

CASE NO. 895-AT-18

SUPPLEMENTAL MEMORANDUM #1

February 23, 2018

Petitioner: Zoning Administrator

Request: Amend the Champaign County Zoning Ordinance to add “Solar Farm” as a new principal use under the category “Industrial Uses: Electric Power Generating Facilities” and indicate that Solar Farm may be authorized by a County Board Special Use Permit in the AG-1 Zoning District and the AG-2 Zoning District; add requirements and fees for “Solar Farm”; add any required definitions; and make certain other revisions are made to the Ordinance as detailed in the full legal description in Attachment A.

Location: Unincorporated Champaign County

Time Schedule for Development: As soon as possible

Prepared by: **Susan Burgstrom**
Senior Planner

John Hall
Zoning Administrator

COMMENTS RECEIVED FROM TED HARTKE

Attached are emails from Ted Hartke regarding concerns related to the proposed amendment. Mr. Hartke has been communicating via email with the Zoning Administrator regarding solar farm requirements since June 2017, and had specifically requested that the email sent at 12:51 p.m. on 1/2/18 be “printed in full color and handed to the decision makers” but the Zoning Administrator mistakenly overlooked that request.

All of Mr. Hartke’s emails and attachments are attached.

ATTACHMENTS

- A Legal advertisement
- B Email from Ted Hartke dated 6/3/17 RE: solar project problems pointed out in Huron County, Michigan...moratorium enacted
- C Email from Ted Hartke dated 6/13/17 RE: solar panel weed growth and fires during dry conditions
- D Email from Ted Hartke dated 9/17/17 RE: Solar project moratorium and info about a New York project
- E Email from Ted Hartke dated 1/2/18 at 12:02 p.m. RE: proposed Champaign County solar farm amendment

- F Email from Ted Hartke dated 1/2/18 at 12:17 p.m. RE: Fwd: Dr. Schomer's Boone County testimony
- G Email from Ted Hartke dated 1/2/18 at 12:51 p.m. RE: Fwd: Hartke pointers for establishing noise limits
- H Email from Ted Hartke dated 2/22/18 at 2:59 p.m. RE: FW: Proposed Solar Farm Requirements
- I Email from Ted Hartke dated 2/22/18 at 5:14 p.m. RE: FW: Proposed Solar Farm Requirements

LEGAL PUBLICATION: WEDNESDAY, FEBRUARY 14, 2018

CASE: 895-AT-18

**NOTICE OF PUBLIC HEARING REGARDING A PROPOSED AMENDMENT TO THE
CHAMPAIGN COUNTY ZONING ORDINANCE.**

CASE: 895-AT-18

The Champaign County Zoning Administrator, 1776 East Washington Street, Urbana, has filed a petition to change the text of the Champaign County Zoning Ordinance. The petition is on file in the office of the Champaign County Department of Planning and Zoning, 1776 East Washington Street, Urbana, IL.

A public hearing will be held **Thursday, March 1, 2018, at 6:30 p.m.** prevailing time in the Lyle Shields Meeting Room, Brookens Administrative Center, 1776 East Washington Street, Urbana, IL, at which time and place the Champaign County Zoning Board of Appeals will consider a petition to:

Amend the Champaign County Zoning Ordinance as follows:

Part A. Amend Section 3 by adding definitions including but not limited to “NOXIOUS WEEDS” and “SOLAR FARM”.

Part B. Add paragraph 4.2.1 C.5. to indicate that SOLAR FARM may be authorized by County Board SPECIAL USE permit as a second PRINCIPAL USE on a LOT in the AG-1 DISTRICT or the AG-2 DISTRICT.

Part C. Amend Section 4.3.1 to exempt SOLAR FARM from the height regulations except as height regulations are required as a standard condition in new Section 6.1.5.

Part D. Amend subsection 4.3.4 A. to exempt WIND FARM LOT and SOLAR FARM LOT from the minimum LOT requirements of Section 5.3 and paragraph 4.3.4 B. except as minimum LOT requirements are required as a standard condition in Section 6.1.4 and new Section 6.1.5.

Part E. Amend subsection 4.3.4 H.4. to exempt SOLAR FARM from the Pipeline Impact Radius regulations except as Pipeline Impact Radius regulations are required as a standard condition in new Section 6.1.5.

Part F. Amend Section 5.2 by adding “SOLAR FARM” as a new PRINCIPAL USE under the category “Industrial Uses: Electric Power Generating Facilities” and indicate that SOLAR FARM may be authorized by a County Board SPECIAL USE Permit in the AG-1 Zoning DISTRICT and the AG-2 Zoning DISTRICT and add new footnote 15. to exempt a SOLAR FARM LOT from the minimum LOT requirements of Section 5.3 and paragraph 4.3.4 B. except as minimum LOT requirements are required as a standard condition in new Section 6.1.5.

Part G. Add new paragraph 5.4.3 F. that prohibits the Rural Residential OVERLAY DISTRICT from being established inside a SOLAR FARM County Board SPECIAL USE Permit.

Part H. Amend Subsection 6.1.1 A. as follows:

1. Add SOLAR FARM as a NON-ADAPTABLE STRUCTURE and add references to the new Section 6.1.5 where there are existing references to existing Section 6.1.4.
2. Revise subparagraph 6.1.1 A.11.c. by deleting reference to Section 6.1.1A. and add reference to Section 6.1.1A.2.

Part I. Add new subsection 6.1.5 SOLAR FARM County Board SPECIAL USE Permit with new standard conditions for SOLAR FARM.

Part J. Add new subsection 9.3.1 J. to add application fees for a SOLAR FARM zoning use permit.

Part K. Add new subparagraph 9.3.3 B.8. to add application fees for a SOLAR FARM County Board SPECIAL USE permit.

All persons interested are invited to attend said hearing and be heard. The hearing may be continued and reconvened at a later time.

Catherine Capel, Chair
Champaign County Zoning Board of Appeals

TO BE PUBLISHED: WEDNESDAY, FEBRUARY 14, 2018 ONLY

Send bill and one copy to: Champaign County Planning and Zoning Dept.
Brookens Administrative Center
1776 E. Washington Street
Urbana, IL 61802
Phone: 384-3708

Susan Burgstrom

From: John Hall
Sent: Thursday, February 22, 2018 4:52 PM
To: Susan Burgstrom
Subject: FW: Solar project problems pointed out in Huron County Michigan...moratorium enacted

From: Ted Hartke [mailto:tedhartke@hartke.pro]
Sent: Saturday, June 3, 2017 10:38 AM
To: John Hall <jhall@co.champaign.il.us>
Subject: Solar project problems pointed out in Huron County Michigan...moratorium enacted

Dear John,

Update on solar energy projects.....there is some movement in Michigan to watch and observe:

<http://www.michigansthum.com/news/article/County-planners-endorse-solar-moratorium-11141374.php>

Cypress Creek Renewables is the same company up there who is working down here. I think you should contact Huron County and figure out what is up with it. The article does not say much except that

"He told the planners that in researching Cypress Creek Renewables, LLC — the company courting local farmers to allow solar development on their land for \$800 an acre — "there were things that didn't add up."

The company, Vaughan said, has never constructed a solar farm. It is a land acquisition company that has purchased already-built solar farms.

Cypress Creek officials sent an email to Jeff Smith, county building and zoning director, saying that due to a mandatory company meeting, no one was able to attend Wednesday's public hearing.

The planners also discussed the fact that solar development would affect enrollment in PA 116, the state's farmland preservation program.

Anything that is developed for commercial solar would have to be pulled from the program and rezoned industrial or commercial."

I think it is possible that Cypress Creek Renewables might not be totally upfront about what they are doing here.....so let's be careful since this appears to be progressing along. I don't know what to think about it except to tell you to be prepared as much as possible. If you read the entire article, it looks like red flags are being raised.

Best regards,
Ted Hartke

Special message: **My email was hacked Dec 30, 2016.** If you received a message that looks like it came from me and it asks you to click a link to share files, DO NOT CLICK ON LINKS OR ICONS. I will never send you a link or ask you to download anything unless I include a detailed project-specific correspondence. To protect yourself, never attempt to download files or click links which seem random or out of the ordinary.

Theodore P. Hartke, PE, PLS
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Huron Daily Tribune <https://www.michiganstthumb.com/news/article/County-planners-endorse-solar-moratorium-11141374.php>

County planners endorse solar moratorium

Brenda Battel, Tribune Staff Writer Published 9:03 am, Friday, May 12, 2017

BAD AXE — Before allowing commercial solar development in county-zoned townships, there are a few things officials need to sort out.

There must be an ordinance, the **Huron County Master Plan** needs to progress, and the taxation of solar development must be investigated.

The **Huron County Planning Commission** supported on Wednesday a year-long moratorium that previously was suggested by the **Huron County Board of Commissioners**.

The planners voted 8-0, with one member absent, to direct the board to enact a one-year moratorium on commercial solar development.

It could be rescinded once an ordinance is in place and will have the option of a one-year extension.

During the public hearing prior to the vote, three of the 20 people in attendance addressed the commission.

One of them was county commissioner **Steve Vaughan**.

He told the planners that in researching Cypress Creek Renewables, LLC — the company courting local farmers to allow solar development on their land for \$800 an acre — “there were things that didn't add up.”

The company, Vaughan said, has never constructed a solar farm. It is a land acquisition company that has purchased already-built solar farms.

Cypress Creek officials sent an email to **Jeff Smith**, county building and zoning director, saying that due to a mandatory company meeting, no one was able to attend Wednesday's public hearing.

