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Project Title:	Palen Solar Power Project - Compliance
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Document Title:	Palen Solar Holdings, LLC's Corrections to 7.30.14 Evidentiary Hearing Transcript
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PSH Corrections to July 30, 2014 Transcript

Page 32, Line 2; change “draw” to “does”.

Page 32, Line 17; change “trans up in cold 1” to “TRANS-7 and CUL-1”.

Page 58, Line 6; change “cost” to “condition”.

Page 65, Line 6; change “efficient” to “emissions”.

Page 67, Line 21; change “alphabet” to “output”.

Page 70, Line 20; change “arbitral” to “arbitrage”.

Page 72, Line 4; change “can” to “cannot”.

Page 73, Line 6; change “to operation” to “following”.

Page 83, Line 8; change “PBA” to “PPA”.

Page 84, Line 13; change “(Inaudible)” to: “I am a partner at Energy and Environmental Economics, Inc., otherwise known as E3, located in San Francisco.”

Page 86, Line 5; change “throughout the state policy argument here” to “throughout my statement here”

Page 86, Line 8; change “I’ll ask” to “he asks”

Page 86, Lines 17-18; change “I’d ask” to “he asks”

Page 86, Line 22; change “an implication of” to “identification of”

Page 86; Line 24; change “of thousands” to “with thousands”

Page 87, Lines 2-6; paragraph should read “And as a result, these types of systems are typically developed through different mechanisms such as utility tariff structures, such as Net Energy Metering, a feed-in tariff, some kind of a policy program rather than through a central utility procurement mechanism.”

Page 87, Line 11; change “92” to “an order of magnitude”

Page 87, Lines 15-16; change “I remember one of the” to “there are a number of”

Page 87, Line 21; change “it seems appropriate” to “it is inappropriate”

Page 87, Line 24; change “in 1179, I also brought out” to “1179 also rebuts”

Page 88, Line 2; change “Section (inaudible)” to “Section 2”

Page 88, Line 8; change “in the (inaudible), PV rules” to “individual PV arrays”

Page 88, Line 9; change “not functionally connected” to “not functionally equivalent”

Page 88, Line 9; change “single solar power project” to “single solar power tower project”

Page 88, Line 10; change “spring turbine” to “spinning turbine”

Page 88, Line 13; change “savings of” to “decisions about”

Page 88, Line 17; change “under the project” to “energy project”

Page 89, Line 10; change “station capacity” to “system capacity”

Page 89, Line 17; change “some level (inaudible) penetration” to “some level of renewable penetration”

Page 89, Line 23; change “including (inaudible)” to “including my firm’s recent”

Page 90, Line 6; change “potentially (inaudible) constrains” to “potential flexibility constraints”

Page 90, Line 8; change “RPS loads” to “RPS levels”

Page 90, Line 13; change “they’re chalking up” to “by charging up”

Page 90, Line 15; change “counter to economics” to “counter to today’s economics”

Page 90, Line 18; change “different (inaudible)” to “different storage”

Page 91, Line 10; change “definition” to “discussion”

Page 91, Line 16; change “48 to 50 megawatts towards FCE’s 550 or 580 megawatt” to “458 megawatts towards SCE’s 580 megawatt”

Page 91, Line 18; change “And So I looked and there was still a lot of” to “and so as of today there is still a lot of”

Page 91, Line 25; change “including distributed energy storage” to “including thermal energy storage”

Page 92, Line 14; change “much larger (inaudible) PV project” to “much larger ground-mounted PV project”

Page 92, Line 16; change “kilowatt rooftop systems” to “500 kilowatt rooftop systems”

Page 92, Line 20; change “of Mr. Powers’ site” to “that Mr. Powers cites”

Page 92, Line 22; change “cost adding five hours of battery storage” to “cost of adding three hours of battery storage”

Page 93, Line 5; change “project (inaudible)” to “project would achieve (32% vs. 17%)”

Page 93, Line 9, change “prevent barring storage” to “prevent battery storage”

Page 93, Line 16, change “very broad signing” to “very broad finding”

Page 93, Line 20; change “I’ll promise that” to “opponents of”

Page 102, Line 23; change “So effectively (inaudible) a similar number to” to “So effectively the CPUC arrived at a similar number to”

Page 103, Line 3; change “five percent of (inaudible) peak load” to “five percent of coincident peak load”

Page 103, Line 23; change “using the costing” to “using the capacity”

Page 104, Line 5; change “Now, (inaudible) the thought” to “Now, this does have the effect of”

Page 104, Line 8; change “more and more” to “load”

Page 104, Line 22; change “has (inaudible) anticipate” to “effectively anticipates”

Page 105, Line 3; change “this is not (inaudible)” to “this is not a floor”

Page 105, Line 24; change “the intent is for” to “the incentives for”

Page 107, Line 25; change “how the (inaudible) whether” to “how the cost numbers are quoted, whether”

