# Board of Directors
# Regular Meeting

Thursday, October 21, 2021
Virtual Meeting via Zoom

The OPALCO Board of Directors are following CDC and San Juan County guidelines for social distancing and all OPALCO public gatherings are cancelled until further notice in order to err on the side of caution in face of tremendous uncertainty with the current pandemic. Board meetings will be conducted as scheduled via remote video conferencing until further notice.

Members may participate in the regular board meetings via Zoom. The first part of the meeting is reserved for member questions and comments. Use the chat feature on Zoom and staff will respond as soon as possible following the meeting. Please follow the protocols listed below:

- Mute yourself unless talking,
- Use your first and last name in your Zoom identity,
- Chat if you have a question/comment and the monitor will put you in the queue,
- OPALCO's Policy 17 - Member Participation at OPALCO Meetings decorum must be followed.

The Zoom link will be updated monthly and published in the board materials the Monday before each meeting. The link for this meeting is:

Meeting URL: https://opalco.zoom.us/j/82558839808

Meeting ID: 825 5883 9808

Members may also submit any comments and questions in writing no less than 24 hours in advance of each meeting to: communications@opalco.com

**Sequence of Events**

- OPALCO Board Meeting
- Executive Session

Board of Directors
Regular Board Meeting
October 21, 2021 8:30 A.M.*
Virtual Meeting via Zoom

**Time is approximate; if all Board members are present, the meeting may begin earlier or later than advertised. The Board President has the authority to modify the sequence of the agenda.*

**WELCOME GUESTS/MEMBERS**

*Members attending the board meeting acknowledge that they may be recorded, and the recording posted to OPALCO's website. Members are expected to conduct themselves with civility and decorum, consistent with Member Service Policy 17. If you would like answers to specific questions, please email communications@opalco.com for post-meeting follow-up.*

# Agenda

# ACTION ITEMS

## Consent Agenda

All matters listed with the Consent Agenda are considered routine and will be enacted by one motion of the Board with no separate discussion. If separate discussion is desired, that item may be removed from the Consent Agenda and placed as an Action Item by request of a Board member.

The Consent Agenda includes:

- **Minutes** of the previous meeting – attached.
- **Approval of New Members** – attached {as required by Bylaws Article I Section 2 (d)}

**NEW MEMBERS – September 2021**

**District 1** (San Juan, Pearl, Henry, Brown, Spieden)

BODEN, THERESA
BROWN, PETER & PETERSEN, TRICIA
BRYANT, ANNE & ALLEN, BRANDIN
CALDWELL, PAIGE & BURKHOLDER, MARK
CARUSO, ALISON
COLACURCIO BROTHERS INC & MCINTYRE, MANLEY
COTTAGE VERDE LLC
DEMROSE, LORNE
DOWNES, LINDA
DYER, CHELSEY
EASTERLING, BRADLEY
EDEN HOLDING, LLC
FLORER, JOE
GAYE, SILVER
GOSSOM, COOKY
GRIFFIN, CAROL & GRIFFIN, JOHN
GUILLEN, OMAR
HARRIS, ROBERT
HATHAWAY, DONNA & SAMUEL, STEVEN
HAUGEN, LORI
HENRIE, JAMES
JOHNS, LISA
KELLERAN, BRETT
KILLORAN, LAURA
KUHEIM, HEIDI
KULL, KRISTINA
LANDRY, CARLY
LAUTER, KRISTIN
LEDGERWOOD, REID
MALONE, BETH
MANGALA, AVONE CHITH
MARTEL, JUSTIN
MESTON, SARAH
O'CONNOR, MARIANNE
OROURKE, ERIN
PEINADO, DAVID & GARCIA, FERNANDA
RADDEN, DYLAN
RICHARD, GAIL
SCHONEBERG, KELLY
SHAW, RACHEL & SHAW, KENNETH
SHERMAN, KATHRYN
SMITH, GARRETT
SMITH, MICHAEL
STERN, CAROL
STONE, ERIC & STONE, TERESA
SWINDELLS, SUSAN
TIDE POOL KIDS
TT&HM LLC
ZAPPELLI, WENDY & ZAPPELLI, LUIS

**District 2** (Orcas, Armitage, Blakely, Obstruction, Double, Alegria, Fawn)

BASTINE, ANDREW & BASTINE, JOHANNA
BIGGINS, JOE & RICHARDS, BETH
BRUCE, HEIDI & BRUCE, W DOUGLAS
COLEMAN, GORDON
DEER HARBOR HEIGHTS WATER ASSO
FLEISCHMAN BONNER & ROCCO LLP
FREELAND, JEREMY
GREENBERG, BETTY
HALL, LUANA & HALL, RICHARD
LEE, DONNA & CRAIG, MIKE
MCLACHLAN REV LIVING TRUST
MILLAN, JAKE & BRODSKY, BETHANY
ORCAS ISLAND FAMILY MEDICINE
PHILLIPS, KATHRYN & PHILLIPS, GLEN
PONGO, BILL
PRADO, SAMUEL
REYNOLDS, PATRICK & REYNOLDS, KELLI
ROBERTS, SEAN
SMART, CAMERON
TODD, JAMES & TODD, NICOLE
TOPACIO, ANNABELLE
VAN NICE, BRUCE & VAN NICE, ROXANNE
WARREN, QUINN
WEAVER, MICHAEL
WOOD, JONATHAN & WOOD, OLIVER

**District 3** (Lopez, Center, Decatur, Charles)

CAMPBELL, SEAN & CAMPBELL, CHELSEY
CARR, RICHARD & SUDEN, ELIZABETH
CHARLTON, THOMAS
CLIFF'S ANCHORAGE LLC
CRIST, BARRY
DABROWSKI, OLIVIER
GASTINEAU, MATHEW
GRILLO, JOHN & FLETCHER, JESSICA
HOPPER, JULIE & HOPPER, ERIC
KAPTEYN, DEBRA

KEELER, JENNIFER & HIBBARD, CHRISTOPHER
MACHENGETE, JACOB
POTTER, PAUL & POTTER, ASHLEY
RUSH, COLY & RUSH, ERIN
TAYLOR, AMELIA

TOMLINSON, JAMES & TOMLINSON, ROY

**District 4** (Shaw, Crane, Canoe, Bell)
No new members

- Capital Credit payments to estates of deceased members and/or organizations no longer in business as shown below:

**October**

| Customer # | Amount |
|---|---|
| 72204 | 1,040.00 |
| 11287 | 374.22 |
| 70200 | 1,059.85 |
| 84417 | 234.97 |
| **Total** | **$ 2,709.04** |

- RUS 219s Inventory of Work Orders of projects completed from the Construction Work Plan. These forms are submitted to RUS for approval of loan funds.

| Inventory | Amount | RUS Description |
|---|---|---|
| 202108 | $40,310.34 | Transclosure, URD and Pole Replacements |
| **Total** | **$40,310.34** | |

Staff requests a motion to approve the Consent Agenda.

**Orcas Power & Light Cooperative**
**Minutes of the Board of Directors Meeting**
**Thursday, September 16, 2021**

Streaming through Zoom attendees were: President Vince Dauciunas, Board members Rick Christmas, Jerry Whitfield, Brian Silverstein, Mark Madsen, Tom Osterman and Jeff Struthers. Staff present were General Manager Foster Hildreth; Manager of Engineering and Operations Russell Guerry; Manager of Finance and Member Services Nancy Loomis; Public Relations Administrator Suzanne Olson; Head Accountant Travis Neal, and Executive Assistant Kelly Koral (serving as recording secretary). Also present were Legal Counsel Joel Paisner and consultant Jay Kimball.

Member comment session commenced at 8:30 a.m.

| | | |
|---|---|---|
| Members in attendance: | Tom Owens | Tim & Holly Kent |
| Guests: | Mike Searcy | |

Regular Session – 8:30 a.m.

Krista welcomed all to the meeting. Asking guests to type in any questions to the chat feature during the member comment period now. Reviewed today's agenda. Solar townhall Monday the 20th. Register to attend. Raffle drawing October 1st on FB Live. Electric vehicle road trip Oct 6 – 11. Now hiring for linemen apprentices for San Juan and Orcas. Also looking for volunteers for the EGC.

President Vince Dauciunas opened the meeting and reviewed the agenda. There are a few time constraints so there may be a need to amend the agenda.

**CONSENT AGENDA**

**MOTION** was made to accept the consent agenda by Madsen. Seconded by Silverstein. Passed unanimously by voice vote.

**ANNUAL MEETING**

Staff proposed holding the 2022 Annual Meeting at the San Juan County Fairgrounds. If, due to COVID-19, we are unable to hold any type of in-person event it will be held virtually. Also proposed – Joel Paisner be approved as Parliamentarian.

**MOTION** was made to hold the annual meeting at the county fairgrounds and approve Joel Paisner to act as parliamentarian. Seconded and approved by unanimous voice vote.

**TARIFF – ECA – SECOND READ**

GM reviewed the ECA and recommends keeping it at its current rate but allowing the Board to invoke adjustments as needed. This will allow the Board the ability to adjust for deviations in actual vs. expected power usage and sales and anticipated power costs. Counsel confirmed this applies to weather, usage and how it affects members.

**MOTION** made by Silverstein to accept the ability for the Board to adjust the ECA as stated above. Second by Madsen. Passed unanimously.

**SOLAR RATE DISCUSSION**

Presentation on Member Generation: Rate Analysis. Discussion was held amongst the Board about the presentation. Mike Searcy from Guernsey joined at 9:30 a.m. Subject is to be brought back at the October meeting for further discussion.

**CAPITAL CREDITS ALLOCATION**

Suggested changes were discussed. First read only. Second read in October 2021.

**COVID UPDATE**

Reviewed current status of funds remaining for assistance to members. No assurances Washington State will step in with any form of aid. NRECA is currently pressing the legislatures for assistance. OPALCO will actively work with members in arrears to develop payment arrangements.

**GM REPORT**

The GM report was reviewed.

End of Regular Session 10:45 a.m.
Executive Session

Back to Regular Session 12:30 p.m.

**MOTION** to approve Moss Adams for the 2021 audit was made. Seconded and approved by voice vote. Jerry Whitfield had left the meeting at 12:00 p.m. so was not involved in the vote.

_____ _____

Vince Dauciunas, President Brian Silverstein, Secretary/Treasurer

Orcas Power & Light Cooperative — Revision: 108578

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## RUS Form 219 Inventory Of Work Orders

Period: AUG 2021 — System Designation: WA O9

Preliminary — 202108

Inventory: 202108

| Loan Project | Year | Work Order Construction (1) | Work Order Retirement (2) | Bdgt (3) | Gross Funds Required: Cost Of Construction: New Constr Or Replacements (4) | Gross Funds Required: Cost Of Removal: New Constr Or Replacements (5) | Deductions: Salvage Relating To New Construction Or Replacements (6) | Deductions: Salvage Relating To Retirements Without Replacements (7) | Deductions: Contrib In Aid Of Constr and Previous Advances (8) | Loan Funds Subject To Advance By RUS (9) |
|---|---|---|---|---|---|---|---|---|---|---|
| 601 | 2018 | 3710 | 3710 | 1 | 2,899.01 | 0.00 | 0.00 | 0.00 | 0.00 | 2,881.35 |
| | | | | | | | | AFUDC: 17.66 | | |
| | | | | | 2,899.01 | 0.00 | 0.00 | 0.00 | 0.00 | 2,881.35 |
| 606 | 2018 | 3751 | | 1 | 4,666.26 | 0.00 | 0.00 | 0.00 | 0.00 | 4,649.51 |
| | | | | | | | | AFUDC: 16.75 | | |
| | | | | | 4,666.26 | 0.00 | 0.00 | 0.00 | 0.00 | 4,649.51 |
| 608 - 8 | 2018 | 3608 | 3608 | 1 | 33,095.35 | 0.00 | 0.00 | 0.00 | 0.00 | 32,779.48 |
| | | | | | | | | AFUDC: 315.87 | | |
| | | | | | 33,095.35 | 0.00 | 0.00 | 0.00 | 0.00 | 32,779.48 |
| **Grand Totals:** | | | | | $ 40,660.62 | $ 0.00 | $ 0.00 | $ 0.00 | $ 0.00 | $ 40,310.34 |

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Orcas Power & Light Cooperative — Revision: 108578

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RUS Form 219 Inventory Of Work Orders

Period: AUG 2021 — System Designation: WA O9

Preliminary — 202108

Inventory: 202108

| Budget Loan | Project | Amount |
|---|---|---|
| 1 | 601 | 2,881.35 |
| 1 | 606 | 4,649.51 |
| 1 | 608 - 8 | 32,779.48 |
| | **Total:** | 40,310.34 |

### BORROWER CERTIFICATION

WE CERTIFY THAT THE COSTS OF CONSTRUCTION SHOWN ARE THE ACTUAL COSTS AND ARE REFLECTED IN THE GENERAL ACCOUNTING RECORDS. WE FURTHER CERTIFY THAT FUNDS REPRESENTED BY ADVANCES REQUESTED HAVE BEEN EXPENDED IN ACCORDANCE WITH THE PURPOSES ON THE LOAN, THE PROVISIONS OF THE LOAN CONTRACT AND MORTGAGE, RUS BULLETINS, AND THE CODE OF FEDERAL REGULATIONS RELATIVE TO THE ADVANCE OF FUNDS FOR WORK ORDER PURPOSES. WE CERTIFY THAT NO FUNDS ARE BEING REQUESTED FOR REIMBURSEMENT OF CONSTRUCTION WORK IN A CBRA AREA.

SIGNATURE (MANAGER) — DATE

SIGNATURE (BOARD APPROVAL) — DATE

### ENGINEERING CERTIFICATION

I HEREBY CERTIFY THAT SUFFICIENT INSPECTION HAS BEEN MADE OF THE CONSTRUCTION REPORTED BY THIS INVENTORY TO GIVE ME REASONABLE ASSURANCE THAT THE CONSTRUCTION COMPLIES WITH APPLICABLE SPECIFICATIONS AND STANDARDS AND MEETS APPROPRIATE CODE REQUIREMENTS AS TO STRENGTH AND SAFETY. THIS CERTIFICATION IS IN ACCORDANCE WITH ACCEPTABLE ENGINEERING PRACTICE.

INSPECTION PERFORMED BY — FIRM

LICENSE NUMBER — DATE — SIGNATURE OF LICENSED ENGINEER

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# 2020 IRS Form 990

The draft 2020 IRS Form 990 will be reviewed during Executive Session.

Note, these 990 figures were reviewed in March 2021 during the 2020 year-end review and again in May 2021 during the 2020 Moss Adams audit. The 2020 return is consistent with last year's filings and is based on the 2020 financial statements (including quarterly reviews), which were audited by Moss Adams and approved by the Board of Directors at the May 20th board meeting. No material adjustments have been made in the compilation of this tax filing.

NRECA has published a useful infographic for how to read a co-op Form 990:
https://www.electric.coop/990-2/

Please note that Staff will post the Form 990 on OPALCO's website once it is officially filed and made available on the web.

Upon review in executive session and return to regular session, staff recommends the Board make a motion to approve the submittal of the 2020 Form 990.

# Capital Credits Allocation (Final Read)

Staff finalized the policy and bylaws revisions reviewed with the Board at the September meeting.

Background:
OPALCO equitably allocates its patronage earnings to each member in proportion to the value of service paid for by the member during the fiscal year. The State of Washington does not have specific restrictions or requirements relating to whether non-operating margins must be included in patronage capital credits. Similarly, RUS regulations do not mandate inclusion of non-operating margins in patronage capital. Subject to law, OPALCO's Articles of Incorporation, and OPALCO's Bylaws, the allocation and retirement of capital credits is at the sole discretion of the OPALCO Board of Directors.

Attached is a revision to Member Policy 11 that allocates operating margins only to capital credit distribution in order to prevent the Co-op from having to raise revenue (through rates) to pay higher future capital credit distributions that would be elevated by current non-operating income (non-electric revenue like patronage capital from other cooperatives). A key factor for the non-operating items is that they are infrequent and not a component of member's key support of the cooperative through the purchase of electric services.

OPALCO continues to solicit federal, state and local grants, which are essential to the development of energy projects directly benefiting the membership. The accounting treatment for posting grant funds is to the non-operating margin section of the Income Statement. This will aid in increasing OPALCO's equity which is essential for funding and developing renewable energy projects. Other current examples of OPALCO's non-operating margin includes interest income, other miscellaneous one-time amounts, such as the sale of vehicles, on-bill financing fees, interconnect fees, and fees from custom orders.

Staff recommends the Board make a motion to adopt the following changes to the OPALCO Bylaws and the OPALCO Member Service Policy 11 – Capital Credits.

**ARTICLE VIII - NONPROFIT OPERATION**

**Section 2. Members' Patronage Capital in Connection with Furnishing Electric Energy.**

Except as provided in Article I, Section 4, in the furnishing of electric energy, the Cooperative's operations shall be so conducted that all members will, through their patronage, furnish capital for the Cooperative. In order to induce patronage and to assure that the Cooperative will operate on a non-profit basis, the Cooperative is obligated to account on a patronage basis to all its members for all amounts received and receivable from the furnishing of electric energy. All such amounts that represent the operating net margin at the moment of receipt by the Cooperative are received with the understanding that they are furnished by the members as capital. The Cooperative is obligated to pay by credits to a capital account established for each member, all such amounts that represent the operating net margin.

The books and records of the Cooperative shall be set up and kept in such a manner that at the end of each fiscal year, the amount of capital, if any, so furnished by each member is clearly reflected and credited in an appropriate record to the capital account of each member, and the Cooperative shall, within a reasonable time after the close of the fiscal year, notify each member of the amount of capital so credited to his account. Notwithstanding the patronage capital provisions by these bylaws, any member who fails to remain an active member for twelve consecutive months shall forfeit all rights to patronage capital received or receivable. All such amounts credited to the capital account of any member shall have the same status as though they had been paid to the member in cash in pursuant of a legal obligation to do so and the member had then furnished the Cooperative corresponding amounts for capital.

a) In the event of dissolution or liquidation of the Cooperative, after all outstanding indebtedness of the Cooperative shall have been paid, outstanding capital credits shall be retired without priority on a pro rata basis before any payments are made on account of property rights of energy members. Thereafter, any payments made on account of property rights of members shall be made to all energy members (including former members) in the proportion which the aggregate patronage of each member bears to the total patronage of all such members. If, at any time prior to the dissolution or liquidation, the Board of Directors shall determine that the financial condition of the Cooperative will not be impaired thereby, the capital then credited to energy members' accounts may be retired in full or in part. Each such retirement of capital shall, in the sole discretion and determination of the Board of Directors, be made pursuant to resolution of general application of the Board of Directors in the following manners:

b) By payment to members in order of priority according to the year in which the capital was furnished and credited, the first received by the Cooperative being the first retired; or

c) By payment to all members on the basis of the ratio that the unpaid capital credits standing in the name of each member on the books of the Cooperative bears to the total unpaid capital credits of all members as shown on the books of the Cooperative. No active member who fails by this method to get a check for the minimum amount would have that amount deducted from his capital credit account; or

d) By discounting of estate payments to dissolved corporations or associations when capital credits are to be retired prior to the time such capital credits would otherwise normally be retired; or

e) By the Board of Directors determining the method, basis, priority and order of retirement.

Capital credited on the account of each energy member shall be assignable only on the books of the Cooperative pursuant to written instruction from the assignor and only to successors in the interest or successors in occupancy in all or a part of such member's premises served by the Cooperative unless the Board of Directors, acting under policies of general application, shall determine otherwise.

Notwithstanding any other provisions of these bylaws, the Board of Directors, at its sole discretion, shall have the power at any time upon the death of any energy member, or upon the dissolution of any corporation or association, to authorize payment of capital credits to the party or parties in title thereto; if the board authorizes payment of capital credits pursuant to this section, the remittance of those credits shall take place in a manner agreed upon by the board of directors and the representative; if the legal representatives of the estate, the dissolved corporation or the association shall request in writing that the capital credited to any such member, corporation or association be retired prior to the time such capital credit would otherwise be retired under the provisions of these bylaws, to retire capital credited to any such member, corporation or association immediately upon such terms and conditions, including such discount as the board shall deem proper, provided, however, that the financial condition of the Cooperative shall not be impaired by the payments herein permitted as determined by the board of directors in its sole discretion.

## Member Service Policy 11 – *Capital Credits* Revisions (FINAL READ)

**ORCAS POWER AND LIGHT COOPERATIVE**
**MEMBER SERVICE POLICY 11**
**CAPITAL CREDITS**

**11.1 GOALS AND OBJECTIVES**

To state the general policy of Orcas Power and Light Cooperative for allocating and retiring capital credits.

**11.2 EXPECTATIONS**

11.2.1 OPALCO shall operate on a cooperative basis for the mutual benefit of all members. Capital credits shall be allocated and retired in a manner that is consistent with operating as a cooperative under federal law. OPALCO will be fair and reasonable to its members and former members, while providing the cooperative with sufficient equity and capital to operate efficiently and effectively, thus protecting OPALCO's financial condition. Subject to law, OPALCO's Articles of Incorporation, and OPALCO's Bylaws, the allocation and retirement of capital credits shall be at the sole discretion of the OPALCO Board of Directors.

11.2.2 Member

An OPALCO member is any member, or member entity, who has paid the membership fee and who is providing patronage by using any OPALCO service.

11.2.3 Capital Credits

Capital credits are the primary source of equity for most cooperatives. Members contribute equitably to the capital of the cooperative every month when they pay their OPALCO bill for electric charges. At the end of each fiscal year, the operating expenses are deducted from the operating income to arrive at the net operating margins. Net operating margins are assignable as capital credits to each member and allocated annually to the member's capital credits account.

11.3 PROCEDURES FOR ALLOCATION OF CAPITAL CREDITS

11.3.1 Board Approval

OPALCO shall allocate capital credits according to the manner, method, timing, and amount approved by the Board.

11.3.2 Patronage Earning Allocations

OPALCO shall equitably allocate its patronage earnings to each member in proportion to the value of service paid for by the member during the fiscal year.

11.3.3 Patronage Loss Allocations

OPALCO shall offset patronage losses with its patronage earnings during any fiscal year.

11.3.4 Formula for Allocation

A member's year-end capital credit allocation is calculated by multiplying OPALCO's annual capital credit allocation factor times a member's annual direct billing for electric energy services.

11.3.4.1 Capital Credit Allocation Factor

Upon the completion of the OPALCO's audited annual financial statements, the total net operating margin is divided by total annual revenue derived from the sale of electric energy services (also known as patronage) which results in the Cooperative's overall allocation factor. The total patronage amounts included are annual electrical demand charges, street and security light charges, kWh usage charges, and basic charges. The Cooperative's revenue components that are not included in the allocation factor calculation are miscellaneous charges (fees, deposits, member-elected contributions, etc.).

11.3.4.2 Member Capital Credit Allocation

To derive a member's year-end capital credit allocation, the Cooperative's overall Capital Credit Allocation Factor is multiplied by the annual amount paid by a member for electric energy services, including charges for electric energy, electric demand, street and security lights, kWh usage, and basic charges. Member billing components not included in the capital credit allocation calculation are miscellaneous charges (fees, deposits, member-elected contributions, etc.)

11.3. 5 Notification of Allocation

Within one hundred eighty (180) days following a fiscal year, OPALCO shall notify each patron in writing of the amount of capital credits allocated to the member for the preceding fiscal year. This notice can be in the form of a letter or as a message on the member's billing statement.

**11.4 PROCEDURES FOR RETIRING AND REFUNDING CAPITAL CREDITS**

11.4.1 At any time if the Board determines that OPALCO's financial condition will not be adversely impacted:

11.4.1.1 The Board may authorize OPALCO to wholly or partially retire and refund capital credits to members and former members; and

11.4.1.2 The Board may also authorize OPALCO to retire and refund the corresponding affiliated organization's capital credits.

11.4.2 The Board shall have the discretion to determine the manner, method, and timing of retiring and refunding capital credits and affiliated capital credits.

11.4.3 Nothing in this policy shall be deemed to entitle a member to receive any capital credit or affiliated capital credit to which they have not contributed, or in a proportion greater than the proportion of their contribution.

11.4.4 General Retirement of Capital Credits

The Board will consider general retirement of capital credits, in accordance with the above conditions, on an annual basis. The Board will review the amount of funds that are available for retirement and, if appropriate, authorize payment of these capital credits to members and former members. OPALCO shall not pay interest or dividends on capital furnished by members.

On an annual basis, the board shall utilize a "smoothing methodology" to minimize year over year fluctuations in cash outlay. The goal of this methodology shall be to keep year over year general retirements as even as possible by ensuring that (a) on average, a 25-year payout schedule is maintained and (b) large fluctuations in future years' retirements are levelized.

11.4.5 Retirement of Capital Credits due to Death

Upon the death of any individual member or individual former member, and pursuant to a written request from the deceased member's representative, the Board may retire the deceased member's capital credits and affiliated capital credits under terms and conditions agreed upon by the member's representative and OPALCO, which will include reduction of said credits as described in Section 11.5.3.

11.4.6 Retirement of Capital Credits to Entities

Upon the dissolution, liquidation or cessation of existence of an entity member or former entity member, and pursuant to written proof that the entity no longer exits, the board may retire the organization's capital credits and affiliated capital credits under terms and conditions agreed upon by the entity member and OPALCO, which will include reduction of said credits as described in Section 11.5.3.

11.4.7 Joint Memberships

Upon OPALCO receiving written notice and adequate proof of any joint membership that is:

11.4.7.1 Terminated or converted through the death of one (1) joint member, the capital credits previously allocated and credited to the joint membership shall remain with the surviving joint member/s; or

11.4.7.2 Otherwise terminated or converted, and unless otherwise instructed by a court or administrative body of competent jurisdiction, the capital

credits previously allocated and credited to the joint membership shall be transferred proportionately to each joint member.

11.4.8 Application to Debt

Before retiring and refunding any capital credits or affiliated capital credits, OPALCO may deduct from the capital credits or affiliated capital credits any amounts owed to OPALCO by the member or former member as per the procedure set forth in Member Service Policy 7 Billing and Collection.

Any remaining capital credits due the member or former member may be distributed during the normal payout cycle of capital credits.

11.4.9 Minimum Amount

OPALCO shall not retire and pay capital credits in an amount less than $5.00.

**11.5 LIMITATIONS**

11.5.1 Forfeiture of Capital Credits

OPALCO shall not enter contracts through which a member or former member forfeits the right to the allocation or retirement of capital credits. RUS Bulletin 102-1 states "No patron should be asked by contract or otherwise to waive his capital credits."

11.5.2 Separate Allocations and Retirements

OPALCO shall separately identify and allocate to its members capital credits and similar amounts allocated to OPALCO by an entity in which OPALCO is a member, patron, or owner. OPALCO may retire these separately identified and allocated capital credits only after the entity retires and pays the amounts to OPALCO.

11.5.3 Valuation of Special Retirements

Special Retirements are applicable for a deceased member, dissolved corporation or association, or bad debt. Special retirements return capital to members earlier than the general retirements, which are typically planned on a 25-year holding period. An earlier retirement has a lower value. OPALCO shall use the percentage rate set by the Board at the January 1987 OPALCO Board of Directors meeting. This is a straight-line accrual; OPALCO will pay 2.5% cumulative for the year the capital credit has been held by OPALCO; (i.e., 2.5% for 2004, 5% for 2003, 7.5% for 2002, etc. In addition, capital credits paid out as special retirements that have been held by OPALCO for over 25 years will be paid at 100%.

11.5.4 Voluntary Assignment to Member Programs

During the General Retirement process, members have the option of voluntarily retiring allocated capital credits and assigning capital credit payments to Board approved OPALCO member programs, including Project PAL, Solar for Schools, M.O.R.E., or other approved programs as determined by the Board. Annual capital credit distributions may be assigned to the selected OPALCO member program on a one-time or recurring basis. Members must notify OPALCO of their voluntary assignment via the attached form. Such assignment forms are to be submitted to OPALCO no later than October 1st of any given year.

11.5.5 Payment and Notice of Retirement

With the exception of Application to Debt in Section 11.4.8 and/or Voluntary Assignment to Member Programs in Section 11.5.4 above, after OPALCO retires capital credits allocated to a member, it shall pay the retired amount by sending a check for the amount to the member's most current address listed on OPALCO's records.

11.5.6 Unclaimed Capital Credits

If a member or former member fails to claim a retired capital credits amount within 180 days, the check will be voided and added to the list of unclaimed capital credit amounts.

## 11.6 RESPONSIBILITY

11.6.1 Implementation of Policy

OPALCO's general manager is responsible for implementing this policy and for developing procedures necessary to allocate and retire capital credits according to this policy.

11.6.2 Recommendations to the Board

OPALCO's general manager is responsible for recommending to the board the manner, method, timing, and amount for allocating and retiring capital credits. The manager is also responsible, when in the best interest of OPALCO, its members and former members, for recommending to the board revisions to this policy.

11.6.3 Review and Approval by Board

The board is responsible for approving the recommended manner, method, timing, and amount for allocating and retiring capital credits. The board is also responsible for reviewing, discussing, and evaluating the general manager's recommendations for revisions of this policy.

# DISCUSSION ITEMS

## Eighth Power Plan

The Northwest Power and Conservation Council (NWPCC) has released the Eight Power Plan draft and it is being circulated to gather comments from the regional utilities. Comments to the draft plan are due back to the NWPCC through November 19th, 2021. Two staff members from NWPCC, Gillian Charles and Elizabeth Osborne, will be available for discussion and to answer question at the OPALCO Board meeting. NWPCC anticipates releasing the plan in February 2022. Below are the industry observations and questions that OPALCO has posed to NWPCC.

### OPALCO NWPCC Energy Strategy Discussion: The Problem and Solutions

### OPALCO NWPCC Energy Strategy Discussion: The Problem and Solutions

Climate disruption is bearing down on us. Rapid decarbonization is the solution. As the noted American economic and energy thought leader Jeremy Rifkin predicted in 1980, once we grasp the enormous implications of shifting the energy base of society from concentrated (fossil fuels) to dispersed (solar, wind), it becomes apparent that our existing energy infrastructure is completely unsuited to a solar/wind future, even with hydro for firming. It will require vast amounts of land, and thousands of miles of new transmission infrastructure to move it from source to cities. An enormous task is ahead of us. It can be done, but…

#### Exec Summary

- **Demand for electricity will double by 2050**, but supply is shrinking rapidly, driven by rapid decarbonization to reduce climate impact.
- **This reduced headroom will lead to near-term rolling blackouts and price increases** during extreme weather events, similar to what we have seen unfolding in Texas and California.
- **It will take years, money, land, transmission and enlightened policy to meet the need** for new clean energy.
- **Current Northwest regional strategies are essentially unfunded mandates with no detailed plan**.
- **A key near-term strategic action should get the Federal Energy Regulatory Commission (FERC) to establish a Northwest Regional Transmission Organization** (RTO). The Northwest is the only region of the US with no RTO. While most of the demand will be west of the Cascades, most of the generation will be east of the Cascades. **The RTO should be Federally mandated to solve the Pacific Northwest capacity problems first**, and weave together the various stakeholders across WA, OR, ID, MT and WY to ensure **reliable** supplies of power, **adequate transmission infrastructure** and **competitive wholesale electricity prices**. And it can accelerate the deployment of essential transmission capacity to interconnect the network of new solar and wind resources needed to meet the regions doubling power needs. We should get this going ASAP to tap into anticipated Federal infrastructure spending aimed at development of new clean energy resources.
- The western **Energy Imbalance Market** (EIM) can play a central role in helping establish the RTO.

### The Northwest Power and Conservation Council (NWPCC)

The Northwest Power and Conservation Council was established pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Public Law 96-501) by the states of Idaho, Montana, Oregon, and Washington. The Act authorized the Council to serve as a comprehensive planning agency for energy policy and fish and wildlife policy in the Columbia River Basin and to inform the public about energy and fish and wildlife issues and involve the public in decision-making.

The NWPCC recently released their draft 2021 Northwest Power Plan, the first overarching plan in five years for how to meet long-term electricity needs with new power resources, energy efficiency, demand response and more. The governments of Washington state and Oregon and public and investor-owned utilities, working together through the Northwest Power Pool, are in the process of figuring out how to implement strategies for the Northwest's power supply that involve little to no new natural gas.

## NWPCC Discussion Topics

The *2021 Power Plan* comes across as aspirational, founded on hope rather than grounded in hard realities of developing new resources that depend on new land, transmission, and environmental approval. Plan assumptions are overly optimistic and will translate to increased probabilities of rolling blackouts and loss of load going forward.


1. **Previous NWPCC Power Plans have had projections that proved too optimistic**, particularly around energy efficiency. In the *2021 Power Plan*, that optimism has spread to nearly every aspect of the plan. Given the numerous recent studies that forecast significant northwest resource adequacy issues (see discussion below, and references at end of document), what drove this optimism, and how confident is NWPCC of their projections? Texas, California, and Europe are recent examples of what can go wrong when demand exceeds supply. It is a cautionary tale. While we can hope for the best, we must plan for the worst. If this document truly wants to be a plan, not a hope, then it must embrace a credible comprehensive worst-case analysis. The risk of not getting this right will impact the regional economy, safety and cost of energy, through the rolling blackouts and unplanned outages during peak weather events – hot, cold, fire, etc.
2. The *2021 Power Plan* doesn't factor **hydro capacity decreasing** due to increasing spill projections, seasonal timing of run-off and potential LSRD removal. For example, Oregon is seriously considering initiating a 24/7/365 spill of hydro, which will reduce renewable hydro capacity that would otherwise be used to firm solar, wind, and meet baseload. (See PPC Fish & Wildlife assessment)
3. **BPA Export / Import** assumptions "as existing" and are not projected, even as BPA is looking to the secondary market to "maximize the value of the hydro system." (See EIM and EDAM)
4. **New Renewable Generation Projects** assumptions are overly aggressive hoping that 3,500 MW will come to market as projected (given capital, siting, & permitting constraints / resistance). See discussion below on land use and environmental issues. Note: The 8th PP renewable energy growth assumptions follow individual state estimations, which are essentially unfunded state mandates. NIMBYism is also rising - e.g. environmental resistance by Sierra Club (see also: Wind Power Project Rejection Database).
   In short: Top-down reports such as the 8th Power Plan vs. bottoms-up summations such as the WA State IRP report show significant disagreement between expectations and committed/planned

resources. There is clearly a mismatch in top-down vs bottom-up estimates on Conservation and Demand Response programs too. Top-down (8th Power Plan) appears to be overly optimistic given the individual utility's IRP submittals. In addition, difficulty in estimating regional power imports and exports usually results in them being ignored, or frozen at current levels.
There are only rough estimates on the quantity, cost, location, and timing of construction of new intermittent renewable generation and storage resources. When all known planned or committed resources are considered, there still appears to be adequacy issues, with unacceptable LOLP's.
Quote of note: *"To be clear, this forecast doesn't represent a forecast of power plants the Council expects will be built in the future. Rather, it shows what we estimate it would take to meet all the various requirements put on Western electric utilities."* (page 6-44)

5. **Energy Efficiency / Demand Response** targets remain optimistic and will require sizable grid upgrade to be realized.
   Quotes of note: *"In recent years, with all the accomplishments and increasing efficiency levels , the future amount of low-cost efficiency available has diminished."* (page 5-29)
   *"Additionally, in the current contracts, many Bonneville customer utilities see little value in pursuing demand response and are limited in the ability to provide a demand response resource to another utility, both within and external to the pool of Bonneville customer utilities. In future contracts, Bonneville should consider provisions supporting its customer utilities 'development and export of demand response resources."* (page 8-93)
6. The 2021 Power Plan doesn't address the numerous **transmission challenges** facing the region. How can resource adequacy be planned for if new transmission assets can't be built? Does the Council support and recommend that BPA participate in the establishment of a RTO dedicated to the PNW to help solve the many transmission related challenges we are facing?
   Quote of note: *"The Council in our work assumes that the transmission planning organizations and utilities will work together to ensure appropriate investment is made into the transmission system to at a minimum maintain the current ability to deliver electricity around the West. While we do not study expansion of the transmission system in this plan, we recommend the region work with the transmission planning organizations to explore the costs and benefits of doing so."* (page 4-23)
7. An examination of individual IRP's shows mid-2020's and beyond capacity shortages for many utilities. The nearly universal response is "**market purchases**" to meet the demand. There is no clear definition of "the market" in terms of who is building what, where, when, and at what cost. There appears to be a belief that EIM, EDAM, and RA programs will somehow produce the "correct" investments in generation, storage, and transmission infrastructure. There is also considerable disagreement about and concern for CAISO's perceived excess control of evolving market structures. Will the PNW wind up paying CA prices for energy as a result?
8. There is frequently mentioned the need for an RTO in the pacific northwest, however, critics just as frequently point out previous failures to create such an entity. Yet, analysts say the problem is unlikely to be solved by hundreds of utilities and 10's of Balancing Authorities somehow producing an optimal market and physical solution.
9. Various reports paint a picture of "**double (or multiple) counting**" of the use of renewable resources. For example, WA State and CA both claim to use "50% or more" of future Montana and Wyoming wind resources. And as Montana/Wyoming transition from coal to renewables, will they keep their wind power for themselves?
10. **Load Growth** estimates and generation resources needed to meet that load vary. Here are three examples of widely diverging views on load growth and generation:

**Northwest Regional Forecast of Power Loads and Resources 2021 through 2031- PNUCC**

"Nearly 100 regional utilities, making up 55% of the load, are forecasting annual energy load growth at under 0.5% per year, including 14 utilities expecting load decay. Most of the forecasted growth comes from utilities in the high growth group (1.5% or more per year). Much of that growth hinges on large new and growing industrial customers in the Northwest."