The planners also discussed the fact that solar development would affect enrollment in PA 116, the state's farmland preservation program.

Anything that is developed for commercial solar would have to be pulled from the program and rezoned industrial or commercial.

Smith said Huron County has 452,185.7 acres of agricultural land, 75 percent of which is enrolled in PA 116.

Planner **Charles Bumhoffer** noted that this leaves 113,000 acres out of the program and potentially available for solar development without penalty.

Special use permits are another option to use to permit solar development.

Spot zoning, which could arise from the use of special use permits, can cause legal problems.

“We have always been against spot zoning,” planner **Mary Babcock** said.

Voters do not have a say in the granting of special use permits, as they do in granting overlay districts, which was the procedure followed for wind development.

Smith emphasized that ultimately, planners look to the master plan to decide what kind of development is allowed in the

county. Before the vote in support of the yearlong moratorium, planner **Robert Oakes** moved to endorse a three-month moratorium that would be renewable four times, every three months, if needed by the board of commissioners and planners.

Supporters thought this would speed up the process.

Those against the move said that there is no rush, and the county first needs to focus on its master plan and the moratorium against wind development.

But Smith reminded the planners that voters turned down the county's two proposed wind developments last week.

County commissioner **Sami Khoury**, who is a liaison between the two boards, said taxation and disclosure of costs for commercial solar must be investigated, as the county awaits decisions by the Michigan Tax Tribunal on hundreds of cases involving wind turbine tax revenue.

Lessons learned in wind energy development were a definite factor in discussing solar development.

"I don't want to get caught like we did with the wind turbines," said **Robert McLean**, planning commission vice chair. "I don't want to be pushed into a corner."

Planner **Carl Duda** said that with the summer growing and vacation seasons coming, it would be best for the commission to take its time.

Oakes said that to cover everything on its plate, more than one monthly meeting may be necessary for the commission.

Bill McPhee of Hume Township spoke during public comment at the end of the meeting.

He said if more than one meeting a month is necessary to do the job, so be it.

"It doesn't matter whether it's the summer or wintertime. You have a job to do," McPhee said.

The board of commissioners is expected to take action on the solar moratorium at its May 23 meeting, which is scheduled for 9 a.m.

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HEARST

Susan Burgstrom

From: John Hall
Sent: Thursday, February 22, 2018 4:52 PM
To: Susan Burgstrom
Subject: FW: Solar panel weed growth and fires during dry conditions.

From: Ted Hartke [<mailto:tedhartke@hartke.pro>]
Sent: Tuesday, June 13, 2017 5:56 PM
To: John Hall <jhall@co.champaign.il.us>
Subject: Solar panel weed growth and fires during dry conditions.

Dear John,

I can imagine a 40 acre field of solar panels and a small fire turned into a big one. The issue is growth of grass and weeds which dry out. Or weed killing chemical residue issues. Please note that some of the statements in this article are rather extreme and anti-solar, there are many statements which are valid for our county to be concerned about.....

<http://timeless-environments.blogspot.se/2015/08/the-worlds-catch-22-with-alternative.html?m=1>

Also, see the notes about the ribbed mobile home awnings being a fire problem.

Ted

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The World's Catch 22 with Alternative Energy Schemes

While there is no doubt the world needs safer alternatives to the conventional energy technologies they've been using, the present rush to schemes they've been pursuing have their own disadvantages as well. Just my personal feelings and opinion of course.



**Image: BHE Renewables
Topaz Solar Farms construction site, Carrisa Plains, CA**

Take a moment, 2.40 minutes to be exact and watch the video of the Topaz Solar Farms construction site which is located on the Carrisa Plains of Central California. Almost close to four years of ongoing construction, plus three years of planning and permitting, the \$2.4 billion, 550-megawatt Topaz Solar Farm is the first of this size in operation. Then when it is finally finished it will be primed to sell power to California utility PG&E. The project is owned and operated by MidAmerican Energy, a subsidiary of Warren Buffett's Berkshire Hathaway. It's a huge ocean of over 9 million solar panels on a massive amount of once agricultural land.

There is no doubt or argument that mankind has got to pursue some kind of healthier energy alternatives to the present failed not so ecological system they have used from the beginning of energy generating systems from the industrial revolution onward. As always, many things humans pursue comes at an ecological price and while Wind and Solar are being touted as the answer to everything wonderful with Eco-Green, there are high costs here as well from an ecological standpoint. Problem is, it is popular today for many who are involved in such money making eco-schemes to demonize anyone who may criticize such projects where unforeseen ecological consequences were never well thought out. The potential for profit and unbridled pursuit of wealth tends to put race horse blinders on such individuals where instead of responsible peripheral vision, we get planners and investors with tunnel vision. Point such concerns out to these industrialists and their proponents and all manner of insults, derogatory name calling and labeling people with legitimate concerns as nothing more than Anti-Science. This is of course the usual cowards way out when no viable answers are forthcoming. This is also a popular tactic in other areas of industrial science where big business interests must be defended at any cost. I'll list a number of my own personal concerns, many of which I have read about and some of which very little attention has been addressed. The NASA pictures below illustrate not only how the landscape has changed, but also the decline of vegetation with regards the present severe drought.



NASA Photos of Change where Topaz Solar Farm is located

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Water Issues: unwashed Solar Panels don't generate as efficiently as clean ones



Sandia National Laboratory
Mr Twister mirror washing machine is the most cost-effective

method of cleaning mirrors at Kramer Junction solar plant
in the Mojave Desert, USA.



Image: iClean Endinburgh

This is a huge issue and far bigger than when it was first brought up by many environmental organizations over a decade ago. Presently the region of western United States and in particular, California, are in the middle of one of the worst droughts in the history of the state. Water is becoming more and more scarce and getting more and more expensive. The question that keeps coming up is where will they get water from in the future ? It has become important for another Industrial Science backed business model, Agriculture, to sink deeper wells and tap into already vastly depleted underground aquifers. Latest News Headlines are "San Joaquin Valley is Sinking." And yet out in the Mojave Desert far removed from Aqueduct infrastructure for irrigation needs, they have tapped into deep previously untapped aquifers for their Solar Panel washing maintenance needs. Not cleaning is not an option for success. These solar farms have also been constructed in a way that has completely destroyed the biological soil crusts which actually help keep the desert's dust down. Now those dust storms have increased and dirty panels DO NOT function well.



Solar-panels-cleaning-©World-Bank-2010

So industrial equipment is needed for industrial cleaning of Solar Farms. This requires massive amounts of water from unsustainable sources. I say unsustainable because there is no way to replace what has been pumped deep from within the earth. The other dangers are the lowering of water tables which can also dry up the very few precious artesian springs that remain throughout the Mojave, Colorado and Sonoran Desert environments. Countless wildlife [animals, birds, reptiles, etc] are terribly dependent on such natural watering holes. Even desert plants with the deep root systems which redirect water distribution through hydraulic lift for other surrounding plants may also be in trouble. See, there is this thing called domino effect and lack of foresight to envision any dire consequences in the future.



Pressure Washing Phoenix - Power Washing Phoenix AZ

The worst target areas are of course the obvious ones, Deserts in the southwest. One also has to consider that these same scenarios are going to play out across the globe in like semi-arid and arid habitats. Europe has big plans for creating Industrial Solar complexes in the Sahara Desert in North Africa that will be the size of some of their own small to medium countries within the E.U. Google the Net and you will see all types of businesses have sprung up around this industry in the form of various maintenance services like the one above in and around the Phoenix area of Arizona. So where do they get their water ? Ideally that water needs to be as clean and purified as possible. Human drinking quality if possible. Then there are those automated cleaning systems within city infrastructures and services from companies offering self-service hands off gadgets which only require one minute washing and one minute rinse from sprinkler heads. Having been in the landscape irrigation maintenance system business, I can assure you the heads will always require some type of tedious regular maintenance of keeping mineral deposits and other debris out of those jets. Water waste is almost always assured.

**Image: Solar Power World**

[*Solar Power World: "Fighting Dirty: Manual Washing vs. Automatic Cleaning of Solar Modules"*](#)

WEEDS: Grassland Fires and Herbicides**Image: KSBY News**

Remember the story at the top of this post on the Topaz Solar Farm complex which was so vast across the Carrisa Plain and growing ? In that video at the minute mark 1:35, I noticed another issue with the potential for problems and that was the dried foxtail grasses underneath the Solar Panels. Well, well, well, lo and behold on July 2nd, 2015 just this past month there was a grass fire on that site which the cause is still under investigation. The suspect electrical problems and sparks under one of the panels. The potential for wildland fires and weeds was a given, but just how will these giant industrial solar farms deal with these weeds ? Well, there is not a whole lot of info out there on that question. Other than a couple of photos on the internet and honorable mention in some literature, there's just not a lot of information out there. But the grass fire is still under investigation with speculation it was something electrical under the panels. Of course no mention of possible employee cigarette being

discarded, but then what self-respecting employee would jeopardize his own job anyway by doing something stupid like coming forward ?

[Fire Breaks out at Topaz Solar Farm](#)

This also happened a couple years earlier at Intel's Solar Farm site near Folsom, California where dry dead grass caught fire when landscapers were trying to clean the areas underneath the panels. Here is a link to that event with video. Now in the video, the firefighters and news people were calling the plant material brush, but trust me, it started in the dead grass. Brush may have been on the outlying borders of the solar panels, but the fire started in dry dead grass under panels.

