter of the Alamo 2 solar farm panels located off Binz-Engleman Road. Some of the panels seem to have been hit by at least six to nine large hailstones. Others were

left completely untouched.

There are close to 18,000 solar panels at Alamo 2 that can power about 800 homes. OCI, who runs the solar farm, said that because of the damage, the power the farm puts out has been diminished but they are still trying to determine to what extent.

"I was at home and watching TV and all of a sudden I hear all this noise outside and I had no idea what was happening," homeowner Mitch Childress said.

Childress lives about half a mile down the street from the solar farm. He has 40 solar panels on his roof. Of those panels, 14 got smacked on Tuesday night.

"We were hoping there wasn't going to be too much damage but it turns out there was a pretty good amount," he said.

Childress added that the panels from Freedom Solar were turned on for the first time two days before the storm, but now he's had to shut them all off.

"I know that Freedom Solar has a lot of customers, and I'm just waiting my turn for them to come, and the maintenance people to come and take a look at it," he said.

They'll assess the damage to his panels while OCI will continue to assess the damage to theirs.

There aren't just solar panels at Alamo 2, though. There are sheep who take care of the grass. Thankfully, they seem to have weathered the storm just fine.

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