**2021 Energy Strategy Transitioning to an Equitable Clean Energy Future – WA State Dept of Commerce**

"Total demand for electricity nearly doubles by 2050 in the Electrification Scenario and expands significantly in the other scenarios. Supplying this electricity from clean electricity sources is cheaper than other alternatives such as decarbonizing fuels. Washington's electricity supply is already 69% clean because of the state's significant hydro resource, however we assume there is no opportunity to expand hydroelectricity supply in the future, so wind and solar resources provide the additional energy needed. In 2020, Washington is a net exporter of energy. As renewable generation fills the state's additional energy needs, Washington becomes a net importer, bringing in 43% of its electricity by 2050 in the Electrification Scenario, 36% of which comes from Montana and Wyoming wind. To understand where imports into Washington derive from throughout the West, please see page 39 of the technical report in Appendix B. The lower relative cost of these out-of-state resources versus in-state opportunities limits the growth of new renewable capacity in state until 2040 when Washington starts to build solar and offshore wind."

**Washington State Electric Utility Resource Planning 2020 Report Pursuant to RCW 19.280.060" – Washington State Department of Commerce, December 2020**

*"Hydropower will remain the dominant source of electric for Washington utilities over the 10-year forecast period. Generation from coal-fired electricity will decrease in the forecast period that will increase reliance on natural gas-fired generation.*

*Base-year aggregated state utility load has remained in a narrow band over the period from 2008 through 2020. Load growth forecasts by utilities for the five and 10-year out points have been trending down with each successive Commerce Utility Resource Plan report.*

*The statewide aggregate growth in electricity demand is expected to be moderate, and most of this growth will be offset through energy conservation programs operated by utilities. However, several utilities with surplus generating capacity and very inexpensive electricity (Chelan, Douglas, and Grant PUDs) are forecasting very high load growth rates over the next 10 years.*

*The report shows that short and long-term contracts make a smaller contribution to total resources in the base year (2019), but they are forecast to make larger contributions in the five and 10-year forecasts than was seen in the 2018 utility resource report.*

*The Pacific Northwest Utilities Conference Committee 2020 Regional Forecast report reveals a projected electricity deficit for the Northwest starting in 2024 (283 aMW) and continuing to grow through the end of the 10-year planning period (3,200 aMW). PNUCC identifies a large number of planned resources in the region, but because they have less certainty from a financial or regulatory standpoint, they therefore are not included in the forecast.*

*The region's premier planning body, the Northwest Power and Conservation Council, evaluated the adequacy of the Northwest electric power supply in 2020 and concluded that resources are not expected to meet its adequacy standard after 2020. Resources are considered adequate when the loss-of-load probability (LOLP) is less than 5 percent. However, with the planned retirements of Boardman and Centralia 1 at the end of 2020, the LOLP will reach of 7.5 percent in 2021 and will no longer meet the Power Council's adequacy standard. The retirement of the Hardin coal-fired power plant and the Klamath Hydro facility in 2021 were forecast to raise the LOLP to 8.2 percent by 2024. The Council noted that other power plant retirements announced for later in the decade would raise*

*the LOLP value further if replacement resources are not brought online in a timely manner."*
**Conclusion:** *Individual utilities, especially those without wholly owned generation resources, are in a planning period of extreme uncertainty about the cost and reliability of their future power supply. Boards and staffs of these utilities need to continually educate themselves on the rapidly evolving scenarios and consider the implications for ongoing investments in their infrastructure.*

11. The plan should include a realistic worst-case analysis, to understand what could go wrong, and then plan for how to mitigate, properly fund, and implement, rather than revise the plan as needed - that won't work.
    Quote of note: *"The 2021 Northwest Power Plan includes many recommendations to the regional and to Bonneville. We recognize that the regional power system is in an extraordinary time of change with many uncertainties associated with future system operations."* (Page 6-42)
12. There is a lack of transparency (at least in the available reports) on the models used, assumptions made, and datasets used to prepare the reports and conclusions. Various reports are given credibility and authority differently by different special interest groups.

## Background: NW Regional Energy Challenges

### Climate Disruption

- Texas and California rolling blackouts are harbingers of our climate disrupted future.
- Global carbon emissions have increased over 3X since 1960, spiking atmospheric CO2 to dangerous levels never seen in over 400,000 years of planetary history.
- As many as 1 million species are now at risk of extinction, many within decades.
- Oceans have been rapidly heating over the past few decades, with about half of the increase since 1865 occurring in the past 20 years.
- Globally, governments are accelerating their plans to reduce climate disruption through urgent moves to decarbonize the planet.

### Northwest Regional Response: Rapid decarbonization, increased probability of rolling blackouts

While some of the material below highlights WA energy strategy, it is just a representative example of what the whole Northwest is grappling with as it moves to decarbonize. For example, Oregon is seriously considering initiating a 24/7/365 spill of hydro, which will reduce renewable hydro capacity that would otherwise be used to firm solar, wind and meet base load.

- To decarbonize the energy sector, Washington state just released their 2021 Energy Strategy, which calls for a rapid shift from fossil fuels to clean electricity, resulting in a near **doubling** of electric load by 2050 (see chart and discussion below). While the strategy relies on hydro to firm that vast new portfolio of intermittent and dispersed wind and solar energy, in a climate warmed world, hydro flows will likely become problematic, making this increasingly difficult, especially since no new hydro is planned.
- Washington is also rapidly shutting down all coal energy production (3,000 MW), increasing dependance on hydro but **reducing the headroom to meet regional load**, with **forecasts** **of imminent rolling blackouts** similar to what Texas and California are experiencing during extreme weather events.

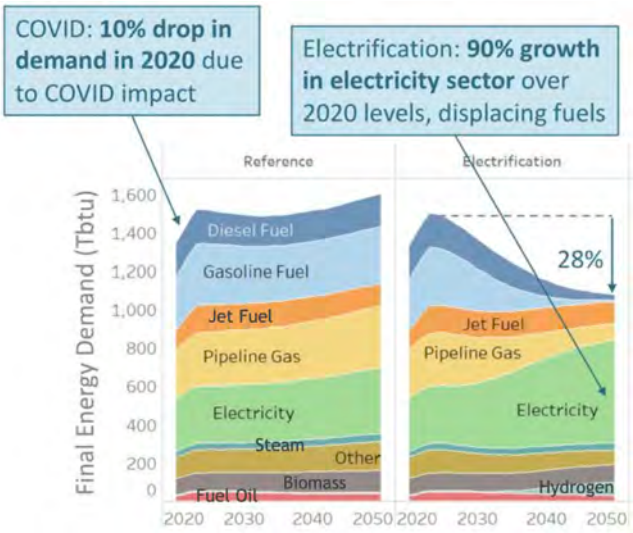
Washington State law declares that a successful energy strategy must balance three goals:

- **Maintain competitive energy prices that are fair and reasonable** for consumers and businesses and support our state's continued economic success;
- **Increase competitiveness by fostering a clean energy economy and jobs** through business and workforce development; and
- Meet the state's obligations to **reduce greenhouse gas emissions 45% below 1990 levels by 2030 and 95% below by 2050**.

We would add that a missing first bullet should strongly affirm maintaining reliability to avoid rolling blackouts.

## Observations, Questions, and Implications

- **To achieve that 95% reduction of greenhouse gas emissions**, Washington energy strategy significantly reduces fossil fuel use and replaces it with clean renewables, firming with hydro and storage. The net result is Total Energy use will decrease by 28% (see chart at right), but electricity use will grow 90%. That electricity will primarily consist of hydro, wind, and solar plus storage. Washington is rapidly removing coal from the fuel mix, with natural gas to follow.
- **That near doubling of load comes primarily from the electrification of transportation and heating**. A whopping 45% of Washington greenhouse gas emissions come from transportation. Electric transportation and heating is much more efficient than fossil-fuel, leading to the 28% reduction of TOTAL energy.




- **Washington's strategy relies on current levels of hydro to firm a vast new portfolio of intermittent wind and solar energy**. But climate disruption is projected to eliminate much of the snowpack in the region, increase extreme rain events, increase spill and stress fish populations. All these things will introduce major variability in hydro flows. Hydro may be less firm, and potentially more intermittent than the past.
- **Washington plans to essentially require the development of a new renewable energy capacity that is twice the size of the Northwest dam system** (developed 100 years ago), in an era that has much more stringent environmental and permitting requirements. This is like a Manhattan project and an Apollo moon shot ongoing for the next 20 to 30 years.

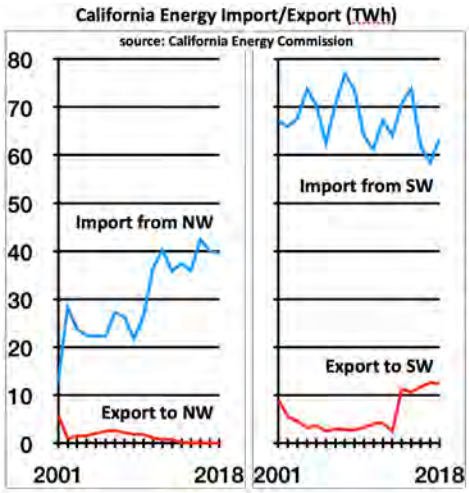
There is no plan for how to do that while meeting their objectives of an equitable, inclusive, resilient clean energy economy. Several issues and challenges need to be clarified.

- **Land for Wind, Solar and Transmission** - We have seen estimates of over 1 million acres needed (see discussion and chart below). How much is needed and can permitting meet environmental requirements in a timely way? At what cost? How long will it take to acquire the land, build the transmission corridors and build the wind and solar capacity? At what cost? How will it impact the cost of electricity? Will Montana, Idaho and Wyoming want to build wind and solar and export it to Washington and Oregon, requiring over a million acres of their wild land? What are the impacts on the industry, BPA revenue/expense, firming of renewables, replacement of capacity, decarbonization legislation, siting, permitting? Using Benton County, WA as an example, Scout Clean Energy of Colorado recently submitted an application to develop a wind power facility in Benton County, Washington. Northwest power producers should provide power to the Northwest first, before exporting to other states such as California and Colorado.

- **Reform and Expand Wholesale Electricity Markets** - The Northwest is very vulnerable to Texas/California style energy disruption. It is the only major economic region of the US without a Regional Transmission Organization (RTO) to integrate and coordinate regional supply and demand (see chart below and discussion in *Background Material* section). It's notable that Texas and California RTOs are not regulated by FERC, leading to extreme "market pricing" fluctuations. To avoid Texas/California style blackouts and market price extremes, the Northwest should accelerate planning and deployment of new energy resources and establish a centralized Regional Transmission Organization (RTO) to ensure resource adequacy. An RTO provides better coordination for transmission planning, unit commitment (deciding which generators will be available to run) and transmission system use. **This RTO should be dedicated to providing power to the Northwest first, before exporting to other states such as California**. When RTOs are regulated by FERC, it ensures **fair and open access** to a broader footprint and **won't be controlled by a single party**. RTOs are therefore more cost effective and efficient to integrate loads and resources versus alternatives.


- **The shift from concentrated to dispersed energy will require significant new transmissions network** - As solar and wind are deployed at optimal sunny and windy locations, they will be more **dispersed** and **distant** than current base-load energy generation. To procure power from distant generators, a utility currently must separately arrange for transmission rights across each separate system used to transport power to its ultimate delivery point. The utility must pay the owner of each transmission system a fee to move power across its system. The massive new dispersed interstate solar/wind portfolio will require a much more efficient coordinated system.

- **California's thirst for Northwest energy** - As the seminal book on California water politics, *Cadillac Desert*, points out, "*Water flows uphill towards money.*" The same can be said of California's notorious energy politics, as climate extremes may foster predatory pricing, reminiscent of California's water war and Enron scandals. **If it were its own nation, California would have the fifth largest economy in the world. California's $3.2 trillion economy depends on reliable energy, at almost any price**. As John Goodin, CAISO senior manager for infrastructure and regulatory policy, observed: "*You not only have to lock up the source, but you have to lock up the transmission as well… CAISO wants out-of-state suppliers to dedicate specific generation resources, including pooled resources, to serve California load so that CAISO is not relying on supply that doesn't materialize.*" As the chart at right shows, California imports increasing amounts of Northwest energy with little in return. Will Northwest energy developers commit to selling to the Northwest or be drawn to out of region sales (e.g. Shepherds Flat, representing more than 20% of Oregon's wind power generating capacity, sells their energy under 20-year contracts to Southern California Edison; Scout Clean Energy of Colorado has submitted an application for the energy from Washington's Horse Heaven Wind Farm.




- **BPA Plans** - Everyone wants BPA to ensure power reliability, but they have no mandate and no desire to be an RTO. In our view, BPA could be a major part of a FERC mandated RTO and stakeholder coalition. BPA does NOT have any requirement (or funding or plans) to build more generating capacity or new transmission lines. BPA is looking to "maximize the value" of all excess power to the highest bidder, potentially leading to Texas/California style extreme pricing. Given our electric loads are expected to double, BPA must respect the northwest utilities

need to maintain their preferential power rights, and not sell our precious resources to the highest bidder, without reinvesting the profits back into the northwest. **Market rates can only go up** due to supply dropping (coal plants closing) and demand doubling (electrification of heating/transportation). BPA gets all the secondary market revenue (above TIER 1), utilities take all the market/financial risk, even if BPA buys the power on their behalf. Further more, who knows what's going to happen with the BPA contract, to be negotiated in 2028.

- Are there ways for the region to coordinate with BPA and their Federal command to support the decarbonization effort?

In short, this is a complex massive project, with a lot of moving parts. Washington has released its ambitious *2021 Energy Strategy* and *Clean Energy Transformation Act* for getting to zero carbon. What we have outlined above is equally applicable to other Northwest states - Oregon, ID, WY, etc..

## Background: Key Elements of a Successful Solution

To decarbonize the planet, nations are essentially trying to replace a fossil fuel infrastructure, developed over the past 100 years, with clean renewable energy, in less than 30 years. This is a very complex, very expensive task, with a lot of moving parts, and problems that have no easy solutions.

Each nation and each state is endeavoring to do an Apollo moonshot and a Manhattan project, over and over and over again, until the work is done. One cooperative utility board member likened it to" rebuilding a DC-3 into a 787 Dreamliner, while in flight, without losing altitude or direction, and keeping the passengers safe and comfortable at the same time."

Developing a massive new portfolio of regionally dispersed generation resources, routed to Northwest population centers, which are expected to double electric energy demand by 2050, will require a wealth of solutions to meet the challenges discussed above.

While much attention has been focused on new renewable technologies like solar and wind power, at the end of the day, massive amounts of land, transmission and permitting, will be the glue that binds it all together. Things like acquiring over a million+ acres of land to host new solar and wind projects. Building over a thousand miles of new transmission lines to move that new dispersed energy to population centers. That network of generation and transmission will need 21st century coordinating entities to ensure **reliable power**, even when the wind and sun are taking a break. And that power needs to be **delivered at a fair and affordable price**.

### Regional Transmission Organization (RTO) Dedicated to the Pacific Northwest

The primary function of this RTO is to **ensure reliability** by integrating a diverse mix of power resources on to the electric grid, for the Pacific Northwest, matching power generation instantaneously with demand to keep the lights on. Harnessing a commodity and then moving it at the speed of light across thousands of miles of high-voltage wires involves sophisticated coordination among **utilities**, **energy generators** and other **resource suppliers**, as well as **consumers**. The ultimate goal is to ensure Northwest access to **affordable**, **reliable** and **sustainable power** – made possible through efficient administration of independent and transparent wholesale energy markets.

This RTO needs to be mandated to solve reliability issues in the Pacific Northwest first. We support for it to be overseen by the Federal Energy Regulatory Commission (FERC), which grants the authority to develop needed new energy resources and regulates the transmission and wholesale sales of electricity in interstate commerce.

This RTO should be created by regional stakeholders in response to FERC's Orders 2000 and 888, to:

- Prioritize power for the Pacific Northwest first, before selling out of state

- Facilitate competition among wholesale suppliers
- Provide non-discriminatory access to transmission by scheduling and monitoring the use of transmission
- Perform planning and operations of the grid to ensure reliability
- Manage the interconnection of new resources, e.g., generation, loads...
- Oversee competitive energy markets to guard against market power and manipulation
- Provide greater transparency of transactions on the system

Stakeholders in this RTO should include FERC, the western EIM, state PUCs, BPA (substantial transmission and generation resources), new solar and wind generators, utilities – a coalition of the willing – built upon successful existing RTO models such as the Southwest Power Pool (SPP). We should avoid unregulated (no FERC oversight) models such as those employed by Electric Reliability Council of Texas (ERCOT).

### Form a Strategic Working Group Dedicated to Establishing an RTO

There is a burning need for regional collaboration and coordination with each other and the Federal Government.

We foresee the potential of a powerful collaboration between the State and Federal government, Department of Energy, state Departments of Commerce, BPA, the western EIM, electric utilities, environmental stewards, and developers of energy solutions, driving policy, funding, and solutions, grounded in a clear-eyed understanding of the challenges and solutions before us.

> *"The engineering of decarbonized systems may prove relatively easy once enough companies, governments, and consumers focus on the need."*
> David Victor author of Global Warming Gridlock

We believe a comprehensive approach to working with stakeholders and thought leaders in DOE and Commerce to problem solve, plan and fund the transition, including establishing a RTO dedicated to the Pacific Northwest, and deepening understanding of options, pros and cons. Below, we highlight first steps and potential solutions to the climate actions and challenges discussed above.

This effort will require trillions of dollars. We need to be looking at a national funding effort. Governors, utilities, and other stakeholders need to identify applicable Federal, state and local funds (e.g. We have found the DOE and Pacific Northwest National Labs to be excellent engaged funding partners with access to funds and best practices). We feel that we can work that network to build a coalition of stakeholders and thought-leaders to identify and take on the big challenges, and fund solutions that can serve our region and the nation.

Key challenges include:

- Forming an RTO dedicated to the Pacific Northwest
- Begin EIM membership discussions to support a broader RTO formation plan
- Investigate emerging firming solutions that may reduce the scale of renewables required
- Assess, plan, permit, and build a feasible transmission network
- Develop Federal, state and local funding support (e.g. from DOE, DOC, PNNL, Amazon's Earth Fund, etc.).
- Streamline public policy and rules related to deployment of generation and transmission systems

### Example Opportunities from the Washington 2021 Energy Strategy

WA's *2021 Energy Strategy* includes the following action items that may have funding available:

- Request support from the U.S. Department of Energy and Pacific Northwest National Laboratory to convene a distributed energy resource workgroup to identify and resolve grid architecture barriers to DER deployment.
- **Electric utilities should pursue the long-term development of a fully integrated western regional electricity market** (see RTO discussion above), beginning with expansion of organized markets to trade day-ahead and longer-term resources. Long-term market development should explore opportunities to trade capacity resources including demand response resources.
- Wholesale market participants should develop market rules to allow trade in electricity from sources verified to comply with CETA's clean energy requirements. The UTC and Commerce, with input from the Carbon and Electricity Markets Workgroup, should adopt rules to ensure this outcome.
- Commerce's 2024 CETA evaluation under RCW 19.405.080 should include an assessment of industry progress in developing efficient and resource-specified electricity markets.
- Funding should be made available to Commerce and electric utilities to conduct a statewide clean energy potential assessment to identify clean energy development zones
- The Governor's office, the UTC and Commerce should pursue opportunities for enhanced transmission planning and integration across the Western grid and advocate for joint development where feasible.
- Utilities and planning agencies should evaluate the need for joint development of new and upgraded transmission capacity and consider the viability of a regional transmission organization.
- Commerce and the UTC should review the progress and outcomes of the NWPP RA initiative and evaluate the need for additional state action to ensure CETA's RA requirements are fulfilled.
- Provide support for increased deployment of advanced metering infrastructure (AMI), with safeguards for privacy and security.
- Provide state support for flexible and resilient planning and project development by creating a new cluster within Commerce's Office of Economic Development and Competitiveness to focus on utility grid optimization and DER deployment.
- Target CEF funding to projects that enable flexible load management and increase grid resilience.
- Develop resources for expanded outreach, technical assistance and education for community efforts.
- Create specific programs for Tribal energy projects that promote Tribal sovereignty and self- determination.
- Support the development of community resilience hubs and energy districts.
- Support clean energy projects that benefit agricultural communities.

## BPA

PNGC had a wide-ranging discussion with BPA Administrator John Hairston on the future of BPA, developing a regional RTO, resource adequacy and CAISO. Administrator Hairston was clear that BPA would limit BPA's support of an RTO to providing technical counsel. He made it clear that BPA would continue to provide an unspecified portion of their capacity to Tier 1 Preferred Customers but would also provide market-priced firm clean hydro energy products to customers such as CAISO.

PNGC will continue to deepen this conversation as we prepare for 2028 contract negotiations.

## Background: Washington 2021 Energy Strategy

Washington's *2021 Energy Strategy* is a bold aspirational document aimed at building an **equitable**, **inclusive**, **resilient clean energy economy**. Similar to Washington's *Clean Energy Transformation Act* (CETA), it lacks critical implementation detail and funding specifics.

The strategy document deepens our understanding that enormous change is upon us. And its planning gaps, once understood by our legislators, may lead to a deep appreciation of the utility industries energy, capital planning, implementation, and engineering prowess.

### What the Washington *2021 Energy Strategy* is and is not

It's important to keep in mind that the Strategy is the first stake in the ground - leading with very high level goals and strategic direction. It is very light on specifics. The most glaring example is the section on developing new energy resources – *Accelerate Investment in Renewable Generating Resources and Transmission. It's* just four pages long. The section's topics include a few paragraphs each on:

- Assess the Potential for and Facilitate Deployment of New Clean Energy Resources
- Strengthen the Transmission System across the West and within the State
- Encourage and Monitor Development of a Resource Adequacy Program
- Reform and Expand Wholesale Electricity Markets

### Washington *2021 Energy Strategy* Aspirational Goals: A Holy Grail

Washington State law declares that a successful energy strategy must balance three goals:

- **Maintain competitive energy prices that are fair and reasonable** for consumers and businesses and support our state's continued economic success;
- **Increase competitiveness by fostering a clean energy economy and jobs** through business and workforce development; and
- **Meet the state's obligations to reduce greenhouse gas emissions** 45% below 1990 levels by 2030 and 95% below by 2050.

### What will the Washington *2021 Energy Strategy* cost?

Washington evaluated a number of scenarios, and the "electrification" approach was found to be the lowest cost. While they are vague about the details, it appears that annual net energy costs would increase by about 1% of GDP by 2030 – about $6 billion per year – equivalent to an 11% increase in Washington's annual budget of $57 billion. There is no indication of where this funding will come from - rate payers, taxes, bonds, investors, grants, carbon tax?

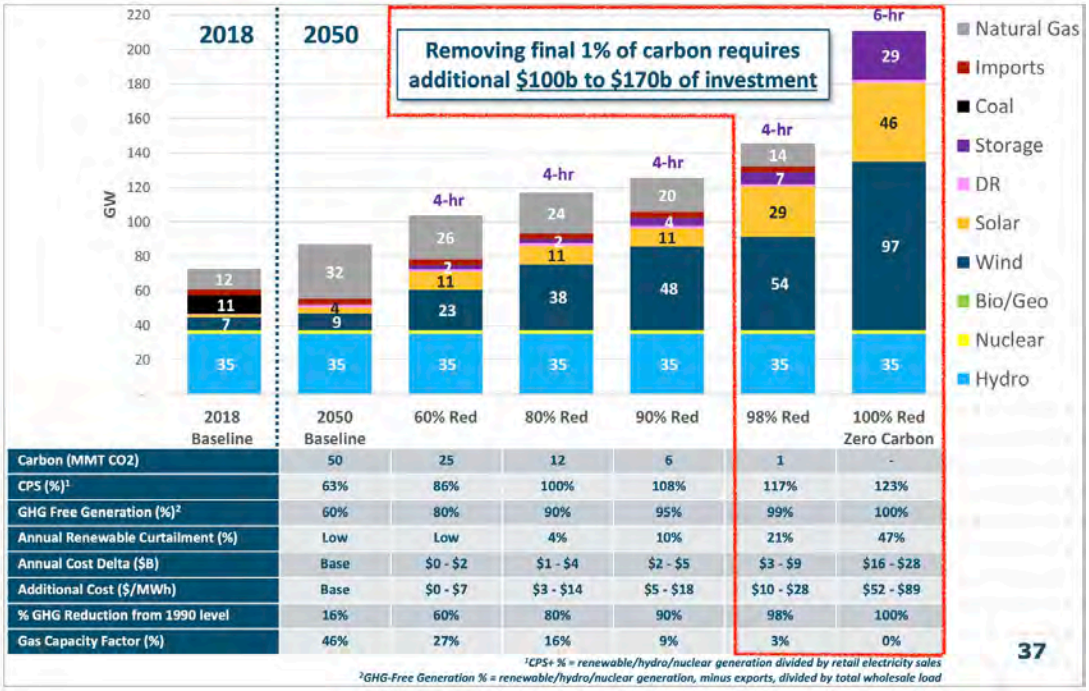
Will a wild west of energy investors develop these resources and force Washington citizens to pay "market rates" to meet demand for energy, similar to what we have seen playing out in Texas, where the consumer becomes subject to predatory pricing during cold snaps and heat waves? We think a Northwest RTO will prevent that from happening.

### E3 Resource Adequacy Study offers some preliminary estimates on the scale of the problem

E3's 2019 study *Resource Adequacy in the Pacific Northwest - Serving Load Reliably under a Changing Resource Mix* provides a framework to think about the Washington Energy Strategy if its load doubling zero carbon approach were mapped to the entire Northwest region.

Referring to the chart below, on the left side we see the 2018 baseline generation resource mix capacity for the Northwest region, with hydro, coal, and natural gas making up the bulk of generation. Total

capacity is about 75 GW, serving a nominal regional load of 247 TWh/year, with peak load of 43 GW. The load in 2050 was estimated by E3 to increase to 309 TWh/year and peak load of 54 GW.




Now let's focus on the right side of the chart in the red outline. the right most stacked column is similar to Washington's 100% reduction of greenhouse gas emissions (GHG , zero carbon), but the E3 model is for a 25% increase in load. Washington is projecting a 90% increase in load, which would scale the 208 GW total to 501 GW of needed capacity.

Either way, to get to zero carbon requires a tremendous amount of solar/wind power over-build, and hence curtailment, to handle the low capacity factor of solar and wind in the Northwest region, especially when the sun isn't shining and the wind isn't blowing. But if the state were to ease that emissions requirement by just 2%, it allows a significant reduction of cost. The 98% GHG reduction stacked column, just left of the right one, shows total capacity dropping from 208 GW total to about 145 GW in the E3 model. The reduction in renewables and storage would be filled by natural gas generation, used only as a last resort. For the Washington model, where load nearly doubles, the 98% GHG reduction would reduce the requirement from 501 GW to 303 GW.

Utility Dive has more on the E3 study and strategic use of modest amounts of natural gas generation to reign in exponential renewables costs:

> The E3 study found that without at least some new natural gas plants to run at peak times, the costs of cutting emissions across the Northwest increase dramatically. Reducing emissions by 90% by 2050 — which retains less than 20 GW of natural gas capacity in the regional portfolio — would cost around $5 billion, but a 100% reduction by 2050, with no natural gas, would cost nearly $30 billion - a sixfold increase in cost. That study was commissioned by several utilities in the region such as Puget Sound Energy and Avista and is one of the primary pieces of research guiding utilities and regional agencies as they work to avoid resource constraints and blackouts, as recently happened in California.
>
> The cost spikes, because natural gas plants are the cheapest form of last-in-line defense against power shortages on peak days with low renewable production. The natural gas plants used in projected

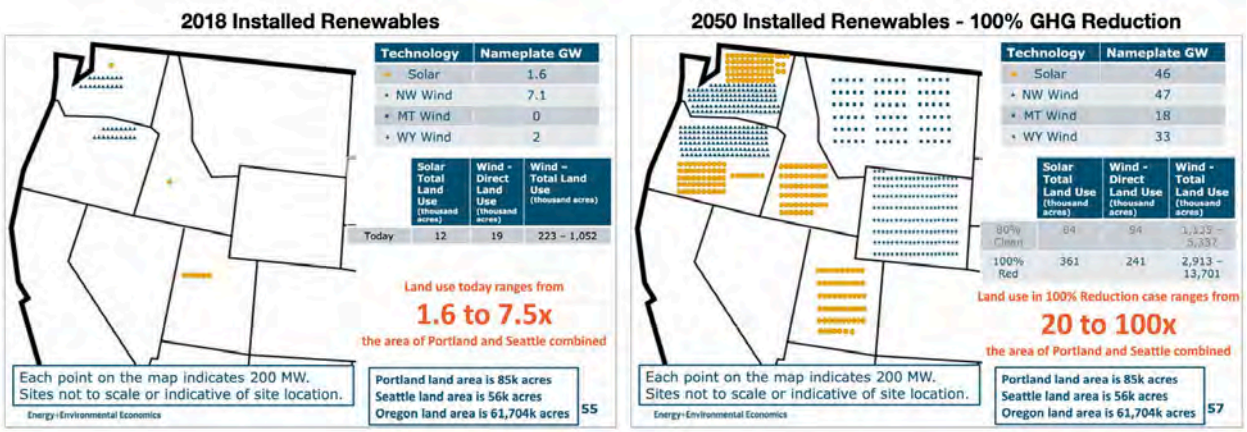
scenarios are only run 3% of their time, but that small contribution makes a big difference to the bottom-line costs, according to the study. While the rich hydropower base is a "massive advantage" for the Pacific Northwest that allows it to require less natural gas backup for renewables than other regions, Olson said, hydro is not the be-all-end-all, especially given that hydro production can be variable from year to year.

Reaching 100% reduction in greenhouse gases by 2050 would require a colossal amount of new renewable energy projects — 97 GW of wind power, which is nearly as much as all current wind capacity across the entire U.S., and over 45 GW of solar power. "*You run out of the ability of the system to absorb renewable energy,*" Olson said, even with large buildouts of lithium-ion battery storage. The study assumed storage durations of up to 4 to 6 hours, so the ongoing search for a "holy grail" of long duration storage over 24 hours could change the picture.

## Enormous Land Requirements

Details In the Washington energy strategy are vague regarding land and permitting costs assumptions for solar, wind and transmission deployment.

Land is a sleeper issue in transforming the grid. From a national perspective, it has been estimated that we need to build three 1,000-mile-long transmission lines every year for the next 30 years to interconnect distributed solar and wind generation with the grid. And in the past 10 years we haven't built even one. It's going to be a big expensive job.




Referring to the chart above, to maintain resource adequacy and prevent rolling blackouts similar to what we have seen in Texas and California, E3 , in their 25% load increase model above, estimates 97 GW of new wind and 46 GW of new solar are needed, requiring an estimated **3 to 14 million acres of land** – or **20 to 100 times the land area of Portland and Seattle combined**. It is unclear whether there are enough sites that are suitable, purchasable and permittable for that level of renewable energy deployment. And that's just for a 25% load increase by 2050, not the 90% Washington energy strategy estimate.

And depending on how thorough we want to be reducing fossil fuel use, Pacific Northwest National Labs estimates to replace jet fuel at SeaTac would require 36% of the electricity generated in Washington, equivalent to 5,000 new wind turbines.

## Enormous Transmission System Requirements

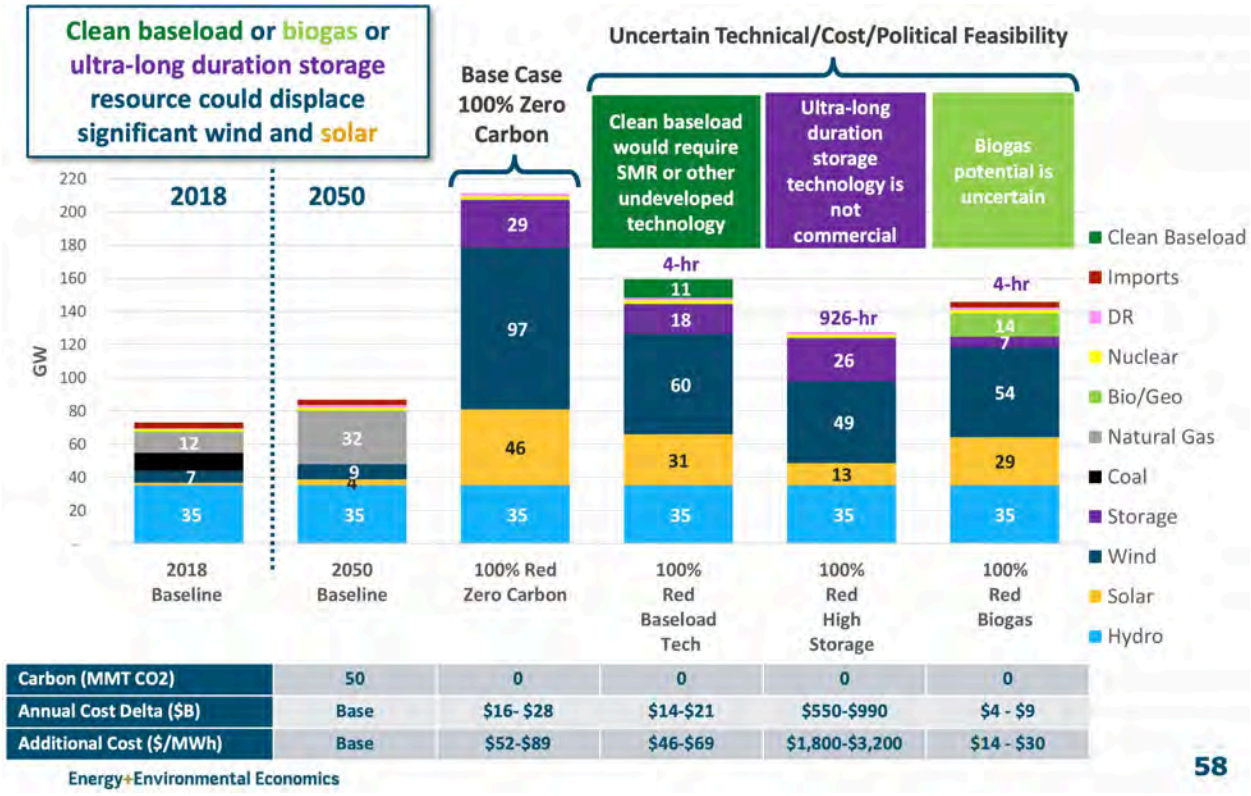
And once you build all that new solar and wind generation on millions of acres of western land, how do you get it to where it will be used?

Most of the best wind and solar sites are located either in Montana or Wyoming (for wind) or Southern Idaho and Utah (for solar). Delivering energy from 140+ GW of wind and solar into load centers would require dozens of new high voltage transmission lines. Will states be willing and able to purchase and permit the required land and then sell the energy to Washington, rather than use it themselves? In effect they are impacting their natural lands for Washington energy benefit. And what happens when carbon taxes force western states that embrace coal to adopt CETA-like policies that shift from thermal to wind and solar resources? Why transmit it to WA when they will need it for their own economy?

The Northwest faces this same issue when it comes to exporting our precious hydro energy to California to meet their hunger for firm energy to stabilize their growing solar portfolio. Should we be exporting Northwest hydro that could be used locally to serve base-load and firm our new portfolio of intermittent wind and solar resources?

## Thinking Outside the Box

Referring to the chart below, E3 explores "uncertain technical/cost/political feasibility" solutions that could significantly reduce costs of 100% GHG reduction implementation. The three solution areas are, from left to right, SMR or similar firm base load generation resource, ultra-long duration storage such as compressed green hydrogen powered fuel cells, and biogas. Or, how about natural gas with 100% carbon capture. All of these things are being investigated and R&D funded by DOE with potential solutions emerging in the 2050 planning horizon of the Washington energy strategy. **We may be able to avoid massive overbuild of solar and wind if emerging technologies can provide clean alternatives to natural gas peaker plants**. We could start planning for a "no regrets" solar and wind generation capacity, and by the time that is complete, we may have clarity on if there are lower cost options for peaking.