<http://www.news10.net/news/article/250619/2/Landscapers-spark-Folsom-grass-fire>

Grassland fire has the incredible potential for wildfire destruction, even more so than chaparral as it can accomplish the damage in a faster shorter amount of time before help arrives. Take a look at the photos of Morgan County Colorado's "Last Chance Fire" and what happen to the electrical infrastructure:

[Flickr: "Morgan County Colorado: "Last Chance Fire"](#)



photo by Knut Loschke
This a photo of a Solar Farm near Markranstädt,

Germany in 2011. It's a weed-ridden solar installation.

Both these photos above and below are examples of overgrown weed infestation in regions where far more rainfall is recorded. Namely Germany and Canada. So how do they deal with such weed management ? Conventionally speaking, the scary scenario is the usual industrial science-based chemical herbicide control through spraying. What scares me is we aren't really necessarily talking about Roundup by Monsanto here. We're talking something far more dangerous if the Solar Farm industries really want to cut corners and save lots of money so that their bottom line looks much better to investors. How does that happen ?? Scroll down, look at the Oil Field and I'll let you in on a secret and personal story.



Thin-film, fixed-tilt power plant in Ontario, Canada



Take a close look at any oil field anywhere in Southern California and notice there are little to NO WEEDS anywhere. Why ??? The companies cannot afford any type of vegetation fire [especially grass fires] any where near their dangerous volatile oil wells. An oil well fire is both dangerous and expensive to put out. With that in mind, in 1989-90 when I worked for Coors-Biotech, it was my job to work closely with our distributors of our natural solvent, most of whom were chemical distributors. One of our

distributors lived in Santa Barbara California and his customer base was mainly the Oil Industry. He told me back then that his Oil Company clients demanded a type of chemical herbicide which had a seven years minimum guarantee of not only killing the weeds but would also sterilize the soil so as to not allow anything to grow on that land for at the very least seven years. I remember how that spooked me. The idea that Chemical companies such as Dow, DuPont or Monsanto had the ability to invent such a creation that would completely destroy all biological life in the soil for such an incredible long duration. Shouldn't have been surprised. Remember Agent Orange ??? In Vietnam there are literally still chemical effects of the junk the US Military sprayed there, especially around former US Air Force bases. Vegetation was considered an aid to the enemy. See the photograph below and the bluish tint around oil wells ? This is a dye they put into the herbicide to identify areas already sprayed with the chemicals. Seriously, take an opportunity, drive up to Bakersfield and surrounding Oil towns and communities and see for yourself what the Oil & Gas Industry has done to the landscape. Once again, I just don't trust what may be used in the future on Solar Farm sites which can ill afford multi-billion dollar equipment destroyed in a grass fire. BTW, wildfire was always a known issue for Topaz Solar Farm as you can see in the link below. Herbicides are mentioned along with grazing, but they make no mention of just what would be used.

[Wildfire Management Plan: Topaz Solar Farm, San Luis Obispo County, California](#)



**Image: Percy Feinstein/Corbis
Overlooking Chevron's Kern River oil field with the Sierra Nevada in the background, March 30, 2015**

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Unintended Consequences of Solar Farms on Wildlife



Ivanpah Solar Electric Generating System Image via <http://www.energy.ca.gov>



Image - PLOS ONE

There are recently other more serious unintended consequences which have come to light, even in a literal sense. Birds, Bats and millions of flying insects are being almost disintegrated when flying over or near some of these Solar Farms. While the Solar Farm operators have always known about the deaths, they have played down the numbers in the past. But recently researchers have found that video surveillance is the most effective method for detecting animals flying around solar power towers, according to a study of various techniques by the U.S. Geological Survey and its partners at the Ivanpah Solar Electric Generating System facility in southeastern California. As you see here in the photo on the right, something was instantaneously zapped from the sky.



National Fish and Wildlife Forensics Laboratory

Below are some important links. First from PHYS-ORG which is the easier read, then from PLOS-ONE has much more deeper research with more than a dozen videos of birds, bats and insects getting burnt to a crisp instantly. One timelapse shows insects by the 1000s being zapped, it looked like fireworks.

[**PHYS-ORG: Videos reveal birds, bats and bugs near Ivanpah solar project power towers**](#)

[**PLOS-ONE: Evaluating the Effectiveness of Wildlife Detection and Observation Technologies at a Solar Power Tower Facility**](#)

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Where should Solar Farms be located & whose backyard ???



Photo courtesy Laura Cunningham, Basin and Range Watch

As of 2010 Energy Developers had presented the federal Bureau of Land Management with 75 applications to build solar facilities within the Mojave desert.



"A solar panel 100 miles by 100 miles in the Mojave Desert (USA) could replace all the coal burned to generate electricity in the entire U.S."

Louis A. Del Monta, Physicist, Author and CEO



image: Solarindia

The picture at top is of the Mojave desert expanse which is considered a goldmine operation for the Solar and Wind power industry. Why? Because as the quote above alludes to, this land is almost always considered a waste, worthless and good for nothing else. However, had the land been something like the photo at right from Solar India where huge tracts of some type of beautiful green forests were cut down and massive Solar Farms replacing it, there would be outrage and protests from all sorts of activists. Deserts somehow don't draw that much attention with the exception of a few people who have been watchdog on the Solar and Wind Industry's often unchecked activities. So deserts generally have gotten a pass when it comes to taking seriously their real worth. I have no problem with pursuing such ideas about Wind and Solar power, but the obsession with the rush for free land and potential for profiteering, which has gotten this world in trouble in the first place is the wrong motive if the justification is to ease climate change. For the most part I have a strong dislike of the industrial business model for anything. Just my opinion of course. The large scale operations that exist presently are totally unnecessary if you take into account the numerous ugly human infrastructure that already exists and could be utilized as space for alternative power generation. Take a

look at examples I have always looked at below and how they should have been implemented in the Southwest's alternative energy schemes.



Image: thehindubusinessline.com

Back in 2013, India inaugurated the first of a series of interconnected Solar Projects over irrigation canals which would not only generate power, but also slow evaporation of water from the irrigation canals. The entire network when completed will be over 85,000 kilometers or 52,816 miles long. This also implies that 11,000 acres of land can be potentially conserved along with about 5,000+ gallons of water saved per year. Now here is my question, How can a country like India which is poorer and if you believe the propaganda, more inferior technologically speaking as compared to the United States, how can they come up with such innovative clever ideas? For one thing, they do not have the land area to waste on massive land gulping Solar Projects as the USA does. They need every bit of arable farmland they can save to feed their population which is huge as compared to the USA. This is more of a corporate business as usual model. There is no reason the concrete lined All American Canal and Coachella Canal could not have such Solar infrastructure built over it. The advantages would be plenty of available water to filter, clean and purify for washing the solar panels and excess water draining back into the canal.



**Image: Comaco Concrete Lining Technology
All American Canal, Imperial County**

Every single canal aside from All American and Coachella should have a solar infrastructure built over the top not only to save land area, but also water. Also smaller, but large infrastructure network of their canal system like Westside Main Canal and Eastside Main and all smaller canals in between. Still, what is incredible, is that India has to come up with these simple brilliant ideas. One wonders what has been getting in the way of such planning over in the United States. There is no doubt that we need cleaner alternatives, but we need happier more aesthetically pleasing ways of accomplishing this. Then everyone can be happy.



Narmada Canal solar power project in India saves agricultural fields for farming

With the Imperial Irrigation Water District making deals to sell off water rights to San Diego just to the west along California's coast and less water for the conventional farming, many farmers in Imperial Valley are taking up farming solar as a business. Such projects on former farmland are the Signal Mountain Solar Project. Still, such areas will be weed prone and we wonder what methods will be used for such control. Traditionally, Imperial Valley has always relied on chemicals. Count on the status

quo continuing here.



Signal Mountain Solar Project west of Calexico and almost a stones throw from Mexico

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***Below are some more human infrastructure example which need no explanation.***



**South Korea Bikelane**  
***South Korea running 20 miles between the cities of Daejeon and Sejong, they can be running down the median of a six-lane highway***



**Sonnenschiff solar city in Freiburg, Germany**



***Dragon-Shaped Solar Stadium in Taiwan is 100% Powered by the Sun Read more: Dragon-Shaped Solar Stadium in Taiwan is 100% Powered by the Sun***



**Photo: Clean Technica**  
***Solar carports have a double benefit: generating renewable energy and reducing the island heat effect***

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And finally, Wildfire Danger Component variables most News Reports don't touch

Solar Panel fires are more common than I first thought when I wanted to address debris under solar panels on roofs and maintenance. Almost nothing out there on leaves, pine needles and other debris collecting under non maintained solar panels on home roofs and creating a wildfire hazard. Seriously, nothing! However there were numerous reports and pictures on electrical issues, fires and dangers for firefighters trying to put out fires on solar rooftops. Apparently there are numerous companies who jumped on board the climate change band wagon of solar craze, who took advantage of government grants and/or loans in the USA & around the world and have since gone bankrupt leaving customers with junk panels which are grossly inefficient and dangerous reputation for starting fires, even after supposed fixes and corrections are made. As I stated, I was originally only interested in the maintenance issues for homeowners and wildfire, but clearly there is far more dirt behind the scenes than mere leaves. Below is a commentary of one such dangerous issue with Solar Panels.

"When a panel fails, fire is a real danger."

"We have had roofs burn. On the composition it has burned and the actual panel catches on fire," said Owens.

