

Solar Circle Minutes

2017-04-24 Solar Circle

Present: Ileana (leader), Phil (project manager), Bob C (minutes), Joe, Walter, Keren, Roberta; Absent:

Extension

Eversource gave us a 90-day extension. Phil will find out what the new deadline is.

East End Damaged Switch

On Patriot's Day 17 April, SunBug checked for power from the panels and discovered water damage in the emergency shutoff on the East End. SunBug has ordered a new shutoff and will be here the week of 24 April. After this shutoff is replaced, the Cambridge Inspector needs to inspect and issue a certificate of completion for the installation.

SunBug Negotiations

Richard, SunBug: Your prior payments to SunBug of \$142,000 should have accrued a total of \$2,840 in interest expenses to CCH over the course of the project's 8-month delay. I therefore propose that SunBug credit this \$2,840 expense to your account. I truly believe that that's a fair, reasonable, and justifiable proposal under the circumstances.

Walter, Board (draft): Dear Richard,

Thank you for your detailed response, and for your offer from SunBug. The Solar Team has discussed the offer and find it quite disappointing. It neither acknowledges the frustration over the mistakes and delay, nor computes the real costs to us. And its logic is flawed.

You may be right about the SREC income which will stretch 10 years whenever we begin. And about the tax credits. But the Netmetering income for electricity generated from August to May is lost to us forever. An analogy would be to imagine suspending your salary for 6 months--and telling you you will catch up in the end. In addition to the lost Netmetering income, Cambridge Cohousing has been obliged to employ our Project Manager, Phil Dowds, for many extra days.

We looked at your estimates of the payback rate of the system, indicating we would be saving about \$14,400/year from the energy generated--disregarding the higher rate of charged to Eversource. Thus the months between August and May would have generated about \$9,600 in netmetering income.

The cost of Phil's extra time is estimated at \$1500. And then there's the interest paid of \$2840.

This response does not take into account the higher sale rate.

Remember that we do not need to respond until after the PTO.

Remember the contract (we do not have a lot of leverage).

Richard's new role is customer care.

Phil is getting more doubtful that this relationship can be stay on the positive side. At some point they will stop pushing to save their reputation with us and we are at risk of them moving to start saving money. To the extent that this gets adversarial we move to the contract and we all lose.

Phil: Just get it done then sort it out once you are complete.

Summarizing the points of the meeting:

1. Phil will remind SunBug of their obligation to keep him in the loop
2. Phil will confirm the deadline of the extended PTO
3. Phil will request a schedule from SunBug that takes us through commissioning
4. Phil will follow up Walter's request for a quote on critter guards
5. The Solar Circle will work on crafting the response to Richard

Possible blame:

SunBug told Ileana that EverSource approved the interconnect and then changed their position when it arrived on site.

Critter Guards and tree trimming

Walter has asked SunBug for a quote on critter guards.

Permission To Operate (PTO)

We have an extension and we have presumed that we have plenty of time. That is less clear at this point.

2017-03-29 Solar Circle: Contract Resolution

Present: Phil Dowds, Walter, Keren, Joe, Ileana, Joe, Roberta, Bob Co, Bill

Tuesday Report: Rehashing what happened on Tuesday, the problem is that the transformer number in Eversource's work order did not match the transformer on our site. The question was whether or not the transformer serves another property in addition to ours.

Since last meeting: Phil and Richard Kane spoke about financial compensation for delays: Although SunBug has clearly suffered Coho has a concern, it is not emotional, it is about doing right by owners.

Various methods of calculating the compensation were discussed. Tax refund was not an issue. The SREC clock starts with the Permission To Operate, and the current rebates are similar in 2017 as a year ago. There was agreement that the money that has not come in from selling energy to the grid is gone. There has been loss. It can be calculated in several different methods. The opportunity costs of capital tied up on owns roof with no production. Phil's costs are a clear rate. The cost of money borrowed from owners.

Richard agrees that the goal is to leave as friends that results in coho choosing SunBug for Phase 2 of the solar panels.

Richard then called Ileana. Ileana was not comfortable talking alone with Richard and suggested he call Walter and that we soon talk with the full group.

Walter conveyed a message in line with Phil's. He confirmed that the loss is in the area of net metering. Richard objected claiming that there is no loss.

Multiple Rounds on Possible Owner Positions:

At some point we are likely to put it this way: "We know both parties have incurred additional expenses, what number do you think would make things right in this relationship?"

It is worth noting that Richard has not yet brought in his boss.

It would send a powerful message to the contractor if at the restoration of power on Tuesday, a representative of the community handed SunBug the second to last payment.

Walter will work to make it happen.

Between now and then, it would be good to have Walter get back to Richard with the outcome of our discussion, as follows:

- It will NOT include any details of payment.
- It will reinforce prior messages that the owners feel a sense of expectations not being met.
- It may share that our questions revolve around appropriate methods for generating possible numbers as a basis for discussion.