Learn More

Draft 2021 Northwest Power Plan

Pacific Northwest poised to test 100% renewables as utilities weigh gas vs. storage

Wind Power Project Rejection Database

"The 2021 Northwest Power Plan For A Secure & Affordable Energy Future, Draft Plan, Council Document 2021-5, September 2021" – Northwest Power and Conservation Council

"Northwest Regional Forecast of Power Loads and Resources, 2021 through 2031" – PNUCC April 2021

"Washington State Electric Utility Resource Planning 2020 Report Pursuant to RCW 19.280.060" – Washington State Department of Commerce, December 2020

"2021 Energy Strategy Transitioning to an Equitable Clean Energy Future" – Washington State Department of Commerce, Second Draft, February 2021

"2021 PSE Integrated Resource Plan" – Puget Sound Energy, Final, April 2021

"2021 Clean Energy Implementation Plan" – Avista, October 2021

"Benton PUD 2020 Integrated Resource Plan" – Public Utility District No. 1 of Benton County, August 2020

"Here's a List of 317 Wind Energy Rejections the Sierra Club Doesn't Want You To See" - Robert Bryce

"Resource Adequacy Today and In the Future in California and the Pacific Northwest" – Energy+Environmental Economics, June 2019

"NWPP Resource Adequacy Program – Detailed Design" – Northwest Power Pool, July 2021

## Solar Rates Discussion

OPALCO set out in 2021 to correct a cost recovery disparity in rates between member generators and the rest of the membership, who have been subsidizing solar rates because the current rate structure is weighted to collect much of the fixed cost to operate the grid through energy (kWh) usage. The Board has a proposal to begin to shift that gap in phases with consideration for the value of the grid and the environmental values that member generators bring to the Co-op.

OPALCO is committed to being a leader in the utility transformation we are facing. We have been a model for utilities across the nation, especially rural electric cooperatives, that serve small, remote and rural populations with dispersed grids. This leadership ensures safety protocols, environmental stewardship, carbon reduction, renewable adoption, grid modernization and system reliability while maintaining affordability for the membership and continuing equity and access for low-income member households.

To do all that, OPALCO must remain a financially viable organization - something it has done well since its founding in 1937.

BACKGROUND:
Serving our territory of 20 island communities requires much higher grid cost to ensure safe and reliable service that supports members now, and well into the distributed energy future. For example, while it takes 11 substations 4 warehouses, 3 crew stations and 2 public offices to manage our widespread system, a mainland utility serving the same population size would be consolidated into one location: one substation, one office, one crew. Ninety percent of our distribution is underground to storm-harden it and our islands are connected by 25 transmission and distribution submarine cables to supply power where it's needed.

OPALCO's current rates depend disproportionately on energy usage (revenue from variable kWh usage) to cover the fixed costs that it takes to operate, maintain, and continually modernize the grid – the same grid that member generators use to buy energy when they need it – and sell power back to the Co-op when they produce more than they need. When solar members reduce their energy load, it's both good and bad. Good that, in aggregate, it can reduce our dependence on the mainland for energy. Bad that the lost kWh revenue – which funds the grid that firms the solar, day and night, summer and winter – leads to unsustainable co-op finances, especially as the number of solar members increases. Since the grid is mostly funded through load revenue, which member generators contribute to at less than half the rate of regular members, OPALCO finances are impacted, which hurts all co-op members.

The rate structure needs to change to ensure an equitable sharing of costs among all co-op members. The net meter subsidy has been funded by OPALCO members for many years: by the 97% of members that don't have or can't afford solar themselves. To move local energy production to the next level (looking at growth from the current hundreds to future thousands of member generators), requires a new financial model for the Co-op, one that levels the playing field and recoups the grid funding in fixed costs that comes through kWh sales.

What is the value of the grid? A typical OPALCO solar member would need to spend thousands of dollars in fossil-fueled generator cost and fuel each year (about 32¢ per kWh + carbon pollution), or $2 million investment in battery storage to make it through the nights and winters. The OPALCO grid serves as a low-cost battery and supports the sale of excess solar energy to other co-op members.

OPALCO has been studying the issue and potential solutions for many years and, after engaging with members this year, proposes to fix this member equity imbalance in two phases. The first phase is to make an adjustment to the solar rate to address the grid maintenance portion of the problem only. The second phase will come over the next decade as the industry evolves into time-of-use and time-of-generation price signaling. With those tools in place, OPALCO will install the advanced metering infrastructure necessary to adequately address the remaining financial inequity.

OPALCO's proposed solar rate adjustment strikes a fair balance, as outlined in our strategic plan (IRP), of incentivizing solar investment, while maintaining our "cost of service" principles, ensuring equity for all co-op members, and financial viability of the cooperative.

CURRENT PROPOSAL:
Today, OPALCO goes further for member solar with a credit at the full retail energy rate and community solar at full retail rate at inception of the project. The current incentive is given at greater than $0.06/kWh above our cost of buying wholesale power (~$0.042/kWh from BPA, OPALCO base retail rate block is 0.1087/kWh). We want to continue supporting member solar generators with appropriate incentives, but we need to do it in a manner that's equitable to all members. To do so, the tariffs below provide a higher incentive at $0.0849/kWh to incorporate a credit for the avoidable costs for facilities and savings provided due to local generation. This allows for greater incentive to maintain the principles of our IRP while satisfying our cost-of-service principles. Please note, the change in tariff only effect produced energy flowing to the grid. These changes have no effect on energy produced that is consumed within the home. In addition, the proposed tariffs will monetize all energy at the time of netted production and consumption (see general provisions #4 and #5).

Systems connecting at greater than 25kW need further review on the distribution system. The tariffs and policy both incorporate a threshold to enter into a power purchase agreement (PPA) above 25kW. Staffs recommends the PPA for systems under 200kW utilize the same billing determinates in the RDR and CDR tariffs. Systems above 200kW will have additional costs directly due to the OPALCO contracts with our power provider.

POLICY AND TARIFFS:
Staff has prepared the below Member Service Policy and Tariffs based on the Board discussion in September. The drafted Member Service Policy 13 – Interconnection of Distributed Energy Resource Facilities in culmination with the draft Tariff RDR-21, Tariff CDR-21 and the OPALCO Distributed Energy

Resource Interconnection Guidelines is intended to replace existing MSP 13, MSP 14, and MSP 15 to streamline the implementation and guidance to the membership. Due to the extensive changes in the policy, staff has provided the strikethrough version in the appendix.

All tariffs are intended to evolve based on changing cost-of-service metrics. The cooperative is purposely ending the cycle of allowing members to stay on legacy tariffs and tariff methodologies. With the adoption of the below proposed tariff structures, the banking of energy (kWh) will cease for new installations after March 31st, 2022. Members with legacy systems need to notify staff to continue with the legacy rate method prior to this date.

During the annual budget process, individual tariff components will be reviewed for consistency with cost-of-service metrics and approved by the Board prior to implementation. Please refer to general provision #7 of each tariff for handling of legacy tariff methodologies services.

Timeline:

| | | |
|---|---|---|
| ✓ | May 5 | Solar Town Hall |
| ✓ | May 20 | Member Generation Trends and Modeling |
| ✓ | June 17 | Internal Staff Review |
| ✓ | August 19 | Guernsey review of alternatives |
| ✓ | September 16 | Impact on co-op members (low-income, low-use, high-use, etc.) |
| ✓ | September 20 | Solar Town Hall – member feedback |
| ✓ | October 21 | Solar Town Hall Recap, Policy and Tariff Structure Proposal (first read) |
| | November 18 | Policy and Tariff Structure Adoption (final read) |
| | December 16 | 2022 Tariff Proposals based on 2022 Budget |
| | January 1, 2022 | Implementation of 2022 Tariffs |
| | March 31 | Deadline to opt out of new tariff |

MEMBER FEEDBACK:

Members were invited to participate in two Solar Town Hall events to understand and discuss the solar rates. On May 5th, the first Solar Town Hall was held and the timeline for the solar rate process was published in board materials. Several members attended board meetings over the summer and commented on the solar rate discussion. OPALCO staff met with solar installers from Rainshadow Solar in September to hear their perspective, as they were unable to attend the town hall event. The September Solar Town Hall was attended by about 200 members and the full solar rate proposal was presented and discussed. Advertising for the Solar Town Hall meetings in local papers, newsletters, social media, bill inserts and on the OPALCO website included the solar rate topic. The appendix contains questions (and answers) and comments from members from the Solar Town Hall discussion in September – and also comments on solar rates from Rainshadow Solar and members at large.

# ORCAS POWER AND LIGHT COOPERATIVE

# MEMBER SERVICE POLICY 13

**Interconnection of Member-owned Distributed Energy Resource Facilities**

This policy covers interconnection of any member owned generating facilities, storage facilities, or other facilities supplying energy to the distribution system of the Orcas Power and Light Cooperative (OPALCO) system, herein referred to as distributed energy resource (DER). This interconnection policy for DER facilities specifies the minimum requirements and conditions for non-utility-owned electric resources that will be interconnected for the purpose of parallel operation with the OPALCO electrical system. DER facilities will be permitted to interconnect to OPALCO's distribution system only after OPALCO determines that the operation of the member's DER facility will be safe and effective and will not interfere with normal operation of OPALCO's electrical systems.

## 13.1 AVAILABILITY

Available to qualifying facilities subject to the limitations below:

13.1.1 Service must be supplying energy to the cooperative's distribution system with solar, wind, battery storage or other distributed energy resources.

13.1.2 Qualifying facilities must adhere to any of OPALCO's power purchasing contract provisions for interconnection of generation or other qualifying facilities.

## 13.2 CHARACTER OF SERVICE

Service where the member has elected to interconnect DER facilities with OPALCO's distribution facilities. The DER facilities may be used to offset the member's own electrical requirements or to supply power to sell to OPALCO. Single phase 120/240 or three phase 277/480 or 120/208 service, at 60 Hz are available. Any service upgrades necessary must comply with MS Policy 5 – *Line Extension*.

## 13.3 PAYMENT FOR SUPPLIED ENERGY

13.3.1 Members interconnecting DER facilities with an inverter nameplate rating of less than 25 kW shall be under the appropriate tariff.

13.3.2 Members interconnecting DER facilities with an inverter nameplate rating of 25 kW or greater shall execute a Power Purchase Agreement with the cooperative prior to operation of the system.

## 13.4 GENERAL PROVISIONS

13.4.1 Design Requirements

13.4.1.1 All equipment used to interconnect to the cooperative's system shall be UL listed for the intended use.

13.4.1.2 All interconnected systems shall comply with current state, national codes, and OPALCO's interconnection guidelines.

13.4.1.3 DER facilities shall have the ability to be monitored by the cooperative via communications protocols defined in the cooperative's interconnection guideline.

13.4.2 Interruption or Reduction of Deliveries

13.4.2.1 OPALCO shall not be obligated to accept deliveries of excess energy and may require member to interrupt or reduce such deliveries:

13.4.2.1.1 When necessary, to construct, install, maintain, repair, replace, remove, investigate, or inspect any of its equipment or part of its system; or

13.4.2.1.2 If it is determined that curtailment, interruption, or reduction is necessary because of emergencies, forced outages, or compliance with prudent electrical practices.

13.4.2.2 Whenever possible, OPALCO shall give the member reasonable notice of the possibility that interruption or reduction of deliveries may be required.

13.4.2.3 Notwithstanding any other provision of this policy, if, at any time OPALCO determines that either (1) the facility may endanger any of OPALCO's personnel or (2) the continued operation of member's facility may endanger the integrity of OPALCO's electric system, OPALCO shall have the right to disconnect member's generation facility from the OPALCO's electric system. The member's facility shall remain disconnected until such time as OPALCO is satisfied that the condition which necessitated the disconnection has been corrected.

13.4.3 Interconnection

13.4.3.1 OPALCO reserves the right require interconnection studies, additional or upgraded facilities, and the interconnection method. Technical provisions for interconnection shall be provide via the cooperative's interconnection guidelines.

13.4.3.2 Member shall pay for designing, installing, operating, ~~and~~ maintaining and any other associated costs of the DER facility and system upgrades, per Member Service Policy 5 – *Line Extensions,* and shall be in accordance with all applicable laws, ~~and~~ regulations, and cooperative guidelines and policies.

Member shall not commence parallel operation of the DER facility until written approval of the interconnection facilities has been given by OPALCO.

13.4.4 Maintenance and Permits

13.4.4.1 Member shall maintain the DER facility and interconnection facilities in a safe and prudent manner and in conformance with all applicable laws and regulations.

13.4.4.2 Member shall obtain any governmental authorizations and permits required for the construction and operation of the DER facility and interconnection facilities. Member shall reimburse OPALCO for all losses, damages, claims, penalties, or liability it incurs because of member's failure to obtain or maintain any governmental authorizations and permits required for construction and operation of member's DER facility or failure to properly maintain member's facility.

13.4.4.3 Member shall obtain appropriate insurance coverage before operation and provide evidence to OPALCO of such insurance, including liability coverage.

13.4.5 Indemnity and Liability

Member shall save harmless, release, and indemnify OPALCO, its officers, directors, employees, other members, and its agents, from any loss, claim or expenses, including but not limited to damages, fines, and other payments arising out of member's actions or inaction in the development and operation, or failures thereof, of its DER facilities and implementing this policy.

# ORCAS POWER AND LIGHT COOPERATIVE

## TARIFF RDR – 21

**RESIDENTIAL DISTRIBUTED ENERGY RESOURCE SERVICE**

**FIRST REVISION**

**AVAILABILITY**

Available to all residential members utilizing Member Service Policy 13 for interconnection of distributed energy resource (DER) facilities, subject to the General Provisions hereunder. DER facilities include solar, wind, hydro, and battery storage.

**TYPE OF SERVICE**

Single-phase, at available secondary voltage, equipment subject to automatic load management controls.

**APPLICATION**

- Primary residential interconnected DER facilities end-use shall be served under this tariff.
- Services with interconnected DER facilities with an inverter nameplate rating of less than 25 kW. [Systems above 25kW will require an independent power purchase agreement]

| | | | |
|---|---|---|---|
| **SERVICE ACCESS CHARGE** | | | $48.41 per billing period |
| **ENERGY ASSISTANCE CHARGE (See General Provision #6)** | | | $0.00076 per kWh |
| **NET CONSUMED ENERGY (Wholesale + Grid)** | | | |
| **Wholesale Purchased Power** | | | $0.0470 per kWh |
| **Grid Usage** | Summer | Winter | |
| Block 1 | ≤ 2,000 kWh | ≤4,000 kWh | $0.0619 per kWh |
| Block 2 | 2,001 - 3,000 kWh | 4,001 - 5,000 kWh | $0.0764 per kWh |
| Block 3 | > 3,000 kWh | >5,000 kWh | $0.0994 per kWh |
| **NET PRODUCED ENERGY** | | | |
| **Wholesale Purchased Power (Credit)** | | | -$0.0470 per kWh |
| **Grid Usage (Charge)** | | | $0.0103 per kWh |
| **Renewable Premium (Credit)** | | | -$0.0482 per kWh |
| **DEMAND CHARGE** | | | $0.0000 per kWh |

**MINIMUM MONTHLY CHARGE**

The minimum monthly charge, under the above rate, shall be the above Service Access Charge per billing period or prorated if service is provided for less than a full billing period.

**POWER COST ADJUSTMENT**

A surcharge or credit may be applied to each billing for service under this tariff to reflect increases or decreases in the cost of power subject to OPALCO Policy 29 – *Rate Design* and Tariff ECA. (See General Provision #6)

**GENERAL PROVISIONS**

1. Member agrees to allow the cooperative, at its discretion, to install automatic load management controls.
2. Primary end-use for residential purposes utilizing Member Service Policy 13 shall be served under this tariff.
3. Summer Block shall be defined as May billing period through September billing period; Winter Block shall be defined as October billing period through April billing period.
4. Net Consumed Energy shall be charges applied to all energy (kWh) consumed at the time where consumption exceeds production. This energy shall be measured at the interconnection meter.
5. Net Produced Energy shall be credits and charges applied to all energy (kWh) produced at the time where production exceeds consumption. This energy shall be measured at the interconnection meter. The sum of all credits and charges totals to a credit.
6. Energy Assistance Charge and Energy Charge Adjustment shall be applied to all energy (kWh) Consumed Energy in the billing period.
7. Services installed, commissioned, and energized prior to March 31st, 2022, may remain on the legacy tariff method used for the March 2022 billing period for interconnected DER facilities provided the cooperative has been notified on or prior to March 31st, 2022.
8. Services billed on a legacy tariff method shall continue using that prior tariff method until one of the following conditions has been met:
    - the service is transferred to another member;
    - an executed agreement to be bound by this tariff;
    - an executed agreement requiring participation in this tariff; or
    - after June 30th, 2029.
9. Wholesale Purchased Power (charge or credit) is the annual blended per kWh charge for OPALCO's cost of wholesale power from the mainland suppliers.
10. Renewable Premium includes costs for reduced load on the grid, an environmental credit, and an implementation phase-in credit.
11. Services utilizing this tariff shall not revert to legacy tariff methodology

# ORCAS POWER AND LIGHT COOPERATIVE

## TARIFF CDR – 21

### COMMERCIAL DISTRIBUTION ENERGY RESOURCE SERVICE

### FIRST REVISION

**AVAILABILITY**

Available to all non-residential members utilizing Member Service Policy 13 for interconnection of distributed energy resource (DER) facilities and metered at more than 20 kW in any one or more of the preceding twelve (12) months, subject to the General Provisions hereunder. DER facilities include solar, wind, hydro, and battery storage.

**TYPE OF SERVICE**

Single-phase or three-phase, at available secondary voltage, equipment subject to automatic load management controls.

**APPLICATION**

- Primary commercial interconnected DER facilities end-use shall be served under this tariff.
- Services with interconnected DER facilities with an inverter nameplate rating of less than 25 kW. [Systems above 25kW will require an independent power purchase agreement]

| | | |
|---|---|---|
| **SERVICE ACCESS CHARGE** | | $67.57 per billing period |
| **ENERGY ASSISTANCE CHARGE** | | $0.00076 per kWh<br>(See General Provision #6) |
| **NET CONSUMED ENERGY (Wholesale + Grid Usage)** | | |
| **Wholesale Purchased Power** | | $0.0470 per kWh |
| **Grid Usage** | | |
| Block 1 | ≤ 5,000 kWh | $0.0505 per kWh |
| Block 2 | 5,001 - 150,000 kWh | $0.0611 per kWh |
| Block 3 | > 150,000 kWh | $0.0971 per kWh |
| **NET PRODUCED ENERGY** | | |
| **Wholesale Purchased Power (Credit)** | | -$0.0470 per kWh |
| **Grid Usage (Change)** | | $0.0103 per kWh |
| **Renewable Premium (Credit)** | | -$0.0482 per kWh |
| **DEMAND CHARGE** | | |
| **Demand Block 1 (≤300 kW)** | | $3.94 per kW |
| **Demand Block 2 (>300 kW)** | | $5.92 per kW |

**MINIMUM MONTHLY CHARGE**

The minimum monthly charge, under the above rate, shall be the above Service Access Charge per billing period or prorated if service is provided for less than a full billing period.

**DETERMINATION OF BILLING DEMAND**

The billing demand shall be the maximum kilowatt (kW) demand established by the member for any period of fifteen (15) consecutive minutes during the period for which the bill is rendered as indicated or recorded by a demand meter.

**POWER COST ADJUSTMENT**

A surcharge or credit may be applied to each billing for service under this tariff to reflect increases or decreases in the cost of power, subject to Member Services Policy 29 – *Rate Design* and Tariff ECA. (See General Provision #6)

**GENERAL PROVISIONS**

1. Member agrees to allow the cooperative, at its discretion, to install automatic load management controls.
2. Primary end-use for commercial purposes shall be served by this tariff.
3. Net Consumed Energy shall be charges applied to all energy (kWh) consumed at the time where consumption exceeds production. This energy shall be measured at the interconnection meter.
4. Net Produced Energy shall be credits and charges applied to all energy (kWh) produced at the time where production exceeds consumption. This energy shall be measured at the interconnection meter. The sum of all credits and charges totals to a credit.
5. Energy Assistance Charge and Energy Charge Adjustment shall be applied to all energy (kWh) Consumed Energy in the billing period.
6. Services installed, commissioned, and energized prior to March 31st, 2022, may remain on the legacy tariff method used for the March 2022 billing period for interconnected DER facilities provided the cooperative has been notified on or prior to March 31st, 2022.
7. Services billed on a legacy tariff method shall continue using that prior tariff method until one of the following conditions has been met:
    - the service is transferred to another member;
    - an executed agreement to be bound by this tariff;
    - an executed agreement requiring participation in this tariff; or
    - after June 30th, 2029.
8. Wholesale Purchased Power (charge or credit) is the annual blended per kWh charge for OPALCO's cost of wholesale power from the mainland suppliers.
9. Renewable Premium includes costs for reduced load on the grid, an environmental credit, and an implementation phase-in credit.
10. Services utilizing this tariff shall not revert to legacy tariff methodology.

# COVID-19 Update

San Juan County has experienced a resurgence of cases due to the delta variant and recommends masking in public indoor places. Please note that OPALCO offices remain closed to the public and its members. Staff has reinstituted remote work to ensure redundancy in the workforce.

For current information from San Juan County Health please use the link below:

https://www.sanjuanco.com/1668/2019-Novel-Coronavirus

# OPALCO COVID-19 Update (Figures are reported from March 20th, 2020 to the date of transmittal, unless otherwise stated)..

## COVID Assistance

Board Approved Funding includes all funding allocated for 2020 and 2021

| | # of Accounts | Amount ($) | Board Approved Funding ($) | Remaining Budget ($) |
|---|---|---|---|---|
| Energy Assist (EAP-C) Commercial COVID | 117 | 142,396 | 200,000 | 57,604 |
| Energy Assist (EAP) Residential COVID | 95 | 42,255 | 100,000 | 57,745 |
| Extend Project PAL Benefits - COVID | 207 | 25,300 | 70,000 | 44,700 |
| Grand Total | 389 | 209,951 | 370,000 | 160,049 |

## Fee Assistance (Lost Revenue)

(Based on variance from collections comparing 2019 to 2020 for the period April 1st to Date)

| | |
|---|---|
| Penalties | 95,493 |
| Reconnection Fees | 6,932 |

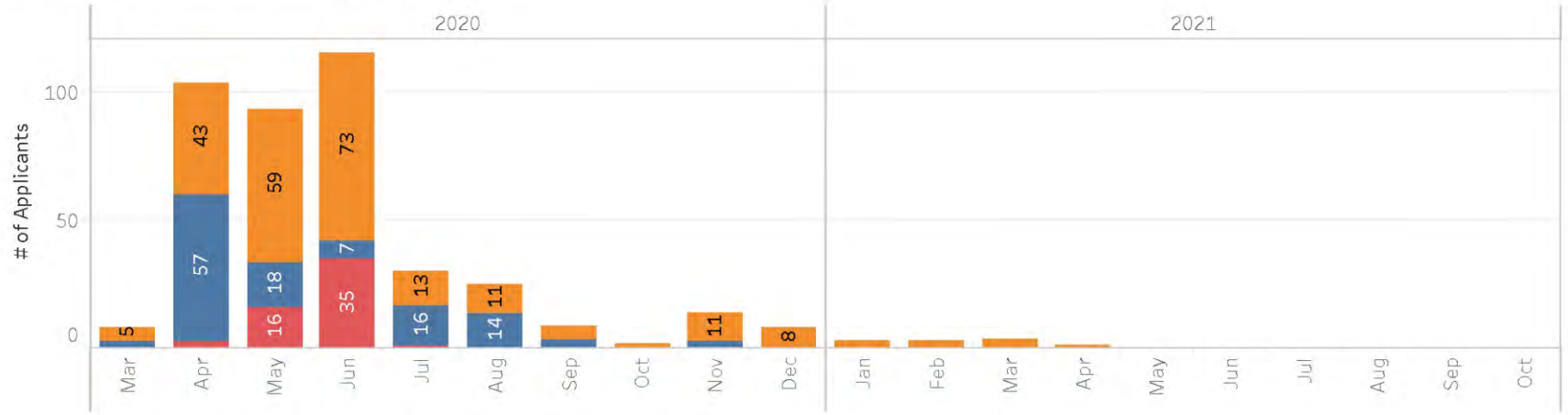
| Measures | Benefit |
|---|---|
| Energy Assist (EAP-C) Commercial COVID | $67.57 per mo., based on number of number of meters on a commercial rate |
| Energy Assist (EAP) Residential COVID | Assistance ranges from $31.41 to $61.41, based on number of permanent household occupants |
| Extend Project PAL Benefits COVID | $100 |
| Penalties | Waiving of late penalties (Normal penalties are 5% of the total balcance post due date) |
| Reconnection Fees | Waiving of reconnect fees (Normal reconnect fee is $50 per instance of reconnecting after a disconnect for non-payment) |

## Member Donations to COVID-19 Relief Efforts

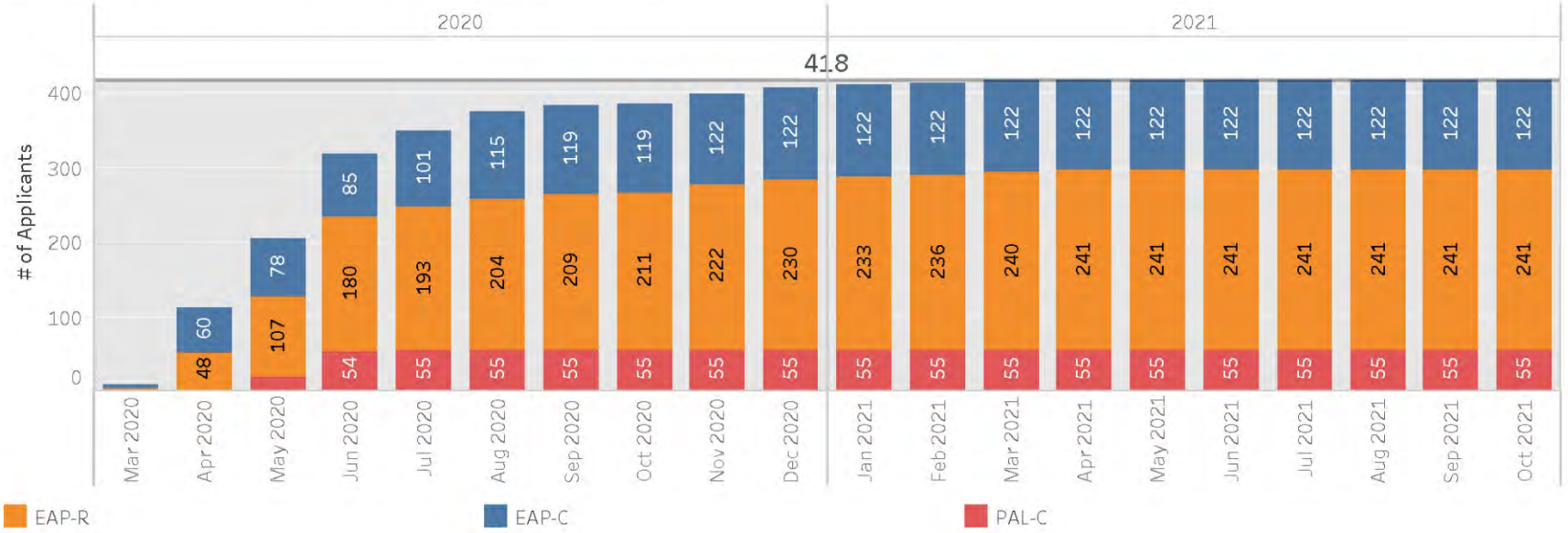
Staff will continue to communicate with members regarding the COVID-19 relief measures, including a request for donations. Staff continues to encourage members to donate to our PAL program.

OPALCO
Co-op Run. Community Powered.

## COVID-19 Assistance Applications

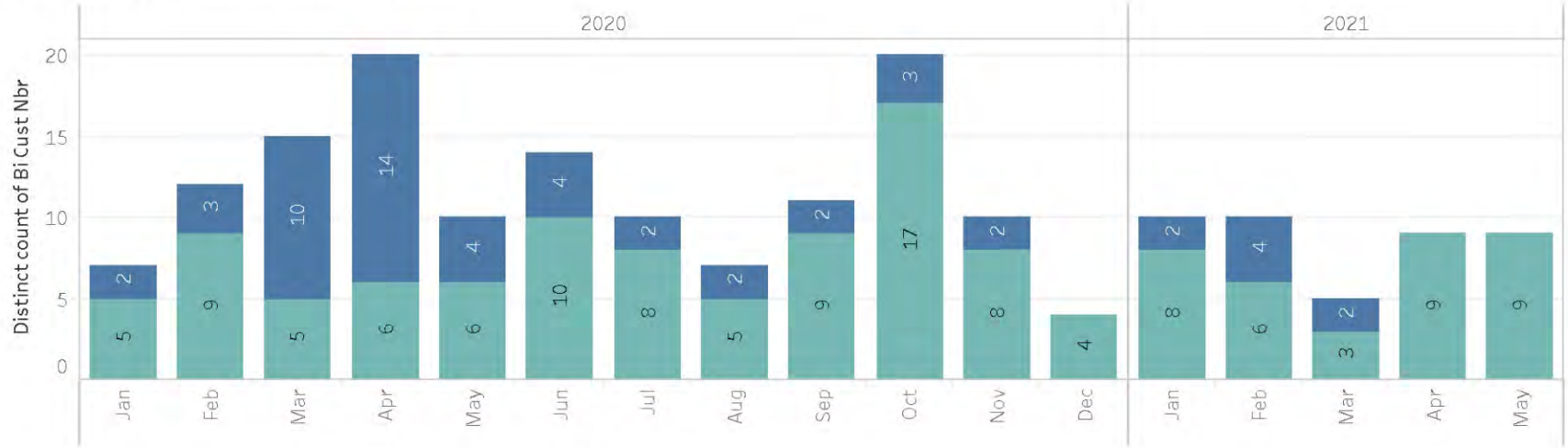



## COVID-19 Assistance Applications Cumulative



OPALCO
Co-op Run. Community Powered.

## Voluntary Disconnects (Meters)




## Voluntary Disconnects Cummulative (Meters)

# A/R 30-60-90

- 30-day A/R is trending slightly higher.
- 60-day A/R is notably higher and stabilizing.
- 90-day A/R notably higher and stabilizing.
- We are seeing a flow through into the 90-day with a notable uptick on the 90-day accounts receivable. The lower usage profiles of the summer will aid in moderating this yet will become dramatic in the late fall. At this stage staff feels this is manageable through the summer and will revisit at the Q3.

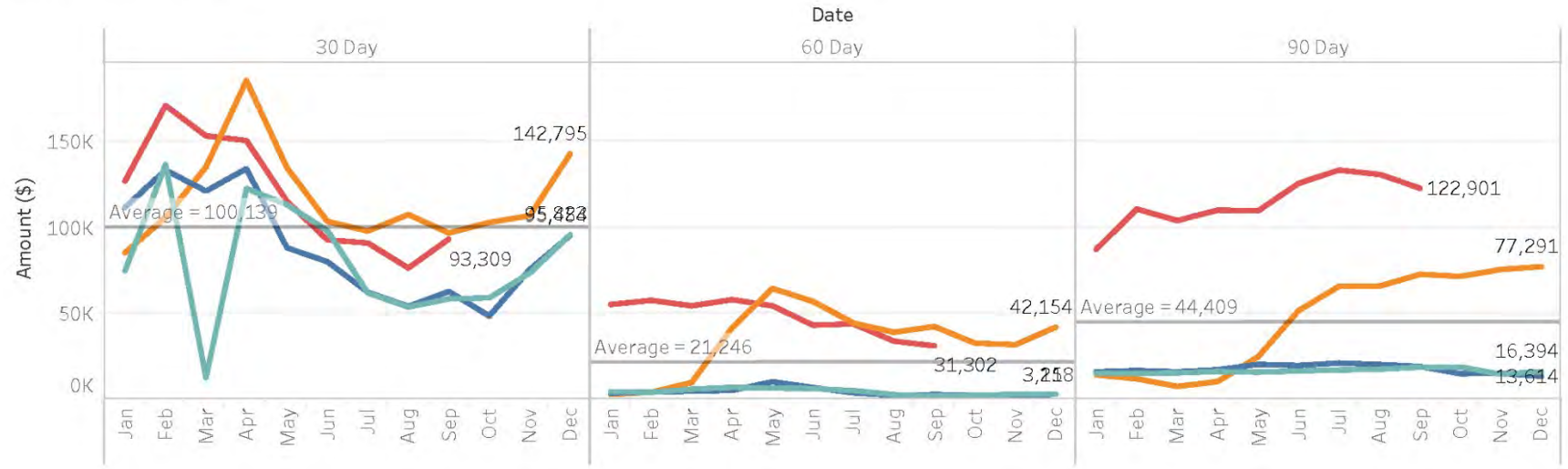
## Long Term AR Comparisons - 30/60 Day

| | 30 Day | | | 30 Day % Difference | | | 60 Day | | | 60 Day % Difference | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 |
| Jan | 111,730 | 85,379 | 127,074 | | -23.58% | 48.84% | 3,837 | 3,101 | 55,338 | | -19.18% | 1,684.60% |
| Feb | 133,447 | 105,886 | 170,874 | | -20.65% | 61.37% | 4,511 | 4,333 | 57,736 | | -3.93% | 1,232.33% |
| Mar | 121,185 | 135,225 | 153,276 | | 11.59% | 13.35% | 4,962 | 9,976 | 54,542 | | 101.04% | 446.76% |
| Apr | 134,240 | 185,370 | 150,556 | | 38.09% | -18.78% | 5,479 | 41,845 | 58,142 | | 663.72% | 38.95% |
| May | 88,272 | 134,798 | 115,334 | | 52.71% | -14.44% | 10,457 | 64,616 | 54,541 | | 517.89% | -15.59% |
| Jun | 80,172 | 103,575 | 92,861 | | 29.19% | -10.34% | 7,126 | 57,091 | 43,314 | | 701.17% | -24.13% |
| Jul | 62,481 | 97,956 | 91,044 | | 56.78% | 7.06% | 4,004 | 44,576 | 44,053 | | 1,013.19% | -1.17% |
| Aug | 54,195 | 107,577 | 76,503 | | 98.50% | -28.89% | 2,543 | 39,191 | 34,029 | | 1,441.27% | -13.17% |
| Sep | 62,931 | 96,832 | 93,309 | | 53.87% | 3.64% | 3,010 | 42,513 | 31,302 | | 1,312.28% | -26.37% |
| Oct | 48,634 | 102,980 | | | 111.75% | | 2,725 | 32,868 | | | 1,106.30% | |
| Nov | 75,636 | 106,860 | | | 41.28% | | 2,078 | 31,986 | | | 1,439.43% | |
| Dec | 95,454 | 142,795 | | | 49.60% | | 3,218 | 42,154 | | | 1,209.94% | |