"In fact, it could have very well been an open flame underneath here with vegetation," said Kauffman.

At a dual solar generating and panel testing station in sunny Davis, BP panels fail regularly. "One day, the worst happened when flaming debris hit the grass below."

"Caught the grass on fire and there was a breeze blowing and that grass actually turned into a grass fire that burned and burned about 25, 30 acres of crops," said Bill Brooks of Brooks Solar Engineering.

(Source)

Also see article from Metropolitan Engineering Consulting and Forensics: **[INSTALLATION, FIRE, PROPERTY DAMAGE, ENVIRONMENTAL DAMAGE AND OTHER LIABILITY RISKS ASSOCIATED WITH SOLAR PANEL SYSTEMS](#)**

Below here is what I was more concerned with as far as maintenance issues because I used to work with and maintain client rooftops and rain gutter drainage problems in the landscape on some of the commercial properties we maintained. The worst problem I ever encountered are the rain gutter designs of aluminum awnings associated with Mobile Homes. They are almost impossible to clean without a hose with intense pressure jet nozzle and even then it's time consuming, messy and wastes tonnes of water. If you don't clean them then the rainwater will never drain down the spouts and the buildup always allowed for weeds to grow and die with the onset of summer. Big time fire hazard and there are literally millions of these Mobile Home Awnings with these problems everywhere throughout Southern California.



Image: manufactured Home Pros



I seriously find this subject hard to believe that nobody has lost a house due to leaves, needles and other debris collecting in the spaces between the solar panels and the house rooftops before. The photo at top is what I dealt with every single fall in preparation for winter rains. Even in open air spaces with no trees nearby, tree leaves and other debris blew high up on the wind currents from great distances and collected under awning tight spots. That's just the nature of the world we live in. Maintenance and cleanliness is a must. But the other danger I found is electrical shock to firefighters because every single little photovoltaic cell continues to produce electricity as long as there is sunlight hitting them. Hence this is a very real danger to firefighters on rooftops and they are aware of this. Spraying water on such electrical panels is a risk as well.



There are clearly without question great uses for solar power in many applications, especially areas of remote road signs and equipment like earthquake monitoring devices, etc. But there are also drawbacks. I haven't even touched on the issues with dangers to wildlife from both the Industrial Solar projects and Industrial Wind Turbine projects, but they are very real. You can google that and other info as well. But caution needs to be taken when you are searching for the right manufacturer and system design. There have been clearly many bad experiences by large seemingly reputable solar companies who have shafted homeowners, investors as well as the Governments. The dire circumstances regarding climate change and need for alternative energy from what mankind has been pursuing and ruining the earth is very real, but you should also be well aware that the public relations behind the alternative energy movement is also taking advantage of this dire need for marketing their business for profit purposes as well. Short cuts are taken for maximizing profits. Should be no surprise here since it is that way when it comes to merchandising anything across the globe. That's the reality of the world we are forced presently to live in. The pursuit of eco-green innovation and solutions however never seems to require humans to alter their own personal resource wasting lifestyles and I can tell you with extremes in climate change, both extreme in temperatures with both heat and cold, the demands for energy will skyrocket at more costs. Pursue a greener lifestyle, but also take a grain of salt to all the sales pitches on alternative energy ideas, especially when someone is trying to sell you something they manufacture. Historically everything humans have done comes with a price and unforeseen consequences, no matter how good the sales pitch and pretty the picture they paint on it. It's called do your own Homework people!



Warning Update 2017: Be wary of Solar Scams

I'm updating this here with something that has taken place at my mum's house in El Cajon California. Telemarketing Solar

companies have been pestering my elderly mother about getting solar on her roof and pitching fable about all the money she will save. Prior to moving to Sweden in May 2006, I planted California Sycamores in her backyard to create a cool shady environment. It has and she no longer needs to turn on that industrial sized Airconditioning unit mounted on the backyard side of her roof. Now since the Solar Salesman told her that she needs to get rid of the of the Sycamor trees, there have been Tree Service people coming by and telling her she needs to top those trees in half because they are too big and dangerous. That is bunk. Most of these tree service companies are hack jobbers which no skill whatsoever in creative artisitic sculpting. Below is a historical photo gallery of how these young native trees were started from one gallon pots in 2005 and trained to have their root systems drive deep into the alluvial soils and reach the water table where no watering is required.



Photograph is mine winter of 2004



The photo above is from 2004. Notice the dormant Texas Umbrella Tree behind the roof with 1000s of messy berries still clinging to the tree and an immense fruitless Mulberry just to the right of the Texas Umbrella. Both were removed and I set out to create a native woodland garden landscape in here backyard that would eventually be watered far less to not at all. I was a landscape supervisor then for a property management company and as a practice I have always preferred one gallon container trees as opposed to anything larger. Most people demand larger container size because they desire instant landscape. No one has patience anymore, but the reality is a one gallon tree if properly trained will far surpass the larger five to twenty-five containerized tree at some point in the future. I learned watering strategies from lessons learned during El Nino wet periods where I observed how large old growth Sycamores and cottonwoods establish themselves in normally dry wash stream beds where most of the time surface water is lacking. The El Nino patterns suggests providing young trees with as much water as they desire the first two or three years, then only water supplement in winters thereafter if winters are drought dry and normal rainfall is missing. Below is what took place.



Photograph is mine 2007

This is 2007, exactly one year after I left for Sweden in 2006 and came back for a summer visit in June 2007. Look at the phenomal growth. This is exactly what occurs during an El Nino wet period in the southwest. This almost never occurs in dry washes during ormal rainfall periods, generally if a seedling appears it won't make it through summer because it fries and subsoil moisture is low or non-existent.



Photograph is mine 2011

Fast Forward to 2011 and you can see the same patio area has large shady treescape. The photo below you can also see the trees are now visible above the roof line.



Photograph is mine 2011

The photograph below is of the trees from my mum's backyard looking towards the house. Her backyard is a third of an acre. She now leaves the back sliding glass door open with large screen and allows very cool breeze to blow through, even on days close to 100 Fahrenheit or 40 Celsius. She has cut the electric by over 100 dollars a month. I'm not saying Solar is bad, I'm saying there are other options to go eco-green and save money.



Photograph is mine - 2013

Today, although I do not have a photo, the trees are huge and double this size that you see in the photograph from 2013. The very idea that trees need to be topped is ludicrous and asinine. And this is where I have issues with Solar Companies. Sales-pitching people to rid property of shade trees, plaster their roofs with industrial eye pollution panels so that so-called free electricity can run your air-conditioner. All I can say folks is use your BRAIN & THINK !!! 😊

Susan Burgstrom

From: John Hall
Sent: Thursday, February 22, 2018 4:52 PM
To: Susan Burgstrom
Subject: FW: Solar project moratorium and info about a New York project

From: Ted Hartke [<mailto:tedhartke@hartke.pro>]
Sent: Sunday, September 17, 2017 4:57 PM
To: John Hall <jhall@co.champaign.il.us>
Subject: Solar project moratorium and info about a New York project

Dear John,

Here's an article I came across today.....for what it is worth:

<http://www.mymalonetelegram.com/apps/pbcs.dll/article?avis=WD&date=20170915&category=MTG01&lopenr=170918921&Ref=AR>

MALONE — The proposed creation of a 900-acre solar farm prompted the Town Board on Wednesday to approve a three-month moratorium on the development of such projects. The delay — which is similar to one adopted by the town of Belmont earlier this year — is intended to give board members time to research a possible local law regulating solar energy projects in the town.

The decision came after representatives from Geronimo Energy, a Minneapolis-based solar and wind energy company with an office in Syracuse, proposed the project to the board, suggesting that it could be “the largest east of the Mississippi.”

The farm would cost the company \$165 million and would occupy 900 acres — roughly 1.5 square miles — south of the village in the vicinity of State Routes 11B and 30. If approved, construction is slated to begin by spring of 2020.

Geronimo representative Eric Will stated that the company is “particularly excited about Malone” due to the amount of open land that could facilitate the project. Will noted that the land in question would be leased “for an extended period of time” likely in the range of 25 years, noting that solar panels degrade and the farm would likely be dismantled “way down the road.”

Town officials were responsive but skeptical of the project, questioning the benefits and consequences it would have in Malone.

If approved, construction of the project would create roughly 300 short-term jobs, with preference given to local companies.

Six full-time jobs would be created for the lifetime of the project, largely devoted to maintenance of the facility and its equipment.

The project would create “no tangible effect” on energy costs in Malone, according to Will. The energy created would be sold to power companies through the National Grid Malone interconnection.

Town officials stressed that their cautious approach to the proposal was not an indication they disapproved of the idea.

“It’s not that we’re against solar,” said Councilor Mary Scharf, noting the town’s other green energy initiatives, including existing solar panels on the roof of a hanger at the Malone-Dufort Airport to help reduce the town’s electric bill.

Councilors were also skeptical about Geronimo’s plan to seek a PILOT agreement, which would provide payments in lieu of property taxes on the land used.

Similar energy projects, including the Jericho Rise wind farm in the towns of Bellmont and Chateaugay, have also carried host community payments, in addition to PILOTs.

Town Supervisor Howard Maneely said he had heard “horror stories” of people coaxed into leaving their homes when wind projects were installed elsewhere the county. Will described solar energy as a “completely different animal” from wind, and asserted that it is “the culture of the company” to be respectful of land and landowners.

Will stressed that the company intends to speak directly with landowners and become “a real part of the community” while the project exists. “We’re here to stay,” he added.