SunBug (Richard and/or a higher up) could come back with a request to meet in person or with a specific response: "We offer you zero, or \$800, or \$8000, based on the following..."

2017-03-20 Solar Circle: Contract Resolution

Present: Phil Dowds, Walter, Keren, Joe, Ileana, Bill, Roberta, Bob Co,

Assuming we will be connected and up in running around 1 April, what is the appropriate amount to pay of the amount we have withheld \$34,000.

Under normal circumstances, \$17,500 would be paid when all work is complete, and the final \$17,500 would be paid once it is connected and our meters are running backwards.

The actual money lost:

Taxes: on track

SRECs deferral: to be calculated according to when the 10-year period begins, fill will find out

Electricity Sales: September-April

Phil will get a sense from SunBug what they are thinking.

We hope to get a clear understanding of what lies ahead to get to final resolution with SunBug prior to making the second to last payment.

2017-01-09 Solar Circle: Alternatives for Connection

Present: Phil Dowds (Project Manager, minutes), Walter, Roberta, Keren, Joe, Ileana (Leader), Richard Kane (SunBug), Bill, Diane came in just before we ended.

Absent: Bob Co

The following is not intended to be complete meeting notes or a thorough problem description. Rather, it is a succinct synopsis of the current situation and the alternatives we have for moving forward.

The Situation: All parties agree that we want to accomplish a line-side connection as stipulated in the contract; this should happen as soon as possible. As of this writing, we all understand that 25 March is the deadline for the PTO (Permission To Operate). Once the photovoltaic system is fully interconnected and ready to switch on, it takes about 3 to 5 weeks for Eversource to issue its PTO. Five weeks backwards from 25 Mar is 18 Feb. Allowing a margin of error, all interconnection work must be complete early in February, and probably no later than Fri 10 Feb.

The Main Path Forward: Despite issues with winter weather, force through with the line-side connection no later than 10 Feb. SunBug will start now to work out the logistics and scheduling of this path; scheduling involves coordination of both a subcontractor and Eversource. SunBug will investigate the feasibility of bringing a mobile generator on site, in case very cold or difficult weather compels us to turn the electricity back on before the interconnect work is complete. This may extend the interconnect work across two days, but the building will be heated for the night.

Alternative One - The Transformer? Make the line-connection at the outdoor transformer, not in the electric room. The permitting, engineering and construction challenges of this possibility are not yet clear. Ken seeks to meet with Eversource on site to explore further. SunBug will notify everyone of the date and time of this visit, and Phil will try to attend.

Alternative Two - The Extension? SunBug has obtained from Eversource an early indication that an extension of the 25 Mar deadline may be possible. If SunBug can obtain a satisfactory written confirmation of extension approval, then Alternative Two allows for making the line-side connection in April, in more favorable weather, with PTO occurring toward the end of May.

Alternative Three - The Swap? SunBug has also obtained from Eversource an early indication that it's acceptable to make a load-side connection now; get the PTO by 25 Mar; and shortly thereafter, convert the account to a line-side connection (again, in warmer weather). If SunBug can obtain a satisfactory written confirmation of swap approval, then we can proceed immediately with a load-side connection. (The load-side connection can be done by SunBug in a few hours, without any coordination among subcontractors and Eversource.)

Decision Timetable: Note that all three alternatives require getting more information and permissions from Eversource; getting these responses is SunBug's top priority for this week. But if we cannot obtain appropriate information and assurances from Eversource in a timely manner, then we have no way to guarantee a line-side connection other than the Main Path. In the very near future, we may be forced to decide to abandon further negotiations with Eversource, and mobilize the Main Path. We should continue to communicate with each other promptly, and by the end of this week, confirm or revise our decision timetable.

It's quite possible that this synopsis is incorrect or incomplete in some way, so if you have something to change or add, now is the time to chime in.

2016-12-23 Solar Circle

Ileana (leader), Bob Co (facilitating, minutes), Walter, Phil Dowds (Project Manager), Joe, Roberta. Absent: Keren

Status change: We reviewed the key details of Richard's email:

On 25 March Eversource Interconnect Permission expires.

There needs to be 3 to 5 weeks from the request for Permission To Operate (PTO)

Acknowledging that even this information is not fully dependable, we would need to be interconnected by 18 February in order to make the PTO request in time to be interconnected prior to the 25 March deadline.

Phil's suggestion: Pick a date and attempt to make the switchgear installation. If the weather is too bad we would go to Plan B with SunBug connecting on the line side of the meter. Then we would ask to later install the Switchgear on a later date. **Is there a chance to do this later?**

Roberta's suggestion: We should not trust that they will do the right thing. We should ask them to remove the panels, repair the damage to our buildings, and issue a full refund. A responsible company would immediately correct their errors or make reparations to their client.