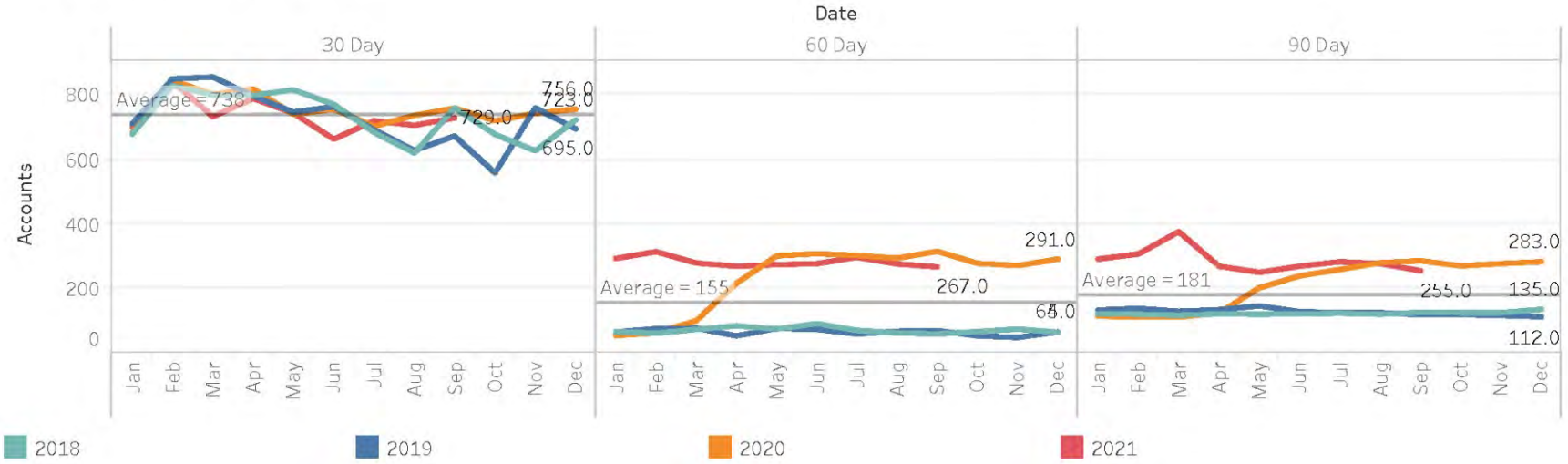
## Long Term AR Comparisons - 90 Day

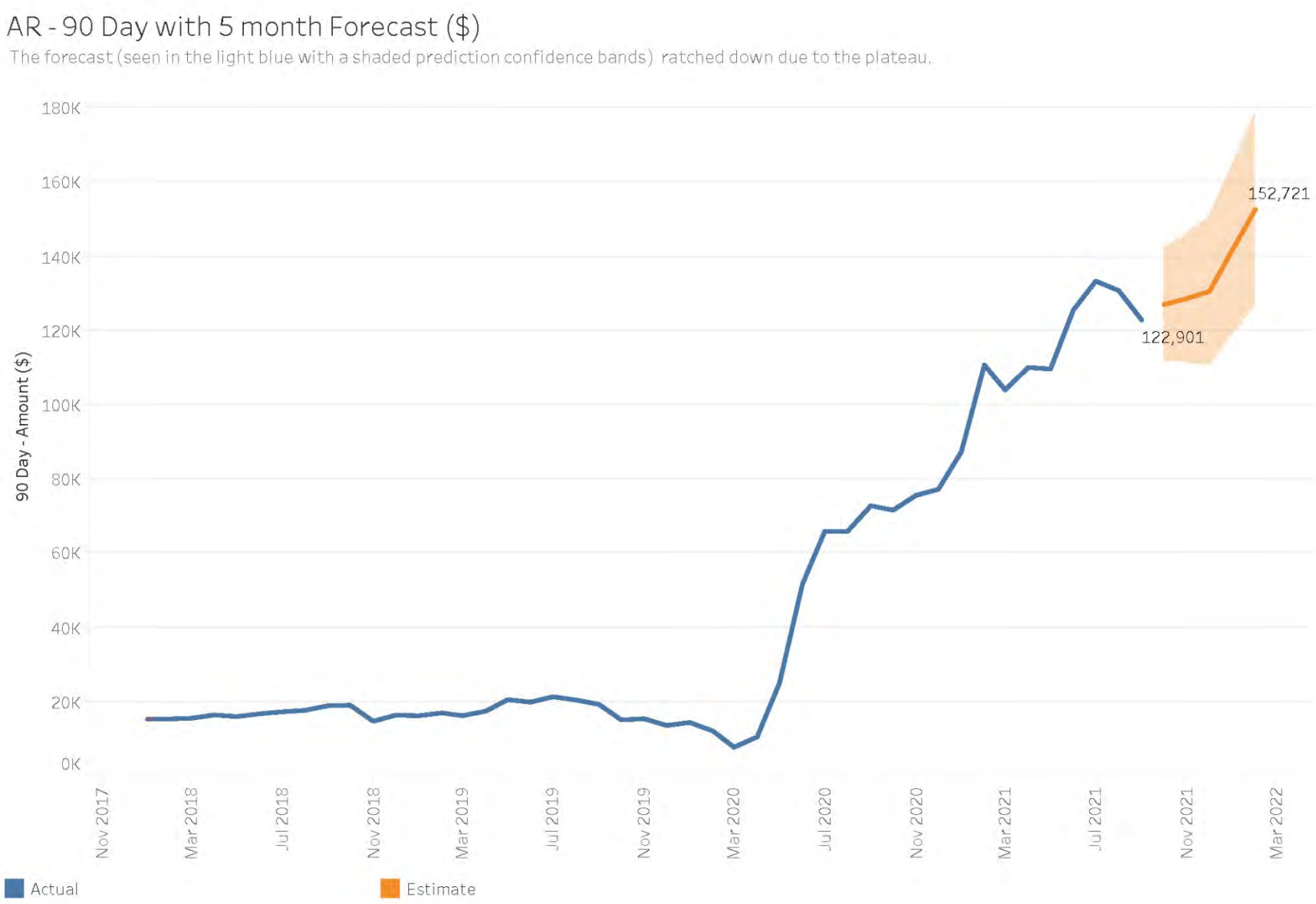
| | 90 Day | | | 90 Day % Difference | | |
|---|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 |
| Jan | 16,248 | 14,427 | 87,419 | | -11.21% | 505.95% |
| Feb | 16,995 | 12,166 | 110,764 | | -28.42% | 810.45% |
| Mar | 16,257 | 7,762 | 104,089 | | -52.25% | 1,241.04% |
| Apr | 17,451 | 10,546 | 110,135 | | -39.57% | 944.38% |
| May | 20,553 | 25,016 | 109,719 | | 21.72% | 338.59% |
| Jun | 19,925 | 51,746 | 125,665 | | 159.70% | 142.85% |
| Jul | 21,349 | 65,931 | 133,418 | | 208.82% | 102.36% |
| Aug | 20,486 | 66,002 | 130,850 | | 222.19% | 98.25% |
| Sep | 19,305 | 72,854 | 122,901 | | 277.39% | 68.69% |
| Oct | 15,115 | 71,660 | | | 374.08% | |
| Nov | 15,429 | 75,673 | | | 390.47% | |
| Dec | 13,614 | 77,291 | | | 467.75% | |

## Long Term AR ($)



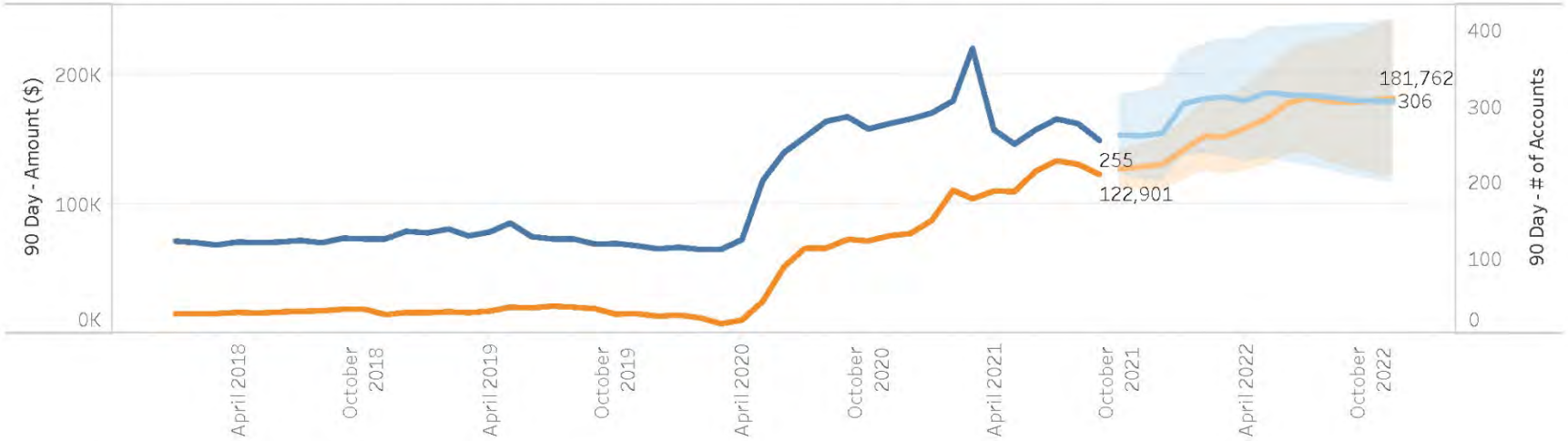

## Long Term AR (Count)



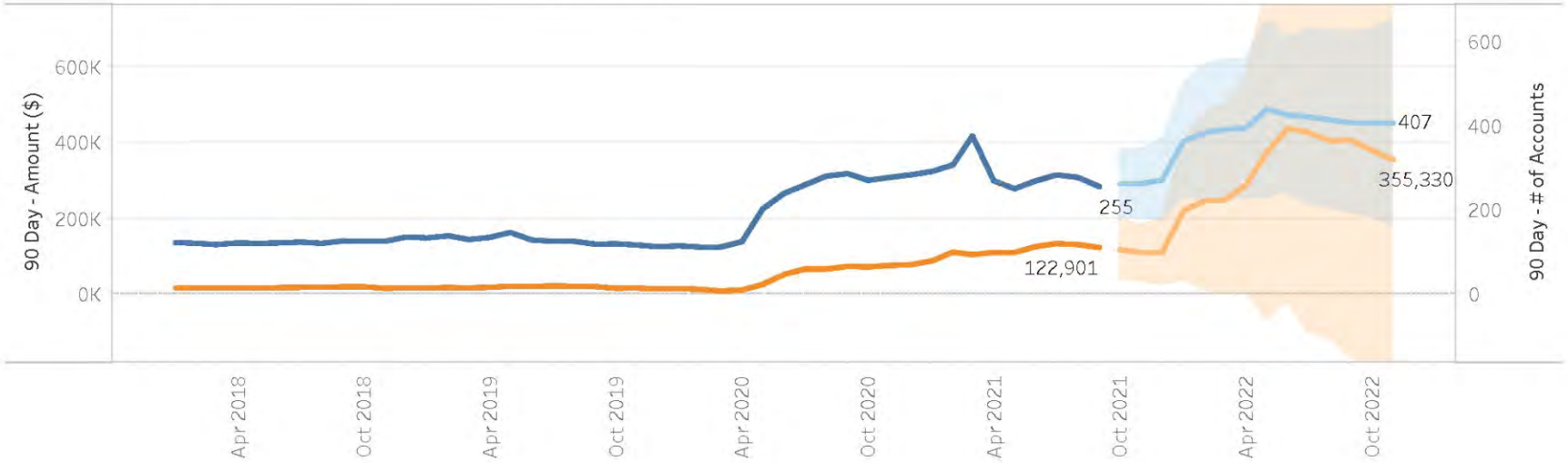

AR - 90 Day with 5 month Forecast ($)
The forecast (seen in the light blue with a shaded prediction confidence bands) ratched down due to the plateau.
90 Day - Amount ($)
180K
160K
140K
120K
100K
80K
60K
40K
20K
0K
Nov 2017
Mar 2018
Jul 2018
Nov 2018
Mar 2019
Jul 2019
Nov 2019
Mar 2020
Jul 2020
Nov 2020
Mar 2021
Jul 2021
Nov 2021
Mar 2022
152,721
122,901
Actual
Estimate

## AR - 90+ Day with YE2021 Forecast ($) - Assumed

The forecast (seen in the light blue with a shaded prediction confidence bands) ratched down due to the plateau.



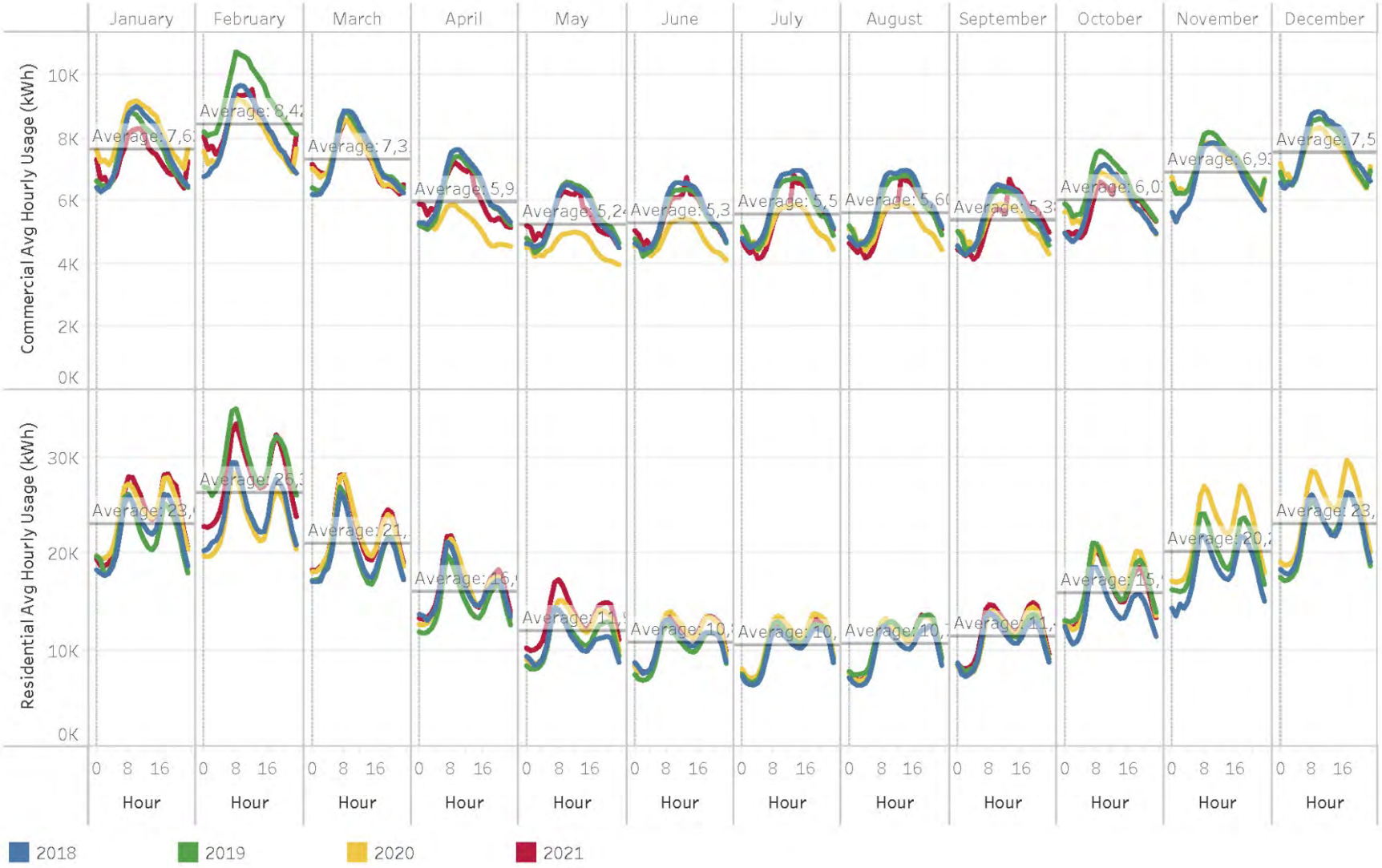

## AR - 90+ Day with YE2021 Forecast ($) - High



# 30/60/90 Day AR Per Account Totals

## Load Shape - Residential and Commercial

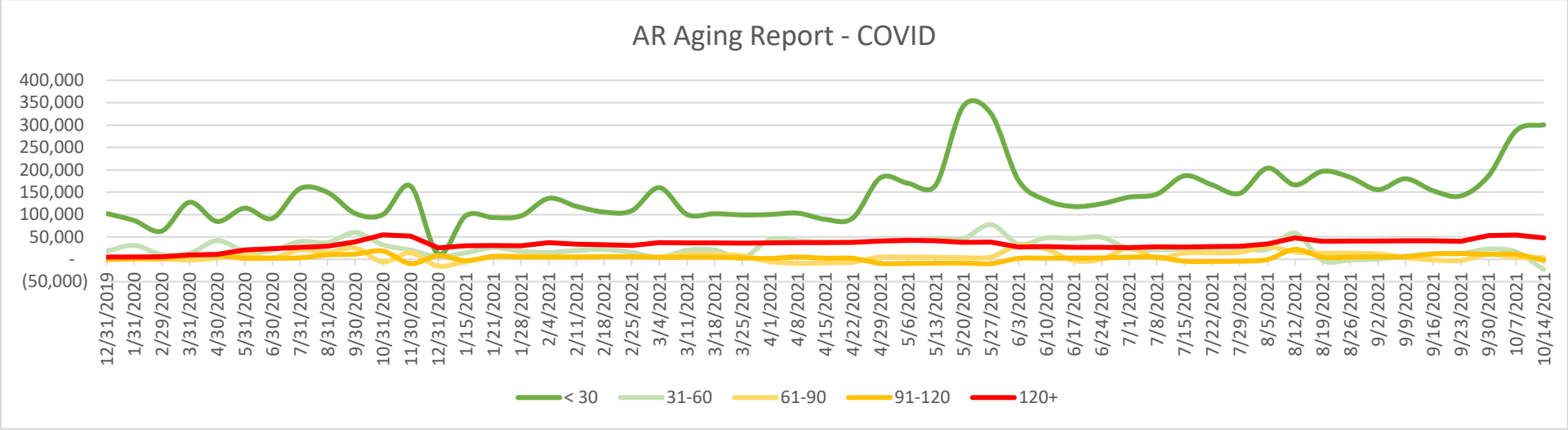
- Current reporting month is a partial data set.



# Rock Island COVID-19 Update

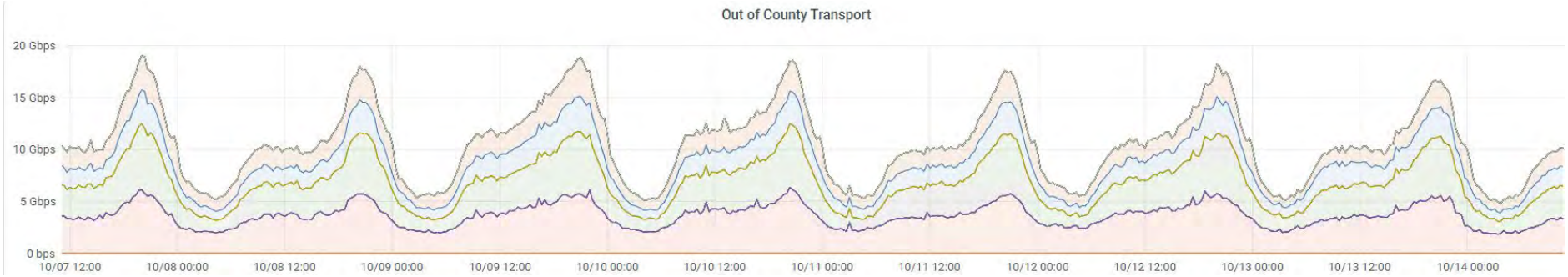
## 30-60-90 Accounts Receivable Trends

All aging reports within normal fluctuations for business. Some long-term debt after the disconnect moratorium (ended Oct 1) is being resolved with customers at this time.




## Transport Network

All traffic continues to maintain normal peaks over the previous 20 months. With transport circuits fully upgraded, no concern over bandwidth



# REPORTS

## General Manager

### DASHBOARDS

Please review the dashboards at https://www.opalco.com/dashboards. Note that all the dashboards are within board approved strategic parameters.

| Finance | Member Services | Outage |
|---|---|---|
| Budget Variance | Disconnects | Historical SAIDI - Graph |
| TIER/Margin | Uncollectable Revenue | Historical SAIDI - Figures |
| Expense | PAL | Outage Stats – Rolling 12 Mo |
| Cash | EAP | Outage Stats – Monthly |
| Power Cost | Service Additions | SAIDI by Category |
| Purchased Power | Annual Service Additions | Outage Summary |
| Annual Power Metrics | Revenue Dist. By Rate | |
| Capital | | |
| Debt/Equity | | |
| WIP | | |
| Income Statement Trends | | |

### ENGINEERING, OPERATIONS, AND INFORMATION TECHNOLOGIES

**WIP**

As of October 14, 2021, there are 405 work orders open totaling $7.96M. Decatur Energy Storage System is $1.5M of the balance. Operations has completed construction on 96 work orders, totaling $1.1M.

**Safety**

John Spain of Northwest Safety Service conducted Vault Rescue training for operations and engineering staff. The total current hours worked without a loss time accident 122,288 hours.

**Tidal**

As a part of staff's ongoing conversations on tidal power, Orbital Marine, Pacific Northwest National Laboratory (PNNL), and OPALCO continue meetings for coordination of effort for the US DOW TEAMER grant, to Orbital and PNNL, and in preparation for the WA DOC grant for preliminary design.

**Grants**

**Washington Department of Commerce - Grid Modernization**

- Decatur Battery Energy Storage System (ESS) (Grant $1M) (partnered with PNNL) – System handoff to PNNL for analysis has begun with an anticipated completion by end of Q3.
- San Juan Microgrid (Grant $2.4M) (partnered with PNNL) – PNNL is conducting an analysis to aid in determining the sizing of each of the battery technologies based on anticipated use cases and economics.
- WA DOC CEF4 Grid Modernization Grants. OPALCO has received conditional award of the following projects. This conditional award awaits the negotiation of contracts with WA DOC and final approval to proceed.

- San Juan Islands Tidal Generation Design (Phase 1 – Preliminary Design) – Analysis and preliminary design for a potential tidal energy project located in the Rosario Strait. Tidal energy could increase resilience and energy independence for island communities, particularly during winter months when solar microgrids have lower production.
- Friday Harbor Ferry Electrification Design (Phase 1 – Preliminary Design) – Analysis and preliminary design for a solar + storage microgrid with the capacity to support five different modes of transport: OPALCO's electrified medium-duty truck fleet, public/private light duty vehicle charging, electric bicycle charging, Washington State Ferries serving Friday Harbor and other marine craft.
- Orcas Biomass (Phase 2 – Detailed Design) - Detailed design and engineering to build a biomass combined heat and power facility with microgrid controls. The facility, fueled by residual materials such as organic waste collected from electricity grid maintenance and forest fuel reduction efforts, would reduce winter peak demand charges and increase energy independence for the islands.

**Washington Department of Commerce – Clean Energy Fund 3 Solar (partnered with PNNL)**

- Low-Income Community Solar Deployment (Grant $1M) – Construction of ~1MW of community solar with ~45% of the array output to be applied to the OPALCO Energy Assistance Program. Staff has executed a contract for scoping and integration of the CEF3 Battery system located on the same site. Staff anticipates an RFP to be released to vendors by Q1 2022.

**US Forest Service (minor in-kind efforts only)**

- Biomass Generation with Biochar (60% Design Grant $72,835) – Funds for preliminary design of a ~1MW Biomass Combine Heat and Power generation. These funds will be paired with in-kind engineering from staff to interconnect.

**US Department of Energy (non-monetary: partnered with NRECA and Lawrence Berkeley National Laboratory)**

- For microgrid projects with solar + storage, cooperatives and small utilities need help designing fair and sustaining community solar rates that allocate benefits rationally to each customer class. OPALCO also seeks to maximize community solar program value and service delivery for our low-income members and develop a decision-tree tool for our Board that enables rate design with full valuation to the microgrid and solar components, while passing benefits from the solar generation to members. Modeling that recognizes our net metering cap, enables transmission deferral, and identifies clear solar rate differentials is needed.

**Clean Energy States Alliance (CESA) for the Implementation of Innovative Energy Storage Pilot Projects**

- Submitted only.

## FINANCE

### 2021 Budget Tracking

Energy (kWh) purchases and sales were higher than budgeted through September 2021. Overall, gross revenue surpassed budget by ~$956k, largely driven by increased kWh sales. This amount was curtailed by the ECA in the amount of $734k ($210k related to December 2020, one month billing lag) resulting in a net sales revenue variance of +$222k through September. Power cost is $160k under budget despite higher kWh purchases due to a lower cost/kWh than budgeted. The table presents full year 2021 projection with actuals through August & September where available.

| Income Statement Summary (in thousands) | 2021 Projection (actuals for prior months) Budget | Projected | Variance |
|---|---|---|---|
| Operating Revenue | $ 31,454 | $ 32,410 | $ 956 |
| ECA Surcharge / (Credit)* | $ - | $ (734) | $ (734) |
| Revenue | $ 31,454 | $ 31,676 | $ 222 |
| Expenses: | | | |
| Cost of Purchased Power | $ 9,735 | $ 9,575 | $ (160) |
| Transmission & Distribution Expense | 6,798 | 6,548 | (250) |
| General & Administrative Expense | 5,449 | 5,150 | (299) |
| Depreciation, Tax, Interest & Other | 8,826 | 8,457 | (369) |
| Total Expenses | 30,808 | 29,730 | (1,078) |
| Non-op rev (Int, Patronage, other)** | 373 | 2,169 | 1,796 |
| Net Margin** | 1,019 | 4,849 | 3,830 |
| TIER | 1.50 | 3.04 | 1.54 |
| Equity % | 35.8% | 38.2% | 2.4% |
| HDD | 1,398 | 1,397 | (1) |
| kWh Purchases | 216,000 | 219,939 | 3,939 |
| kWh Sales | 203,260 | 208,020 | 4,760 |

* The ECA returned $734k to members in the form of bill credits through Sept 2021

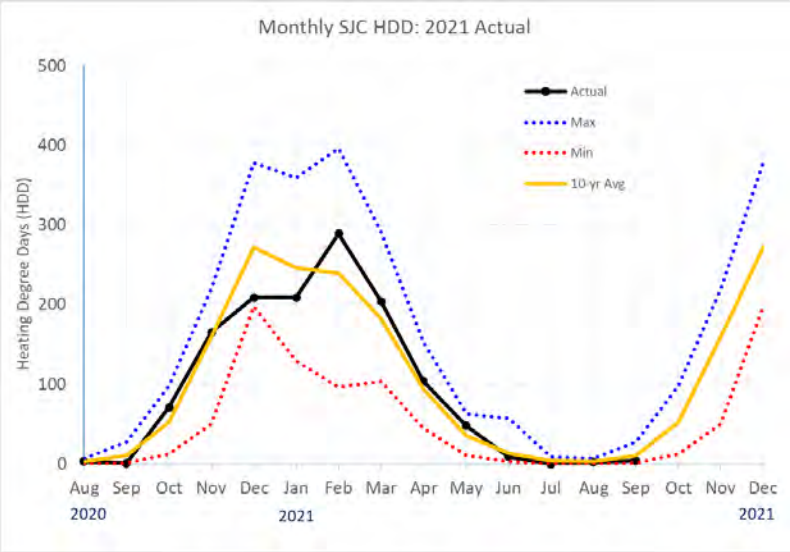
** PPP Loan forgiveness recognized as non-operating revenue in Sept '21

### Monthly ECA

The calculated amount for the September ECA was a bill credit of $.009113 per kWh which returned $100,929 to members, or $8.07 per 1,000 kWh. The October billing period ECA is projected to be a bill surcharge of $.003675 per kWh.

### Heating Degree Days (HDD)

The fall of 2020 began to settle back to near historic averages. Then December and January began trending more towards an El Niño pattern. This pattern flipped in February and March 2021 as HDDs came in above historical averages for the months. Q2 and into Q3 2021 has settled near the historic average as the spring and summer months are expected to follow this trend.

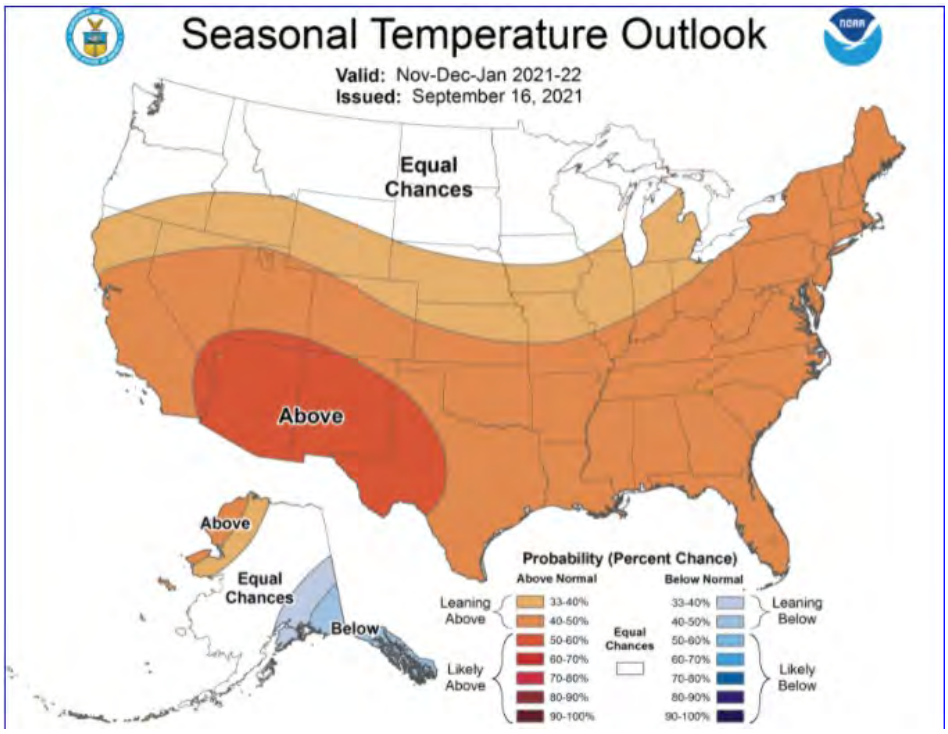


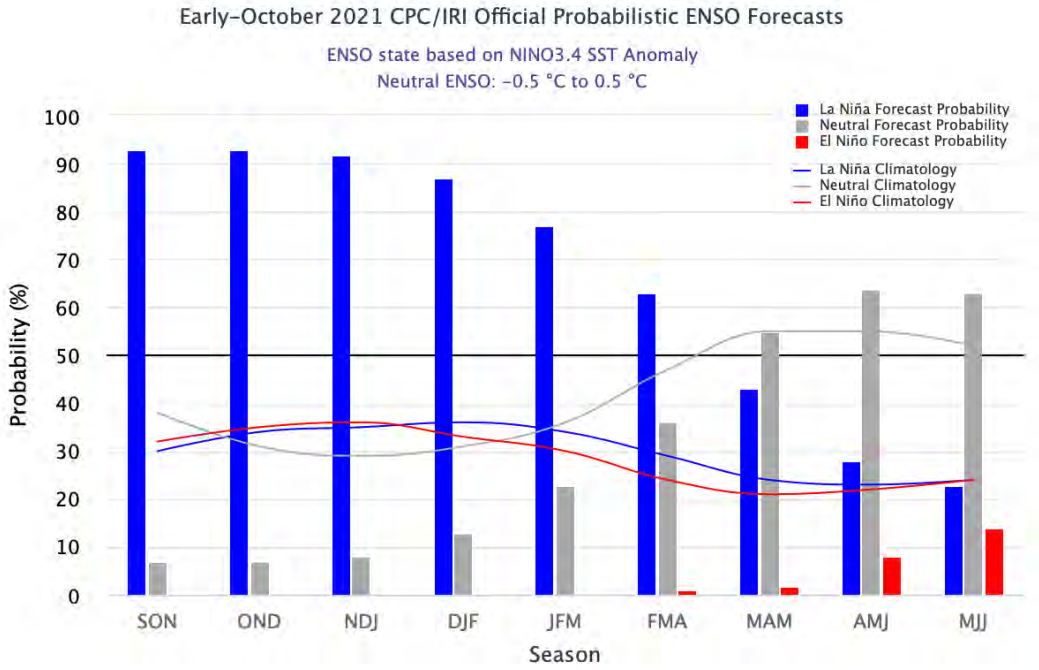

*10-year max, min, avg is 2010-2020

**Weather Forecast**

Looking ahead to the NOAA 'three-month outlook temperature probability' for Nov-Dec-Jan 2021 – 22 there is uncertainty in next winters weather outlook showing 'equal chances (EC)' of above/normal/below temperatures in our region for the winter. We continue to monitor these predictors monthly.

**2021-22 Nov-Dec-Jan Outlook**



Source: NOAA National Weather Service

## MEMBER SERVICES

**Energy Assistance**

**EAP:** During September 2021, 318 members received ~$11.7k from the low-income Energy Assist program, compared to 347 members who received ~13k in assistance in September 2020.

**Project PAL:** During September 2021 7 Members received ~ $1.3K in Community/Family Resource Center Awards.

**Covid Project PAL:** During September 2021 17 Members received ~$1.7k in Awards.

**LIHEAP:** Award season ended in September.

**T-RAP:** Treasury funds for Rental Assistance and Utilities continue to be available through 2022.

**Switch it Up!**

There are now 203 projects complete and billing for a total of $1.6M outstanding. There are another 34 projects in various stages of the process. Some projects have been delayed as residential contractors have been limited by COVID-19.

**Energy Savings**

There were eight rebates paid out to members totaling $6.2k. This includes one fuel switching ductless heat pump rebate and three EV charging station rebates.

OPALCO used the entire BPA rebate budget to finance member rebates over the past two years. OPALCO has received the next two-year allocation of $478,800 to continue to support members in energy efficiency projects and upgrades.

**Solar Interconnects**

There were seven new interconnect applications submitted in September, seven members were interconnected with solar for a total of 491 (https://energysavings.opalco.com/member-generated-power/). There are an additional 22 pending connection.

**Community Solar**

During the September 2021 billing cycles, the Decatur Community Solar array produced 60,000 kWh. A total of ~$6,067 was distributed to 268 accounts.

**Solar Incentives**

In October, OPALCO paid out ~$50.8k to Member Owned Renewable Energy (M.O.R.E.) participants as their yearly incentive. WA State incentives were also paid out to members in the total of ~$174k. Of that amount, $91.4k went to members participating in The Renewable Energy System Incentive Program (RESIP) and $82.6k to members who own shares in our Community Solar array on Decatur Island. Members who received a community solar incentive of $500 or more will receive a check in the mail, incentives below $500 will see on a credit on their October bill.

## COMMUNICATIONS

**National Co-op Month: Member Stories**

OPALCO is celebrating National Cooperative Month with stories about the amazing member owners of the Co-op with our newsletter, website and ads in local papers and on social media. In case you missed it, check out latest member profile story about our own General Foreman Steve Eyler: https://energysavings.opalco.com/member-profile-steve-eyler-general-foreman-a-family-legacy-of-linemen/. Steve followed the legacy of his dad, uncles and granddad into the lineworker trade and is getting ready to retire in January. OPALCO salutes Steve for his service!

**Island Way Workshops**

The 2021 Island Way Workshop series concluded with a Solar Town Hall event on September 20th via Zoom with 114 members in attendance. The agenda included a summary of the Island Way campaign, Russell Guerry gave an update of the Bailer Hill Microgrid project and Foster presented the solar rate proposal currently under discussion and asked for member feedback. Member comments and questions are detailed in Appendix A.

The meeting lasted about an hour and a half. The tone of the membership was positive and curious. The majority of the members present were most interested in community solar, as evidenced by two pop-up polls that we ran in the chat box during the event. We asked members: 1) "What motivated you to participate in the Town Hall?" (**83% Community Solar**, 53% climate change, 50% home solar, 46% solar rates, 22% raffle); and 2) "What part of our energy future interests you most?" (**88% community solar/microgrids**, 73% solar/batteries for home, 71% efficiency/conservation, 69% decrease dependency on mainland power, 69% climate change, 45% OPALCO programs, 41% affordability of power bill).

A number of members and member-generators asked good questions how the new rate structure will affect their own solar investments and Foster answered questions live in the session. Staff have followed up with a handful of members after the meeting and will continue to collect feedback on the solar rate proposal.

Island Way workshops and activities will continue in 2022. There is still much work to be done in preparing our members for the big energy transition!

**Island Way Raffle Drawing**

The names of three members were drawn during a FaceBook Live event at noon on October 1st to award the Island Way Raffle prizes. The winners are: Heidi Krogstad – ten shares of the Bailer Hill Microgrid Project; Sam Blackman – Greenworks electric lawnmower; and Sue Bauer – Stihl electric blower. Staff have contacted the members to arrange deliver of their prizes. Read the media release: https://www.opalco.com/three-big-winners-in-opalcos-island-way-raffle-solar-shares-and-electric-tools/2021/10/. About 190 people viewed the FaceBook Live event.

Members were entered into the raffle for each Island Way event they attended – beginning with the annual meeting. Each entry was assigned a number and a randomizer tool will be used to draw the winning numbers/names.

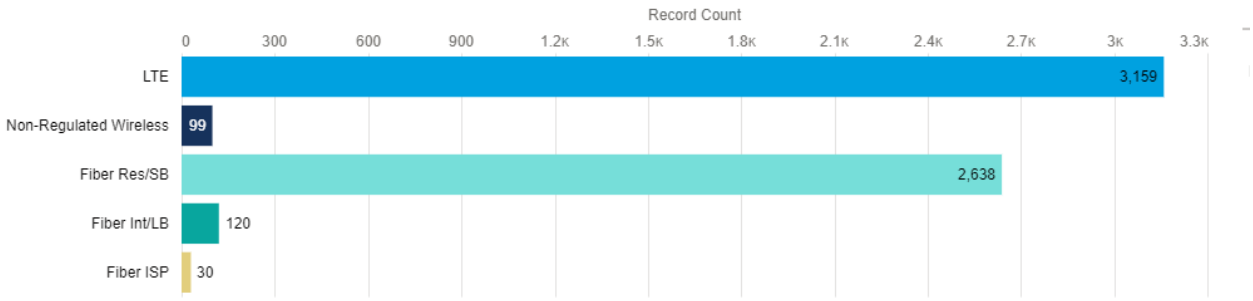
**EV Happy Deal**

To date, 34 members have purchased a used EV from Island eCars, made possible by a grant from the Bonneville Environmental Foundation. As of 10/8/21, only ONE more Happy Deal is available. Once complete, staff will be closing out the grant and reporting on results.