Geronimo would also implement landscaping measures and plant trees to retain the aesthetics of the area used.

“It’s the right thing to do,” said Will.

Currently the Town of Malone has no laws related to solar energy, and Town Board members insisted they be given time to research and draft a new local law.

“We’re still learning,” Maneely said.

Currently all operational Geronimo projects are located in the Midwest, though Will stated that they have spoken to other municipalities in New York state.

Geronimo energy has filed paperwork for one additional project in the state — Saugerties Solar, a smaller 20-megawatt project in Ulster County.

Officials in the town of Bellmont have approved a six-month moratorium on issuing permits for solar arrays in recent months, citing their experiences with the Jericho Rise wind farm.

“We don’t want to have happen what happened with the wind,” Bellmont Supervisor Bruce Russell said at a June meeting during which the moratorium proposal was discussed. “A moratorium buys time ... to develop a full law.”

Town of Chateaugay officials are also considering a solar farm moratorium.

Special message: **My email was hacked Dec 30, 2016.** If you received a message that looks like it came from me and it asks you to click a link to share files, DO NOT CLICK ON LINKS OR ICONS. I will never send you a link or ask you to download anything unless I include a detailed project-specific correspondence. To protect yourself, never attempt to download files or click links which seem random or out of the ordinary.

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Susan Burgstrom

From: John Hall
Sent: Thursday, February 22, 2018 4:52 PM
To: Susan Burgstrom
Subject: FW: proposed Champaign County solar farm amendment

From: Ted Hartke [<mailto:tedhartke@hartke.pro>]
Sent: Tuesday, January 2, 2018 12:02 PM
To: John Hall <jhall@co.champaign.il.us>
Subject: Re: proposed Champaign County solar farm amendment

Dear Mr. Hall,

The Champaign County zoning office has a few major problems with the solar energy and wind turbine ordinances.

MOST IMPORTANTLY: The noise limits are harmful to the neighbors in both ordinances. Our wind turbine noise limit is outdated and problematic because the Illinois Pollution Control Board rules have changed....no longer have adjustments for impulsive noise as they did in the past. This was a change which was overlooked by many communities. The only impulsive noise adjustments which still exist are for the "highly impulsive" noises from forging or metal stamping operations. The solar facility noise limit says "50 decibels" in the Kankakee County document, however that limit is way beyond the US EPA 1970's community reaction noise chart prepared by Steven Ambrose AND beyond the maximum noise limit established by Dr. Paul Schomer in 2015. (I will send both of those supporting documents.)

The maximum noise shall not exceed 39 dBA per Dr. Schomer. The World Health Organization states that adverse health effects begin at 40 dBA. Since the EPA research, Dr. Schomer, Steve Ambrose/EPA community noise reaction chart, and the World Health Association says these things, then it is prudent for the Champaign County Zoning Ordinance to say the same.

For your information, my abandoned house in InvEnergy's wind farm has noise/sound measurements in the 45 dBA levels.

The reason the higher noise limits are introduced is because those limits are common in more heavily populated cities where background noise is already high. In the city, traffic noise, construction noise, airplane noise, and manufacturing noise is typically only during short time periods of each day..... The problems with the noise from wind turbines is that they are for very long extended periods of time, day and night, and solar farm noise could be a very harsh buzzing/humming noise which could cause severe stress for a next-door neighbor trying to spend time in their own space. Rural areas such as Champaign County Illinois will not have tolerance of noise coming from an isolated noise producer.

I think all of the residents and landowners in Champaign County have the basic ownership and human right to be allowed to sleep on their own land, so therefore the fairest noise measurement location should be at the property line as a way to contain pollution impacts on the leaseholder's properties. Please also include waivers for noise and glare/flicker so that developers AND neighbors have the ability to negotiate noise/flicker/glare impacts with each other. This removes the county from being intertwined as a mediator or accused or alienating anyone's rights to have developments or to hinder ability for citizens to protect themselves from developers.

I also believe all of the pilots and owners of private runways in Champaign County should have some input regarding glare before a "field of mirrors" is placed anywhere near their landing strips. The glare portion of the Kankakee ordinance seems wrongfully eliminated and has hazard potential, but please check with aviation folks about that.

Best regards,

Ted Hartke

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On Tue, Jan 2, 2018 at 10:49 AM, John Hall <jhall@co.champaign.il.us> wrote:

Hello, Ted. I hope your Holidays were Happy.

Champaign County recently received an application for a solar farm and so I have proposed a text amendment to add Zoning Ordinance requirements for “solar farm”.

The text amendment will be formally proposed at a meeting of the Champaign County Board’s Environment and Land Use Committee (ELUC) meeting this Thursday, January 4, 2018, at 6:30 p.m. but the proposed text amendment will be held for review for one month until the February 9, 2018, ELUC meeting at which I hope to get permission to proceed to a formal public hearing at the Champaign County Zoning Board of Appeals.

See the attached memorandum that at this time includes only a schematic outline of the proposed amendment. The attached memorandum reviews the anticipated timeline of the public hearing. Most of the attachments to the memorandum are included with the memorandum pdf but the wind farm requirements are included as a separate pdf file.

You are welcome to attend the ELUC meetings and provide comments. Email comments are also welcome.

Sincerely,

John Hall
Director
Zoning Administrator

Champaign County Department of Planning and Zoning

Brookens Administrative Center
1776 East Washington Street
Urbana IL 61802
Tel [\(217\) 384-3708](tel:2173843708)
Fax (217) (819-4021)

Susan Burgstrom

From: John Hall
Sent: Thursday, February 22, 2018 4:52 PM
To: Susan Burgstrom
Subject: FW: Dr. Schomer's Boone County Testimony
Attachments: Dr. Schomer Boone County.pdf

From: Ted Hartke [<mailto:tedhartke@hartke.pro>]
Sent: Tuesday, January 2, 2018 12:17 PM
To: John Hall <jhall@co.champaign.il.us>
Subject: Fwd: Dr. Schomer's Boone County Testimony

Dear Mr. Hall,

Attached is Dr. Paul Schomer's testimony.

I believe Schomer's noise limit of 39 decibels maximum noise is appropriate. At this noise level, I think we would have remained in our home.

Ted

Special message: **My email was hacked Dec 30, 2016.** If you received a message that looks like it came from me and it asks you to click a link to share files, DO NOT CLICK ON LINKS OR ICONS. I will never send you a link or ask you to download anything unless I include a detailed project-specific correspondence. To protect yourself, never attempt to download files or click links which seem random or out of the ordinary.

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EFFECTS OF WIND TURBINE ACOUSTIC EMISSIONS

June 23, 2015

Paul D. Schomer, Ph.D., P.E.
Schomer and Associates, Inc.
Champaign IL. 61821

Member, Board Certified,
Institute of Noise Control Engineering

Standards Director, Emeritus
Acoustical Society of America

1

Wind turbine effects

- ☐ Annoyance -- audible sound
- ☐ "Health" effects -- infrasound
- ☐ Sleep disruption -- both audible and infrasound

2

Wind turbine effects

- ☐ Annoyance -- audible sound
- ☐ "Health" effects -- infrasound
- ☐ Sleep disruption -- both audible and infrasound
- ☐ The Illinois Pollution Control Board (IPCB) is only responsive to the first bullet: annoyance
- ☐ So, the Health effects caused by infrasound are not addressed by the IPCB.

3

IPCB Does Not Adequately Protect Citizens From Wind Turbine Noise Annoyance

- ☐ A wind turbine is what is termed in ISO 1996-1 and ANSI S12.9 Part 4 an "impulsive source" but not a "highly impulsive source"
- ☐ The original IPCB rules had specific A-weighted limits for impulsive sources
- ☐ Sometime around 1990 or 2000, someone convinced the IPCB to make the definition of impulsive sound highly impulsive, which eliminates most impulsive sound from the regulation, leaving only gunfire, metal hammering and stamping, pile-driving, and similar highly impulsive sounds regulated, with essentially only a 5 dB penalty.

4

IPCB Does Not Adequately Protect Citizens From Wind Turbine Noise Annoyance (cont.)

- ☐ This action by the IPCB is incorrect in two ways: they mixed up the definitions, and failed to apply the recommended penalties to what was done
- ☐ ISO 1996-1 and ANSI S12.9 Part 4 both recommend 5 dB as the penalty for impulsive noise and 14 dB as the penalty for highly impulsive noise
- ☐ So wind turbine noise gets incorrectly classified as a continuous, non-tonal, non-impulsive industrial source with a nighttime limit of approximately 48-51 dB

5

IPCB Does Not Adequately Protect Citizens From Wind Turbine Noise Annoyance (cont.)

- ☐ All the Illinois rules regarding residential, commercial, and industrial land uses and the sound that can be emitted from one land use to another were written in about 1968, and did not contemplate wind farms.
- ☐ The following text will show the maximum acceptable sound level for wind farm noise at night.

6

Annoyance—audible sound

- Transportation noise is assessed using the Day-night Average Sound Level (DNL)
- Recommended level for traffic noise in urban/suburban areas is DNL = 55 dB (ANSI S12.9 Part 5, WHO, World Bank, FERC, others).
- Surface Transportation Board (STB) and Federal Railway Administration (FRA) essentially recommend DNL = 55 dB

7

Annoyance—audible sound

- Two modes of transportation, the two noisiest, recommend and use a *higher* criterion level:
 - The Federal Highway Administration's (FHWA) recommended level for road traffic noise is DNL = 65 dB; a 10-fold increase in power; a doubling of loudness over that recommended by neutral bodies.
 - The Federal Aviation Administration (FAA) also recommends DNL = 65 dB, but in this case, the source is known to be at least 5 dB more annoying than road-traffic-noise at the same DNL level. It represents a 30-fold increase in power; a tripling of loudness over that recommended by neutral bodies.

