

# Team Meeting

10/09//2018

Coover 1324

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<b>Type of meeting:</b>	Meeting with Client
<b>Note taker:</b>	Katayi Katanga

**Attendees:** Whole team present

**Please read:**

**Please bring:** Laptop

## *Minutes*

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**Agenda item:** Safety Moment

**Presenter:** Nur

**Discussion:**

Car and road safety. Driving safely as the weather is changing due to snow and rain. What to do when your car is hydroplaning. Use headlights and cruise control.

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**Agenda item:** Why Estancia, New Mexico?

**Presenter:** Ahmed, Chufu, Nur, Tam

**Discussion:**

Students sent out a write up to the client, but didn't get a response so they presented the write-up to get some feedback. The process of choosing a location began with finding land for sale at a good price in different states, then looking at the weather and solar radiation of the area. Using this method, we came up with three locations. To get the best location out of the three, we compared the following factors:

- Solar radiation
- Land size and price
- Sunny days per year
- Elevation
- State financial incentives ranking
- Total cost of solar power plant
- Extra land for substation and expansion
- More cost-effective than the rest of the Nation
- Distance to the nearest city/town

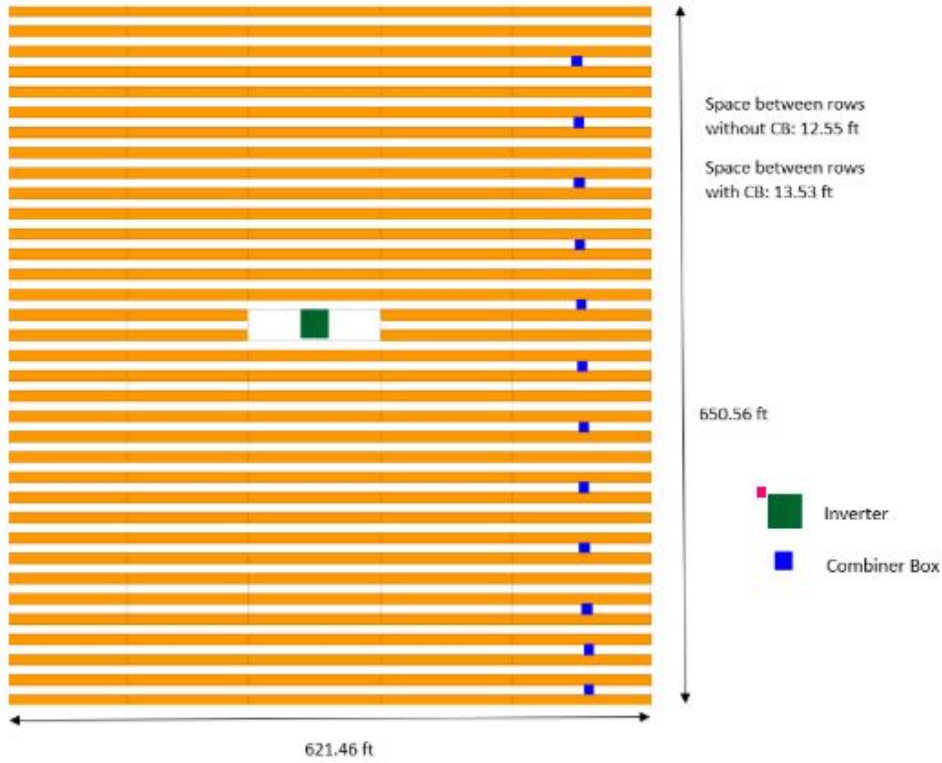
The results were as follows:

State Financial Incentives Ranking (Out of 50)	The ranking of states giving loans or grants. #1 is the best and #50 is the worst.	#28	#27	#8	Estancia, NM
Total Cost of Solar Plant (Million \$)	How much the solar plant would cost in each location. Less cost is better.	64.72	65.02	64.58 (5x35 version)	Estancia, NM
How Much Land Left For Substation/Expansion(acres)	How much land is left for the substation and future expansions. More land is better.	252.7	30.8	211.7 (5x35 version)	Millville, CA
More Cost-Effective Than the Rest of the Nation	How much more cost-effective each location is compared to the rest of the nation. Higher percentage is better.	38.1%	21.6%	22.0%	Millville, CA
Distance To Nearest City/Town (m)	How far the nearest town is to the location. The further the better, considering the dangers of having a <u>large scale</u> plant close to people.	Palo Cedro (6,343)	Alpine (50,291)	Estancia (7,893)	Alpine, TX