**EV Road Trip**

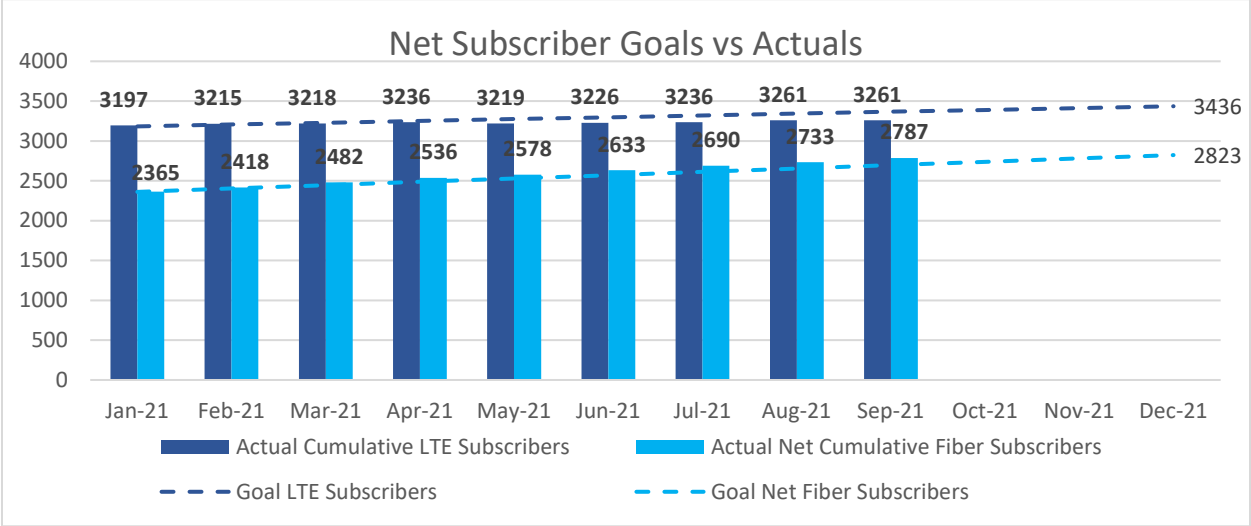
Communication Specialist Krista Bouchey and her dog Pepper, the "Switch-it-up-pup," went on the road driving OPALCO's Island Way Electric Vehicle across Washington to demonstrate how EVs work – and how it feels to drive carbon free. They toured wind farms, solar sites and dams and met with other public power providers along the way. Check out the blog posts about the trip at: https://energysavings.opalco.com/electric-life-blog/.

# Rock Island Snapshot



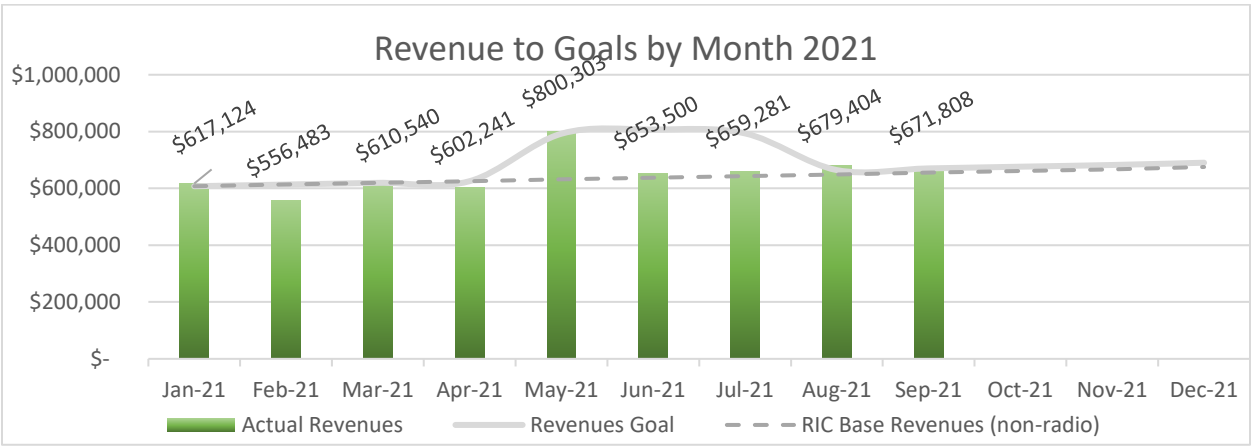

**6,046 Internet Service Customers**

**Net Subscribers 2021**




Subscriber numbers are adjusted to reflect the Access EDU services. The no cost education services are not being counted in the net total of Fiber and LTE.

**Revenues**




❖ August revenues are not closed out and are subject to change.

# APPENDIX

## Solar Town Hall Comments and Questions

### Questions (45 answered live)

**Stephen Schubert** - Are we going to talk about next periods solar share rates might be?

> *OPALCO Response: [Clarified that the question is in respect to community solar rates.] The Bailer Hill Microgrid Project economics are not yet available. Stay tuned for more information in early 2022.*

**Sharon Abreu** - Can you speak to our concern, having purchased 33 solar panels from Rainshadow Solar three years ago, that the rate we're being paid for the solar energy we produce and send to OPALCO may be reduced? Can we trust OPALCO's projections about future rates of return? That was a huge purchase for us.

> *OPALCO Response: The current OPALCO proposal continues legacy rate methods for current net metering customers at their existing rate until 2028, provided OPALCO is notified prior to March 31st, 2022.*

**Steve Bowman** - Will the solar panels be made in the USA?

> *OPALCO Response: We don't currently have a contractor for our next Community Solar project. Those details are unknown.*

**Jessa Madosky** - Are the shares on top of your regular bill or instead of your regular bill?

> *OPALCO Response: Community solar production credits show up as a line item (credit) on the monthly bill. One way to think about the investment is as an offset to the kwh (energy) usage on your bill – but each bill contains all of the normal line items PLUS a community solar credit.*

**Marty Clark** - You mention benefits of community solar for San Juan Island. What benefits for Lopez? Does OPALCO have any specific plans for solar on municipal rooftops?

> *OPALCO Response: Community Solar shares can be purchased from any member regardless of their home island, so all participants benefit. There are some direct local energy resilience benefits for meters in proximity to a microgrid: they can provide a small back-up power supply during an outage event (for example: the Decatur microgrid could power about 500 average user homes for up to four hours during the summer months). OPALCO hopes to build multiple microgrid projects on each of the ferry-served islands, but success depends on member appetite, the challenge of finding suitable land and permitting for renewable energy generation, and grant funding. OPALCO supports municipal rooftop projects as independent commercial member generation, but rooftop installations are not ideal for community solar/microgrid projects.*

**Jessa Modosky** - So when you say it "offsets" do you mean that it offsets carbon emissions but doesn't reduce the power bill for customers or do you mean that it reduces the bill from other sources and "offsets" the cost of energy from other sources

> *OPALCO Response: The former. The solar credit appears as a line item on each participating members' bill – in addition to all the normal charges. OPALCO's community solar production does not change the Co-op's energy purchases or the cost of power – it is on a very small scale at this*

*point and primarily for the purpose of developing a small amount of local energy to help our island communities through emergency situations*.

**Stephen Schubert -** If there is an arrangement when a facility generates power that is transferred to you, what are cost savings for this? Is the rate dependent upon this project?

*OPALCO Response: The rate that OPALCO will pay to member generators for the power that is transferred back to the grid is the solar rate proposal under discussion.*

**Stephen Schubert -** That is, say last year I sent 1 megawatt hour into the grid and got 4 cents back per KwH. This year they are proposing to lower rates, so let's say I again provide 1 megawatt hour, will they pay me 3 cents for example for that whole megawatt hour?

*OPALCO Response: Prior rates was an annual banking of kWh with a pay out of 5 cents per kWh. The proposed rate is to pay for the energy that flows to the grid in the month in question (no banking) at 8.5 cents per kWh.*

**Sandy Bishop** - From a friend who cannot attend: Will generators still get full amount "credit" at least for the amount of energy flowing into the grid, even though the rates for the energy going into the grid will be lowered?

*OPALCO Response: Yes, the monthly credits for energy flowing to the grid will be at 8.5 cents per kWh and credited to the member's power bill on a monthly basis.*

**Chom Greacen** - According to OPALCO's presentation (https://www.opalco.com/wp-content/uploads/2021/09/board-presentation-september.pdf), solar will have a "Maximum size at no greater than 125% of average annual load in addition to existing maximum unit size of 100 kW." What's the rationale for the size limit given our need to decarbonize quickly and competing uses of our limited land resources.

*OPALCO Response: OPALCO has altered the approach due to administration complexity of the 125%. The proposed approach is to have an independent power purchase agreement (PPA) for those connecting systems over 25kW. The conceptual PPA would rely on the tariff billing determinants until the system exceeds 200kW so that any BPA rate impacts can be passed directly to the facility. This provides greater opportunities for large systems.*

**Janet Alderton** - How did the solar plus agriculture meeting go? I am not a farmer, but I am hoping that there was interest and potential synergies.

*OPALCO Response: Good, OPALCO has been meeting with representatives from the SJC Agricultural Guild and the conversation is positive and productive. We have an agreement with a sheep farmer to graze the Bailer Hill Microgrid Project and this property is already in the farmers grazing plan and in use.*

**Robert Gamble** - what type of batteries?

*OPALCO Response: Lithium Iron Phosphate*

**Margaret Osgood** - Is buying into the solar community project accessible to people of all socioeconomic backgrounds?

*OPALCO Response: Equity and inclusion are the cooperative way. The Decatur project shares were priced at $150 each – and subscriptions were capped in the first round of offering to make sure anyone who wanted a share was able to get theirs before larger subscribers were allowed to buy more. We will likely do something similar for the San Juan project. We also received a grant that will direct production from $1M worth of shares into OPALCO's low-income energy assistance program that provides monthly bill credits to qualified low-income households.*

**Chris Greacen -** Will OPALCO's SCADA and switching system allow OPALCO to route power from the mini grid to essential loads (e.g. hospital) during outages?

> *OPALCO Response: Yes once this Bailer Hill project is completed. Microgrids will ideally be located on a circuit in proximity to essential services so that they can supply a small amount of local energy in times of outages and other emergencies or peak energy usage events. The scale and capacity of these microgrids is very small compared to our co-op loads, but they will be an important part of OPALCO's plan to maintain reliable power to our island communities.*

**Tom Baldwin** - What plans are there to incentivize members to install batteries in a neighborhood to provide power to a region? That is, like a generator for a number of residents.

> *OPALCO Response: There are no plans for neighborhood energy storage, at the moment, but it's likely that members will be able to utilize Switch it Up on-bill financing dollars for energy storage (and solar) projects in the near future. It's also possible for neighborhoods to organize their own community solar projects and include energy storage. OPALCO will work with these projects like any member generator.*

**Sarah Severn** - Can you please put the email for the community solar in the chat. You may have done this earlier, but I had to rejoin the call and lost the chat record.

> *OPALCO Response: solar@opalco.com*

**Stephen Shubert** - Are the rate credits between a facility and you going to be affected by this project? Is the rate set on a per hr basis?

> *OPALCO Response: Once the project has matured, we will have better clarity on all specifics of rates for the next community solar.*

**Timothy Dwyer** - Are solar shares transferrable or can they be sold back to OPALCO should the need arise?

> *OPALCO Response: If you close your OPALCO membership, you can transfer your solar unit/s to any other active OPALCO member, or to OPALCO's Energy Assistance Program. If you move within the service territory, you can bring them with you to your new location – but you can't take them with you if you leave the Co-op. If you leave the Co-op and do not designate a beneficiary, your shares will be donated to the OPALCO Energy Assistance Program.*

**Sandy Strehlou** - Partnering with agricultural interests is more than just allowing grazing. Sustainable grazing means restoring the grazing fields through sowing cover crops and other nitrogen-producing vegetation to protect soil health. Beyond that, I hope that the 50 solar farms will not be developed on land that could be used to grow crops, not just for grass for livestock. The Bailer Hill site could be used for agriculture. What is OPALCO doing to develop solar without eating up good potential farmland?

> *OPALCO Response: Our community is in need of both space for agriculture and solar generation. OPALCO is working in collaboration with farmers, livestock growers and agricultural interests to find the best locations for these projects with sensitivity to our local food supply, island aesthetics and in balance with our need for a local renewable power supply.*

**Mark Gasser** - With Our new solar panels and Model 3, and plan to buy a Tesla Powerwall battery being controlled by Tesla-managed algorithms, will this state and OPALCO allow us to produce more power than we consume/share power over the grid? Can I add more panels to produce more power than I use?

> *OPALCO Response: OPALCO is researching the ability to better integrate with such facilities so that we can leverage these systems for incentives to the members and for better economics for the company.*

**Island Oak LLC** - It seems to me the agriculture partnership could be solved by creating solar fence lines leaving the open space for all kinds of agriculture. Is there a program to take advantage of fence lines? that would help some of the farmers as well as give long lines of solar next to power pedestals.

> *OPALCO Response: Fence line solar is a great idea for a member generator project. Economies of scale will be lower due with less dense projects. There may also need to be adjustments to San Juan County code for building at the property lines to permit such facilities.*

**Margaret Osgood** - how would the energy buyback rates differ between a person connected to the community grid vs. someone who has a solar system setup at his/her own property/home/business?

> *OPALCO Response: Each community solar production credit rate is determined through a calculation of all project costs such as land, construction and the retail rate for power. Rooftop solar would be based on the proposed tariff.*

**Pete Helsell** - What % of the OPALCO's total power requirement for the islands will be provided by the two community solar projects?

> *OPALCO Response: Extremely small percentage. The total annual production from these projects is estimated to be 5,600,000 kWh which is roughly 2.5% of the annual.*

**William Hurley** - Is it still possible to buy solar shares on Decatur? Are there future solar projects planned for Decatur?

> *OPALCO Response: The Decatur project is fully subscribed. We do not currently have any other solar projects planned for Decatur Island. Yet members across the system are encouraged to buy shares in the Bailer Hill project.*

**Poke Haffner** - Does OPALCO prefer that members buy into the community solar rather than installing rooftop on their own homes?

> *OPALCO Response: OPALCO encourages the installation of as many solar facilities as possible while balancing our community's needs, aesthetics, and the environmental acceptability. OPALCO wants to see solar on homes AND Community Solar. Each program has benefits to the community and we see the value in both. To meet the future power needs of our island communities, we'll need all of the local resources we can develop.*

**Chris Greacen** - Follow-up to Margaret's question: if customer-owned PV systems are shifted to monthly net metering rather than an annual basis (the topic of part 2 of this town hall), will community solar credits work the same way? Or would they be still settled on an annual basis?

> *OPALCO Response: The Decatur Community Solar rates and methods are set. The next community solar project has not been determined at this point.*

**Stephen Schubert** -I thought you were modernizing so that you can switch power at need amongst the islands. as explained at a membership meeting. So solar contributed to that projects or effort?

> *OPALCO Response: Our goal is to provide power to critical facilities during outage instances throughout our service territory. This effort will take time and $ resources to build. Communications infrastructure is also a major component of doing so.*

**Mark Gasser** - This Tesla Power plant algorithm is being started in New York and will allow the system to tap our batteries and share this electricity to Power Companies to cover their peak loads. They would manage our batteries so that they leave power to cover our needs. State laws, I believe, need to be changed to allow this to happen. Would OPALCO support this in our state?

> *OPALCO Response: Yes, and we look forward to it.*

**Susan Mustard** - Now that I am ready to do so, can someone at OPALCO help me sort out what will work best for me: solar installed on rooftop OR joining community solar project?

> *OPALCO Response: The best place to start would be to have solar installers come take a look at your roof to see what your specific situation would be as far as array size and cost. Then if you are still interested you could chat with someone at OPALCO about investing in Community Solar. We anticipate the project opening up for sales in early 2022. [Note: staff followed up directly with this member.]*

**Tom Baldwin** - I know that the topic for today is solar. But, solar in winter is minimal while heating is maximal. On the other hand, wind is highest in winter. And, tides are totally reliable. What thought is going into other than solar?

> *OPALCO Response: OPALCO currently has a grant to explore the feasibility of tidal power which has great potential in our service territory. Prior wind models indicated that wind power in San Juan County is less favorable and inconsistent. There may be projects in the greater area to investigate feasibility.*

**Ingrid Kjelstrup** - Will the community solar development efforts save money for the OPALCO customers? Or does it make more sense to let our large provider invest in these types of clean energy initiatives while we support by purchasing their product?

> *OPALCO Response: Both things need to happen. We need some locally generated power for a small amount of local energy resilience and more renewable power is needed in our region.*

**Chom Greacen** - If I understand correctly, we are shifting from net metering to net billing on a monthly basis? Under the proposed change, the credit from excess solar generation can be netted against the monthly charge?

> *OPALCO Response: Yes. If you produce more power than you use, OPALCO buys that power back from you (at $0.0849) kWh and you will see that credit on your next month's bill.*

**Poke Haffner** - If there's no year-end settlement, what would annual excess generation be about?

> *OPALCO Response: Your excess generation is added to your bill each month rather than carrying kWh to "year-end".*

**Michael Racy** - If I am understanding correctly the elimination of carry forward credits creates a significant disadvantage for investment by a part time resident?

> *OPALCO Response: This is dependent on the time frame you are using your service and the loads when using. The member still receives a credit in the month where solar is generated regardless of whether the house is occupied or not.*

**Margaret Osgood** - If grandfathered-in members were paying the rates of new member generators, how much more time would it take a person to pay off the price of a solar system? Won't this de-incentive people from purchasing at-home solar systems? What other possibilities are there to make up for loss of return from solar incentives as they are now?

> *OPALCO Response: Depends on all of the parameters of your installation. At the current rate all co-op members are covering fixed costs of our net metering members. The current inequity is about 0.5% of revenues and will increase following the trend of solar generator growth (2020 increase was >20%). Until fixed costs are appropriately shared and recovered with certainty, the financial viability of the Coop is at risk. We want to continue supporting member solar generators with appropriate incentives, but we need to do it in a manner that's equitable to all members. This proposed new rate still provides a monthly credit to net metered members when energy flows to*

*the OPALCO system. The credit is composed of the avoided power costs (BPA, transmission costs, etc.), an environmental component, and a phasing mechanism to moderate solar credit incentives.*

**Keith Wentworth** - If a person is now offsetting their average annual load, how much more will generators need to add to their arrays to offset costs over the next ten years? Any guess?

*OPALCO Response: This is very dependent on the cost increases OPALCO gets in this timeframe. We know BPA will have a contract change in 2028 with unknown impacts. Indicators also show greater inflation in the next few years which will affect labor and material costs for providing service.*

**Pete Helsell --** Is there an overall vision that the development of alternative energy generation in the islands (solar, biomass, wind?) could result in our entire utility becoming a net-zero model for the country? Big dream??

*OPALCO Response: This is probably a big dream given that doing that will have a large impact to the aesthetic nature of our community and competing priorities, such as agriculture. While we can build enough generating and storage capacity to cover essential services during an emergency event (and, hopefully, charge the new hybrid electric ferries planned for our region), our island communities would not support the construction of enough renewable projects to meet the need for power–and, indeed, the amount of land required (1200 acres) for such an endeavor would irreparably change the nature of our beautiful islands.*

**Sharon Abreu** - So just to get clear, can credits generated in the summer be used in the winter?

*OPALCO Response: No. If you get a big credit throughout the summer months, you will carry that monetary credit until it is used up in subsequent months.*

**Michael Racy** - We are summer/fall residents. Our house is not well suited to solar due to trees and orientation. We would love to invest in the community solar project but if I understand the pricing structure the lack of carry forward means there is no benefit when we are not using power.

*OPALCO Response: No, you get a credit on your power bill when the power is generated. The credit will carry forward until you use it up. Check out the Community Solar calculator on our website at www.opalco.com/solar to get an idea of how that might work.*

**Sandy Strehlou** - The United States is behind the ball on all of these energy alternatives as compared to many other nations. What examples from other nations, particularly in rural areas of those nations is OPALCO looking to for answers for many of these questions?

*OPALCO Response: We look toward the industry for any opportunity to provide better services to our members. For instance, we are engaged in a project to investigate tidal power opportunities with a company that has active projects in Scotland.*

**Susan West** - When do the new rates and policies go into effect? What's the go-live deadline for being grandfathered?

*OPALCO Response: The new rates are proposed to go into effect on January 1, 2022, yet members will have the opportunity to stay on legacy rates provided their system(s) is energized prior to April 1, 2022.*

**Sharon Abreu** - It seems our county still has a long way to go in getting energy efficient. How can we better incentivize stepping that up? I know OPALCO has been trying to get people to do that.

*OPALCO Response: Good question! What ideas do you have? OPALCO relies heavily on efficiency incentives/rebates funded by BPA. In addition, the Co-op has garnered more than $20M through the USDA's Rural Energy Savings Program to allow members to make efficiency upgrades and pay*

*for them over time on their bills (Switch it Up). We are looking for ways to get more members involved in spending those dollars! Every efficiency gain helps. We have only 10 years to share those funds out; the clock is ticking! Please help us spread the word.*

**John Calogero** - You spoke about utilizing OPALCO properties, and the Bailor Hill site might support the hospital and airport in an emergency. Why is there not emphasis to put panels on all of the large roofs, such as the hospital, the airport, the schools, Market Place, King's, that is to say close to the need? Is there little concern for voltage loss over distance?

*OPALCO Response: The square footage available on rooftops is not ideal for the scale of a community solar project and, to make it worthwhile, there also needs to be land available for the energy storage component. Rooftop projects are also less attractive for large scale projects due to accessibility and maintenance issues. However, OPALCO does support those members in building their own solar projects, and partners with Sustainable Connections (Opportunity Council) who offers commercial solar assessments, grants and technical expertise to businesses who want to go solar.*

## Comments

**Janet Alderton -** The solar panels can provide shade refuges for sheep during hot days.

**Janet Alderton -** Very cool! (When Foster was talking about rates) geothermal? Microsoft says tapping into geothermal energy will reduce its energy consumption by more than 50%, compared to a typical utility plant. https://www.youtube.com/embed/LeQxTI-s48A?enablejsapi=1&wmode=transparent

**Stephen Witte -** You might want to be careful not to incentivize folks to only buy enough to be worthwhile for the summer and continue to rely on fossil fuel for the winter.

**Chom Greacen -** I think the move from yearly settlement of net metered credit to monthly net billing is fair and a good idea. Thanks for all the considerations that go into this proposal.

**Jake Millan -** @Foster, I second that thought that OPALCO is absolutely a forward-thinking utility. Kudos to this whole team and the programs you all are putting together.

**Chris Greacen - I** would encourage this shift in customer generator tariffs to be evaluated on the basis of optimizing for maximum renewable energy and resiliency in the OPALCO service territory in order to shift electricity generation to non-carbon sources. Fundamentally, the biggest issue here is climate change. Rooftop PV, community solar, mainland renewables (Eastern Washington) -- we need it all. There are many things to balance here: economies of scale (negatively affecting small-scale), transmission constraints (negatively affecting large-scale on-island), real-time wholesale rates, resiliency in the event of natural disasters (big plus for local generation/storage). I think this change to monthly settlement is reasonable given the cost structures that OPALCO is facing and the dramatic decrease in PV prices in recent years. I encourage OPALCO to keep a "yes-and" approach to moving to 100% renewables. I understand this is more or less the direction of OPALCO's IRP.

**Pete Helsell -** You're an impressive team - thanks for a good meeting and for all of your hard work on meeting the challenges, I'll plan to read through the IRP!

### After the town hall meeting:

**Lyn Sorensen -** We participated in your solar update a couple of weeks ago. I really like the fact that you do things like this to stay in touch with your members. That said, I was disappointed with the overall message. You stated many times that renewables, and specifically solar, are the future and that dependence on BPA is not a good plan. Your proposed solar policy however is much less incentive than today's plan despite the need to move to it. I completely get that you guys have to be a financially wise

institution. What I expected you were going to say was that you were improving the attractiveness of going to solar. Not so evidently. We recently got an estimate for solar for a commercial building with the idea that we could do net metering. We have a roof that has the potential of putting up 3800 ft.$^2$ of panels And we are in the commercial district on Lopez Island. We even thought about approaching OPALCO to see if you wanted to put in a car charging station. The estimate we got from the solar folks is now meaningless and we were already looking at a fairly long pay back. I really wish you guys would rethink your attitude towards solar.

**Rainshadow Solar** – *including OPALCO's response to their comments/questions*

Thanks to Chris and Justin for sharing their comments on solar rates. OPALCO understands and appreciates that a change to solar rates affects the business model for solar installers and represents a shift in how installers will design and market their solar systems. OPALCO and Rainshadow are both working in the interest of keeping our respective businesses viable and serving our members/customers.

Rainshadow Solar's comments are below, in BLACK, with OPALCO annotations in-line, in RED, just below each Rainshadow comment. We encourage members to read through and let us know your thoughts. You can reach us at communications@opalco.com.

The timeline for reviewing and approving solar rates was set in May (see board materials) and included two solar town halls where solar rates were discussed with the membership and feedback received. Member comments are welcome during the beginning of monthly board meetings. The remaining timeline includes:

| | |
|---|---|
| October 21 | Solar Town Hall Recap, Policy and Tariff Structure Proposal (first read) |
| November 18 | Policy and Tariff Structure Adoption (final read) |
| December 16 | 2022 Tariff Proposals based on 2022 Budget |
| January 1, 2022 | Implementation of 2022 Tariffs |
| March 31 | Deadline to opt out of new tariff |

**Rainshadow Solar Rate Comments - annotated in-line with OPALCO commentary**

1. **First, it is important to recognize OPALCO's leadership in supporting solar.** There are many examples of utilities nationwide who have chosen short-term profit over long-term community benefits. OPALCO stands out in its effort to focus on sustainable energy:

   *"[Our] commitment to the utilization of renewable resources and carbon reduction"* (OPALCO Mission Statement)

   "*We care deeply about our island communities and are dedicated to the protection of our sensitive environs"* (OPALCO Values Statement, Guiding Documents)

   *"We are dedicated to financial and environmental stewardship through sound governance, management and operating practices."* (OPALCO Values Statement, 2020 Annual Report)

- The OPALCO Board has demonstrated an understanding that **hydropower** is not an optimumal "renewable energy" source: *"OPALCO Board Rescinds Dam Resolution in Favor of Collaboration with*

*Membership"*,
(OPALCO Newsroom, 1/24/2020)

Thank you. Our initial goals are to add enough local generation for emergencies and keep expanding subject to limits set by members, available grant funding and governmental/environmental regulation on contemplated energy resources, including solar, wind, tidal, etc.

It's true: no energy source is optimal. Though each has its pros and cons, we are extremely fortunate to have a large amount of very low carbon, low-cost hydro in our fuel mix. However, we need to acknowledge the impacts these resources have on our environment. We know there is no perfect energy resource. We have members that are concerned about solar and storage system environmental impact. Issues include toxic mining and the extraction of minerals such as lithium, indium, cobalt, nickel, etc., often in vulnerable communities and nations, or using child or forced labor. The Intergovernmental Panel on Climate Change estimates that solar panels have 11.5 times more carbon emissions than hydro.

Carbon emissions are a critical thing, since as many as one million species are now at risk of extinction, many within decades, according to the UN's Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

2. **Second, climate change and Washington's changing energy mix requires significant change.**
   OPALCO is well aware of some upcoming challenges, but this arena is rapidly changing and dynamic:

   Clean Energy Transformation Act (CETA): *"OPALCO will meet ~30% of its power needs with local solar + energy storage (battery) projects by 2040."* [Island Way presentation, January 2021]

OPALCO's ultimate percent of local renewable generation will be based on member acceptance, permitting certainty, and federal/state/local grants.

There's no one silver bullet renewable resource. We need to optimize every energy resource we can. Rooftop solar will be a part of the solution solar (probably a few thousand rooftops would be viable, given shading and other constraints). Community/Utility-scale solar will be in the mix, as well as tidal, if members and permitting support it.

The Bonneville Power Authority contract expires in 2028 which could dramatically change rates and energy source mix for OPALCO members.

Local energy generation and storage will be a huge part of the solution.

- Community solar is becoming much more expensive because of rapidly increasing property prices in San Juan County.

*"The total assessed value for San Juan County increased more than $946 Million over last year"*. (San Juan County, 2021, https://www.sanjuanco.com/1357/Change-of-Value-Notices).

The latest community solar project is forecast to cost less than the Decatur Project per unit. And, future project costs may also be less expensive: each project depends on several variables - grants, large solar array efficiencies, land donations, permitting evolution and member support.

There is still a good appetite for Community Solar in OPALCO's membership. At the September Solar Town Hall, we polled members: 1) "What motivated you to participate in the Town Hall?" (**83% Community Solar**, 53% climate change, 50% home solar, 46% solar rates, 22% raffle); and 2) "What part of our energy future interests you most?" (**88% community solar/microgrids**, 73% solar/batteries for home, 71% efficiency/conservation, 69% decrease dependency on mainland power, 69% climate change, 45% OPALCO programs, 41% affordability of power bill). As long as there is member interest, we will keep building community solar microgrids, to give all members access to the benefits of solar and to power critical systems and services throughout the county during outages.

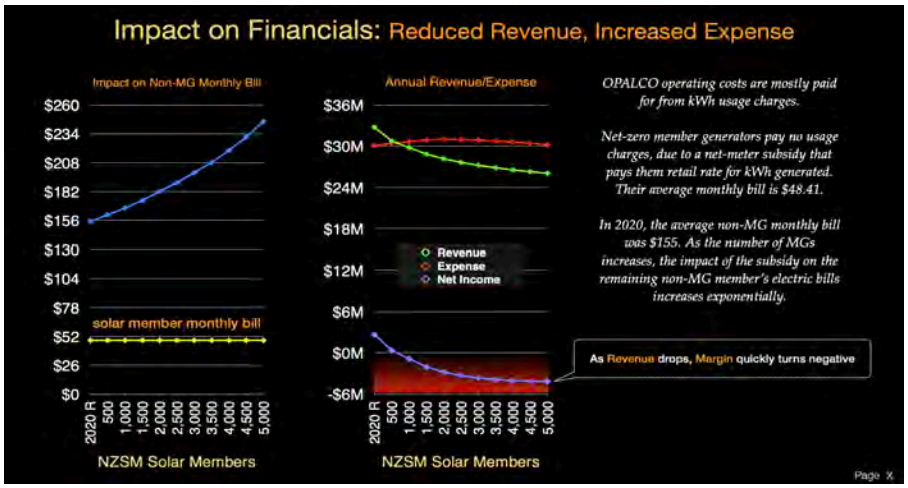
- Member generators/storage providers are a resource that OPALCO should prioritize more.

We agree. As we get into time-of-use and time-of-generation, our intention is to compensate our membership when we utilize the members facilities based on the values these resources provide during times of need.

Cooperatives are built on a foundation of shared equity. All OPALCO members are a priority. As we discuss in the attached memo:

- We believe that many of our member generators don't want to be prioritized more if it hurts the co-op or burdens other members.
- Member generators have received numerous subsidies over the years to help reduce the cost of solar in the northwest, where payback periods are longer than in sunnier regions. But that is not sustainable as the number of member generators grows.
- The majority (~97%), of OPALCO members are not member generators. But they pay a portion of their monthly bill to subsidize the member generators' net metering rate. As the number of member generators increases, that puts a larger burden on regular members and is not equitable.

The chart below shows how co-op finances become unsustainable as the number of member generators increases, reducing revenue (the green line) from reduced load. The chart at left shows the increase of typical non-MG bills to subsidize member generators at the current rate.



If members don't over-generate power onto the grid, then the proposed solar rate structure won't have a negative impact on them. If excess generation is exported to the grid, members will still get solar production credits and only have to pay for their use of the grid when/if this occurs. That is a fair solution. OPALCO operates at the cost of service; member generators on the co-op system should, too.

As you point out, demand for electricity is rising, and this will cause the price of mainland power to rise, especially as coal and hydro capacity decreases. Solar generators will see the value of OPALCO's solar generation credits rise as mainland power costs rise. Note that rate increases are bad for all members. We want to keep usage rates as low as possible to help keep member energy bills as low and to accelerate the shift from fossil fueled heating and transportation.

The purposed solar rate allows existing solar generator members to remain on the legacy solar rate as long as they opt-out of the new solar rate by March 31, 2022. Please note that, for some solar members, especially those that generate more than they consume, the new rates will be better for them, and generate credit each month, rather than at end of the following year.

**3. Third, the problem that OPALCO seeks to address is not clear.**

The problem is clear. Please see the charts above and the memo discussion. The net meter subsidy is financially unsustainable as the number of member generators grows.

Is the issue a load management issue?

No, the issue is about the financial sustainability of the co-op.

- OPALCO has shared analyses suggesting potential issues when net zero solar members (NZSM) are 50% of total solar members. The assumptions in this analysis deserve additional scrutiny.

Rainshadow Solar's experience is that very few solar members achieve net zero.

The financial sustainability issue remains. For example, co-op finances become a problem at about 500 net zero solar members. If most new member generators are slightly less than net zero, the financials still become unsustainable just a little bit slower. For example, if the average new member generator generates 10% less than their load, then the finance issue would happen at 10% more average members, in the case above, 550 members instead of 500. Same problem. As the chart below shows, the number of installations per year is growing and the average installation size is rapidly approaching net-zero.

Many of these OPALCO customers are concurrently adding loads from beneficial electrification (e.g., mini-split heat pumps) and transportation electrification, making net zero even more difficult to achieve.

The proposed tariff does not impact member's own usage which is offset by production effectively offsetting the retail rate for this energy. It impacts overgeneration which has less impact in the statement above.

OPALCO's Integrated Resource Plan (IRP) notes the positive contribution from solar in a changing climate that may not have been captured adequately in the NZSM analysis above:

- "*But, with climate change...Winters are warming and summers are too. There will be reduced need for winter heat and increased need for summer air conditioning. Snowpack is decreasing, which means less hydro flow in summer, which could mean lower hydro production and higher hydro costs in summer when big cities have increased air conditioning load. Solar can help fill the gap from reduced summer hydro. And, increasing local renewable energy such as solar, wind and tidal helps increase local energy and economic resilience."* (Page 68)

- *"There is a rotation of load from winter-peaking to summer-peaking that will unfold over the coming decades."* (Page 4)

All true. Load will likely shift over the coming decades. But the financial challenges are in the coming few years. Not decades. And load is load. A member generator typically has minimal load (while using the grid much more than regular members), so the revenue reduction issue remains. In short: member generators use, depend on, and benefit from the grid as much or more than a non-member generator, but since the grid is funded primarily through load revenue, which member generators contribute to at less than half the rate of regular members, OPALCO finances are impacted, which hurts all co-op members.

Another analysis showed that 90% of annual loads might only require 14kW PV, plus 22kWh battery storage from an example with Massachusetts, which somewhat comparable to Washington in terms of climate, (Clean Energy Group, 8/19/21) – this scenario is both technologically feasible and being explored by customers today.

Yes! OPALCO was the source that sent you that information because we are excited about that scenario. Again though, the issue of load reduction, leading to unsustainable co-op finance remains.

Is the issue a fairness issue? OPALCO abides by the seven cooperative principles, including "members contribute equitably to, and democratically control, the capital of their cooperative."

- OPALCO has noted that solar generators have access to the grid, while benefiting from their investment in rooftop solar to sell back to the grid. The argument is that this may not be a "fair" transaction.

These members have invested, on average $30,000, to produce on-island energy from a completely renewable source.

While we appreciate that significant investment, those member generators are being subsidized by the remaining membership, many of which can't afford to install solar on their roof. Continuing to follow the current rate method would further exacerbate the cost of service inequity.

These members are also not requiring as much BPA-sourced energy in much of the year that are clearly impacting endangered salmon runs as well as keystone predators like Southern Resident Killer Whales.

These member generators are the foundation for incorporating future storage projects that OPALCO could tap as dispatchable assets.

These solar generators have been instrumental in **helping OPALCO demonstrate its commitment to locally-sourced, renewable energy generation, without the capital investment being incurred by OPALCO**.

We agree and value the contributions of member generators. AND, the grid has value, too: it is essential for a member generator to over produce in summer and sell to other members and get through winter when solar output is much less than load. Solar is valuable, the grid is valuable, and most of us just want to make sure that the cost of the grid is recovered sustainably and equitably.

- It is important to recognize that OPALCO has an established precedent for allocating resources based upon values and future-planning:

  Social values (*"We are a socially-responsible, member-owned organization"*) – PAL & Energy Assistance Program

  Changing technology (*"We continually evolve our services, and offer programs to meet the needs of our membership"*) – purchase of Rock Island Communications

  Environmental values/energy sourcing (*"commitment to the utilization of renewable resources and carbon reduction"*) – net metering & community solar

Yes! OPALCO members get and give. This can only prevail when co-op finances are healthy. We believe that most member generators value the grid as much as they value generating their own energy. Each benefits from the other. Perpetuating a rate design that depends on the whole membership to subsidize member generators' personal solar investment is not being "socially responsible" or equitable.

Is the issue a revenue issue?

Yes. See discussion above.

- In 2020, OPALCO's revenue and kWh purchase was higher than the previous 3 years. Based on OPALCO data, solar generation is not even keeping pace with increased energy demand for all members.

Don't mistake yearly fluctuations in load as trend. Weather is the main driver of yearly flux. Load has been essentially flat this past decade, thanks to the Co-op's very successful energy efficiency programs, especially with regard to converting resistance heating to super-efficient heat pumps.

- OPALCO's proposed solar rate tariff scenarios example with 2020 solar generators projects a net positive revenue increase of $25,153 with the new solar tariff, annually. This increase is calculated based upon 315 existing residential member generators (as an example), but it is important to recognize that it will take years to add that many more new residential member generators impacted by a rate change. Alternatively, other revenue generation/cost savings approaches can be taken instead:

We don't believe members generators are doing it to make a profit at the cost of the Co-op's wellbeing. At the September Solar Town Hall, it was clear from comments and polls that they are first and foremost trying to help reduce our dependence on the mainland. The solar rates change the speed of payback, but it is still a profitable action, for both the member and for solar installers.