8

Annoyance—the role of weightings

- The so called A-weighting is used to assess most noise including transportation noise.
- The wind turbine industry has alleged that A-weighting should be used to assess wind turbine noise.
- A-weighting cuts out much of the high and low frequencies
- Wind turbine noise contains “strong low-frequency content”

9

Annoyance—the role of weightings

- According to both ISO and ANSI S12.9 Part 4, A-weighting should not be used for wind-turbine noise, but the industry *has not complied with these Standards*.
- Specifically, ISO 1996-1 contains the following:
 - For the assessment of sounds with strong low-frequency content, the rating procedures should be modified. The measurement location may be changed and the frequency weighting is affected since sounds with strong low-frequency content *engender greater annoyance than is predicted by the A-weighted sound pressure level*.

Note: All references to ANSI are to S12.9 Part 4 except for the one reference to Part 5 on slide 7. All references to ISO are to 1996-1.

10

Annoyance—the criterion

- Because of its somewhat impulse-like character, an impulse noise adjustment that is added to other noise should be investigated for use with wind turbine noise
 - This impulse noise occurs at the rate that blades pass the tower
- An alternative metric to A-weighting is required
- These two factors together, sound character and the non-standard use of A-weighting, require a 5 to perhaps 15 dB adjustment.
- Note: in terms of listening, 3 dB is typically the smallest change people notice.

11

Annoyance—the role of community norms

- There is a big difference between Capron IL, a quiet and rural area, and Manhattan Kansas, with there being a much bigger difference between Manhattan Kansas and Manhattan NY.
- This is known, and standards suggest up to 10 dB be subtracted from the criterion in quiet rural areas because of their lower tolerance for noise than in urban or suburban areas.

(ANSI/ASA S12.9 Part 4; ISO 1996 Part 1)

12

Annoyance—the criterion

- *The quiet rural setting requires a 5 to 10-dB adjustment.*
- Of the 5 to 15 dB adjustment to be made because of A-weighting and impulsiveness, *non-standard use of A-weighting alone requires at least a 5-dB adjustment.*
- So there should be a 10 to 25 dB adjustment to the criterion of DNL = 55 dB

13

Annoyance—the criterion

- DNL = 55 dB is the traffic noise criterion.
- Adjusting the 55 dB criterion by 10 to 25 dB indicates that the criterion should be adjusted down to DNL = 30 to 45 dB

14

Annoyance—the criterion

- The nature of DNL is that if the DNL is based on a sound level that is constant over the entire 24 hour day, that sound level is 6 dB lower than the DNL level that it calculates to.
- For example, a constant, 24 hour level of 39 dB calculates to a DNL = 45 dB. (ANSI, ISO)
- The results are that *the nighttime level and, indeed, the 24 hour level at most should be < 39 dB,* and it is not unlikely that the correct limit is lower than 39 dB.
- A constant level range from 24-39 dB equates to a DNL range from 30-45 DNL.

15

Uncertainty

- The travel of sound from a source to a receiving point constantly changes because of minor changes in the atmosphere between the source and the receiving point.
- The sound level one actually records at a receiving point takes the shape of a bell curve, and with a bell curve, half the data will be randomly above the design level and half the data will be randomly below.
- This random variation creates the uncertainty.

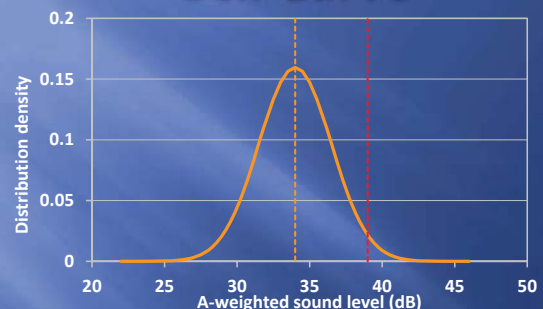
16

Uncertainty (cont.)

- To ensure that nearly all of the data are below the criterion level, one subtracts a tolerance from the prediction. This tolerance is solely based on the parameters for the bell curve as fit to the data.
- To ensure that less than 5 percent of the data exceed the criterion, one needs to subtract 4-6 dB from the criterion of 39 dB.
 - The 4-6 dB comes from long-term measurements from colleagues and studies I have been involved with on windfarms in Oregon and Illinois. The standard deviations increase with increasing distance from the wind turbines. Hessler has collected A-weighted data in 3 directions at 1000ft and one direction at 2000ft. These data show standard deviations for the higher part of the data set as 1.5 dB at 1000ft and 2 dB at 2000ft, which clearly supports the selection of a standard deviation of 2.5 dB at 2500ft. These data are also consistent with other data collected in Illinois.

17

Bell Curve



This is frequently called a bell curve. It portrays what is called a “normal” distribution and it portrays how frequently different sound levels occur. The average level is 34 dB, marked by the orange line, and there are equal data on either side of the bell curve. The “near maximum” level, not to be exceeded, is marked by the red line. 95% of the area is beneath the orange curve and to the left of the red line; 5% are to the right of the red line.

18

Uncertainty (cont.)

- Subtracting 5 dB is my recommendation and, I believe, the minimum that can be recommended.
- By way of comparison, if one wanted to ensure that less than 1 percent of the data exceed the criterion, (in contrast to 5 percent), one needs to subtract 6-9 dB from the criterion of 39 dB.
- The percent of the data exceeding the criterion is directly related to the tolerance chosen. A smaller tolerance (e.g. 5 dB) protects 95 percent of the data. A larger tolerance (e.g. 7.5 dB) protects 99 percent.
- **So I recommend designing for 34 dB** and requiring that no more than 5 percent of the data exceed the 39 dB, nearly always by only 0-2 dB.

Annoyance—translating the criterion into distance

- The noise at any home or other site in the vicinity of a windfarm is the sum of the acoustic energies from each and every one of the wind turbines that reach that site. In the worst case, there can be perhaps four like turbines, each 1000 ft in a different direction from the residence.
- In this example, the sound level would be 6 dB higher than predicted for just one turbine. So basing the criterion on the distance between one turbine and a point in the community can under-predict the true sound level.

Annoyance—translating the criterion into distance (cont.)

- Conversely, because A-weighting eliminates most of the low-frequency energies, the decay with distance could be 6.5 dB per doubling of the distance rather than 6.
- Because 6 dB is the theoretical decay with distance term in simple situations and because it is cited in some industry-produced documents, we will use 6 dB.

Converting criterion (including tolerance) to distance

Wind Turbine Sound Propagation at the example of 102 dBA sound power at hub

Distance (ft)	Noise Reduction (dBA)
1	102
2	96
4	90
8	84
16	78
32	72
64	66
128	60
256	54
512	48
1024	42
2048	36
4096	30

- The criterion, including tolerance, is 34 dBA.
- The table on the left gives dBA versus distance for a large wind turbine with an A-weighted power level of 102 dB.
- The distance that corresponds to 34 dBA is 2580ft; nearly half a mile.
- **NOTE:** These calculations are all for a hub power level of 102 dB. If the selected wind turbine had a different power, then all of these numbers go up or down by the difference between the power of the selected wind turbine and 102.

Wind turbine effects on sleep

- Effects of outdoor audible sound:
 - Almost no significant effects predicted at 39 dB or lower (WHO)
 - Sharp increase in adverse health effects predicted in the 40-55 dB range (WHO)
- Effects of non-audible low-frequency and infrasound:
 - Reported awakenings in agitated and/or scared states

Some of the reported effects of wind-turbine low-frequency and infrasonic emissions (Effects Reported)

- Pulsations
- Pressure on the ear
- Headache
- Fatigue
- Nausea
- Dizziness

Who will be affected? Where, when, and why?

- We do not know?
- Many windfarms have no observable problems
- However, in the case of wind farms with high numbers of complaints, it appears that something like 1/3 of the residents self-report being significantly affected, with a subset of these reporting to being severely affected
- We do not know the true number because those receiving money from the windfarm typically have in their contract a prohibition on speaking out or taking part in any action in opposition to the windfarm.

25

Who will be affected? Where, when, and why?

- Research could provide answers
- But almost always, industry has maintained research was not needed and gotten public authorities to agree.
- We now turn to the very recent results of a community research study where the windfarm cooperated by turning turbines on and off and supplying data on operations – I believe under court order.