Joe's suggestion: When we met about this, the main reason to do this was to have solar power. If they had given us a simpler proposal without the Switchgear, Plan B, we probably would have accepted the line side connection all the same. Ileana agrees, the basic reason to do this was environmental. I'm sure people would agree to the simpler installation. Everything takes longer. Eversource approved the permit without the new switchgear.

Discussion: SunBug admits that they dropped the ball on the switchgear. This is likely to cost \$15-20,000.

Walter suggests not threatening to remove the panels. We have cancelled the last two payments so we are withholding \$35,000.

SunBug is suggesting we go with plan B. Walter suggests we not pay SunBug until we have Plan A.

Phil: the choice should be influenced by a direct engagement with Eversource.

Walter: Norma is engaged with a group in Boston that is organizing.

Two Proposals:

1. Plans A-B-A

2. Plans B-A

3. Roberta: Take the panels off the roof. Our promise of 20 percent efficiency has gone down to 13 percent. I have been unhappy from the start. It was never a good idea but I went along. 13 percent of our power is too little, we could do a lot with that money. I have no faith in SunBug as they did not even apply for the switchgear until 7 November when the equipment arrived and they could inspect it. They could have applied for this in July and now we are up against this new drop dead date. I do not have confidence that SunBug is going to deliver. I do not think it is worth it. My suggestion is to demand a full refund with no recourse. I am willing to be convinced.

Because of the contract, the risk lies with SunBug. Regardless, we cannot afford to allow SunBug to risk losing the PTO.

Our response: Given new uncertainties around the lineside interconnection we accept SunBug's recommendation on the temporary load-side connection at the earliest possible date. We remain committed to the lineside connection as contracted.

Phil will craft a written response on behalf of Cambridge Cohousing and distribute it for suggestions to Walter before sending it to SunBug.

Tax Refund: With the possibility of withholding the final two payments from SunBug the tax year 2016 solar panel investment amount drops to around \$145,000.

We do not want to sit down with Richard at this time.

2016-12-18 Solar Circle

Ileana (leader), Phil Dowds (Project Manager), Joe, Roberta, Keren, Richard (SunBug)

Status: A contractor from Eversource came to the site last week and is concerned about the need to remove a door frame in order to install the last bit of equipment.

A year ago, the financial model indicated that we should put in a new electrical service connected to the grid rather than connect it behind our existing meters.

We have low kwh rate and a high demand charge, so it made sense to install a new meter with no load but only spin backwards to capture the more favorable rate available to us.

The alternative is to scrap the new connection and connecting into the existing service. This is less advantageous in the long term but it would be quick and easy to connect.

This would impact the net metering cap allocation and the new service, to see if we can switch the approvals to the existing connection(s). It is unusual to have the meter out on the transformer rather than inside next to the panels. In order to do this we must get the meter between the transformer and the meter. Both meters would move indoors.

Plan A Logistic Challenge: There are some logistics difficulties of coordination: Plan A requires us to turn off the electricity for a day. If we schedule a day that turns out to be a day with below freezing temperatures, then it will require us to reschedule. Eversource will show up and disconnect the west buildings to move out the existing equipment. They anticipate this being a difficult job requiring 9-10 hours. This raises concerns on what to do if the temperatures start to drop.

The benefits are safeguarded even if we instal in March: Net Metering Cap Allocation can be extended, S-RECs eligabiity is intact as we are already mechanically complete, and the tax benefits are based on "crude costs" assumed to have been incurred in the year it was installed regardless of when the last check is sent and cashed.

Plan B: If we scrap the new service and install meters behind the existing meters in the West End and it could be installed in an easy day. The power shutoff would be less than an hour.

Plan C: Put the interconnection and new service at 135 Richdale with no need to replace the switchgear. We would relocate the inverters to the East End. The existing switchgear is okay. This would give us an advantageous rate. This might require an engineering analysis prior to the transfer of approvals. This would complicate the flat roof solar installation.

Plan D Hybrid between A and B: SunBug installs a new meter between the inverters and the solar input into our breaker panel as is the usual approach. At a later date in the warmer weather we can schedule a day of power shut off to do the work.

If we expect to generate 50,000kwh per year, we expect 45 S-Recs per year assuming an S-Rec income at \$270/S-Rec or \$10,000 per year. If we forego the S-Rec income in the first quarter 2017 is \$1500.

Quick Reaction: B and C are not attractive. Most of us like staying the course and adjusting the installation date as best we can.

2016-06-28 Solar Circle

Ileana (leader), Phil Dowds (Project Manager), Joe, Roberta, Keren

Change Order: The price is \$2,780 for routing the conduit through the ceiling of the common house basement not including patching and painting. Work could start as early as later this week. We approve. Phil will compose the notice to the community of this work and Keren will send this to cch-talk. Keren will contact Aaron that we have approved this change order.

Master Schedule: we are moving up the main project start date to 18 July. The schedule shows that the contract price has increased by "\$2.8 thousand."