This level of annual savings could be achieved in a month, by **encouraging or requiring OPALCO members to switch from paying via credit card to bank account**, similar to the efforts that other cooperatives are taking to reduce unnecessary costs for members. Put another way, members paying via credit card and requiring OPALCO to incur credit card processing fees are burdening the entire membership for this convenience, when no-cost alternatives are easily available.

Thank you for the thought and suggesting ways to prudently manage our expenses. Please note, OPALCO has senior staff with extensive experience in optimizing the mix of pre-paid, post-paid, cash, and credit forms of payment to minimize billing and collection cost. This is all reviewed regularly for ways to reduce cost and ensure timely accounts receivable.

**Tier 2 or 3 energy rate tiers could be raised marginally**. In the long-term, this may encourage OPALCO membership to pursue energy efficiency and/or on-site generation and storage that ultimately reduce demand charges from BPA and provide savings to all members.

The existing rate structure from BPA doesn't follow such price signaling under our current "cost of service" situation. However, we do expect future power rates to have significant price signals following the prices for power on mainland power. Our future rate structure will be transitioning to "time-of-use" and "time-of-generation." As this occurs the tier pricing structure you reference will become increasingly important in the "cost-of-service" TOU/G rate structures at that time.

That said, decarbonization is the key to reducing climate impact, so keeping electric rates affordable for all members helps accelerate converting all the fossil-fueled heating and transportation to clean electric.

4. **Fourth, the potential for unintended consequences is great.**

The proposed change significantly extends the potential payback of solar (or solar + battery) installations by 11% to 31%, depending on the scenario. A recent study reported that case studies in places where net metering rollbacks occurred, the rate of solar adoption was reduced or plummeted (Dutzik et al., 2021). We expect this change to result in:

The Use Cases you reference appear hard to imagine on a large scale. First, the proposed rate only impacts members during times of over-generation, when excess power is put onto the grid. In addition to the members receiving solar generation credits for the energy, member generators will only pay a small amount for grid usage/maintenance.

In addition to applying for Federal, State and Local grant opportunities for utility scale solar, we will also advocate for rooftop solar incentives. OPALCO plans to open our member re-lending program (Switch it Up/RESP) to Solar and Battery projects once our solar rates are not in direct conflict with our financial viability to accelerate rooftop solar adoption.

- Fewer installations to meet renewable, local generation goals set by OPALCO; in fact, this change has the potential to reverse previous goals set by OPALCO.

As an example, a key conclusion of OPALCO's IRP was *"Near term focus is on building equity, winning grants, and incentivizing member efficiency, **renewable energy and battery storage programs**."* (Page 4)

- Solar and storage installations driven by motivation for energy arbitrage/OPALCO avoidance.

  This opposes projected increased energy use revenue from the proposed rate change, while increasing the cost of a renewable energy system.

  Members with this motivation may never work with OPALCO for dispatchable resource sharing in the future.

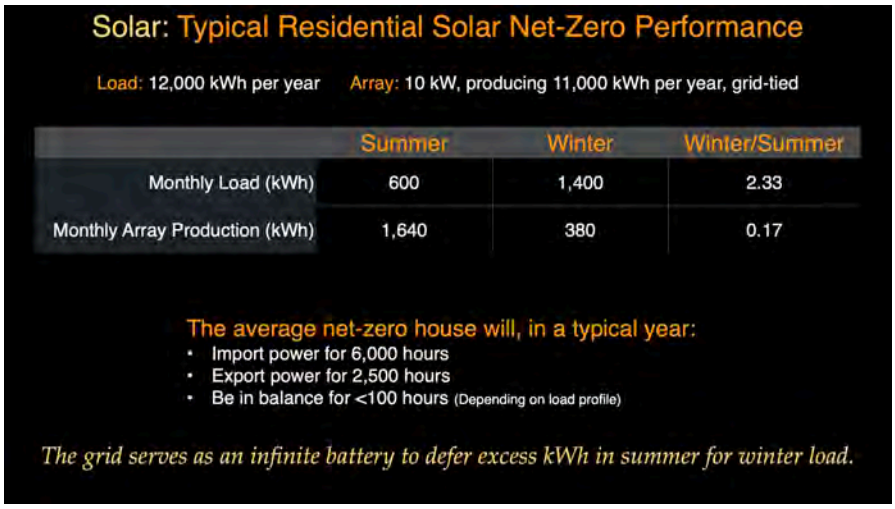
Energy spikes in winter are very expensive. While solar generation is minimal in northwest gray winters, storage can play a valuable role in reducing winter demand charges, and we think member storage incentives will be attractive, in much the same way that solar incentives were, in the early days of solar when it was an emerging technology.

- More off-grid installations that reduce facility charge revenue.

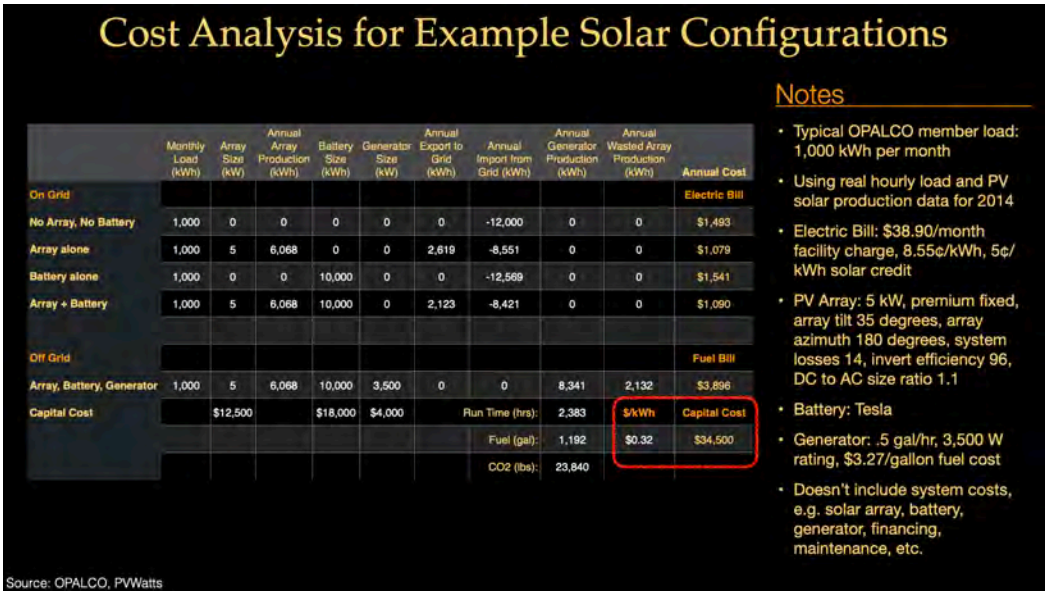
What do you estimate the cost and carbon footprint are for going off grid, for a typical OPALCO member - solar/wind generation, storage, generator, fuel, etc.?

Our research shows that a typical OPALCO solar member would need to spend thousands of dollars in batteries, fossil-fueled generator cost and fuel each year (about 32¢ per kWh + carbon pollution), or $2 million in battery storage to make it through the nights and winters.

We believe that most islanders value the grid and realize that to go off grid would require extensive burning of fossil fuels for generator and/or a wood stove. To get through the winter without burning fossil fuels would require ~$2 million in storage capacity. The chart below shows a typical member's summer and winter load and solar production. They are using the grid a lot, especially for storing summer over-generation for winter credit.

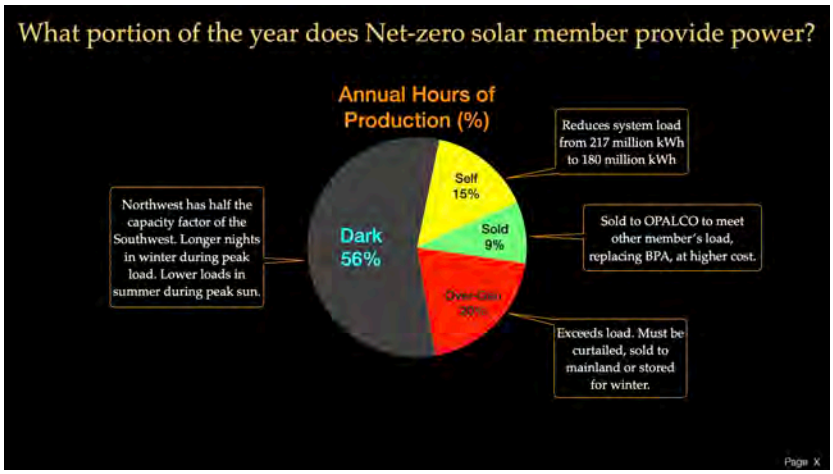



This next chart shows the economics of going off grid with a generator to handle winter, to avoid the expense of battery storage, which is only good for hours or a day or two. Going off grid is not something that one does to save money or reduce climate impact. It's much more expensive and polluting. To suggest that solar members will do that because they can't profit from solar in the current payback period sells members short.




| | Monthly Load (kWh) | Array Size (kW) | Annual Array Production (kWh) | Battery Size (kWh) | Generator Size (kW) | Annual Export to Grid (kWh) | Annual Import from Grid (kWh) | Annual Generator Production (kWh) | Annual Wasted Array Production (kWh) | Annual Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| On Grid | | | | | | | | | | Electric Bill |
| No Array, No Battery | 1,000 | 0 | 0 | 0 | 0 | 0 | -12,000 | 0 | 0 | $1,493 |
| Array alone | 1,000 | 5 | 6,068 | 0 | 0 | 2,619 | -8,551 | 0 | 0 | $1,079 |
| Battery alone | 1,000 | 0 | 0 | 10,000 | 0 | 0 | -12,569 | 0 | 0 | $1,541 |
| Array + Battery | 1,000 | 5 | 6,068 | 10,000 | 0 | 2,123 | -8,421 | 0 | 0 | $1,090 |
| | | | | | | | | | | |
| Off Grid | | | | | | | | | | Fuel Bill |
| Array, Battery, Generator | 1,000 | 5 | 6,068 | 10,000 | 3,500 | 0 | 0 | 8,341 | 2,132 | $3,896 |
| Capital Cost | | $12,500 | | $18,000 | $4,000 | | Run Time (hrs): | 2,383 | $/kWh | Capital Cost |
| | | | | | | | Fuel (gal): | 1,192 | $0.32 | $34,500 |
| | | | | | | | CO2 (lbs): | 23,840 | | |

And going off grid means that you are unable to sell excess solar kWh to the grid. the chart below shows the typical portion of time a home generates energy or needs energy.




- An <u>exacerbation of social inequity</u> with respect to renewable energy by making locally-generated, renewable energy (and storage) less accessible to many islanders. This is a huge issue, given the affordable housing challenges that San Juan County already faces.

The social inequity is depending on all co-op members, including low income, to subsidize those who can afford $30,000 to install a personal solar system. Community solar projects are the great social equalizer, giving members at every economic bracket an opportunity to access the benefits of solar. OPALCO is a leader among co-ops in winning grants to help provide affordable solar to low-income members, without putting it on the backs of the general members. In addition, OPALCO's substantial low-income energy assistance programs are only sustainable with healthy co-op finances.

OPALCO will continue to be a model for utilities across the nation, especially rural electric cooperatives, that serve small populations with dispersed grids. This leadership ensures safety protocols,

environmental stewardship, carbon reduction, renewable adoption, grid modernization and system reliability while maintaining affordability for the membership and continuing equity and access for low-income member households. However, OPALCO must remain a financially viable organization for us to continue being a leader in the effort.

- Direct impacts to clean technology jobs (and supporting businesses, such as freight) in the islands, which has been touted by OPALCO as beneficial for the community to *"lift income for working people above the low wage tourist economy"* (OPALCO IRP, page 24). Rainshadow Solar employs ten full-time employees who live and work in the county.

With a financially healthy co-op, clean-tech jobs will increase in the coming years, thanks to incentives to bring the next generation of solar and storage systems to rooftops and community solar sites throughout the county. In the coming years, as storage deployments accelerate, we anticipate many more clean-tech jobs to install and service the expanding base of solar and storage systems and smart home technology.

OPALCO is able to consider solar rate changes because OPALCO met Washington's net-metering threshold requirement - this requirement was based upon historical peak demand from 1996 (25 years ago). As a point of reference, the population has nearly doubled between 1990 and 2020, and peak demand has also increased since 1996. The goal of the net-metering threshold (RCW 80.60.005) was to 1) encourage private investment in renewable energy resources; 2) stimulate the economic growth of this state; and 3) enhance the continued diversification of the energy resources used in this state. What happens if the State of Washington increases the net metering threshold for all utilities in the state, to meet Washington's clean energy goals?

OPALCO will comply with all governmental requirements and the co-op rate structure will continue to evolve as the Federal, State, and utility industry programs evolve.

OPALCO may encounter similar challenges as Snohomish PUD did in 2017 with the optics of trying to explain the decision to move to a different solar tariff model. As a result of SnoPUD's experience and the public backlash that ensued, SnoPUD decided to revert to retail net metering which they continue today.

In a co-op, there is more at stake than optics. The co-op must strike a balance, serving all its members.

5. **Fifth, the proposed change leaves many questions that have yet to be answered.**

How are legacy systems designated? By meter, by building, by member? Can legacy status be passed on if a death occurs or property sale happens? Can legacy systems be updated?

See proposed Member Services Policy and Tariffs in these board materials. Existing members will have the option to opt-out of the new solar rate, provided they notify us prior to March 2022. Legacy systems can't be passed down. Modifications requiring recertification by OPALCO will be moved to new solar rate.

How do solar installers estimate the future economics of an install? Will the difference between the buy and sell rates always be the same, or change year-to-year, or month-to-month depending on energy markets?

See proposed Member Services Policy and Tariffs. As always, billing rates change each year during our annual budget process to ensure a fair cost of service and periodic cost of service studies are conducted. Solar rate billing components will be adjusted at that time too.

How will financing institutions interested in funding projects account for future changes in transactions?

We can't speak for financial institutions, but would imagine they would do it as they always have, looking at business case, ROI, etc.

How was the "environmental value" of $0.01 determined? This value seems much too low, and we suggest that a literature review should be conducted, as there have been many studies in the past decade evaluating the economic value of environmental benefits and ecosystem services.

OPALCO conducted research through literature review, professional rate consultants, and our local power profile, including OPALCO power purchases, BPA fuel mix, EPA GHG assignments to PNW grid for Fossil fuel generation, and WA Clean Energy Transformation Act. We found that for the "social cost of carbon," 1 kWh of solar is worth $.00112. We felt rounding that up by a factor of about 10 was a good start. Please provide any information that may provide further clarity.

What are the administration and member education costs associated with changing the current tariff to a buy-sell arrangement? Will the net result be revenue positive?

Administrative and member education costs are minimal as they are integral to the work efforts of salaried staff. The outreach tools that will share the information are already in play each month; the messaging is all that changes.

Have all members been asked about this significant change?

All members have had opportunities to read about the process and proposal for the change in solar rates since the topic was introduced in May. Members are welcome to comment at all board meetings and two solar town hall meetings were held with robust attendance and conversation: the first, in May to introduce the topic and make members aware of the timeline for member feedback; and the second in September when the current proposal was shared and discussed. Member comments and questions from the September solar town hall are included in these board materials.

- How many unique members were able to attend the Solar Town Halls?
- In 2020, a member survey was given in which 449 members responded. One of the key findings included *"Members are most likely to feel that OPALCO is actively addressing energy conservation/efficiency and renewable energy, although mean ratings for both fall below 4.01. How actively the co-op is addressing the transition away from fossil fuels and electrification of transportation is lower, with mean ratings of 3.76 and 3.50, respectively."*
- Also in 2020, a Switch-It-Up survey was given to 33 members. One of the results of that survey was that more than 50% of the respondents were interested in on-bill financing for rooftop solar, the highest score for any option (as a point of comparison, community solar interest was less than 40%).

Yes! We are excited about that. OPALCO has worked hard to get grants to help our members save money, reduce carbon emissions, and decrease our dependence on the mainland. We expect members will appreciate the new ways to finance solar, storage and will focus our efforts on getting more members to take advantage of the available funding.

> What happens when a member pursues significant energy conservation measures that dramatically change consumption (and potentially shift production/consumption percentages)?

The new rates reward that. A member that has low usage and high generation benefits more in the new rates. That's because the excess is credited at 8.495¢ per kWh, compared to 5.2¢ in the current rates.

**OPALCO should instead focus on key opportunities and greater connectivity to its membership through dispatchable resource agreements, smart grid technologies, and long-term investments that benefit all, including future generations.**

All of those things are well underway by the Co-op's highly skilled team. But bringing it all back to the core message, all of this can only be done by a co-op that is financially sustainable.

We are happy to continue discussing solutions with you and would be willing to participate on a task force to develop a better approach for any future changes immediately. In the Spring of 2021, OPALCO indicated that there would be a task force to look at solar rates (and that we would be a part of this effort). We had hoped to be a part of an active task force, but this task force never materialized.

This rate review process started at beginning of the year with a timeline for solar rate review announced in May. Staff met with Rainshadow on numerous occasions to discuss the process and proposal.

We value our relationship with Rainshadow Solar and have enjoyed collaborating over the years. We believe that dispatchable storage, low interest on-bill financing, and numerous other upcoming local energy projects will accelerate local renewables in the county and grow Rainshadow's business at a greater rate than you imagine - all of this to the benefit of co-op members. In any case, it will happen better and faster if we are working in a spirit of collaboration - and we welcome that.

Thank you for your time,

Justin Wolfe

Chris Wolfe

Rainshadow Solar

**Addenda**

Here's a summary of the new rates:

# Net Metering Proposed Changes

- Real-time credit when energy is produced
- For generation in excess of consumption, customer receives a credit in the month of generation (no month-to-month banking or year-end settlement credits)
- Solar generator impacts:
  - System own use still paid at full retail rate
  - Excess generation slightly less than retail rate (~$0.085 vs ~$0.109)
  - Annual excess generation more than existing (~$0.085 vs ~$0.052)
- All existing member generators would be "grandfathered" at rate implementation
- Based on current member generator profile, new member generators would see $9.81 increase in monthly bill

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# Current Member Generator Rates

Overview

- Member Generator (MG) production rates are specified in OPALCO Policy 14
- Option to apply a fixed fee for administrative costs
- Must comply with nameplate capacity no greater than 200 kW
- OPALCO is not obligated to accept MG over-generation and can interrupt, reduce or curtail

Net Metering

- Monthly production nets with monthly usage, over-generation is banked to following months until the following April true-up. Annual production greater than annual load, is paid at PNGC/BPA + 1¢ per kWh of excess.
- WA RCW requires net metering, as we have applied it, to be offered to the first 4% of 1996 Peak consumers or until Jun 30, 2029. Our System Peak in 1996 was 54.985 MW AC (4% = 2.199 MW AC).
- Our current connected solar as of today is 3.878 MW (DC) (estimated 3.684 MW AC); several systems are underreported. As of today, we have no obligation to connect further members at the existing rate structure for solar connected services.

Buy/Sell - production only, no load

- Five members in system
- PNGC/BPA + 1¢ per kWh of production

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## OPALCO Supporting Local Generation Through the Years

- Robust net metering program
- WA energy production credit program administration
- M.O.R.E. program administration
- Community Solar Program, with low-income grants
- Grid modernization enabling more solar and increased transactional grid for members to buy/sell of energy
- Winning grants and advocating for tax credits and state/ national policy to increase local renewables
- Streamlining permitting process in county for solar
- Forthcoming low interest on-bill finance for solar and batteries

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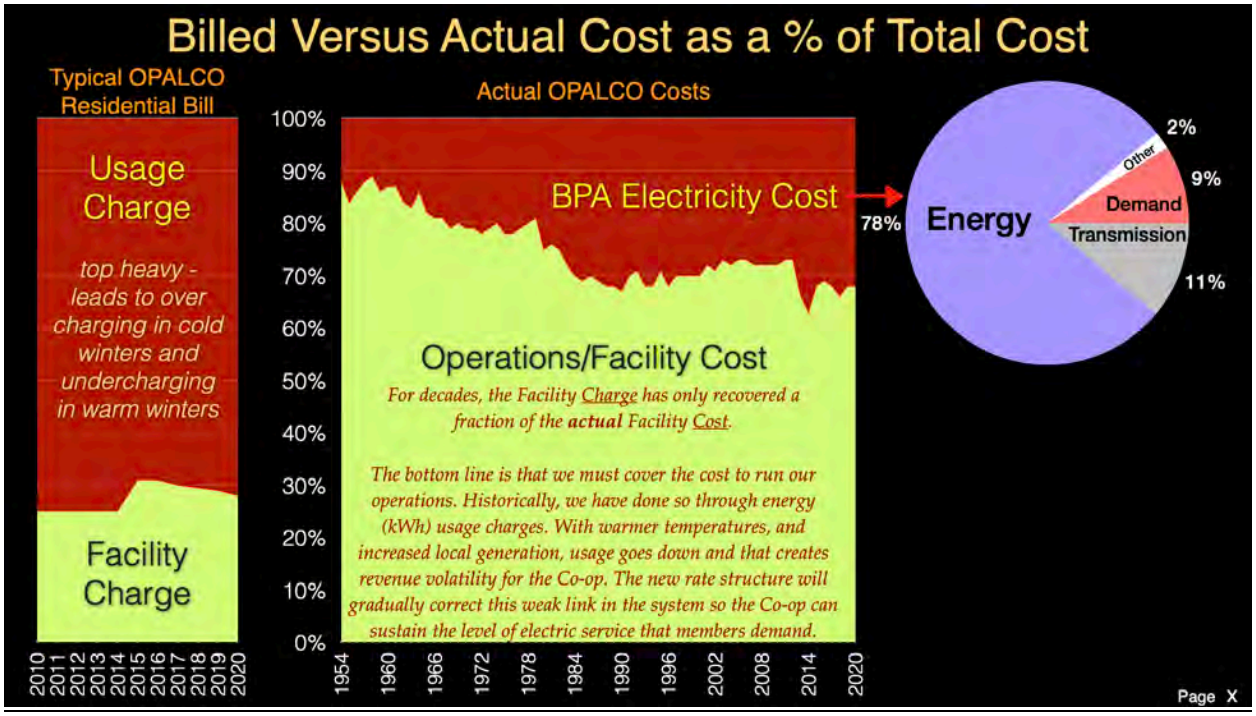
## Billed Versus Actual Cost as a % of Total Cost

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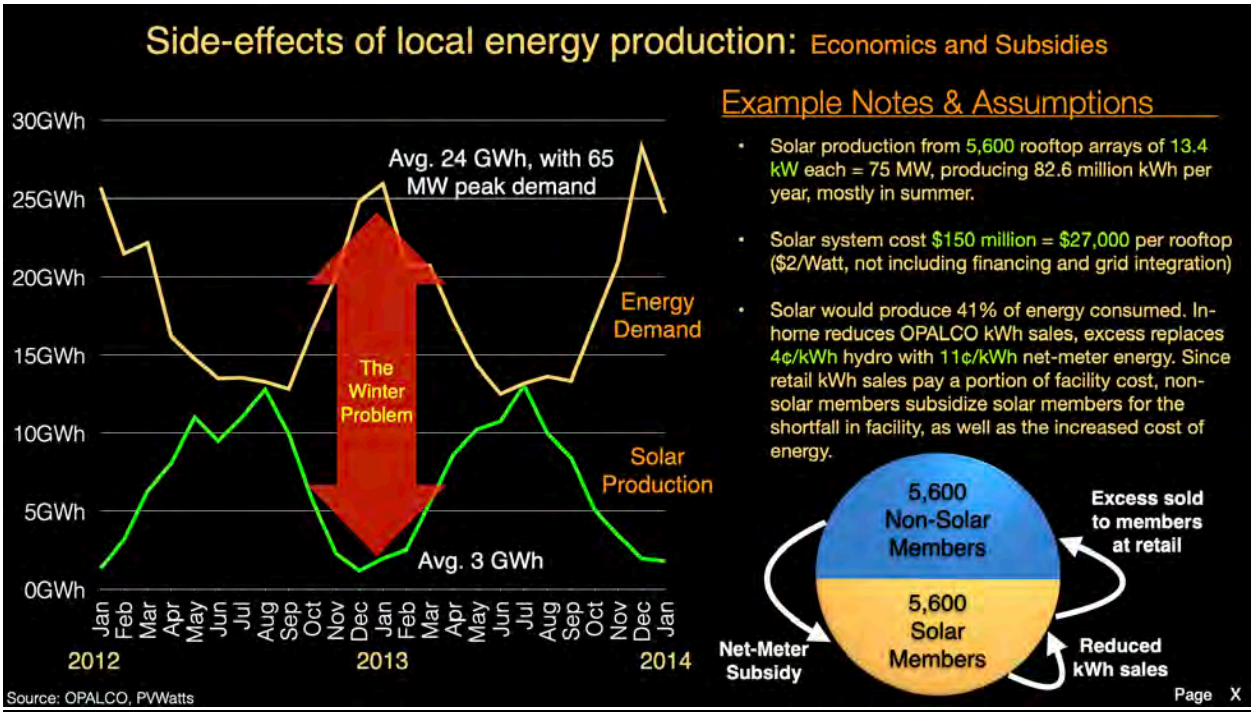
Side-effects of local energy production: Economics and Subsidies
30GWh
25GWh
20GWh
15GWh
10GWh
5GWh
0GWh
Avg. 24 GWh, with 65 MW peak demand
Energy Demand
The Winter Problem
Solar Production
Avg. 3 GWh
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
2012
2013
2014
Source: OPALCO, PVWatts
Example Notes & Assumptions
Solar production from 5,600 rooftop arrays of 13.4 kW each = 75 MW, producing 82.6 million kWh per year, mostly in summer.
Solar system cost $150 million = $27,000 per rooftop ($2/Watt, not including financing and grid integration)
Solar would produce 41% of energy consumed. In-home reduces OPALCO kWh sales, excess replaces 4¢/kWh hydro with 11¢/kWh net-meter energy. Since retail kWh sales pay a portion of facility cost, non-solar members subsidize solar members for the shortfall in facility, as well as the increased cost of energy.
5,600 Non-Solar Members
5,600 Solar Members
Excess sold to members at retail
Net-Meter Subsidy
Reduced kWh sales
Page X

# Rainshadow Solar Original Correspondence

October 15, 2021

OPALCO Board Members (Jeff Struthers, Rick Christmas, Tim Osterman, Vince Dauciunas, Dr. Jerry Whitfield, Brian Silverstein, and Mark Madsen)

Re: Comments on Solar Rates

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Friends and fellow community members,

We appreciate the opportunity to provide comments and perspective on OPALCO's initial proposal on changes to the solar rate structure, both as local business owners and as OPALCO members.

1. **First, it is important to recognize OPALCO's leadership in supporting solar**. There are many examples of utilities nationwide who have chosen short-term profit over long-term community benefits. OPALCO stands out in its effort to focus on sustainable energy:
   - "[Our] *commitment to the utilization of renewable resources and carbon reduction*" (OPALCO Mission Statement)
   - *"We care deeply about our island communities and are dedicated to the protection of our sensitive environs"* (OPALCO Values Statement, Guiding Documents)
   - *"We are dedicated to financial and environmental stewardship through sound governance, management and operating practices."* (OPALCO Values Statement, 2020 Annual Report)
   - The OPALCO Board has demonstrated an understanding that **hydropower** is not an optimum "renewable energy" source:
     - *"OPALCO Board Rescinds Dam Resolution in Favor of Collaboration with Membership"*, (OPALCO Newsroom, 1/24/2020)

2. **Second, climate change and Washington's changing energy mix requires significant change.** OPALCO is well aware of some upcoming challenges, but this arena is rapidly changing and dynamic:
   - Clean Energy Transformation Act (CETA): *"OPALCO will meet ~30% of its power needs with local solar + energy storage (battery) projects by 2040."* [Island Way presentation, January 2021]
   - The Bonneville Power Authority contract expires in 2028 which could dramatically change rates and energy source mix for OPALCO members.
   - Local energy generation and storage will be a huge part of the solution.

1

- Community solar is becoming much more expensive because of rapidly increasing property prices in San Juan County.
  - *"The total assessed value for San Juan County increased more than $946 Million over last year".* (San Juan County, 2021, https://www.sanjuanco.com/1357/Change-of-Value-Notices).
- Member generators/storage providers are a resource that OPALCO should prioritize more.

3. **Third, the problem that OPALCO seeks to address is not clear.**
   - Is the issue a *load management* issue?
     - OPALCO has shared analyses suggesting potential issues when net zero solar members (NZSM) are 50% of total solar members. The assumptions in this analysis deserve additional scrutiny.
       - Rainshadow Solar's experience is that very few solar members achieve net zero.
       - Many of these OPALCO customers are concurrently adding loads from beneficial electrification (e.g., mini-split heat pumps) and transportation electrification, making net zero even more difficult to achieve.
       - OPALCO's Integrated Resource Plan (IRP) notes the positive contribution from solar in a changing climate that may not have been captured adequately in the NZSM analysis above:
         - *"But, with climate change…Winters are warming and summers are too. There will be reduced need for winter heat and increased need for summer air conditioning. Snowpack is decreasing, which means less hydro flow in summer, which could mean lower hydro production and higher hydro costs in summer when big cities have increased air conditioning load. Solar can help fill the gap from reduced summer hydro. And, increasing local renewable energy such as solar, wind and tidal helps increase local energy and economic resilience."* (Page 68)
         - *"There is a rotation of load from winter-peaking to summer-peaking that will unfold over the coming decades."* (Page 4)
       - Another analysis showed that 90% of annual loads might only require 14kW PV, plus 22kWh battery storage from an example with Massachusetts, which somewhat comparable to Washington in terms of climate, (Clean Energy Group, 8/19/21) – this scenario is both technologically feasible and being explored by customers today.
   - Is the issue a *fairness* issue? OPALCO abides by the seven cooperative principles, including *"members contribute equitably to, and democratically control, the capital of their cooperative."*
     - OPALCO has noted that solar generators have access to the grid, while benefiting from their investment in rooftop solar to sell back to the grid. The argument is that this may not be a "fair" transaction.
       - These members have invested, on average $30,000, to produce on-island energy from a completely renewable source.

        - These members are also not requiring as much BPA-sourced energy in much of the year that are clearly impacting endangered salmon runs as well as keystone predators like Southern Resident Killer Whales.
        - These member generators are the foundation for incorporating future storage projects that OPALCO could tap as dispatchable assets.
        - These solar generators have been instrumental in **helping OPALCO demonstrate its commitment to locally-sourced, renewable energy generation, without the capital investment being incurred by OPALCO.**
    - It is important to recognize that OPALCO has an established precedent for allocating resources based upon values and future-planning:
        - Social values (*"We are a socially-responsible, member-owned organization"*) – PAL & Energy Assistance Program
        - Changing technology (*"We continually evolve our services, and offer programs to meet the needs of our membership"*) – purchase of Rock Island Communications
        - Environmental values/energy sourcing (*"commitment to the utilization of renewable resources and carbon reduction"*) – net metering & community solar
- Is the issue a *revenue* issue?
    - In 2020, OPALCO's revenue and kWh purchase was higher than the previous 3 years. Based on OPALCO data, solar generation is not even keeping pace with increased energy demand for all members.
    - OPALCO's proposed solar rate tariff scenarios example with 2020 solar generators projects a net positive revenue increase of $25,153 with the new solar tariff, annually. This increase is calculated based upon 315 existing residential member generators (as an example), but it is important to recognize that it will take years to add that many more new residential member generators impacted by a rate change. Alternatively, other revenue generation/cost savings approaches can be taken instead:
        - This level of annual savings could be achieved in a month, by **encouraging or requiring OPALCO members to switch from paying via credit card to bank account**, similar to the efforts that other cooperatives are taking to reduce unnecessary costs for members. Put another way, members paying via credit card and requiring OPALCO to incur credit card processing fees are burdening the entire membership for this convenience, when no-cost alternatives are easily available.
        - **Tier 2 or 3 energy rate tiers could be raised marginally.** In the long-term, this may encourage OPALCO membership to pursue energy efficiency and/or on-site generation and storage that ultimately reduce demand charges from BPA and provide savings to all members.

4. **Fourth, the potential for unintended consequences is great.**
    - The proposed change significantly extends the potential payback of solar (or solar + battery) installations by 11% to 31%, depending on the scenario. A recent study reported that case

studies in places where net metering rollbacks occurred, the rate of solar adoption was reduced or plummeted (Dutzik et al., 2021). We expect this change to result in:

- Fewer installations to meet renewable, local generation goals set by OPALCO; in fact, this change has the potential to reverse previous goals set by OPALCO.
  - As an example, a key conclusion of OPALCO's IRP was "*Near term focus is on building equity, winning grants, and incentivizing member efficiency, **renewable energy and battery storage programs**.*" (Page 4)
- Solar and storage installations driven by motivation for energy arbitrage/OPALCO avoidance.
  - This opposes projected increased energy use revenue from the proposed rate change, while increasing the cost of a renewable energy system.
  - Members with this motivation may never work with OPALCO for dispatchable resource sharing in the future.
- More off-grid installations that reduce facility charge revenue.
- An exacerbation of social inequity with respect to renewable energy by making locally-generated, renewable energy (and storage) less accessible to many islanders. This is a huge issue, given the affordable housing challenges that San Juan County already faces.
- Direct impacts to clean technology jobs (and supporting businesses, such as freight) in the islands, which has been touted by OPALCO as beneficial for the community to "lift income for working people above the low wage tourist economy" (OPALCO IRP, page 24). Rainshadow Solar employs ten full-time employees who live and work in the county.

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5. **Fifth, the proposed change leaves many questions that have yet to be answered.**
   - How are legacy systems designated? By meter, by building, by member? Can legacy status be passed on if a death occurs or property sale happens? Can legacy systems be updated?
   - How do solar installers estimate the future economics of an install? Will the difference between the buy and sell rates always be the same, or change year-to-year, or month-to-month depending on energy markets?
   - How will financing institutions interested in funding projects account for future changes in transactions?

- How was the "environmental value" of $0.01 determined? This value seems much too low, and we suggest that a literature review should be conducted, as there have been many studies in the past decade evaluating the economic value of environmental benefits and ecosystem services.
- What are the administration and member education costs associated with changing the current tariff to a buy-sell arrangement? Will the net result be revenue positive?
- Have all members been asked about this significant change?
    - How many unique members were able to attend the Solar Town Halls?
    - In 2020, a member survey was given in which 449 members responded. One of the key findings included "*Members are most likely to feel that OPALCO is actively addressing energy conservation/efficiency and renewable energy, although mean ratings for both fall below 4.0*[1]*. How actively the co-op is addressing the transition away from fossil fuels and electrification of transportation is lower, with mean ratings of 3.76 and 3.50, respectively.*"
    - Also in 2020, a Switch-It-Up survey was given to 33 members. One of the results of that survey was that more than 50% of the respondents were interested in on-bill financing for rooftop solar, the highest score for any option (as a point of comparison, community solar interest was less than 40%).
- What happens when a member pursues significant energy conservation measures that dramatically change consumption (and potentially shift production/consumption percentages)?

**OPALCO should instead focus on key opportunities and greater connectivity to its membership through dispatchable resource agreements, smart grid technologies, and long-term investments that benefit all, including future generations.**

We are happy to continue discussing solutions with you and would be willing to participate on a task force to develop a better approach for any future changes immediately. In the Spring of 2021, OPALCO indicated that there would be a task force to look at solar rates (and that we would be a part of this effort). We had hoped to be a part of an active task force, but this task force never materialized.

Thank you for your time,

Justin Wolfe

Chris Wolfe

[1] Ratings were reported on a 5-point scale.

# Member Service Policy 13 – Interconnection of DER Facilities (Markup Version)

## ORCAS POWER AND LIGHT COOPERATIVE

## MEMBER SERVICE POLICY 13

### Interconnection of Member-owned Distributed Energy Resource Facilities

This policy covers interconnection of any member owned generating facilities, storage facilities, or other facilities supplying energy to the distribution system of the Orcas Power and Light Cooperative (OPALCO) system, herein referred to as distributed energy resource (DER). This interconnection policy for DER facilities specifies the minimum requirements and conditions for non-utility-owned electric resources that will be interconnected for the purpose of parallel operation with the OPALCO electrical system. DER facilities will be permitted to interconnect to OPALCO's distribution system only after OPALCO determines that the operation of the member's DER facility will be safe and effective and will not interfere with normal operation of OPALCO's electrical systems.

**13.1 AVAILABILITY**

Available to qualifying facilities ~~within San Juan County~~ subject to the limitations below:

13.1.1 Service~~Energy~~ must be ~~generated~~ supplying energy to the cooperative's distribution system with solar, wind, battery storage or other distributed energy ~~small-scale renewable~~ resources.