26

The Cooper Study (Cooper)

- Australia
- Subjects: 3 couples in 3 houses; 0.6 to 1.6 km (2,133 to 5,249 ft.)
- Power company provided operations data and turned turbines on and off; subjects did not know when
- Subject responses in sync with turbine power being generated, and major changes in power
- Subject responses were not in sync with the audible sound or vibration

27

The Cooper Study

- Demonstrates that there is a cause and effect relationship between turbine power output and subject response
- Power companies say it is a terrible study
- Followed all the rules set down by the power company itself
- If they think it is wrong *they should want to replicate it* with neutral experimenters at a similar site – e.g., Shirley WI (Shirley Study)

28

A brief history of wind industry allegations

- 7 major allegations, and potentially one revised allegation
- There are factual data to evaluate 6 of the 7

29

I. Alleges, A-weighting is appropriate: **Wrong**

- According to both ISO (International Organization for Standardization) and ANSI (American National Standards Institute) Standards, A-weighting should not be used for wind-turbine noise, but the industry *has not complied with these Standards.*

30

2. Alleges, a wind turbine is quieter than a refrigerator: **Wrong**

- Follows from incorrect use of A-weighting
- A-weighted level from a wind farm may be lower than the level for a refrigerator but it is *not quieter*
- This shows *how wrong A-weighting is* for assessing wind-turbine noise

31

3. Alleges, if you can't hear it, it can't hurt you: **Wrong**

- We don't see x-rays, but they *can hurt us*
- We don't see infra-red, but it *can hurt us*
- We don't hear ultrasound, but it *can hurt us*
- We don't hear infrasound, but it *can hurt us*
- The Cooper study shows that the wind industry's assertion is not correct

32

4. Alleges, it is 100% the nocebo effect; Australia, USA, Canada, etc.

- Claim non-auditory effects are 100% imagined in perhaps 25 countries around the world
- Claim people hear the sound and make themselves angry
- Due to the internet
- Those who are sensing effects:
 - Include infants, small children who can't read the internet (Shirley Wind study)
 - Include the deaf (Cooper study)

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4. Alleges, it is 100% the nocebo effect; Australia, USA, Canada, etc.: **Wrong**

- Claim people **hear** the sound and make themselves angry
 - About **2/3 of the complainants** we met at Shirley **could not hear the turbines** inside their houses
 - The researchers could not reliably hear the turbines in 2 of the 3 tested homes
 - The **best subject** in the Cooper study is **deaf**
- Blaming the internet is also a fallacy
 - Same public responses to low-frequency industrial noise existed at least **40 years ago** – and there was **no internet** to blame

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5. Alleges, no low-frequency noise or infrasound, it's all "modulation:" **Wrong**

- A wind turbine is a very big fan
- Just like *all other fans*, a wind turbine *radiates acoustic energy at its blade passage frequency*
- Borne out by measurements around the world

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6. Alleges, no non-audible pathway and corresponding effect(s) exist: **Wrong**

- Cooper's study shows cause and effect for at least one non-visual, non-audible pathway by which wind turbine emissions affect the body and "signal" the brain.
- What you can't hear, can hurt you.

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6. Alleges, no non-audible pathway and corresponding effect(s) exist: Wrong

- ISO 1996 Part 1: “Investigations have shown that the perception and the effects of sounds differ considerably at low frequencies as compared to mid or high frequencies. The main reasons for these differences are as follows:”
- Among other reasons, ISO 1996 Part 1 has:
 - “perception of sounds as *pulsations* and fluctuations;”
 - “complaints about *feelings of ear pressure*”

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6. Alleges, no non-audible pathway and corresponding effect(s) exist: Wrong

- 1985 Toronto study exposed people to 8 Hz (Toronto Study)
 - 12 to 23 %, reacted
- 8 Hz that had lower levels and numbers of overtones elicited
 - **Nausea, Dizziness**
- 8 Hz that was rich in overtones elicited
 - **Headache, Fatigue**

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6. Alleges, no non-audible pathway and corresponding effect(s) exist: Wrong

- The ISO standard shows that this allegation is Wrong.
- The 1985 Toronto study shows that this allegation is Wrong.
- The Cooper study shows that this allegation is Wrong.

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Reported effects of wind turbine low-frequency and infrasonic emissions

<u>EFFECT</u>	<u>REFERENCE</u>
□ Pulsations	□ ISO 1996-1
□ Pressure on the ear	□ ISO 1996-1
□ Headache	□ Toronto
□ Fatigue	□ Toronto
□ Nausea	□ Toronto
□ Dizziness	□ Toronto

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7. “Expert” studies find no references to non-audible pathways: Wrong

- Several “expert” studies all find nothing
 - The “expert” studies do not find ISO 1996-1
 - The “expert” studies do not find the 1985 Toronto study

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7 major allegations; all are shown to be wrong

- A-weighting is not OK to assess turbine noise
- Wind turbines are not quieter than a refrigerator
- What you can’t hear, can hurt you
- It is not 100% nocebo
- Wind turbines emit infrasound
- A non-audible pathway by which wind turbine emissions affect the body does exist
- Research exists

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What will industry say?

- They will bring in dozens of experts to say how wrong every fact is. They will find a reason why every Standard, every fact, and every study I quoted is flawed.
- They will tell you the levels used in the Toronto study were too high. This is true for wind turbines, but this was 1985 and the purpose was for higher level sources, not wind turbines.
 - But the “expert” studies should have found this study and reported on it. They did not.

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Evaluating industry and supportive “expert” studies

- Studies by industry and /or government
- A Massachusetts study said every study in the world on human response to wind turbine noise that might help a community in any way was inadequate for one reason or another. One of their most cited reasons for deprecating a study was that the study was cross-sectional rather than longitudinal. It is not important, for now, what these terms mean.

(Massachusetts Study)

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Evaluating industry and supportive expert studies

- Massachusetts EPA and Dept. of Public Health
- Panel of “Independent Experts”
- “The limited description of the selection process in this study is a limitation as well, as is the cross sectional nature of the study. Cross-sectional studies lack the ability to determine the temporality of cause and effect; in the case of these kinds of studies, we cannot know whether the annoyance level was present before the wind turbines were operational from a cross sectional study design. Furthermore, despite efforts to blind the respondent to the emphasis on wind turbines, it is not clear to what degree this was successful.”

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Evaluating industry and supportive expert studies

- There have been several hundred noise surveys around the world, mainly on transportation noise.
- I know of two (the Cooper study; Fidell, *circa* 1980) and doubt there were more than 3 or 4 that were longitudinal. The longitudinal method is almost always unfeasible in environmental noise studies, and certainly not feasible in the case of wind turbine noise studies; a community would need to have the survey under way before the survey had been announced to the community.
- Same for “hiding the purpose.” How do you hide tank, artillery, and bomb noise in a survey around an army base; aircraft noise by an airport?

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Evaluating industry and supportive expert studies

- Recent Health Canada study (Health Canada Study)
- I think it has focus problems but I will not go into those
- It has been lauded by the industry
- However, the quote that I gave a few slides ago fits this study perfectly:
 - “It is cross-sectional and you cannot tell how well they hid the purpose of the study.”
- Nobody seems to mention this, not the CEO of AWEA, he lauded it.

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The point is people need to evaluate what is being said

- Quieter than a refrigerator
- A-weighting is fine for assessment
- If you can't hear it . . .
- No low frequencies
- Of the thousands of people around the world having problems with wind turbines, 100 % are imagining it. It is all nocebo.
- No known pathways or effects except for hearing
- No known research supporting other pathways or effects

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Conclusions

- With Cooper, the preponderance of the evidence is that infra-sound causes adverse effects in some people
- Industry provides no proof that the wind turbine acoustic emissions are not causing adverse effects. Their proof is “expert” studies that find that “no literature exists.” And all of these expert studies failed to find the pertinent international standard and at least 2 other pertinent documents.

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Recommendations

- For audible noise, public officials should require that the the maximum A-weighted sound level at any residence be < 39 dBA
- For very low-frequency sound and infra-sound, public officials should require industry to prove that their new designs will not create adverse effects on people, notably, on sleep or those of the type listed on earlier charts. This proof from industry must be provided before any new windfarms are approved.

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Susan Burgstrom

From: John Hall
Sent: Thursday, February 22, 2018 4:52 PM
To: Susan Burgstrom
Subject: FW: Hartke pointers for establishing noise limits

From: Ted Hartke [<mailto:tedhartke@hartke.pro>]
Sent: Tuesday, January 2, 2018 12:51 PM
To: John Hall <jhall@co.champaign.il.us>
Subject: Fwd: Hartke pointers for establishing noise limits

Dear Mr. Hall,

These "snips" are some excerpts from my sworn testimony in regards to wind farms.

These specific notations should be printed in full color and handed to the decision makers. If noise is allowed to be at higher levels than these, then your citizens will have a basis for a lawsuit against the commissioners/board members/legislators who allow or "approve" the harm to children and other residents. KEEP NOISE BELOW 39 dBA.....PUT IN SETBACKS WHICH CORRESPOND WITH 39 dBA Maximum noise per Dr. Schomer. HDR Engineering prepared the noise analysis for InvEnergy's project here in Champaign-Vermilion County Illinois.....HDR says 40 dBA is sufficiently low to minimize or eliminate sleep interference.....EPA says observed health effects begin at 40 dBA, Dr. Schomer says "design for 34 dBA and NOT TO EXCEED 39 dBA, and the EPA studies show widespread complaints begin at 34 dBA.

All of this corresponds with the experience we had at our abandoned home. Now that we know this is a problem and exactly how to address the issue, we can make our ordinance here based on science and experience instead of the "industry standards" which have failed in many other places.