Invoicing: SunBug records shows that we have paid \$52,000. From now on, SunBug will copy Phil on all invoices.

Inverter location: Molly and Dan are talking with Bill Huber on switching spots with him. All parking allocations will pass through Keren. This will need to move by Monday 18 July.

Contacts: Phil's Project Roster includes the Solar Circle and a list of residents already identified as being directly affected. We reviewed this list to identify how they will be impacted, including attic access, parking spots, etc. Keren as will make a general announcement to the community on work starting this week with the full project starting on the 18th. Ileana will organize an evening gathering to meet Phil and see his slides on how the project happened at Cornerstone. This will be Tuesday 12 July. Ileana will bring Sharon and Richard up to speed by email.

Unit 116 Notification: This location will need more notice for scheduling work than other locations.

Hofeller Co.: In the interest of transparency, we will maintain an open invitation to Frank to be present for any of our meetings. We will also include him emails sent to the Solar Circle. Keren will notify Frank of his status as someone we include in our emails. Keren should suggest to Frank that he invite Jeff Seigel over for a view of the electrical changes.

Design Review: Will be up this evening for the two week review process.

July 18 start: Ileana will be away when the work starts on the 18th. Joe will be the point person while Ileana is away.

Loans: Joe and David met to get on the same page on the details of the loan. This will conform to what was presented to the community. Joe and David will produce the necessary documents.

Cch-talk update: The specific separate communications will be sent by several people as outlined above.

2016-06-20 Solar Circle

Ileana (leader), Phil Dowds (Project Manager), Joe, Roberta, Keren

Conduit runs and equipment mounting: Reinforcing the idea that we should not choose to save \$100 in the present if it will result in the need to spend \$100 or \$1000 in the future, we ask Phil to explore the possibility of installing electrical conduits inside walls wherever possible. This will permit future (even later this summer) work on siding, trim and flashing to proceed without the need to call in an electrician to shut off power prior to work and restore power when work is done. Electrical conduits are typically run inside walls with access points at fixtures, junction boxes and panels.

Phil will also request that any equipment mounted to exterior walls use properly flashed trim blocks as in other locations so that it does not void our siding warrantee.

Truck Location and Stockpiling: We identified three locations for possible parking of a panel truck for the duration of the work for storing materials: the East End and West End driveways, and the off-street parking spot next to unit 115.

Bathroom Access: We will give a common house key to the on-site foreman so that the workers can access the bathrooms in the East End and Common House basements.

Lock Box Keys: Responsibility as on-site point person for access to units will rotate through the Solar Circle members. Each person performing this role will need to have a key to the lock box in the office.

Invoices: Invoices will pass through Phil who will report to the Solar Circle and pass them on to Hofeller for payment.

Loan arrangements: The terms and conditions of the internal loans should remain as presented to the community at the Full Circle and in the Solar Panel Proposal. Joe and David will meet to work out the lending mechanism and documents, and determine whether it is best to make changes to what was originally presented. Significant alterations such as the frequency of interest calculation, payments, or the mechanisms by which repayments are funded should first be discussed with the Board then presented as a change to those whom it will impact.

2016-05-18 Solar Circle

Ileana (leader), Roberta, Keren, Bob Co (minutes), Guest: Walter

Inverter Location: Patrick recommends the wall of the garage in the third and/or fourth bay from the vehicle door on the inner wall. This is the best location for meeting the project criteria.

Chain of Communication: We agree that we will work out how best to represent the interests of current and future residents in private among the Solar Circle and Project Manager Phil (meetings and email) before communicating via Phil cc cch-solar google group email to SunBug Solar.

Glade Conduit: New information from Scott reveals the strong possibility that the existing glade conduit will work for our purposes and we will not need to dig a new trench. Phil has asked

SunBug Solar for their recommendation for a low-voltage Telcom specialist that CCH would hire to help us in determining the use-ability of the existing Glade Conduit.

West Array-Inverter Conduit: Patrick outlined a path from the Array through attics, out the back of the building and down the wall to the garage ceiling. Bob pointed out the two reasons not to put conduit on siding: it voids the siding warranty, it is an expensive obstacle for other maintenance work that requires expensive electrician hours to relocate conduit when replacing siding, flashing, trim or other work we are likely to, or guaranteed to, encounter in the coming years.

East Array-Cutoff-Glade Conduit: Array on the East End roof needs to connect to a Cut Off box at ground level then through the Glade Conduit starting in unit 116 basement. We discussed the Fire Department preference for locating the Cut Off in their faces when they arrive, the code allowable location anywhere at ground level even the back, and several possible locations in between including on the building wall of the East End driveway or on the north wall by the corner of 116 near the east end of the Glade Conduit.

Phil's contract: We are waiting for Phil to send Keren a Word document which Keren will then edit as discussed and get back to Phil for his approval and signatures (Walter and Phil).