Page 110, Line 11; change “20 50-kilowatt rooftop” to “20 500-kilowatt rooftop”

Page 117, line 5; change “I guess, (inaudible) piece” to “I guess I brought in one new piece”

Page 135, Line 9; change “some level of thermal solar penetration,” to “some level of renewable energy penetration”

Page 135, Line 24; change “higher models” to “higher levels”

Page 136, Line 2; change “viability” to “variability”

Page 136, Line 9; change “provided by wind sources” to “provided by energy sources”

Page 136, Line 14; change “strong buy-in of power” to “strong diurnal pattern”

Page 137, Lines 4-5; change “(inaudible) relations” to “sub-hourly variations”

Page 137, Line 5; change “pump type of storage” to “pumped hydro storage”

Page 137, Lines 7-8; change “mixed amount of time scales” to “many different time scales”

Page 138, Line 4; change “during the middle hours” to “during the morning hours”

Page 165, Line 16; change “Inertial” to “Inertia” in both places.

Page 165, Line 22; change “frequently” to “frequency”.

Page 167, Line 19; change “(inaudible)” to “the State”.

Page, 138, Line 16; change “aim that energy” to “and with that energy”

Page 170, Line 11; “removable” is “renewable”

Page 170, Line 20; “RAPAR (phonetic)” is “ratepayer”

Page 175, Line 16; “claimant” is “climate”

Page 176, Line 1; “data” is “adder”

Page 178, Line 2; “low” is “load”

Page 179, Line 4; “data” is “adder”

Page 191, Lines 10 and 11; should be attributed to Mr. Galati who for the record is not female.

Page 204, Line 1; “mind” should be changed to “mined”.

Page 204, Line 13; “start it in tanks run” should be changed to “store it in tanks”.

Page 204, Line 15; “—and” should be deleted from the sentence.

Page 204, Line 18; “start in the” should be changed to “store it in a”.

Page 205, Line 11; “viral” should be changed to “soil”.

Page 205, Line 14; “(inaudible)” should be changed to “material”.

Page 209, Line 21; “whole” should be changed to “full”.

Page 234, Line 13; “agree” should be “disagree”

Page 244, Lines 17 through 23; should be corrected to read as follows:

"~~(Inaudible) to~~ The document**s** **show that there are** ~~the~~ differences ~~on~~ **in the parties' views on the risk posed by** ~~(inaudible)~~ exposure to solar flux and the right level of solar flux**, and we can** understand **this from a** ~~what the~~ basic or fairly **basic** look **at** ~~of~~ the physics of light and heat, and take a little **break** from biology and explain some **of the** physics behind it. So electromagnetic radiation is a form of ~~light~~ **radiant** energy. It's often called radiant energy. The way"

Page 245, Line 1; should be corrected to read as follows:
"that ~~(inaudible)~~ **propogate** as ~~a variety of~~ particles**, but** in waves."

Page 245, Line 2; should be corrected to read as follows:
"Now, if you can look at Exhibit 1201, this shows **the**"

Page 245, Line 5; should be corrected to read as follows:
"**scale** ~~access~~ of wave length. So if you're going from left to"

Page 245, Line 9; should be corrected to read as follows:
"So those ~~(inaudible)~~ **bands** are kinds of"

Page 245, Line 11; should be corrected to read as follows:
"~~(inaudible)~~ **wavelengths** and, of course, other frequenc~~y~~**ies**, but we won't"

Page 245, Line 13; should be corrected to read as follows:
"So ~~how can~~ **looking at** the main ~~(inaudible)~~ **part** of the graph in"

Page 245, Lines 16 through 22; should be corrected to read as follows:
"spectrum, which have very familiar names, like ~~naonwaves~~ **radio waves**, microwaves ~~(inaudible)~~ **and then** it says on the graph ~~intro, usable~~ **infrared, visible** light, ultraviolet, lots of forms of light, x-rays. So these **are** different kinds of electromagnetic radiation ~~are (inaudible)~~ **divided into different bands**. So **light** energy ~~into~~ **is** a form of radiant energy, and we can see it in 1201, ~~and~~ **which shows** electromagnetic energy in the full"

Page 246, Lines 1 through 3; should be corrected to read as follows:
"called **the** solar spectrum, which is in Exhibit 1202. ~~(Inaudible)~~ **This chart is familiar** to anybody who works in solar energy, the top ~~column~~ **line or curve** on the graph is ~~(inaudible)~~ **the irradiance** at the

Page 246, Lines 6 through 7; should be corrected to read as follows:
"curve **which** is a choppy line **is what** ~~that~~ makes it down to sea level. And ~~the~~ **this** specific one relates to what's called, it's an

Page 246, Lines 11 through 14; should be corrected to read as follows:
“So looking at ~~(inaudible)~~ **this chart** we can see that ~~thermal~~ **solar** radiance or the ~~fair~~ **solar** spectrum ~~power~~ **part** of the electromagnetic spectrum is approximately ~~about no more than~~ 14200 nanometers **to** ~~(inaudible)~~ **3**~~2~~,000 nanometers. Or,”