Categories	Description	Millville, CA	Alpine, TX	Estancia, NM	Who Wins?
Solar Radiation (kWh/m/day)	How much solar radiation a location gets per <u>day</u> . Higher solar radiation is better.	5.67	6.49	6.41	Alpine, TX
Land Size and Price	The size and price of each location. More land for a cheap price is what we want.	440 acres for \$375,000	280 acres for \$147,000	560 acres for \$195,000	Estancia, NM
Sunny Days/Year (Days)	An average of how many sunny days each location gets per year. More sunny days is better.	249	247	280	Estancia, NM
Higher Than Average Sunshine Compared to the Rest of the Nation	How much higher than average sunshine each location gets. Higher percentage is better.	19.1%	33.1%	33.8%	Estancia, NM
Elevation (ft)	How high the location is from sea <u>level</u> . UV increases at higher altitudes as the atmosphere has less chance to absorb the incoming UV. Higher elevation is better.	600	4514	6103	Estancia, NM

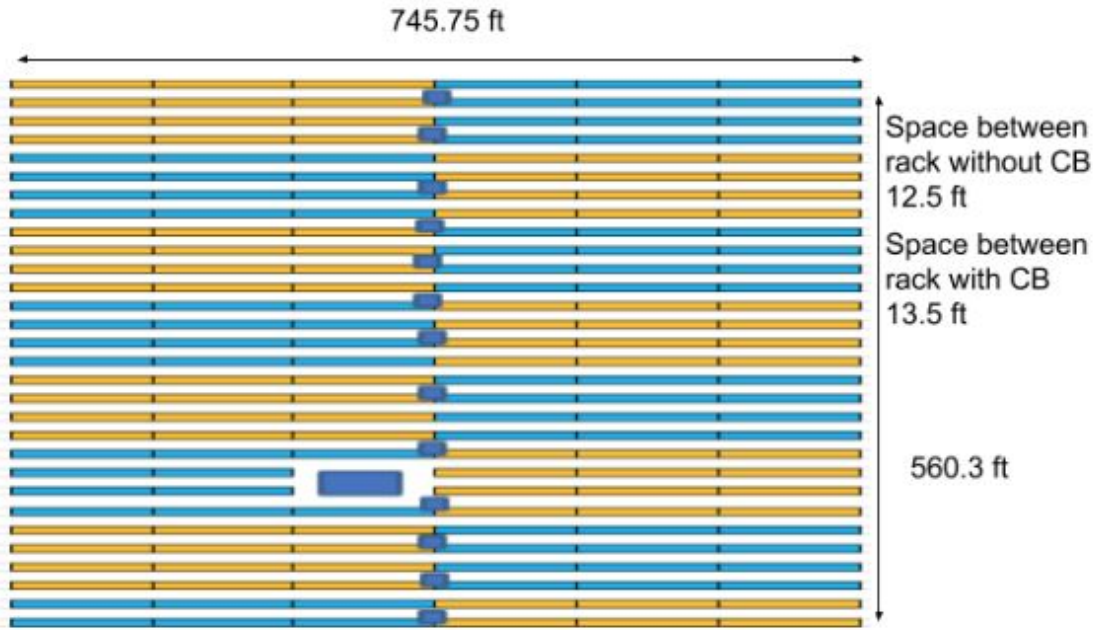
We came up with 3 layouts for our location. We chose different rack columns and rack rows to come up with a layout that would give us a symmetric plant and good ILR. The three layouts are:

5x35, 1 inverter and 12CBs

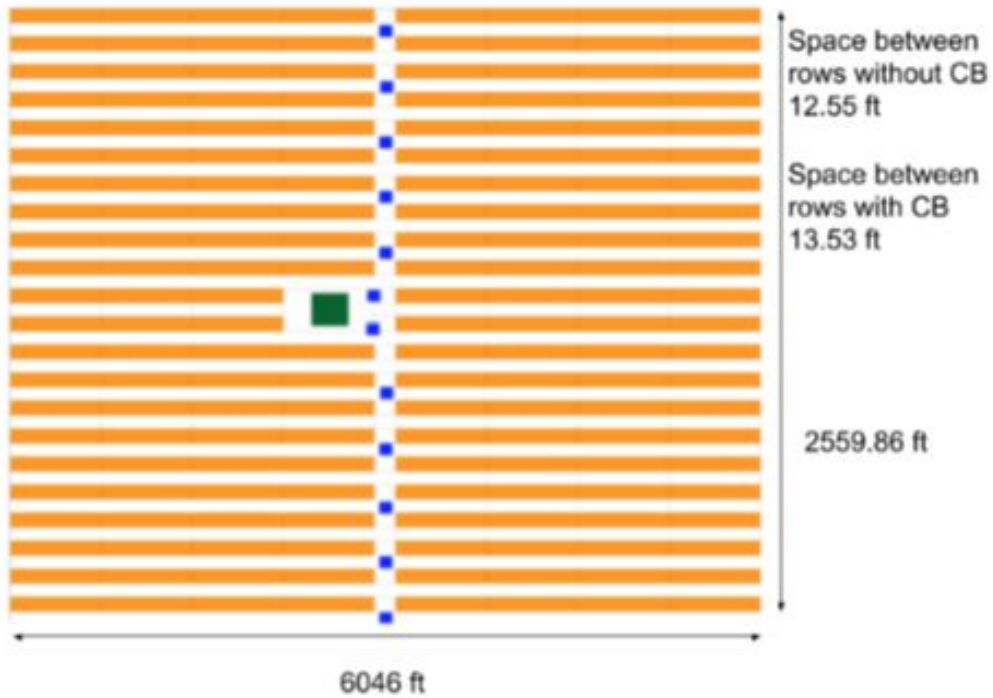


Solar Plant Cost				
Panels	236664	48.279456	million \$	
CBs	432	0.55320192	million \$	
Inverters	36	15.556275	million \$	
Land	348.2920827	0.195	million \$	560 acres
<b>Total Cost</b>		<b>64.58393292</b>	<b>million \$</b>	

6x30,1 inverter and 13CBs



8x22, 1 inverter and 12 CBs



The best layout was selected based on the following table:

Categories	5x35	6x30	8x22	Who Wins?
ILR	1.27937	1.31635	1.28677	8x22 Version
Solar Plant Size (acres)	348.29	357.35	355.30	5x35 Version
Total Cost (million \$)	64.58	64.68	64.86	5x35 Version

### Conclusions:

The 5x35 layout will be used for the final plant layout. Katayi and Nur will work on improving it for next week. The 16 ft NEC road requirement will be included for rows leading to the inverter. Once Cole provides the voltage drop sheet, the students will find the best placement for the inverter and CBs. Emily tasked the students with finding a way to place the CBs that makes more sense at first glance.

Action items	Person responsible	Deadline
✓ Final plant layout	Kat and Nur	10/15
✓ Voltage drop sheet	Cole	10/9

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**Agenda item:** NREL SAM output **Presenter:** Kat

### Discussion:

Using the supplementary software provided, students compared their system to the system created in NREL SAM. There were a few differences, such as the ILR value found using SAM which was way lower than that found using the array parameter tool. SAM suggested using almost 100,000 more panels. Katayi also compared our system to one she developed using Helioscope. The helioscope website helped us figure out what the layout would actually look like and helped with wiring. This output will be presented next week with the final array layout.

### Conclusions:

Looked into system losses using NREL SAM. The helioscope output will be shared next week.

Action items	Person responsible	Deadline
✓ n/a		



## ***Other Information***

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### **Resources:**

<https://www.isolarworld.com/solar-projects/operating?page=8>

<https://decisiondata.org/solar-by-city/estancia-nm/>

<https://www.usclimatedata.com/climate/estancia/new-mexico/united-states/usnm0106>

<https://www.landwatch.com/Torrance-County-New-Mexico-Farms-and-Ranches-for-sale/pid/326674754>

[https://www.bestplaces.net/climate/city/new\\_mexico/estancia](https://www.bestplaces.net/climate/city/new_mexico/estancia)

<https://www.travelmath.com/cities-near/Estancia,+NM>

<http://solarlove.org/largest-solar-installation-new-mexico/>

<https://www.kob.com/kobtvimages/repository/cs/files/Roswell-Chaves%20Project%20fact%20sheet%201-8-15.pdf>

**Special notes:** None