Paying SunBug Solar: We have made the first installment and the MOU payment. We expect a \$35K payment later this summer. Walter will arrange for Hofeller to make the next payment on the designated date.

Internal Loan Letters: Walter will work with Keren to alter the draft wording of previous loan arrangements and get those ready for our solar subscribers.

Inverter Locations: The electrical room location would not require design review, while the other locations would. We will wait a week or two for Phil to return and enquire at the next conversation to confirm the final location of the inverters. Then we will run it through Design Review.

Cch-talk update: The Solar Circle met yesterday and has the following to report:

- SunBug's Master Electrician's preliminary recommendations on equipment and conduit locations (in the minutes)
- Contract logistics on Phil Dowds (project manager) and SunBug Solar

To see the full minutes, please visit our Wiki > 6 Condo Management Circle > 6.5 Projects > Solar Panels, or <https://sites.google.com/site/cambridgecohousing/board/projects/solar-panels>.

Thank you!

2016-05-03 Solar Circle with SunBug Solar

Richard Kane, Aaron Simms, Brandon Taylor (SunBug Solar Project Management Team)

Ileana, Roberta, Bob Co, Keren, Walter

Minutes Keeper: Bob Co

Communications: We are following the formal structure of Contractor — Project Manager — Solar Circle. No direct communication between Contractor and Solar Circle without including the Project Manager. Ileana requests being included in all communications between Contractor and Project Manager.

Parking: Two box trucks and one vehicle

Hours: 7am-3am typically with most noise the first day of each roof.

Roof Access: East: ladder; Common House: stairs

Lifts: expected: ladders or ladder lifts; possible: hydraulic lift

Duration: 2 to 3 weeks

SunTubes at 309: after installation, we will look for locations for solar tube inlets.

Project Timeline: Because of fast tracking, we are up to the normal week 6 phase of technical drawing and permit applications (building, electrical). We have ordered the panels. Payment schedules anticipate June (\$35,000) and September (\$35,000) payments and a mid September start of installation (due to SunBug's and Phil Dowds' schedule).

Tax Exemption Forms: ST-12 and ST-5 (non-profit). At issue is the exemption from Sales Tax. Check-box #3 qualifies us because of building is a Principal Residence.

Eversource Schedule Z: This utility document allows allocation of solar production to a specific electrical service account: 161 Richdale Ave (which is the account address Eversource uses for 175 Richdale Ave.). There will be a new meter and new account number for recording the input into the grid of our solar production. The Utility decides which plan we sell our rate at. We are hoping for Rate 51 (Optional General Time of Use Plan rate).

Tour stop 1: Recycling room in search of the vertical "future-proof" conduit.

Tour stop 2: Electrical Room: Needs de-cluttering in order to evaluate it as a site for two meters and the site preferred for the inverters due to the proximity advantages between the meters and the inverters.

Tour stop 3: Bike Room: The Plan "B" location for inverters only. Conduit would be run from panels to bike room, bike room to meters in electrical room.

Tour stop 4: Free City Corridor: The Plan "C" location for inverters only. Conduit would be run from panels to inverters then from inverters to meters in electrical room.

Tour stop 5: between recycling and stair doors to the track side: Shut-Off location Plan "A" The shut-off panel is 14-18 inches wide and about 3 feet tall and stands out from the wall about 8 inches. The utility interconnect applications identify this as the location of the PV System Disconnect.

Tour stop 6: Next to Fire Panel and along the entry verandah: These sites pose aesthetic compromises given the bulky configuration of the Disconnect box but could also work.

Tour stop 7: Sidewalk view of the West Stack Roof: Envisioning the path of conduit through the attic, up into the flat roof parapet, Aaron favors interior conduit runs to the top of the main stair then down through the vertical chase to the basement and onward to the inverters, disconnect, and meter.

Tour stop 8: SolaTube sites: The triangular shaped exposed roof shingle areas between the vertical panels and the diagonal roof valley above 309 provides several excellent sites for installing SolaTubes above the 309 bathroom and kitchen.

cch-talk summary: The Solar Subcircle of the Condo Management Circle met Tuesday with SunBug Solar's Project Management Team with the following outcomes:

- Communications chain: Contractor — Project Manager Phil Dowds — Solar Circle — Owners

- Expected Project Schedule: Mid-September to Early October, weekdays 7am-3pm; 6-8 workers
- Preliminary equipment locations: Panels on East and West Stack roofs, Conduit inside walls (where possible) otherwise in surface mounted conduit, Inverters in common house electrical room (if possible) otherwise in bike room or Free City corridor, System Disconnect on trackside wall outside recycling room door

To see the complete minutes, please visit the Wiki > Condo Management Circle > Projects > Solar Panels:

<https://sites.google.com/site/cambridgecohousing/7-managing-board/projects-list/solar-panels>