Best regards,

Ted Hartke

HDR CLAIMS (Continued)

California Ridge Wind Energy Project

Sound Analysis Report

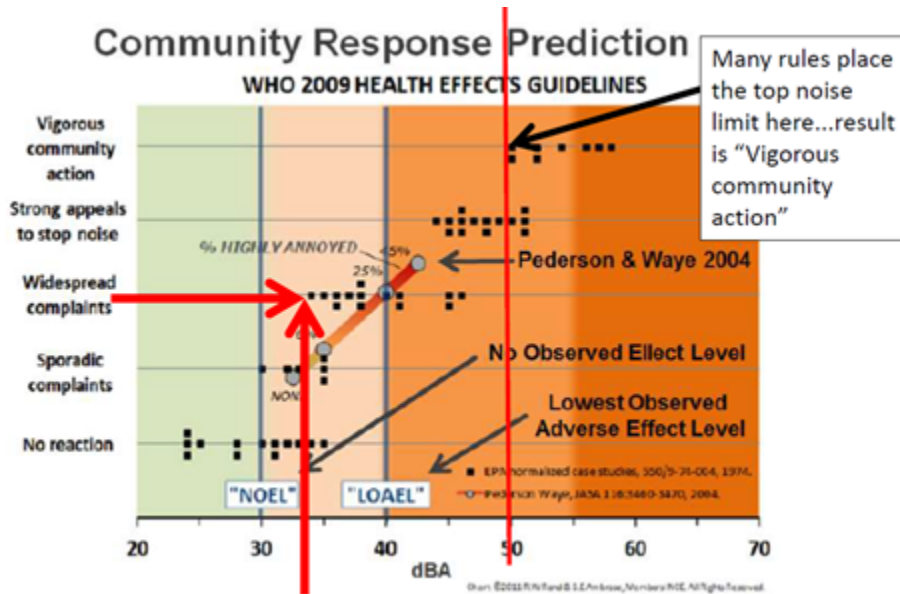
With the conservative additions, the analysis indicates that the majority of locations would experience turbine sound levels of less than 40 dBA (outdoors). This level is sufficiently low to minimize or eliminate any potential for sleep interference or indoor/outdoor speech interference, as defined by the US Environmental Protection Agency (EPA). Furthermore, these average hourly levels are compatible with parameters for acceptable levels of noise within residential land uses established by the EPA guidelines and the State of Illinois' requirements – per Title 35, Chapter I, Part 901.

InvEnergy Vermilion County Application has PROBLEMS!!!!

Sound Analysis Report (HDR Engineering) Page 9 June 2011

Majority of locations would experience sound levels of less than 40 dBA. This level is sufficiently low to minimize or eliminate any potential for sleep interference? If true, then why Hartke Home Abandonment after **SLEEP DEPRIVATION ISSUES PERSISTED ???**

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Widespread Complaints Start at 33.5 dBA !!

Dr. Paul Schomer's criterion

- *The nature of DNL is that if the DNL is based on a sound level that is constant over the entire 24 hour day, that sound level is 6 dB lower than the DNL level that it calculates to.*
- *For example, a constant, 24 hour level of 39 dB calculates to a DNL = 45 dB. (ANSI, ISO)*
- *The results are that **the nighttime level and, indeed, the 24 hour level at most should be ≤ 39 dB**, and it is not unlikely that the correct limit is lower than 39 dB.*
- *A constant level range from 24-39 dB equates to a DNL range from 30-45 DNL.*
- *Hartke note: Dr. Schomer should know.....he authored the Illinois standards. He co-authored the InvEnergy noise study near my abandoned home.*

Dr. Schomer's noise to distance conversion:

Wind Turbine Sound Propagation at the example of 102 dBA sound power at hub	
Distance (ft)	Noise Reduction (dBA)
1	102
2	96
4	90
8	84
16	78
32	72
64	66
128	60
256	54
512	48
1024	42
2048	36
4096	30

- *The criterion, including tolerance, is 34 dBA.*
- *The table on the left gives dBA versus distance for a large wind turbine with an A-weighted power level of 102 dB.*
- *The distance that corresponds to 34 dBA is 2580ft; nearly half a mile.*
- *NOTE: These calculations are all for a hub power level of 102 dB. If the selected wind turbine had a different power, then all of these numbers go up or down by the difference between the power of the selected wind turbine and 102.*

Special message: **My email was hacked Dec 30, 2016.** If you received a message that looks like it came from me and it asks you to click a link to share files, DO NOT CLICK ON LINKS OR ICONS. I will never send you a link or ask you to download anything unless I include a detailed project-specific correspondence. To protect yourself, never attempt to download files or click links which seem random or out of the ordinary.

Theodore P. Hartke, PE, PLS
 President
 Hartke Engineering and Surveying, Inc.
 117 S. East Avenue P.O. Box 123
 Ogden, Illinois 61859 [217.840.1612](tel:217.840.1612)
tedhartke@hartke.pro

Susan Burgstrom

From: John Hall
Sent: Friday, February 23, 2018 1:48 PM
To: Susan Burgstrom
Subject: FW: FW: Proposed Solar Farm Requirements

From: Ted Hartke [<mailto:tedhartke@hartke.pro>]
Sent: Thursday, February 22, 2018 2:59 PM
To: John Hall <jhall@co.champaign.il.us>
Subject: Re: FW: Proposed Solar Farm Requirements

Dear John,

I am requesting a 30 minute presentation time to address inadequate protections for landowners who may be adjacent to solar farms.

- 1.) Our ordinance calls for NO MINIMUM SETBACK to adjoiners for substations. Substations may be fire or explosion hazards. Would you like having your bedroom window facing a property line adjacent to a substation which is situated immediately adjacent to your property line??
- 2.) Our ordinance calls for certain noise limits relative to the location of a residence on nearby property. The Illinois Pollution Control Board noise limits and rules/regulations require noise measurements to be recorded/calculated at the property line. This is a direct contradiction to our proposed code because it bases the noise measurement located at the residence. The existence of a noise which exceeds IPCB limits on adjacent land may be a health hazard and impacts potential development for lands adjacent to the solar farm. Just because a home has not been built already DOES NOT cause people's right to live and build homes on vacant land to expire or be diminished.

My family abandoned our home in 2013 because of wind turbine noise entering into our home. The IPCB standards you are trying to apply to solar farms are NOT protective. Certainly solar farm facilities could easily meet safe noise limits as long as they are designed with transformers/substations placed toward the center or adequate distances away from property lines as to keep the unhealthy noise limited to within the boundaries of the solar farm leased area(s). Also, noise barriers within a solar farm area would likely be feasible and affordable to effectively reduce noise limits to below 40 dBA at the exterior property lines. Of course, I think it would be appropriate to allow for waivers as long as adjoiners will agree with the terms and negotiate their own conditions and agreement directly with the would-be solar farm developer.

I have already submitted adequate documentation which supports these statements. Unfortunately, when I looked through the supporting documents for the proposed changes to our county codes, NONE of my material appears to be included. I am very disappointed that this may be the case, and I will be voicing criticism against you and your staff for ignoring/excluding my input.

Can you please respond with some explanation or directions to where I can find that my submittals were included with the board packet??

Best regards,

Ted Hartke

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Theodore P. Hartke, PE, PLS
President
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On Fri, Jan 26, 2018 at 4:38 PM, John Hall <jhall@co.champaign.il.us> wrote:

Mr. Hartke:

Attached are annotated and non-annotated Draft versions of the proposed Zoning Ordinance text amendment to add requirements for “solar farm” to the Champaign County Zoning Ordinance, which is on the Agenda for the February 8, 2018, ELUC meeting.

More information will provided with the actual Agenda.

Note the decommissioning requirements in the Champaign County Zoning Ordinance involve not just the requirements in Section 6.1.4 Wind Farm and the proposed Section 6.1.5 Solar Farm but also Section 6.1.1 Site Reclamation for NON-ADAPTABLE STRUCTURES.

When the Environment and Land Use Committee is comfortable with this Draft the next step is to refer the amendment to the Zoning Board of Appeals for a public hearing and after the public hearing the ZBA recommendation will come back to ELUC and then ELUC will make final a recommendation to the County Board.

Sincerely,

John Hall
Champaign County Zoning Administrator

Susan Burgstrom

From: John Hall
Sent: Thursday, February 22, 2018 5:16 PM
To: Susan Burgstrom
Subject: FW: FW: Proposed Solar Farm Requirements

From: Ted Hartke [<mailto:tedhartke@hartke.pro>]
Sent: Thursday, February 22, 2018 5:14 PM
To: John Hall <jhall@co.champaign.il.us>
Subject: Re: FW: Proposed Solar Farm Requirements

Dear Mr. Hall,

I believe your statement about not providing my emails to the ELUC "you never asked me to forward them" is in error.

This is a huge disappointment.....as I point out that my email on Jan 2nd specifically states as follows:

These specific notations should be printed in full color and handed to the decision makers.

All of the emails and explanations were important and to be distributed, but the attachments in the Jan 2nd email should be printed and provided as a hand-out.

It was important to me that the information I provided to you, as the designated authority who is charged with gathering all of the information, would be distributed to our elected officials. There is no excuse to have kept all of my submittals hidden/marginalized/minimized after I specifically requested that my specific notations be printed in full color and handed to the decision makers. At best, this is sloppy work. At worst, this is an indication that you are not taking me seriously and puts doubts in my mind that you are doing a proper job.

To be 100% absolutely clear, I hereby request that all of my materials/submittals and correspondence regarding this matter be printed and distributed to all of the ELUC and ZBA member. After all of my submittals have been distributed to all of those individuals, please provide all of their names and contact information in a return email.

Best regards,

Ted Hartke

Special message: **My email was hacked Dec 30, 2016.** If you received a message that looks like it came from me and it asks you to click a link to share files, DO NOT CLICK ON LINKS OR ICONS. I will never send you a link or ask you to download anything unless I include a detailed project-specific correspondence. To protect yourself, never attempt to download files or click links which seem random or out of the ordinary.

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