13.1.2 Qualifying facilities must adhere to any of OPALCO's power purchasing contract provisions for interconnection of generation or other qualifying facilities. ~~Maximum of 25 kW per unit.~~

**13.2 CHARACTER OF SERVICE**

Service where the member has elected to ~~operate its alternate electric generating~~ interconnect DER facilities~~y~~ with OPALCO's distribution facilities. The ~~alternate electric generating~~ DER facilities~~y~~ may be used to offset the member's own electrical requirements or to supply ~~generate~~ power to sell to OPALCO. Single phase 120/240 or three phase 277/480 or 120/208 service, at 60 Hz are available. Any service upgrades necessary must comply with MS Policy 5 – *Line Extension*.

**13.3 PAYMENT FOR SUPPLIED ~~NET~~ ENERGY**

~~The member may choose, subject to the limitations of General Provisions, Section 13.4.2.3, either Net Metering or Buy/Sell:~~

~~13.3.1 Net Metering~~

~~13.3.1.1 In the event the energy generated by the facility exceeds the energy consumed on the member's premise, the excess may be distributed to OPALCO's grid through OPALCO's meter causing the member's meter to run backward.~~

~~13.3.1.2 The member shall pay for energy consumed under the appropriate rate tariff, including OPALCO's base charge, based on actual meter readings.~~

~~13.3.1.3 In no case will a credit be issued for negative usage. Instead, a bill for zero usage will be issued and negative kWh will be "banked" for usage by the member in a subsequent month except that any banked kWh on the anniversary of the beginning date of service under the tariff shall be donated to OPALCO.~~

~~13.3.2 Buy/Sell~~

~~13.3.2.1 OPALCO will install, and equally share cost with member, meters to register the energy flow into and out of the member's facility. The member shall purchase energy flowing into their facility under the appropriate rate tariff. The member may elect to sell the entire output of their system or the portion that is excess to their needs to OPALCO.~~

~~13.3.2.2 OPALCO will purchase all energy flowing out of member's facility at 0.5 cents per kWh above the rate paid by the member (for example, 6.52 cents per kWh for residential).~~

~~13.3.2.3 OPALCO reserves the right to limit purchases, under the buy/sell option, that exceed OPALCO's ability to resell the power to its members.~~

13.3.1 Members interconnecting DER facilities with an inverter nameplate rating of less than 25 kW shall be under the appropriate tariff.

13.3.2 Members interconnecting DER facilities with an inverter nameplate rating of 25 kW or greater shall execute a Power Purchase Agreement with the cooperative prior to operation of the system.

**13.4 GENERAL PROVISIONS**

13.4.1 Design Requirements

13.4.1.1 All equipment used to interconnect to the cooperative's system shall be UL listed for the intended use.

13.4.1.2 All interconnected ~~photovoltaic~~ systems shall comply with current state, national codes, and OPALCO's interconnection guidelines ~~requirements of Section 690 of the National Electrical Code (Solar Photovoltaic Systems) and IEEE P929, Recommended Practice for Utility Interconnection of Photovoltaic (PV) Systems~~.

13.4.1.3 DER facilities shall have the ability to be monitored by the cooperative via communications protocols defined in the cooperative's interconnection guidelines ~~Non-photovoltaic systems should adhere to the requirements of 13.4.1.2 as if written for the non-photovoltaic system. OPALCO may place other requirements on non-photovoltaic systems~~.

13.4.2 Interruption or Reduction of Deliveries

13.4.2.1 OPALCO shall not be obligated to accept deliveries of excess energy and may require member to interrupt or reduce such deliveries:

13.4.2.1.1 When necessary, to construct, install, maintain, repair, replace, remove, investigate, or inspect any of its equipment or part of its system; or

13.4.2.1.2 If it is determined that curtailment, interruption, or reduction is necessary because of emergencies, forced outages, or compliance with prudent electrical practices.

13.4.2.2 Whenever possible, OPALCO shall give the member reasonable notice of the possibility that interruption or reduction of deliveries may be required.

13.4.2.3 Notwithstanding any other provision of this policy, if, at any time OPALCO determines that either (1) the facility may endanger any of OPALCO's personnel or (2) the continued operation of member's facility may endanger the integrity of OPALCO's electric system, OPALCO shall have the right to disconnect member's generation facility from the OPALCO's electric system. The member's facility shall remain disconnected until such time as OPALCO is satisfied that the condition which necessitated the disconnection has been corrected.

13.4.3 Interconnection

13.4.3.1 ~~Member shall deliver the excess energy to OPALCO at OPALCO's meter.~~ OPALCO reserves the right require interconnection studies, additional or upgraded facilities, and the interconnection method. Technical provisions for interconnection shall be provide via the cooperative's interconnection guidelines.

13.4.3.2 Member shall pay for designing, installing, operating, ~~and~~ maintaining and any other associated costs of the DER ~~alternate-electric generating~~ facility and system upgrades, per Member Service Policy 5 – *Line Extensions,* and shall be in accordance with all applicable laws, ~~and~~ regulations, and cooperative guidelines and policies~~OPALCO's *Agreement for Interconnection of Member Owned Alternate Electric Generating Facilities 25 kW or Less and Technical Specifications for Installation of Member Owned Alternate-Electric Generating Facilities 25 kW or Less*, which may be amended from time to time~~.

~~13.4.3.3 With the exception of cost sharing of meters used for the buy/sell option, the member shall pay standard connection fees in accordance with this tariff.~~

~~13.4.3.4 If member elects to utilize the buy/sell option, they shall deliver this energy to a second meter located near the meter which registers power flowing into the facility.~~ Member shall not commence parallel operation of the ~~generating~~ DER facility until written approval of the interconnection facilities has been given by OPALCO. ~~Such approval shall not be unreasonably withheld. OPALCO shall have the right to have representatives present at the initial testing of member's protective apparatus.~~

13.4.4 Maintenance and Permits

13.4.4.1 Member shall maintain the ~~alternate electric generating~~DER facility and interconnection facilities in a safe and prudent manner and in conformance with all applicable laws and regulations ~~including, but not limited to, OPALCO's *Technical Specifications for Installation of Member Owned Alternate Electric Generating Facilities 25 kW or Less*~~.

13.4.4.2 Member shall obtain any governmental authorizations and permits required for the construction and operation of the ~~alternate electric generating~~DER facility and interconnection facilities. Member shall reimburse OPALCO for all losses, damages, claims, penalties, or liability it incurs because of member's failure to obtain or maintain any governmental authorizations and permits required for construction and operation of member's ~~generating~~DER facility or failure to properly maintain member's facility.

13.4.4.3 Member shall obtain appropriate insurance coverage before operation and provide evidence to OPALCO of such insurance, including liability coverage.

13.4.5 ~~OPALCO may enter member's premises or property:~~

~~13.4.5.1 to inspect with prior notice at all reasonable hours, member's protective devices.~~

~~13.4.5.2 to disconnect at OPALCO's meter or transformer, without notice, the interconnection facilities (or the entire service if the interconnect facility cannot be disconnected at or near the meter), if, in OPALCO's opinion, a hazardous condition exists and such immediate action is necessary to protect persons, OPALCO's facilities, or property of others from damage or interference caused by member's alternate-energy facilities, lack of properly operating protective devices or inability to inspect the same.~~

~~13.4.6~~ Indemnity and Liability

Member shall save harmless, release, and indemnify OPALCO, its officers, directors, employees, other members, and its agents, from any loss, claim or expenses, including but not limited to damages, fines, and other payments arising out of member's actions or inaction in the development and operation, or failures thereof, of its DER facilities and implementing this policy. ~~The cooperative shall hold harmless and indemnify member for any loss, claim or expense arising out of the actions or inaction of the cooperative or its agents in implementing this policy. This section shall not relieve any insurer of its obligation to pay claims in accordance with the provisions of any valid insurance policy.~~

~~13.4.7 Amendment to Tariff – Effective December 17, 2003~~

~~The following member-owned generating facilities installed prior to December 17, 2003 will be grandfathered under the provisions of this tariff:~~

~~Mary Irene Ekberg[1] Location #2254131-001~~
~~Kaj Enderlein Location #2048308-002~~
~~ME & Gail Williamson Location #3173301-120~~

- Richard Greaves & Becky Brennan Location #2126423-001
  Location #2127307-002
- Andrew Evers[2] Location #3183435-001
- Marilyn Anderson & Rachel Adams[3] Location #2227131-001
- Andy Harris[4] Location #2246399-001
- John & Cathy Roselli Location #2291205-001
- Dorothy Wachter Location #2201404-002
- Ronald & Elizabeth Keeshan Location #1594199-066

If any of the above member-owned generating facilities is inactive for a period of ninety (90) days or more, the facility will be served under Member Service Policy 14.

[1]Inactive 2009
[2]Inactive 2004
[3]Inactive 2003
[4]Inactive 2009

**ORCAS POWER & LIGHT COOPERATIVE**
**MEMBER SERVICE POLICY 14**
**INTERCONNECTION OF MEMBER GENERATORS AND STORAGE**

This policy covers interconnection of any member owned generating facility, herein referred to as distributed energy resource (DER), to the OPALCO distribution grid. Any DER energized prior to December 17, 2003 will continue to be covered under Member Services Policy 13. The member may select from the following options:

(1) Net Metering allows the member to consume energy generated by their system which will offset the amount of energy purchased from OPALCO; OR

(2) Buy/Sell allows the member the option to consume a portion of the energy produced.

**14.1 AVAILABILITY**

14.1.1 Energy must be generated from small scale renewable resources such as, but not limited to, solar, wind, and to micro-hydro;

14.1.2 All power is considered non-firm, (this means power that is not available 24 hours per day, seven days per week);

14.1.3 Facilities with nameplate capability no greater than 200 kilowatts (kW). Facilities over 200 kW must go through BPA's generation interconnection process;

14.1.4 Requests for interconnection will be processed on a first-come, first-served basis. Engineering will review applications and determine maximum generation capacities as it pertains to maintaining system reliability and safety;

14.1.5 OPALCO shall reserve the right to apply a fixed fee for administrative costs. The member shall be given reasonable notice before fixed fees are applied.

**14.2 SERVICE CHARACTERISTICS**

Single phase 120/240 or three phase 277/480 or 120/208 service, at 60 Hz are available. Any service upgrades necessary must comply with MS Policy 5 – Line Extension.

**14.3 GENERAL PROVISIONS**

14.3.1 Design Requirements

The DER shall be built and operated to comply with Interconnection Standards for Member Generators with nameplate capability no greater than 200 kW.

14.3.2 Interruption or Reduction of Deliveries

14.3.2.1 OPALCO shall not be obligated to accept delivery of DER's energy and may require member DER to interrupt or reduce such delivery:

14.3.2.1.1 In order to construct, or maintain any of OPALCO's equipment or system;

14.3.2.1.2 If curtailment is necessary because of emergencies, forced outages, or compliance with prudent electrical practices.

14.3.3 The members proposed facility must be pre-approved by the OPALCO Engineering Department prior to construction.

14.3.3.1 Member shall provide a detailed interconnection diagram showing disconnecting device(s) as well as any associated protection as required by applicable standards/practice and codes.

14.3.3.2 The member may be required to install additional protective equipment for the DER installation. OPALCO shall have the right to have representatives present at the initial testing of member's protective apparatus.

14.3.3.3 The DER shall not commence parallel operation of the facility until OPALCO has authorized the start up.

14.3.3.4 Smart inverter ride through is required for all new inverters after the September 8th, 2017 and shall be certified to Underwriters Laboratories UL 1741 SA (Supplement A)

~~14.3.3.5 OPALCO may require the member to operate the DER for various power factor (PF) ranges within its specification and either enable or disable the dynamic Volt/VAR ability.~~

~~14.3.3.6 OPALCO may determine that additional anti-islanding protection is required and will be installed at the expense of the member.~~

~~14.3.4 The member shall complete, sign and submit an Interconnection Application and an Agreement for Interconnection of Member Generators prior to beginning construction.~~

~~14.3.5 Member shall pay for designing, installing, operating and maintaining the DER in accordance with OPALCO standards and agreements that apply at the time of installation. OPALCO's standards and agreements are detailed in OPALCO's Agreement for Interconnection of Member Generators and Interconnection Standards for Installation of Member Generators, which may be amended from time to time.~~

~~14.3.6 OPALCO reserves the right to designate the metering type, location, and method of interconnection. The member shall be required to pay a contribution in aid of construction for all equipment and upgrades necessary to OPALCO's distribution system in order to accommodate the facility.~~

~~14.3.7 Member shall obtain any governmental authorizations and permits required for the construction and operation of the DER. Member shall reimburse OPALCO for any and all losses, damages, claims, penalties or liability it incurs as a result of member's failure to obtain or maintain any governmental authorizations and permits required for construction and operation of DER or failure to properly maintain member's facility.~~

~~14.3.8 The DER shall comply with all requirements standards of all local, state, and federal rules and regulations or codes which may be applicable.~~

~~14.3.9 Notwithstanding any other provision of this policy, if at any time OPALCO determines that either (1) the facility may endanger OPALCO personnel or (2) the continued operation of member's facility may endanger the integrity of OPALCO's electrical system, OPALCO shall have the right to enact MS Policy 3.5 – Immediate Disconnection.~~

~~14.3.11 The owner of the DER shall install, at no cost to OPALCO, a disconnect device that is manually operated, accessible, visible, and lockable. OPALCO reserves the right to lock this device in the "open" position. This protective switching equipment may be operated without notice or liability by OPALCO or an OPALCO representative if, in the opinion of OPALCO or its representatives, continued operation of the DER in connection with OPALCO's system may create or contribute to a system emergency or safety hazard. OPALCO shall endeavor to minimize any adverse effects of such operation on the DER.~~

~~14.3.11.1 Single-phase customers with inverter based generation less than 15 kW are not required by OPALCO to have a lockable AC Disconnect Switch so long as the installation meets all applicable local/national codes and standards. However, if the customer does not install a lockable AC Disconnect Switch, the~~

revenue meter may be removed to isolate the customers generator from the electric distribution system. The removal of the revenue meter will result in the loss of electrical services.

14.3.12 The member must provide OPALCO a written notice of sale or transfer of the DER or the premises upon which the facility is located within thirty (30) calendar days. To continue interconnection service to the new member, a new interconnection agreement, signed by the new member, is required within thirty (30) calendar days. The net metering rate will cease to the departing member, but will transfer to new member upon receipt of signed documents.

14.3.13 Members must notify OPALCO if any significant changes (beyond general maintenance) are made to the interconnected system. This may include, but is not limited to, altering the AC inverter capacity, changing inverter types, increasing DC capacity before the inverters, or otherwise altering the system's one-line diagram initially submitted to OPALCO.

14.3.14 OPALCO may enter member's premises or property:

14.3.14.1 To inspect the member's protective devices during reasonable hours with prior notice;

14.3.14.2 To disconnect at OPALCO's meter or transformer, without notice, the DER (or the entire service if the DER cannot be disconnected at or near the meter) if, in OPALCO's opinion, a hazardous condition exists.

**14.4 NET METERING**

14.4.1 Net Metering is the connection method in which the DER may consume the energy generated by their system in order to offset the amount of energy purchased from OPALCO. In the event the energy generated exceeds the energy consumed by the DER, the excess may be distributed to OPALCO's grid.

14.4.2 In no case will a credit be issued for excess energy generated. A bill for zero usage will be issued and excess kWhs will be "banked" for usage by the member in a subsequent month. Payment for any banked kWhs remaining on April 30th of each year shall be made based on OPALCO's yearly average of wholesale power purchased from PNGC. The yearly average shall be determined each year on March 31st using OPALCO's year-end Rural Utilities Service (RUS) Form 7, Part K, Section (e) Average Cost. In addition, a green power premium shall be paid at one cent ($.01) per kWh.

14.4.3 The Net Metering billing adjustment applies to charges for energy consumed only. A member participating in the Net Metering Program is subject to the OPALCO tariff under which the member receives service. Banked kWhs shall be applied only to energy usage and not the service access charge. In all cases, the service access charge will apply.

14.4.4 OPALCO shall provide meter aggregation for members who are participating under the Net Metering section of this policy. If a member's interconnection under Net Metering is

known to produce more energy than the member's premises can consume on a yearly basis, then OPALCO shall allow the member to apply the excess energy to any other of the member's account(s) that are under exactly the same name as the member's interconnected facility. Members may only aggregate up to 5 meters. The member shall provide OPALCO with the account information for which they wish meter aggregation at the time application is made. Members can change the accounts which are being aggregated one time each year, on or before April 30th. Requests must be in writing and the change shall take effect in the next billing period.

**14.5 BUY/SELL**

14.5.1 Energy delivered into the OPALCO system will be reimbursed on a monthly basis by OPALCO. The established rate at which OPALCO will purchase all energy flowing out of the DER and delivered to OPALCO's distribution grid for non-firm power shall be based on OPALCO's yearly average of wholesale power purchased from BPA PNGC. The yearly average shall be determined each year on March 31st using OPALCO's year-end Rural Utilities Service (RUS) Form 7, Part K, Section (e) Average Cost. In addition, a green power premium shall be paid at one cent ($.01) per kWh.

14.5.2 The Buy/Sell option applies to charges for energy consumed only. In all cases the basic charge will apply. OPALCO reserves the right to limit purchases that exceed OPALCO's ability to resell the power to its members.

**14.6 MEMBER OWNED RENEWABLE ENERGY (MORE) FUND/PRODUCTION INCENTIVES**

All MORE incentives will be funded through voluntary contributions; OPALCO offers no guaranteed incentive payments. New DERs will be admitted into the MORE Incentive Program on a first come, first served basis after July 1, 2010. MORE installations will follow the Net Metering Section 14.4 of this policy.

14.6.1 Production meter: Member will install, at their expense, a meter base which will accommodate an OPALCO meter. The production meter is a separate meter from the OPALCO billing meter and is required to record all energy produced from the DER.

14.6.2 Incentives will be administered through an independent committee of OPALCO members following approved MORE committee guidelines. See MORE guidelines for more details.

**14.7 INDEMNITY AND LIABILITY**

Member shall hold harmless and indemnify OPALCO, its other members, employees, and its agents, from any damage, loss, claim or expense arising out of member's actions or inaction in connection with this policy. OPALCO shall hold harmless and indemnify member for any loss, claim or expense arising out of the actions or inaction of OPALCO, its employees, or its agents in implementing this policy. This section shall not relieve any insurer of its obligation to pay claims in accordance with the provisions of any valid insurance policy.

~~ORCAS POWER AND LIGHT COOPERATIVE~~
~~MEMBER SERVICE POLICY 15~~
~~INTERCONNECTION OF DISTRIBUTED RESOURCES~~

## ~~15.1 INTRODUCTION~~

### ~~15.1.1 Scope~~

~~This interconnection standard for distributed generation specifies the minimum requirements and conditions for medium and large (10,000 kVA maximum) non-utility-owned electric generation that will be interconnected for the purpose of parallel operation with the Orcas Power and Light Cooperative (OPALCO) electrical system. Distributed generation will be permitted to interconnect to OPALCO's transmission or distribution system only after OPALCO determines that the operation of the member's facility will be safe and effective and will not interfere with normal operation of these systems. Small (0-200 kW) distributed generation is covered by Member Service Policy 14 Interconnection of Member Generators.~~

### ~~15.1.2 Application~~

~~This standard shall be used when planning the installation of medium and large distributed generation greater than 200 kW. OPALCO has different interconnection requirements for the following range of nameplate capacities of generators that a member can select for a distributed generation facility:~~

- ~~200- 500 kVA Type 1 Interconnections~~
- ~~500- 1000 kVA Type 2 Interconnections~~
- ~~1000- 2000 kVA Type 3 Interconnections~~
- ~~2000- 10000 kVA Type 4 Interconnections~~

~~The member may elect to a) operate the generation facility as a completely separate system from OPALCO, b) operate the generation facility only with momentary parallel operation with the OPALCO system or c) operate the generation facility in parallel operation with the OPALCO system. The requirements in this standard generally apply to a member's generation facility that operates in parallel with the OPALCO system. Furthermore, the member may elect to operate the generation facility in parallel with the OPALCO system to a) self generate power with no power export, b) generate power entirely for sale back to OPALCO or c) generate power to be concurrently consumed by site loads with the surplus for sale back to OPALCO. For simplicity, the term member refers to any distributed generator, cogenerator or small power producer, even though they may not be an OPALCO member or purchase power from OPALCO. The member shall complete, sign and submit an Interconnection Application and an Agreement for Interconnection prior to beginning construction.~~

### ~~15.1.3 Member Responsibility~~

~~The minimum required protective relaying and/or safety devices and requirements specified in this standard, are for protecting only OPALCO facilities and the equipment of other members from damage or disruptions caused by a fault, over current condition, malfunction or improper operation of a distributed generation facility. These requirements are also necessary to ensure the safety of utility workers and the public. Minimum protective relaying and interconnection requirements do not include additional relaying, protective or safety devices as may be required by industry and/or government codes and standards, equipment manufacturer requirements and prudent engineering design and practice to fully protect a member's generation facility; compliance with these additional requirements are the sole responsibility of the member.~~

~~This standard contains general information about the interconnection requirements for member-owned distributed generation. In addition to all applicable regulatory, technical, safety, and electrical standards and codes, members also will be subject to contractual and other legal requirements, which are only summarized in this standard. These regulations, requirements, contracts and other materials contain complete information concerning the interconnection and govern over the general provisions in this standard.~~

~~15.1.4 Definitions~~

~~"Avoided Cost" is defined as cost avoided by OPALCO due to the purchase of the member's energy.~~

~~"Interconnection" means the point of electrical connection between the member's generation facility and the OPALCO electrical system.~~

~~"Separate Operation" refers to the operation of a member's generation facility that does not have the capability of transferring electrical energy to OPALCO.~~

~~"Momentary Paralleling" refers to a member's generation facility that will only operate in parallel with OPALCO for 100 milliseconds or less,~~

~~"Parallel Operation" refers to a member's generation facility that is interconnected with OPALCO power system so that electrical power may flow in either direction across the common connection.~~

~~"Open Transition" refers to break-before-make type transfer switches for the transfer of power to a load from different sources without momentary or permanently connecting the two sources.~~

~~"Closed Transition" refers to make-before-break type momentary transfer switches with a maximum of 100 milliseconds parallel time. Any parallel time greater than 100 milliseconds will not be considered momentary or "closed transition".~~

~~"Islanding" refers to the situation where a portion of OPALCO's load becomes isolated from OPALCO's generation sources but remains electrically connected to the member's generation source.~~

~~"Back-feed" refers to the transfer of power from an emergency energy source to any portion of the normal power system.~~

~~"Reclosing" refers to the operation of a system protective device that has the ability to sense and interrupt overcurrents by de-energizing the circuit and to subsequently automatically re-energize the circuit.~~

~~"Grid Interactive" refers to an electric power production device that is intended to be operated in parallel with an electric power system to supply power to common loads.~~

~~"Stand-alone" refers to an electrical power production device that has the capability to operate independently of an electric power system.~~

~~"SCADA" refers to the supervisory control and data acquisition system operated by OPALCO.~~

~~"Distributed Resources" refers to electrical power generation having a capacity of not more than 10 MVA that are connected to OPALCO's distribution system (12.5 kV) or sub transmission system (24.9 kV or 69 kV).~~

~~"Responsible Party" refers to the owner, operator or any other person or entity that is accountable to OPALCO for the distributed resource.~~

~~15.1.5 Acceptable Generation Sources~~

~~The member may select any energy efficient generation source such as hydro, solar and wind energy. The end conversion to OPALCO's system must be three phase 60 Hertz (Hz) alternating current (AC) at a voltage and capacity compatible with OPALCO's system at the interconnection point as discussed in Section 4. Member generation facilities shall be designed and operated in accordance with this standard and the recognized industry standards listed in section 3.1. Adequate protective devices shall be provided to protect OPALCO's system and its members from abnormal voltages and frequencies or other disturbances. Medium and large generation facilities shall produce their own reactive power requirements to ensure operation at a machine specified power factor. Reactive power requirements for 200-500 kVA three-phase induction generators will be reviewed on a case by case basis.~~

~~The member may elect to run generation equipment in parallel with the OPALCO system or as a separate system with either the capability of momentary paralleled or nonparallel load transfer between the two independent systems if the following requirements are met.~~

~~15.1.6 Separate Systems~~

~~For a member's facility operating in a separate operation mode to be practical, the member may want the capability to transfer load between the two systems by making the transfer in an open transition mode. This can be accomplished by either an electrically or mechanically interlocked switching arrangement which precludes operation of both switches in the closed position simultaneously. If the member has a separate system, the~~

~~member shall permit OPALCO to verify by any reasonable method that the transfer scheme meets the nonparallel requirements. This verification shall be accomplished but is limited to review of drawings and equipment specifications and by field inspection of the transfer scheme. OPALCO will not be responsible for approving the member's generation equipment system design or operation. Most Uninterruptible Power Supply (UPS) systems do not specifically meet the separate operation criteria. However, if they are not capable of back feed, they shall be classified as a separate operation system. If they can back feed, they must meet the requirements of either momentary paralleling or parallel operation.~~

~~15.1.7 Momentary Paralleling~~

~~Momentary paralleling shall require the use of a closed transition (make-before-break) integrated automatic transfer switch with synchronizing capabilities. The automatic transfer switch shall be incapable of paralleling the member with the OPALCO system longer than 100 milliseconds and shall be tested, verified, and documented by the member for proper operation at least every 2 years. Other protective equipment needed for momentary paralleling shall include equipment capable of sensing a failed closed transition transfer switch operation and subsequent tripping the inter-tie breaker. If the paralleling time is greater than 100 milliseconds then the equipment must open the inter-tie breaker. Momentary paralleling shall be limited to 500 kVA to reduce possible voltage flicker for other members receiving their power from the same distribution feeder as the member. Momentary paralleling of greater than 500 kVA may be permitted following a system study to determine if such an installation will cause adverse effects to other members or members. The cost of the system study shall be borne by the member.~~

~~15.1.8 Parallel Operation~~

~~The member's generation in parallel operation is electrically connected to the OPALCO power system and must be considered in the electrical protection of OPALCO facilities. OPALCO's ability to provide safety to OPALCO personnel who may need to perform work on a power line is lost when a member facility is operating in an islanded mode. The ability to maintain electrical power within specifications to members is also lost during an islanded operating condition. For these reasons, protection from islanding shall be incorporated into each member's generation facility connected in parallel with OPALCO.~~

~~The protection system design incorporated into member facilities shall be performed by a power system engineer qualified to perform such work and who is licensed as a professional engineer in the state of Washington. The protection system design shall be reviewed by OPALCO. Prior to energizing a member facility, any changes to the protection system design requested by OPALCO shall be made by the member. Smaller inverter type equipment meeting the most recent UL and IEEE standards for interconnecting to utility power systems may have integral protection equipment built into one complete package. All interactive equipment shall be reviewed by OPALCO and any required changes must be implemented by the member.~~

## ~~15.2 GENERAL REQUIREMENTS~~

~~15.2.1 Initial Application~~

~~The member shall complete the attached OPALCO "Application for Parallel Operation with Utility Service" form after the generator nameplate capacity, parallel mode of operation and power export category have been decided. The completed application form shall be submitted to OPALCO along with the following application fees:~~

| ~~DG SIZE~~ | ~~APPLICATION FEE~~ |
|---|---|
| ~~200-500 kVA~~ | ~~$500~~ |
| ~~500-1000 kVA~~ | ~~$500~~ |
| ~~1000-2000 kVA~~ | ~~$1000~~ |
| ~~2000-10,000 kVA~~ | ~~$2500~~ |

~~As part of initial application, the member shall submit preliminary plans for the generation facility including a site plan, and one line diagram.~~

~~15.2.2 OPALCO Preliminary Review~~

~~Within 30 days of receipt of the initial application and preliminary plans, OPALCO will review the information provided and schedule a meeting with the member at the site to discuss the interconnection requirements and the OPALCO modifications that must be charged to the applicant for the interconnection. In addition, OPALCO will provide a detailed list of the final plans, specifications and other information necessary for a complete engineering review of the member's generation facility and the estimated OPALCO engineering fee for the review.~~

~~15.2.3 OPALCO Final Plans and Specifications Review~~

~~OPALCO will review the final plans, specifications and other information requested during the preliminary review and will return an interconnection analysis to the member within 60 days of receipt of the final plans and specifications along with the engineering fee payment. If the engineering review reveals that system studies are necessary to model large generation facilities, OPALCO will notify the member of the additional cost in writing. Any modifications of the plans and specifications by the member will extend the time period for review and may require payment for additional costs.~~

~~The engineering review will be consistent with this standard and the guidelines established by the current IEEE 1547 "Standard for Interconnecting Distributed Resources with Electric Power Systems" and IEEE 1547.1 "Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems". Any review of distributed generation plans and specifications by OPALCO shall not impose any liability on OPALCO and does not guarantee the adequacy of the member's equipment to perform its intended function. OPALCO disclaims any expertise or special knowledge relating to the design or performance of generating installations and does not warrant the efficiency, cost effectiveness, safety, durability or reliability of generating installations.~~

~~15.2.4 Energy Sales and Purchase~~

~~If power import and export to OPALCO is planned, energy flow to OPALCO shall be measured by the net (in/out) metering method. Bi-directional meters shall be installed so that the member consumes all of the energy generated in order to offset the amount of energy purchased from the OPALCO system. Energy flow to the member will be metered separately and billed monthly in accordance with the terms of the purchase agreement and OPALCO's existing rate tariff. OPALCO shall pay the member on a monthly basis for the energy supplied to the OPALCO system. The rate paid by OPALCO shall be the avoided cost of generation as determined in OPALCO's existing rate tariff. Avoided cost shall be defined as cost avoided by OPALCO due to the purchase of the member's energy. The member shall sign a separate approved contract for the sale and purchase of energy including any extra charges for additional billing, meter reading and/or member service costs.~~

~~If generally power export to OPALCO is planned, the buy/sell connection method may be used where the member agrees that no less than 51% of available generation is sold to OPALCO under a wholesale rate tariff. Energy delivered into the OPALCO system will be reimbursed on a monthly basis at an established rate based on OPALCO's yearly average of wholesale power rates. The buy/sell method only applies to energy and OPALCO reserves the right to limit purchases that exceed OPALCO's ability to resell the power to its members.~~

~~OPALCO shall not be required to make any energy purchases that will cause OPALCO to be not in compliance with any applicable contracts or requirements of its wholesale power suppliers.~~

~~15.2.5 Additional Metering Requirements~~

~~OPALCO generally will procure, install, own, inspect, test, and maintain meters to record flows to and from the OPALCO system. OPALCO will require energy recorders on large generation facilities that indicate the integrated demand. Also, OPALCO will require in/out metering of reactive volt-amps on large generation facilities. The specific installation of this additional metering is discussed in sections 6-8. All costs of complex metering equipment to accommodate large generation facilities will be included in the interconnection costs.~~

~~15.2.6 Line Extensions and Modifications to OPALCO Facilities~~

~~The interconnect analysis prepared by OPALCO will include estimates of any line extension, line conversion, facility upgrade or other costs to be incurred in order to provide electric delivery service at the interconnection of the member's generation facility. The member shall pay in advance the full cost of construction of any transmission, substation, distribution, transformation, metering and protection facilities or equipment that OPALCO determines is required to serve the member's generation facility. The charges will be in accordance with OPALCO's standard policies governing line extensions~~

and other improvements. If necessary at the time of initial interconnection or at some future time, OPALCO may modify the electric delivery system in order to better serve the member's generation facility and to continue to purchase power from the facility. Furthermore, OPALCO may modify the electric delivery service at any time if the quality of power provided by the member adversely affects the OPALCO system and its members. The member shall be responsible to reimburse OPALCO for all costs of these additional modifications. If future changes to the primary voltage of the member's generation facility are required by OPALCO, all upgrade costs for metering, transformers or other equipment on the member's side of the interconnection shall be the responsibility of the member.

15.2.7 Construction of Distributed Generation

The member shall sign and execute the approved OPALCO contracts for the interconnection and parallel operation of distributed generation. The required interconnection facilities for the members generation shall be constructed as outlined in this standard including, but not limited to, disconnect switch with visible open, primary fuse or circuit breaker protection, dedicated transformer, generator circuit breaker and protective relaying. The member shall comply with all applicable tariffs, policies and procedures of OPALCO and the Rural Utilities Service. Furthermore, the member shall comply with applicable electrical industry standards listed in section 3.1 and all applicable federal, state and local laws, ordnances rules and regulations. After completion of construction, the member shall comply with the test requirements in section 9 before OPALCO will conduct the final inspection.

15.2.8 Liability Insurance

Prior to the final interconnection, the member shall provide a certificate of insurance showing satisfactory liability insurance including contractual liability insurance covering indemnity agreements that insures the member against all claims for damage and for personal injury or death arising out of, resulting from or in any manner connected with the installation, operation and maintenance of the members generating equipment. The member shall hold harmless and indemnify OPALCO, its members, employees and agents from any damage, loss, claim or expense arising out of the member's actions or inaction in conjunction with this policy. OPALCO shall hold harmless and indemnify the member for any loss, claim or expense arising out of the actions or inaction of OPALCO, its employees, or agents in implementing this policy. The amount of such insurance coverage shall not be less than $500,000 per occurrence plus as additional $100,000 for every 500 kVA.

15.2.9 Final Interconnection

After execution of the required agreements and completion of the generation facility, OPALCO will conduct a final inspection of the facilities and interconnection to the OPALCO system. Upon satisfactory completion of the final inspection, OPALCO will issue a written notice to commence parallel operation. OPALCO's review process and final inspection is

intended as a means to safeguard OPALCO's facilities, members and personnel. Any review by OPALCO shall not impose any liability on OPALCO and does not guarantee the adequacy of the member's equipment to perform its intended functions or meet required industry safety standards. OPALCO may, at its sole discretion, prevent the interconnection or disconnect the interconnection of any distributed generation facilities due to reasons such as safety concerns, reliability issues, power quality issues, breach of interconnection contract or any other reasonable issue. The disconnection may be made without prior notice.

## 15.3 GENERAL DESIGN REQUIREMENTS

### 15.3.1 Required Codes and Standards

The member's generation facility must comply with the following applicable codes and standards:

IEEE Std. 100-2000 "IEEE Standard Dictionary of Electrical and Electronic Terms";

IEEE Std 519-1992 "IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power systems"; IEEE Std. 929-2000 "IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems"; IEEE Std. 1547-2005 "IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems"; IEEE Std. 1547.1-2005 "Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems"; IEEE Std. 1547.2-2008 "Application Guide for IEEE Std. 1547"; IEEE Std. 1547.3-2007 "IEEE Guide for Monitoring, Information Exchange Control"; IEEE Std. C50.13-1977 "Requirements for 60 Hz Cylindrical Rotor Synchronous Generators"; IEEE Std. C57.13-2008 "IEEE Standard Requirements for Instrument Transformers " IEEE Std. C62.92-2002 "Guide for the Application of Neutral Grounding in Power Systems, Part 1-4"; ANSI Std. C84.1-2006 "Electric Power Systems and Equipment-Voltage Ratings (60 Hertz); ANSI/IEEE Std. 446-1995 "Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications"; ANSI/IEEE Std. 142-2007 "IEEE Recommended Practice for Grounding of Industrial Commercial Power Systems-Green Book"; ANSI C2-2007 National Electrical Safety Code; UL Std. 1741 "Inverters, Converters, and Controllers for Use in Independent Power Systems"; NFPA 70-2011 National Electrical Code

### 15.3.2 Voltage Requirements

The member shall operate generating equipment in a manner that maintains steady state voltages on the OPALCO system within ANSI Range A requirements as specified in ANSI Standard C84.1. Furthermore, the member shall provide an automatic method of disconnecting the generating equipment from the OPALCO system if a sustained voltage deviation in excess of +5% or-10% from nominal voltage persists for more than 10 seconds, or a deviation in excess of +10% or –30% from nominal voltage persists for more than 1 second. Larger voltage deviations shall be disconnected immediately within 10 cycles. The generating equipment shall not reconnect until at least five minutes after the voltage and frequency is restored to the normal range and the system is stabilized.

~~OPALCO regulates the system voltage in its substations at the 12.5 kV distribution level. Therefore, large generation facilities that require an interconnection at the 69 kV transmission level shall include voltage regulation equipment to limit voltage excursions to within ANSI Range A tolerances.~~

~~15.3.3 Voltage Flicker Requirements~~

~~The member's generating equipment shall not cause excessive voltage flicker on the OPALCO system. The voltage flicker at the interconnection point shall not exceed 3% voltage dip and shall be within IEEE Standard 519 limitations.~~

~~15.3.4 Frequency Requirements~~

~~The operating frequency of the member's generating equipment should not deviate more than +0.5 Hz or –0.7 Hz from a 60 Hz base. The member's generation facility shall have field adjustable frequency relays that automatically disconnect the generating equipment from the OPALCO system within 15 cycles if the frequency tolerance provided by OPALCO cannot be maintained. The generating equipment shall not reconnect until at least five minutes after the voltage and frequency is restored to the normal range and the system is stabilized.~~

~~15.3.5 Harmonics~~

~~The total harmonic distortion (THD) voltage shall not exceed 5% of the fundamental 60 Hz frequency and the individual harmonic distortion (IHD) voltage shall not exceed 3% of the fundamental 60 Hz frequency in accordance with IEEE Standard 519 limitations.~~

~~15.3.6 Maximum Fault Currents and Clearing Times.~~

~~The combined fault current from the member's generating equipment and the OPALCO system shall not exceed the capabilities of OPALCO's system protection devices. OPALCO will provide the maximum three phase and line to ground fault currents for the system at the member's interconnection and the interrupt ratings of OPALCO system protection devices. If the member's generating equipment causes excessive fault currents on the OPALCO system, the member shall install equipment to limit the fault current or compensate OPALCO for the costs of replacing the inadequate system protection devices. Furthermore, the member's primary protection device shall automatically disconnect the generating equipment within 10 cycles for the maximum fault current or within 1 second if the voltage on one or more phases falls below –30% of the nominal voltage. This disconnect timing allows the generator to be disconnected from the utility system prior to an automatic reclose on the OPALCO system. The generating equipment shall not reconnect until at least five minutes after the voltage and frequency is restored to the normal range and the system is stabilized.~~

~~15.3.7 Power Factor~~

~~All medium and large distributed generation facilities with stand-alone capabilities shall operate near unity power factor and will be required to provide any necessary reactive~~

power for member's loads. Small distributed facilities generation facilities that require reactive power from the OPALCO system shall be operated at a power factor greater than 0.90 or according to a mutual agreement with OPALCO.