2016-04-13 Solar Circle

Present: Richard Kane (SunBug Solar), Keren, Walter, Roberta, Ileana, Bob Co (Minutes)

Updates on the status of our applications:

- S-REC Certificates: Our original 40kw system application is approved for the S-REC program on the condition that our system is constructed by 8 January 2017. The extension of the S-REC program comes with more certificates on the market with the likely impact of lower market value of the certificates during the first year or so.
- Interconnect Approval: it is approved.
- Net-metering approval: The Eversource Cambridge rate plan at which we will sell our electricity to the utility has been raised from 19¢ to 23¢ per kilowatt hour using a weighted estimation of the Optional General Time of Use Plan rates.
- SunBug has agreed to cap our cost for a trench between the East and West End at a maximum of \$3000. Previously this was estimated to be \$7000 or more.

In sum, we find ourselves emerging out of a period of profound uncertainty and into a position that is as strong or stronger than the one we had hoped for when first proposing the solar project in December.

While the individual factors incorporated into the payback scenarios modeled in spreadsheets several months ago have shifted upward or downward, the net outcome appears to be a wash or somewhat in our favor. Based on this, the Solar Circle finds itself confident that the conditions are as predicted in our original proposal.

Based on this assessment, we will present our findings to the Board at the May meeting and recommend that we move forward with signing a Construction Contract with SunBug Solar currently undergoing minor revisions.

2016-01-10 Solar Circle

Proposal Text

Keren's proposed addition to the Solar Proposal was adjusted and approved:

"The CMC will conduct an annual evaluation of the Project that it will present to the Full Circle. Annual evaluations will cover the system performance and status of project repayment. The first year evaluation will also include an analysis of the actual project costs, any installation issues, and an accounting of recovery of the tax credits."

Ballot Text

Revision of one section for greater clarity.

Frequently Asked Questions (FAQs)

We reviewed many of the 8 pages of our FAQ document revising for greater clarity and accuracy. Keren will retrieve the remaining numbers needing filling in.

Planning the 24 Jan Full Circle

Following the Dynamic Governance process, Bob will facilitate the 6 steps of the Consent process:

Context of the proposal: Ileana

1 Proposal: Walter with clarification on recovering tax credits

Financial: Joe, brief

2 Clarifying questions with reference to FAQs shared early and often prior to meeting

3 Quick Reaction, by show of hands

4 Consent Round in context of paramount and reasoned objection filter

5 Resolving Objections, repeat 4

6 Announce and Celebrate

Project Management

Our conversations of the pros and cons of Hofeller v. resident v. Phil Dowds in the role suggested that Phil is perhaps our best option. Walter, Bob and Ileana will follow up with Phil and make a proposal to the Board.

2015-12-30 Solar Circle

MOU Changes

Since the actual contract amount is likely to change as the specific scope of work and array configuration develops, we will delete mention of the expected contract price.

If other people are doing what we are doing we are not guaranteed a spot in the cue under the 1600 megawatt limit. The MOU just jump starts the building permit and utility permit process that will put us on the list sooner. It could still take 3 months. The Board could choose to sign the MOU as soon as Monday 4 January.

Adapting Cornerstone's Credit Recovery Agreement

Might we include the roof under the panels as part of our cost for the purposes of tax credits? This could be a good idea. This is to be decided later.

Revisions to the Cornerstone agreement discussed one by one produced notes for the next draft of the proposal and related appendices: FAQs, Expected costs and repayment schedule, the SunBug Solar Contract.

Follow Up:

Bob will work on the next proposal draft.

Ileana will organize a visit to JP Cohousing.

Ileana will invite Richard Kane to Monday 18 January Pizza/Potluck and an info session
Joe will work on Angel Loan and Tax Credit donation documents.

Next Meeting: 4:30 Monday 4 January before Pizza and the Board Meeting

2015-12-07 Solar Circle (6:00 at Pizza/Potluck)

Firm up Solar Panel Recommendation to the Board and Community

The Solar Circle recommends signing a Memorandum of Understanding (MOU) with SunBug to move forward with installing photo-voltaic arrays on the south facing pitched roof on the East and West Stacked Flats. The MOU allows SunBug to proceed with permitting prior to our commitment to a full contract thus increasing our chances of qualifying for tax credits and risks only the costs of permitting, estimated to be around \$5000.

Questions remaining:

- Adjusted spreadsheet
- Separate analysis of west-facing array
- Insurance questions
- Pest-guard costs and considerations
- Snow removal
- Others?

2015-11-30 Solar Circle

present: Ileana (Leader), Bob Co (Secretary), Keren, Roberta, Joe

Summary

We are on the waiting list for the next local Community Solar purchase program and waiting for a solar leasing proposal from Transformations Energy. SunBug suggests that we sign a MOU to get the ball rolling sooner with a lower commitment level, and will visit on Thursday to review technical systems on site. The committee will meet next Monday to firm up a recommendation to the Board on moving forward with solar panels on the pitched roofs.