Page 246, Lines 18 through 25; should be corrected to read as follows:
“and that’s ~~graunlite~~ **more or less green light**, as we know it. And in fact, 9~~0~~**7** percent of all the energy in the ~~fair~~ **solar** spectrum that comes from the sun is in ~~white lines~~ **wavelengths** between 250 nanometers and 1,800 nanometers. And that’s when the ~~(inaudible)~~ **portion** of the infrared light. Okay, so **that’s** how ~~can does~~ energy gets to earth through the atmosphere and how it’s distributed by different wave lengths. Now, **solar** ~~thermal~~ flux is a measure of

Page 247, Line 2; should be corrected to read as follows:
“we can characterize ~~thermal~~ **solar** flux by the familiar watts per”

Page 247, Lines 5 and 6; should be corrected to read as follows:
“energy. It’s ~~(inaudible)~~ **easier** to understand physically than light energy because it’s just most**ly** ~~of those~~ subatomic”

Page 247, Line 25; should be corrected as follows:
“~~(inaudible)~~ **in fluids** such as ~~microwaves~~ **liquids** or gases, which then carry”

Page 248, Lines 1 through 25; should be corrected as follows:
“the heat away. **Like when you blow on your soup, the air from your breath** ~~(Inaudible)~~ is convecting the heat away from the soup. And not to confuse you, but ~~this round~~ **the rate** of heat transfer can also be measured in ~~elementric~~ **the same units of** watts per square meter**, the** ~~In the~~ same ~~way~~ **units** we use for solar flux. And that heat **transfer** is called ~~solar~~ **thermal** flux. So flux, in terms of watts per square meter is a ~~way~~ **measure** of transferring energy and it can apply ~~in~~ **to** different kinds of energy, light energy, or radiant energy, and thermal energy. ~~(Inaudible~~) **Back to heat transfer: the third heat** transfer mechanism is radiation. **It takes us back around** ~~It makes its round in~~ to our discussion of solar flux. It brings us back to where we started talking about electromagnetic radiation. When objects get hot they ~~(inaudible)~~ **radiate** electromagnetic energy in the infrared portion of the spectrum. All objects or all objects above ~~optimum (inaudible)~~ **absolute zero** but for all practical purposes all objects. The hotter the object, the more energy it radiates. That’s we get our heat from the sun through ~~radioactive~~ **radiative** heat transfer. That’s also how so-called thermal ~~energy~~ **imaging** works, Infrared ~~(inaudible) they~~ **cameras** can’t **really read** ~~run on low~~

temperatures. They ~~have the~~ **see** radiant energy or infrared light and ~~(inaudible) the~~ **translate its intensity and wavelength to** temperature based on its built-in software. But light energy and even infrared **light** energy is not heat."

Page 249, Line 2; should be corrected as follows:
"that it hits it is converted to solar energy. ~~(Inaudible)~~ **As we all learned as kids,"**

Page 249, Line 4; should be corrected as follows:
"why light-colored clothes are more comfortabl**e**~~y~~ in a sunny"

Page 249, Lines 6 through 10; should be corrected as follows:
"nothing. The glass in ~~y~~our heliostat ~~varies~~ **mirrors**, for example. It's imperfectly transparent so it ~~(inaudible)~~ **absorbs a little bit, a few percent, mostly in the low end of** the solar spectrum, ~~with~~ **which is** the ultraviolet. ~~None~~ **A little** of the infrared and some ultraviolet. Air, **which is** transparent, absorbs for all practical"

Page 249, Lines 17 through 20; should be corrected as follows:
"and conflation is when **the** identities of~~ thermal conflux~~ **two or more concepts, sharing** ~~is showing~~ some characteristics of one another seem to be a ~~similar~~ **single** identity. Flux ~~works with (inaudible)~~ **applies to both heat and light** and the differences"

Page 249, Lines 23 through 25; should be corrected as follows:
"statements in the record we can show that **heat** ~~in~~flux has been conflated **with** ~~like~~ light flux ~~(Inaudible) and.~~ **resulting in errors or**
25 misunderstandings ~~we get in~~ **regarding** estimates of avian impacts due **to flux**"

Page 260, Line 25; "McClury" should be changed to "McCrary".

Page 268, Lines 21 through 23; should be corrected as follows:
"quickly. So wind, you know, ~~(inaudible)~~ **will convect the heat away from the receiver and a few meters away** it might still be a couple hundred degrees. But again, you know, that's a**t** maximum flux. The hot air's not going to be **very far from the receiver**

Page 390, Lines 9 and 10; should be corrected to read as follows:
"heliostats and ~~spillby~~ **standby** during the early months than during ~~(inaudible)~~ **commercial operation.**"

Page 427, Line 23; "RADA" should be changed to "radar".