To Do:

- > Joe will follow up with Transformations Energy on competing solar bids, and seek advice from a tax lawyer on the solar tax credit program.
- > Ileana will facilitate the SunBug site visit Thursday 1pm, and get details on the MOU approach
- > Keren will review SunBug's MOU wording
- > Roberta will seek engineering advice on higher efficiency panels
- > Bob will work with Lauri to get pricing for working around flat roof solar panels

Next Meeting:

5:30 at Pizza, Monday 7 December to finalize a recommendation to the Board

Community Solar Follow-up, Keren

It is difficult to build new photovoltaic capacity in the area. We are at the top of the list with the utility office that works with Community Solar.

Solar Tax Credit Recovery Model, Joe

Mark Durenburg, New England Clean Energy recommended by Sarah James, is not interested in working in Cambridge.

Ted Sawyer, Transformations Energy, clarified that they had never written up a formal proposal. He is contacting the salesperson that produces proposals to put the ball in their court.

> Joe will follow up

Richard Kane, SunBug, Deposit: 10 percent at contract signing; Tax credits are eligible upon the commissioning of the system (actually feeding power into the grid); the 1600 megawatt cap is on planned solar capacity; the cost of "preparing the site" was intended as the costs of cutting down trees but is widely interpreted as the cost of the new roof under the panels and the IRS has never made this a priority to clarify.

Walter asked for Richard Kane to recommend a tax consultant.

Phil Dowds, Cornerstone, is offering to share how they worked the Tax Credit Recovery. He asserted that there is no alternative really to going with straight percentage ownership share.

> Joe will follow up on tax advice.

How will we finance? We probably have enough in the reserves to do it. As before, we would put in place a back up loan program to protect us from an assessment. Another way is to borrow money from owners who are solar power supporters at something like 3 percent interest.

Follow up with SunBug

Richard Kane, SunBug, would like to make a site visit with a technical person to see conduits, electrical panels, roof rafters, etc. next Thursday 1pm.

> Ileana will facilitate the visit.

Richard suggests a way to take some of the pressure off us and start moving forward, that we could sign a Memorandum of Understanding (MOU). This has been used to get the ball rolling on the permitting and SREC qualification without an irreversible commitment.

> Ileana will get an estimate of expected out of pocket expenses, we will be on hook for in case we chose to back out of the MOU.

> Keren will review the wording.

Pitched or All Roofs?, Ileana

Instead of taking this decision for granted, do we want to commit to installing solar to all roofs or just the pitched roofs?

If there is a rationale for limiting our first stage to the pitched roofs it would be that our flat roof does not yet need replacing. By holding off on solar panels on the flat roof we avoid the costs of prematurely replacing the flat roof or of needing to remove and reinstall solar panels when the time comes to replace the flat roof.

> Bob will get prices from Lauri:

1. What does the flat roof replacement cost if done all at once with no equipment to work around versus in two separate phases, first South and then north (if we were to keep the solar panels on the roof but move them around during installation)?
2. What would it cost for an Electrician to remove the flat roof solar panels, stockpile them on the lawn, and reinstall panels after the roof is replaced?
3. What would it cost for an Electrician to remove and reinstall the flat roof panels in three stages (Remove the south half and stockpile to the north half, remove north half and stockpile it all to the south, reinstall north and south halves)

Go Round on Pitch only or Pitch plus flat:

Joe is in favor of pitched roof only because of lower first costs, lower risk, and lower commitment.

Keren concurs with the additional sense that solar panel efficiencies will be going up in the future. Our recommendation could be to do solar everywhere but starting with pitched roofs.

Roberta agrees with Joe and Keren with one hesitation: we should find the most efficient panel available anywhere not just what SunBug uses. There must be a panel that is better than 21.4 percent efficient. Even the 23 percent efficient panels we hear of are 10 percent more productive than 21 percent efficient panels. There are reports of panels reaching 40 percent efficiency.

> Roberta will follow up with her engineering connections to see if we could upgrade to higher efficiency panels.

Ileana agrees with the concerns over where the panels are made. We should proceed in a way that our panels are produced as much as possible in the USA.

Bob, is in favor of moving forward with the MOU without making either efficiency, or plant location into a precondition that might stop this project. If we can get higher efficiency or a better assembly plant location we might be willing to delay or pay more, etc. but the larger context is that the community needs a successful solar project and if this is our best shot, we should take it.

2015-11-23 Solar Circle

present: Ileana (Leader), Bob Co (Secretary), Keren, Roberta, Joe

Summary

With the state's 1600 megawatt solar credit cap likely to be reached in summer 2016, the recommendation to the Board will be to move forward with shingle roof replacement for the entire complex in the early spring to expedite the installation of photovoltaics on the East and West Stacks. Richard Kane of SunBug (Cornerstone's solar array) is the most compelling basis for advancing to installation. We continue to entertain other options including a lease arrangement and a power purchase agreement with another company. Other work during the next two weeks:

- Bob will develop a Design Proposal for approval at the December Board and Full Circles.
- Joe will develop a tax credit recovery model based on a survey of households.

The Solar Circle will meet again 4pm Monday 30 December.

—

Solar Shingles

Roberta spoke to the only Solar Shingle distributor for our region.

We were rejected as we do not have the roof area on a pitch to qualify for a bid.

Solar Leasing

Joe contacted Ted Sawyer of the company offering us a Power Purchase Agreement, Transformations, Inc., in May 2013, and his response was incomplete. Joe will reconnect.

Sungevity, CA, called Joe back and shared that we do not do condos.

Solar Panel Purchase

Richard Kane, of SunBug, contacted us about the likelihood that the new Net Metering legislation is likely to be far lower SRE Credits moving forward. The 1600 SREC deadline is likely to be mid-year 2016. We need to sign a contract, get a building permit, and get a utility interconnect approval—about 2 to 3 months. Questions:

- What payment at time of contract?
- Can they confirm that we are locked into Credits when we are contracted and not installed?
- Can we include the cost of the roof under the panels in our Credit application?
- Follow up with square footage cost for the roof areas?
- Which model of tax credit recovery? Cost, percentage share, how much would you have been able to use in 2014?
- Depending on the result, do we have another option?

What if we were moving ahead?

Process

Dynamic Governance rules: we have a proposal, we follow the consent process on the Helping Circle, on the Condo Management Circle, and in the Full Circle.

We will have a proposal for the Board at the 8 Dec meeting.

With approval, we will have a proposal for the Consent Board by 8 Dec, including the tax credit model.

Full Circle 20 December

In order to get a sense of how much credit we will get, we may be asking you to look at your 2014 tax returns to answer a hypothetical question about how much tax credit you might have benefited from in 2014.

Joe will:

- call Phil Dowds at Cornerstone to get insight on tax recovery models
- Ted Sawyer to get a bid
- Richard Kane on including roof cost in the tax credit.
- Do we need to give him money on signing the contract?

Bob: Draw up a design review proposal for the next Board meeting

Keren: Community Solar follow up.

Ileana: Develop a CCH talk message to show us where we have come on this path.

SUMMARY OF SOLAR PANEL INITIATIVE TO DATE: 11/23/15

The situation that precipitated this initiative: the strong probability that our roofs would be replaced very soon (usually cited as necessary before we could consider installing solar panels). Also very attractive federal solar tax credits (30%) are due to expire 12/16.

Board Meeting 11/2/15 - Solar Task Force formed - Ileana, Keren, Bob C., Roberta.

Board supports a future solar presentation by Richard Kane of SunBug Solar that will include Philip Dowds of Cornerstone Cohousing.

SunBug Solar presentation 11/12/15 by Richard Kane of an initial solar panel proposal to the Managing Board (minus Maddy, Dick and John), some other LLP members (John M., Peg), Dan (2003 solar cmte. member) former Board members Joe and Rowena and Lauri Chinn-Abbinante from Hofeller. Phil Dowds spoke in support of Richard Kane and SunBug Solar with whom he worked on the solar panel installation at Cornerstone Cohousing earlier this year.

This initial proposal by SunBug's Richard Kane is for placing solar panels on both the pitched roofs and the flat roof at Cambridge Cohousing. All Board and LLP members received this proposal by e mail.

Solar Task Force meets 11/16/15 and Joe attends as the former Treasurer of the Board to give his input on how we might finance solar panel purchase by Cambridge Cohousing.

The task force requests a second proposal from SunBug that would include only the pitched roofs.

The task force also wants to revisit the lease and Power Purchase Agreement (PPA) for solar that was offered to Cambridge Cohousing in May of 2014 after Ted Sawyer and Ben Cumbie of Transformations (Zero Energy Homes) gave a presentation to Board and other interested community members. Joe says he will contact them.

Roberta raises the possibility of solar shingles and volunteers to investigate and coordinate with Lauri Chinn-Abbinante

Ileana requests the second solar proposal (pitched roofs only) from SunBug Solar and it is e mailed to all Board members and LLP members during the week of 11/16

2015-11-16 Solar Circle Meeting

present: Ileana (Leader), Bob Co (Secretary), Keren, Roberta, Joe

Joe's funding models:

Investors: Invest and get some low interest return on investment that might be 5 years or

Residents: Continue paying current rates for electricity.

Model A: The challenge of fully taking advantage of the tax credits: distributing credits according to percentage ownership involves many households being offered tax credits that they do not have the chance to take advantage of because they do not pay enough tax.

Model B: is to distribute tax credits according to the residents who can take advantage of it.

Model C:

Model D: Resident D has enough tax liability to take advantage of the full \$4500 2016 tax credit. Resident D gets the credit.