15.3.8 Ground Fault Protection

Distributed generation facilities shall have ground fault protection that limits potential over voltages and coordinates with OPALCO ground fault protection. OPALCO distribution feeders are a wye connected four wire multigrounded neutral system that is generally effectively grounded with respect to the substation source. For a single line to ground fault, this arrangement limits the voltage rise on unfaulted phases to about 125 to 135% of the prefault condition according to IEEE Standard C62.92. Therefore, to prevent overvoltages, all medium and large distributed generation facilities on multigrounded neutral systems shall be effectively grounded so that the generating equipment operates as an effectively grounded source on the OPALCO distribution system. If the generator will be resistance grounded, the member shall use appropriate protective relaying to detect primary side ground fault overvoltages and quickly trip the generator off line. This relaying shall instantaneously trip the circuit breaker within 10 cycles to limit overvoltages. OPALCO transmission lines are generally delta connected so the grounding of interconnections at the transmission level will be studied on a case by case basis.

Please note that rocky conditions make effective grounding difficult in many areas. The ground grid for member generation facilities shall be designed in accordance with IEEE Standard 142 and shall be based on the measured soil resistivity at the site.

15.3.9 Negative Sequence Detection

Certain fault conditions on the OPALCO system may cause negative sequence currents to flow in the member's generator. A voltage phase sequence (Type 47) or similar relay should be installed on all medium and large three phase generators to protect from excessive negative sequence currents.

15.3.10 Three Phase Synchronous Generators

The member is solely responsible for properly paralleling and protecting three phase synchronous generators used for distributed generation. Synchronization of the generator shall not cause a voltage fluctuation at the interconnection greater than +5% or –5% of the prevailing voltage level or cause excessive reactive power flow in either direction. Sufficient generator reactive power capability shall be provided to withstand normal voltage changes on the OPALCO system. The generator's excitation system shall conform to the field voltage versus time criteria specified in ANSI/IEEE Standard C50.13 in order to permit adequate field forcing during transient conditions. Synchronism check relays may be used to manually synchronize generators less than 500 kVA. For synchronous generators greater than 500 kVA, the member shall maintain an automatic voltage regulator (AVR) in operation at all times for each unit. OPALCO shall be notified

~~if the AVR is removed from service for maintenance or repair. The specifications of large synchronous generators should be jointly determined by the member and OPALCO to ensure intersystem coordination and operating capability.~~

~~15.3.11 Three Phase Induction Generators and Inverters~~

~~The member is solely responsible for properly paralleling and protecting three phase induction generators and inverters used for distributed generation. Induction generators may be connected and brought up to synchronous speed as an induction motor if it can be demonstrated that the voltage fluctuation at the interconnection is within +5% or –5% of the prevailing voltage and within the flicker limits in section 3.3. Otherwise, the member will be required to install step switched capacitors or other techniques to bring voltage fluctuations to acceptable levels. Line commutated inverters do not require synchronizing equipment. Self commuted inverters shall be used in parallel with the OPALCO system only with synchronizing equipment.~~

~~The member shall provide a reactive power supply for induction generators and inverters. The installation of capacitors may be required to limit the adverse effects of reactive power flow on OPALCO's distribution system. However, the installation of capacitors for a reactive power supply at or near an induction generator greatly increases the risk that the induction generator will become self-excited if accidentally isolated from the OPALCO system. In order to reduce the possibility of self-excited operation, the reactive power for 200-500 kVA induction generators will be studied by OPALCO on an individual basis. If necessary, the reactive power may be supplied by OPALCO and the cost of capacitors and kVARh metering along with monthly reactive power charges will be billed to the member.~~

## ~~15.4 DESCRIPTION OF INTERCONNECTIONS PERMITTED BY OPALCO~~

~~15.4.1 Basic Interconnection Requirements~~

~~OPALCO has established basic minimum interconnection requirements for medium and large member owned parallel generation facilities that will be connected to its system. These requirements vary according to the generator type, installed capacity, primary protection, interconnection type, voltage and location on the OPALCO system. Small member owned parallel generation facilities 200 kW or less are covered by OPALCO's "Interconnection Standards for Member Generators with Nameplate Capability No Greater than 200 kW".~~

~~15.4.2 Generator Limitations~~

~~OPALCO will permit the interconnection of distributed resources having an installed capacity of not more than 10 MVA if the proposed generation facilities are within the capabilities of its transmission and distribution systems. However, certain limitations apply depending on the generator type and size as shown in Table 4.1.~~

~~Synchronous generators produce the reactive power necessary for the machine electro-magnetic fields whereas the reactive power for induction generators must be supplied by external capacitors or the utility. Since OPALCO's rural distribution system has limited capacity to transfer reactive power, induction generators will be limited to 500 kVA or less. Furthermore, single phase machines will unbalance OPALCO's three phase system so all medium and large generators must be three phase machines.~~

~~15.4.3 Installed Capacity and Primary Protection~~

~~Electrical industry standards for operating, metering and protection of generators are generally dependent on the generator nameplate capacity. Small generators can be connected at lower voltages with simpler equipment and protection schemes. OPALCO has grouped medium and large generators into four size classifications: 200-500 kVA, 500-1000 kVA, 1000-2000 kVA, and 2000-10,000 kVA as shown on Table 4-1.~~

~~Small generator installations typically have power fuses for protection of the primary bus including the interconnection transformer. Fuses are inherently single pole devices so all three phases of the primary bus of the member's facility are not completely disconnected if a line to ground or a line to line fault occurs. This results in abnormal voltages on the unfaulted phase or phases of a three phase system. Therefore, OPALCO requires a three phase current breaker for primary protection at the member interconnection point on all generators with installed capacity greater than 500 kVA.~~

~~15.4.4 OPALCO Transmission and Distribution System~~

~~The OPALCO transmission and distribution system is unique because it is situated on six islands of various sizes. The three big islands, San Juan, Lopez and Orcas generally have large distribution substations with 7.5 to 20.0 MVA transformer capacity. Shaw is a medium size island that has an in-between substation with 5.0 MVA transformer capacity. These four islands are interconnected with a 69 kV transmission system. Blakely and Decatur are small islands that have substations with 1.5 MVA or smaller transformer capacities. These two islands and Olga Substation on Orca Island are supplied by a 24.9 kV submarine cable that has limited capacity. OPALCO is planning to replace the 24.9 kV submarine cable with a new 69 kV submarine cable in about three years. Consequently, the interconnection type, voltage and capacity that is presently available for medium and large generation facilities depends on the physical location as shown in Tables 4.2 and 4.3. The capacity limitation on Blakely and Decatur Islands will be modified in 2014.~~

~~15.4.5 Interconnection Type and Voltage~~

~~Four types of interconnections are available on the OPALCO system. A 480/277 kV three phase connection would be provided for small generators with 200-500 kVA installed capacity from a dedicated OPALCO transformer. The member would have to pay for the transformer and OPALCO would own the transformer and provide the maintenance. Medium size generators would be connected to nearby OPALCO 7.2/12.5 kV three phase distribution feeders. The member would be required to pay for any line upgrades~~

~~required such as conversion from single phase to three phase distribution line. The member also would be required to furnish medium voltage power transformers 500 kVA or greater required at the interconnection point. Where existing distribution facilities are limited OPALCO prefers that large generators 1000 kVA or greater be connected directly to the 7.2/12.5 kV bus of existing OPALCO 5.0-20 MVA distribution substations or directly to an available OPALCO transmission circuit via a member furnished substation. The member would be required to pay for the new 7.2/12.5 kV substation circuit breaker position and any dedicated three phase line to the generation facility. The four types of connections are shown in Tables 4.2 and 4.3.~~

~~15.4.6 Interconnection Location~~

~~Since Lopez, Orcas, Shaw and San Juan Islands have existing substations with 5.0-20 MVA transformer capacities and a 69 kV transmission system, larger generators generally can be accommodated on these islands as shown in Table 4.2. However, the existing small substations and the 24.9 kV transmission system on Blakely and Decatur Islands and Olga presently limit the maximum generator size to about 2000 kVA on these islands as shown in Table 4.3. The applicant may submit detailed PSS/E computer simulations to justify a larger generator installation that OPALCO will review before a final decision is made.~~

~~15.4.7 Specific Interconnection Design Requirements~~

~~The minimum specific design requirements for the following four interconnection classifications are summarized in Table 4.4.~~

~~Type 1: 200-500 kVA Grid Interactive, Induction and Synchronous Generators~~
~~Type 2: 500-1000 kVA Synchronous Generators w/wo Member Load~~
~~Type 3: 1000-2000 kVA Synchronous Generators w/wo Member Load~~
~~Type 4: 2000-10,000 kVA Synchronous Generators w/wo Member load~~
~~The specific requirements for these four types of interconnections are also discussed in the following four sections.~~

**TABLE 4.1**

**GENERAL REQUIREMENTS FOR MEDIUM AND LARGE GENERATION FACILITIES ACCORDING TO INSTALLED CAPACITY AND VOLTAGE**

| REQUIREMENT | TYPE 1 | TYPE 2 200 TO 500 kVA | TYPE 3 500 TO 1,000 kVA | TYPE 4 1,000 TO 2,000 kVA | 2,000 TO 10,000 kVA |
|---|---|---|---|---|---|
| Three Phase Machine | Y | Y | Y | Y | |
| Induction Machine | Y | N | N | Y | |
| Synchronous Machine | Y | Y | Y | Y | |
| Fuse Primary Protection | Y | Y | N | Y | |
| Circuit Breaker Primary Protection | N | Y | Y | Y | |
| Low Voltage Connection | Y | N | N | Y | |
| Medium Voltage Feeder Connection | N | Y | N | Y | |
| Medium Voltage Bus Connection | N | N | Y | Y | |
| High Voltage Substation Connect | N | N | N | Y | |

**TABLE 4.2**

**LOPEZ, ORCAS, SHAW & SAN JUAN ISLANDS TYPICAL INTERCONNECTION ALLOWED ACCORDING TO INSTALLED CAPACITY AND INTERCONNECTION VOLTAGE**

| Interconnection Type | Installed Capacity (MVA) | Transmission 69kV 3ph Substation | Distribution 12.5kV 3ph Ex. Sub Bus | Distribution 12.5kV 3ph Ex. Sub Bus | Secondary 480V 3ph** Ex. Transf. |
|---|---|---|---|---|---|
| | 0.2 | | | | |
| 1 | 0.5 | | | | |
| 2 | 1.0 | | | | |
| 3 | 1.5 | | | | |
| 3 | 2.0 | | | | |
| 4 | 2.5 | | | | |
| 4 | 3.0 | | | | |
| 4 | 3.5 | | | | |
| 4 | 4.0 | | | | |
| 4 | 4.5 | | | | |
| 4 | 5.0 | | | | |
| 4 | 5.5 | | | | |
| 4 | 6.0 | | | | |
| 4 | 6.5 | | | | |
| 4 | 7.0 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 4 | 7.5 | | | | |
| 4 | 8.0 | | | | |
| 4 | 8.5 | | | | |
| 4 | 9.0 | | | | |
| 4 | 9.5 | | | | |
| 4 | 10.0 | | | | |

**TABLE 4.3**

**DECATUR, BLAKELY ISLANDS AND OLGA TYPICAL INTERCONNECTION ALLOWED ACCORDING TO INSTALLED CAPACITY AND INTERCONNECTION VOLTAGE**

| Interconnection Type | Installed Capacity (MVA) | Transmission 69kV 3ph Substation | Distribution 12.5kV 3ph Ex. Sub Bus | Distribution 12.5kV 3ph Ex. Sub Bus | Secondary 480V 3ph** Ex. Transf. |
|---|---|---|---|---|---|
| | 0.2 | | | | |
| 1 | 0.5 | | | | |
| 2 | 1.0 | | | | |
| 3 | 1.5 | | | | |
| 4 | 2.0 | | | | |
| NA | 2.5 | | | | |
| NA | 3.0 | | | | |
| NA | 3.5 | | | | |
| NA | 4.0 | | | | |
| NA | 4.5 | | | | |
| NA | 5.0 | | | | |
| NA | 5.5 | | | | |
| NA | 6.0 | | | | |
| NA | 6.5 | | | | |
| NA | 7.0 | | | | |
| NA | 7.5 | | | | |
| NA | 8.0 | | | | |
| NA | 8.5 | | | | |
| NA | 9.0 | | | | |
| NA | 9.5 | | | | |
| NA | 10.0 | | | | |

~~**TABLE 4.4**~~

~~**SUMMARY OF MINIMUM REQUIREMENTS FOR VARIOUS INTERCONNECTION TYPES**~~

| ~~REQUIREMENT~~ | ~~TYPE 1~~ | ~~TYPE 2 200 TO 500 kVA~~ | ~~TYPE 3 500 TO 1,000 kVA~~ | ~~TYPE 4 1,000 TO 2,000 kVA~~ | ~~2,000 TO 10,000 kVA~~ |
|---|---|---|---|---|---|
| ~~Grid Interactive/Induction Machine~~ | ~~Y~~ | ~~N~~ | ~~N~~ | ~~N~~ | |
| ~~Synchronous Machine~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Three Phase Interconnection~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Lockable Main Disconnect Switch~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Primary Fuse Protection~~ | ~~Y~~ | ~~Y~~ | ~~N~~ | ~~N~~ | |
| ~~Primary Circuit Breaker Protection~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Secondary In/Out Metering~~ | ~~Y~~ | ~~N~~ | ~~N~~ | ~~N~~ | |
| ~~Primary In/Out Metering~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Dedicated Transformer by Utility~~ | ~~Y~~ | ~~N~~ | ~~N~~ | ~~N~~ | |
| ~~Dedicated Transformer by Member~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Generator Circuit Breaker~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Under-Voltage Protection (27)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Over-Voltage Protection (59)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Under-Frequency Protection (81U)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Over-Frequency Protection (81O)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Phase Over Current (50/51)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Neutral Over Current (51N)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Ground Over Voltage Protection(59 N)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Synchronism Check (25)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Directional Power (32)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Phase Sequence (47)~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Field Current (40)~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Transfer Trip~~ | ~~N~~ | ~~TBD~~ | ~~TBD~~ | ~~TBD~~ | |
| ~~Close Permissive Required~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Automatic Synchronizer~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Isolation Detection/Anti-Islanding~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Communications-Voice~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Telemetering~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Power Quality Monitoring~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Energy Recorder~~ | ~~N~~ | ~~N~~ | ~~N~~ | ~~Y~~ | |
| ~~Export Power Control Equipment~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Operational Data Logging~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Sequence of Event Reporting~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~Fault Recording~~ | ~~N~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | |
| ~~PSS/E Modeling~~ | ~~N~~ | ~~N~~ | ~~N~~ | ~~Y~~ | |
| ~~Metering CTs By Utility~~ | ~~Y~~ | ~~Y~~ | ~~Y~~ | ~~N~~ | |
| ~~Metering CTs By Member~~ | ~~N~~ | ~~N~~ | ~~N~~ | ~~Y~~ | |

| | | | | |
|---|---|---|---|---|
| Machine Testing | N | N | N | Y |
| Momentary Paralleling | N | N | N | N |

## 15.5 SPECIFIC REQUIREMENTS FOR 200-500 kVA TYPE 1 INTERCONNECTIONS

### 15.5.1 Application

The specific requirements for Type 1 interconnections with installed generator capacity of 200-500 kVA are described in this section. A typical one line diagram of a Type 1 interconnection for a grid interactive or induction machine is shown in Figure 11.1 and a typical one line diagram of a Type 1 interconnection for a synchronous machine with member loads is shown in Figure 11.2. Also, the minimum requirements are summarized in Table 4.4 in Section 4.7.

### 15.5.2 Basic Description

Type 1 interconnections are based on a dedicated OPALCO 480/277 V three phase transformer at the interconnection point. This transformer will be connected by OPALCO to a nearby 7.2/12.5 kV three phase primary distribution feeder. The member will be required to pay for all OPALCO costs for the transformer and primary interconnection. If a distribution line extension or single phase to three line conversion is required, the member also will be required to pay for these improvements in accordance with OPALCO's normal line extension and upgrade policy. OPALCO will provide normal operation and maintenance of the transformer and primary facilities for the member.

### 15.5.3 Interconnection Transformer

OPALCO will supply and install the 480/277 V interconnection transformer in accordance with OPALCO's standard services policy. The interconnection transformer will be connected in a grounded wye/grounded winding configuration and will provide a 480/277 V three phase four wire supply to the member. The member shall construct a suitable pad mounted transformer base as detailed in this policy. In addition, the member shall be responsible for all costs and materials for the underground primary feeder as outlined in this policy.

### 15.5.4 Metering

OPALCO will provide a 480/277 V three phase electronic meter and current transformers for revenue metering at the generation facility. The member shall furnish and install the current transformer enclosure, meter socket and junction box at the locations shown in Figures 11.1 and 11.2.

The metering equipment for Type 1 interconnections shall be capable of recording the kWh (in) and kWh (out) separately. Additional metering for kW and kVARh will be determined by the requirements for the individual installation.

### 15.5.5 Lockable Disconnect Switch

A manual 480 V three pole disconnect switch with provisions for locking and mechanical indication of the "open" position shall be provided at the locations shown on Figures 11.1 and 11.2. This disconnect switch shall be rated for the installation ampacity and have an interrupt rating adequate for the available fault current at the interconnection. The member shall furnish, install and maintain this switch.

15.5.6 Interconnection Circuit Breaker

A 480 V three pole circuit breaker is required at the interconnection with the OPALCO system. This circuit breaker shall be rated for the maximum generator current and have an interrupt rating adequate for the available fault current at the interconnection. The protective relays shall trip this circuit breaker for excessive phase and neutral over current and a synchronism check relay is required to supervise manual synchronized circuit breaker closing. The member may use the 480 V three pole circuit breaker also as a manual disconnect switch if the enclosure has provisions for locking in the "open" position and visible external mechanical indication of the switch position. The member shall furnish, install and maintain this circuit breaker.

15.5.7 Grounding

The 480/277 V three phase four wire circuit will include a multi-grounded neutral at the interconnection transformer terminals. The member shall adequately ground this circuit in accordance with NEC requirements in order to prevent hazardous conditions.

15.5.8 Generator

Type 1 generators shall be three phase induction or synchronous machines or inverters. Generation equipment used for Type 1 interconnections shall meet the requirements of IEEE 1547-2003 and UL 1741 along with any supporting documents created for testing, clarifications or supplemental information for each article. Generation equipment shall have adequate ratings for the intended application.

15.5.9 Generator Circuit Breaker

All Type 1 generators shall be connected with a three phase generator circuit breaker that has adequate ratings to meet load and short circuit requirements. Furthermore, Type 1 generators without stand alone capability shall have protective relays that trip this circuit breaker for excessive over/under voltage, over/under frequency, phase overcurrent, ground fault and phase sequence protection.

15.5.10 Protective Relays

The member shall submit a one line diagram with the proposed relay protection to OPALCO. Adequate protective devices shall be provided to detect and clear short circuits or grounds on the OPALCO system and to detect and disconnect the generator from abnormal voltages, frequencies and other detrimental conditions. Instrument transformers shall meet ANSI standards for C200 relay accuracy. Circuit design and specified equipment shall be reviewed by OPALCO prior to installation.

For Type 1 synchronous generators with stand alone capability, protective relays that trip the generator circuit breaker for excessive over/under voltage, over/under frequency, phase and neutral overcurrents, ground fault, directional power and phase sequence protection shall be provided . Also, a synchronism check relay shall be provided to supervise manual synchronized closing of the generator circuit breaker.

15.5.11 Anti-Islanding Protection

The member shall provide isolation detection and anti-islanding protection for Type 1 synchronous generators and coordinate those protection schemes so that OPALCO circuit reclosing will not be adversely affected. Member generation shall not be reparalleled after disconnection unless conditions return to normal and approval is received from the OPALCO control center.

15.5.12 Telephone Communications

The member shall provide and maintain on site, 24 hour voice quality telephone communications with OPALCO so that emergency information can be conveyed to the member.

15.5.13 Telemetry

OPALCO may require minimal telemetry for Type 1 generators to dial up the installation and verify at a minimum on-line/off-line status and measure amps, watts, vars and voltage output. All costs for communication equipment will be the responsibility of the member.

15.5.14 Harmonics

The harmonic output of Type 1 generators, including power inverters, shall comply with IEEE 1547, IEEE 519, and/or UL 1741. If the generator exceeds IEEE recommended specifications, the member will be required to install filtering to bring the harmonic output to an acceptable level.

15.5.15 Safety Practices

The member shall design and install an adequate facility and equipment grounding system that conforms to NEC, NESC and IEEE standards and current OPALCO and RUS practices for safe utility grounding. The member's facilities shall be fenced and secure to prevent unauthorized personnel access.

## 15.6 SPECIFIC REQUIREMENTS FOR 500-1000 kVA TYPE 2 INTERCONNECTIONS

15.6.1 Application

The specific requirements for Type 2 interconnections with installed generator capacity of 500-1000 kVA are described in this section. A typical one line diagram of a Type 2 interconnection for a synchronous machine with consumer loads is shown in Figure 11.3 and a typical one line diagram of a Type 2 interconnection for a synchronous machine

~~without consumer loads is shown in Figure 11.4. Also, the minimum requirements for Type 2 interconnections are summarized in Table 4.4 in section 4.7.~~

~~15.6.2 Basic Description~~

~~Type 2 interconnections are based on a tap of an existing OPALCO 7.2/12.5 kV three phase primary distribution feeder with sufficient capacity for the proposed generation. OPALCO will furnish a metered 7.2/12.5 kV four wire three phase supply to the member's 500-1000 kVA three phase interconnection transformer that steps the voltage down to the generator level. The member will be required to pay for all OPALCO costs for the primary distribution feeder connection. If a 7.2/12.5 kV distribution line extension or single phase to three phase line conversion is required, the member also will be required to pay for these improvements in accordance with OPALCO's normal line extension and upgrade policy.~~

~~15.6.3 Metering~~

~~OPALCO will furnish and install the 7.2/12.5 kV three phase primary feeder connection and primary metering in accordance with OPALCO's standard services policy. The member shall be responsible for all costs and materials required for the primary connection and metering as outlined in this policy.~~

~~The primary metering equipment for Type 2 interconnections shall be capable of recording the kWh (in) and kWh (out) separately. Additional metering for kW and kVARh will be determined by the requirements of the individual installation.~~

~~15.6.4 Lockable Disconnect Switch~~

~~A manual 15 kV three pole lockable disconnect switch with visible open or mechanical indication of the "open" position shall be provided at the location shown on Figures 11.3 and 11.4. The 15 kV disconnect switch shall be rated to open the magnetizing current of the transformer and the full load current of the generator. Also, this disconnect switch shall simultaneously open all three phases and have an interrupt rating adequate for the available fault current at the interconnection location. The 15 kV disconnect switch shall be new, conform to the RUS List of Approved Materials (Pub. 202.1) and shall be furnished with an effectively grounded switch operator's platform.~~

~~15.6.5 Interconnection Transformer~~

~~If the generation facility has a standalone synchronous generator that will be resistance grounded, a dedicated transformer with a grounded wye primary winding configuration and a delta secondary winding configuration shall be provided to protect the generator from ground faults. The interconnection transformer shall be protected from excessive phase and neutral overcurrents by a primary 15 kV circuit breaker as shown in Figures 11.3 and 11.4. The interconnection transformer shall be furnished, installed and maintained by the member. It should be energy efficient.~~

~~15.6.6 Interconnection Circuit Breaker~~

~~A three phase circuit breaker with external trip and close shall be provided on the primary side of the transformer to protect the transformer from over-currents and to synchronize a generator with stand alone capability to the OPALCO distribution system. The protective relays shall trip either circuit breaker for excessive phase and neutral overcurrents. Also, an automatic synchronizer and a synchronism check relay is required to supervise the circuit primary breaker closing. The primary circuit breaker shall be furnished, installed and maintained by the member.~~

~~15.6.7 Grounding~~

~~The member shall ground the winding wye points and case of the interconnection transformer so that the transformer is effectively grounded. Furthermore, the member shall adequately ground secondary circuits in accordance with NEC requirements to prevent hazardous conditions.~~

~~15.6.8 Generator~~

~~All Type 2 generators shall be three phase synchronous machines. Generation equipment used for Type 2 interconnections shall meet the requirements of IEEE 1547-2003 and UL 1741 along with any supporting documents created for testing, clarification or supplemental information for each article. Generation equipment shall have adequate ratings for the intended application.~~

~~15.6.9 Generator Circuit Breaker~~

~~All Type 2 generators shall be connected to a three phase generator circuit breaker that has adequate ratings to meet load and short circuit requirements. Synchronous generators with or without consumer loads shall have protective relays that trip this circuit breaker for excessive over/under voltage, over/under frequency, phase and neutral overcurrent, ground fault, loss of field, directional power and phase sequence protection. Also, an automatic synchronizer and a synchronism check relay shall be provided to supervise synchronized closing of the circuit breaker.~~

~~15.6.10 Protective Relays~~

~~The member shall submit a one-line diagram with proposed relay protection to OPALCO for review. In addition, member relays shall be coordinated with OPALCO relays to ensure proper function. Adequate protective devices shall be provided to detect and clear short circuits or grounds on the OPALCO system and to detect and disconnect the generator from abnormal voltages, frequencies and other detrimental conditions. If necessary, OPALCO may require additional protective devices, depending on specific system conditions at the member's generation facility.~~

~~Utility grade protective relays shall be furnished for all Type 2 interconnections. Protective relays shall be equipped with operation indicators (targets) or shall be connected to an annunciator or event recorder in order to determine the cause of~~

misoperations. Instrument transformers shall meet ANSI Standards for C200 relay accuracy. Circuit design and specific equipment shall be reviewed by OPALCO prior to installation.

15.6.11 Anti-Islanding Protection

The member shall provide isolation detection and anti-islanding protection for Type 2 synchronous generators and shall coordinate those protection schemes so the OPALCO circuit reclosing will not be adversely affected. Furthermore, the method to prevent reparalleling of member generation shall be provided. Member generation shall not be reparalleled after disconnection unless conditions return to normal and approval is received from the OPALCO control center.

15.6.12 Telephone Communications

The member shall provide and maintain on site, 24 hour voice dedicated telephone facilities for communications with the OPALCO control center so that emergency information can be conveyed to the member.

15.6.13 Remote Control

Remote control of member equipment or devices by OPALCO control center shall be required for Type 2 interconnections. Type of OPALCO control includes: close permissive control, transfer trip capabilities, interconnect breaker tripping and SCADA. OPALCO shall require telemetry capability to "dialup" the installation to verify at a minimum on-line/off-line status and to measure amps, watts, vars and voltage output. All costs for communications equipment will be the responsibility of the member.

The member shall furnish and install a Remote Terminal Unit (RTU) compatible with OPALCO's SCADA system along with any necessary transducers. Transducers shall be utility grade and subject to OPALCO approval. Space for communication and control equipment and all necessary communications lines shall be provided by the member.

15.6.14 Harmonics

The harmonic output of Type 2 generators shall comply with IEEE 1547, IEEE 519, and/or UL 1741. If the generator exceeds IEEE recommended specifications, the member will be required to install filtering to bring the harmonic output to an acceptable level.

15.6.15 Operational Records

The member will be required to install equipment for export power control, operational data logging, sequence of event reporting and fault recording on Type 2 interconnections. OPALCO will review the member's generation to determine what equipment will be required. All costs for necessary equipment will be the responsibility of the member.

15.6.16 Safety and Practices

The member shall design and install an adequate facility and equipment grounding system that conforms to NEC, NESC and IEEE recommended standards and current OPALCO and RUS practices for safe utility grounding. The member's facilities shall be fenced and secure in order to prevent unauthorized access.

## 15.7. SPECIFIC REQUIREMENTS FOR 1000-2000 kVA TYPE 3 INTERCONNECTIONS

### 15.7.1 Application

The specific requirements for Type 3 interconnections with installed generator capacity of 1000-2000 kVA are described in this Section. A typical one line diagram of a Type 3 interconnection for a synchronous machine with consumer loads is shown in Figure 11.5 and a typical one line diagram of a Type 3 interconnection for a synchronous machine without consumer loads is shown in Figure 11.6. Also, the minimum requirements for Type 3 interconnections are summarized in Table 4.4 in section 4.7.

### 15.7.2 Basic Description

Type 3 interconnections are based on a 7.2/12.5 kV three phase circuit breaker position at the nearest existing OPALCO substation with sufficient capacity for the proposed generation. This circuit breaker position will be dedicated to the member's generation facility. OPALCO will furnish and install the new 7.2/12.5 kV circuit breaker position including buswork, disconnect switches and 15 kV circuit breaker or recloser. OPALCO will review the available capacity of the existing substation transformers and establish acceptable generation limits for Type 3 interconnections at substations.

The member will be required to pay for the new circuit breaker position. OPALCO will provide normal operation and maintenance of the new circuit breaker.

### 15.7.3 Primary Line

A dedicated 7.2/12.5 kV three phase primary distribution line using wood poles or URD cables will be required between the new substation circuit breaker position and the member's generation facility. The member will be required to pay all OPALCO's costs for the primary distribution line in accordance with OPALCO's normal line extension policy. The line must be constructed to RUS standards using new materials from the RUS List of Approved Materials (Pub. 202.1). OPALCO will provide normal operation and maintenance of the new line.

### 15.7.4 Metering

A metered 7.2/12.5 kV three phase four wire supply will be provided to the member's 1000-2000 kVA three phase transformer that steps the voltage down to the generator level. OPALCO will furnish and install 7.2/12.5 kV three phase primary metering at the site in accordance with OPALCO's standard service policy. The member shall be

~~responsible for all OPALCO costs for the primary connection and metering at the member's facility.~~

~~Primary metering for Type 3 interconnections shall be capable of recording the kWh (in) and kWh (out) separately. Additional metering for kW and kVARh will be determined by the requirements of the individual installations.~~

~~15.7.5 Lockable Disconnect Switch~~

~~A manual 15 kV three pole lockable disconnect switch with visible open or mechanical indication of the "open" position shall be provided at the location shown on Figures 11.5 and 11.6. The 15 kV disconnect switch shall be rated to open the magnetizing current of the transformer and the full load current of the generator. Also, this disconnect switch shall simultaneously open all three phases and have an interrupt rating adequate for the available fault current at the interconnection location. The 15 kV disconnect shall be new, conform to the RUS List of Approved Materials (Pub. 202.1) and shall be furnished with an effectively grounded switch operators platform.~~

~~15.7.6 Interconnection Circuit Breaker~~

~~A 15 kV three pole circuit breaker is required on the primary side of the interconnection transformer for overcurrent protection of the transformer and synchronizing with the OPALCO distribution system. This circuit breaker shall be rated for the maximum generator current and have an interrupt rating adequate for the available fault current at the interconnection. The protective relays shall trip this circuit breaker for excessive phase and neutral overcurrent. Also, a synchronism check relay and automatic synchronizer is required to supervise the primary circuit breaker closing. The 15 kV primary circuit breaker shall be furnished, installed and maintained by the member.~~

~~15.7.7 Interconnection Transformer~~

~~If the generation facility has a standalone synchronous generator that will be resistance grounded, a dedicated transformer with a grounded wye primary winding configuration and a delta secondary winding configuration shall be provided to protect the generator from ground faults. The interconnection transformer shall be protected from excessive phase and neutral overcurrents by the primary (15 kV) circuit breaker. The interconnection transformer shall be furnished, installed and maintained by the member. It should be energy efficient.~~

~~15.7.8 Grounding~~

~~The member shall ground the winding wye points and case of the interconnection transformer so that the transformer is effectively grounded. Furthermore, the member shall adequately ground secondary circuits in accordance with NEC requirements to prevent hazardous conditions.~~

~~15.7.9 Generator~~

~~All Type 3 generators shall be three phase synchronous machines. Generation equipment used for Type 3 interconnections shall meet the requirements of IEEE 1547-2003 and UL 1741 along with any supporting documents created for testing, clarification or supplemental information for each article. Generation equipment shall have adequate ratings for the intended application.~~

~~15.7.10 Generator Circuit Breaker~~

~~All Type 3 generators shall be connected to a three phase generator circuit breaker that has adequate ratings to meet load and short circuit requirements. Synchronous generators with or without consumer loads shall have protective relays that trip this circuit breaker for excessive over/under voltage, over/under frequency, phase and neutral overcurrents, ground fault, loss of field, directional power and phase sequence protection. Also, an automatic synchronizer and a synchronism check relay shall be provided to supervise synchronized closing of the circuit breaker.~~

~~15.7.11 Protective Relays~~

~~The member shall submit a one line diagram with the proposed relay protection to OPALCO for review. In addition, member relays shall be coordinated with OPALCO relays to ensure proper function. Adequate protective devices shall be provided to detect and clear short circuits or grounds on the OPALCO system and to detect and disconnect the generator from abnormal voltages, frequencies and other detrimental conditions. If necessary, OPALCO may require additional protective devices, depending on specific system conditions at the member's generation facility.~~

~~Utility grade protective relays shall be furnished for all Type 3 interconnections. Protective relays shall be equipped with operation indicators (targets) or shall be connected to an annunciator or event recorder in order to determine the cause of misoperations. Instrument transformers shall meet ANSI Standards for C200 relay accuracy. Circuit design and specific equipment shall be reviewed by OPALCO prior to installation.~~

~~15.7.12 Anti-Islanding Protection~~

~~The member shall provide isolation detection and anti-islanding protection for Type 3 synchronous generators and shall coordinate those protection schemes so the OPALCO circuit reclosing will not be adversely affected. Furthermore, the method to prevent reparalleling of member generation shall be provided. Member generation shall not be reparalleled after disconnection unless conditions return to normal and approval is received from the OPALCO control center.~~

~~15.7.13 Telephone Communications~~

~~The member shall provide and maintain on site, 24 hour voice dedicated telephone facilities for communication between the generating station and the OPALCO control center so that emergency information can be conveyed to the member.~~

~~15.7.14 Remote Control~~

~~Remote control of member equipment or devices by OPALCO control center shall be required for Type 3 interconnections. Type of OPALCO control includes: close permissive control, transfer trip capabilities, interconnect breaker tripping and SCADA. OPALCO shall require telemetry capability to "dialup" the installation to verify at a minimum on-line/off-line status and to measure amps, watts, vars and voltage output. All costs for communications equipment will be the responsibility of the member.~~

~~The member shall furnish and install a Remote Terminal Unit (RTU) compatible with OPALCO's SCADA system along with any necessary transducers. Transducers shall be utility grade and subject to OPALCO approval. Space for communication and control equipment and all necessary communications lines shall be provided by the member.~~

~~15.7.15 Harmonics~~

~~The member is required to install power quality monitoring equipment on Type 3 interconnections. If the harmonic output exceeds recommended specifications in IEEE 519, the member will be required to install filtering to bring the harmonic output to an acceptable level.~~

~~15.7.16 Operational Records~~

~~The member is required to install equipment for export power control, operational data logging, sequence of event reporting and fault recording on Type 3 interconnections. OPALCO will review the member's generation to determine what equipment will be required. All costs for necessary equipment will be the responsibility of the member.~~

~~15.7.17 Safety and Practices~~

~~The member shall design and install and adequate facility and equipment grounding system that conforms to NEC, NESC and IEEE recommended standards and current OPALCO and RUS practices for safe utility grounding. The member's facilities shall be fenced and secure in order to prevent unauthorized personnel access.~~

## ~~15.8 SPECIFIC REQUIREMENTS FOR 2000-10,000 kVA TYPE 4 INTERCONNECTIONS~~

~~15.8.1 Application~~

~~The specific requirements for Type 4 interconnections with installed generator capacity of 2000-10,000 kVA are described in this section. A typical one line diagram of a Type 4 interconnection for a synchronous machine with consumer loads is shown in Figure 11.7 and a typical one line diagram of a Type 4 interconnection for a synchronous machine without member loads is shown in Figure 11.8. Also, the minimum requirements for Type 4 interconnections are summarized in Table 4.4 in section 4.7.~~

~~15.8.2 Basic Description~~

~~Type 4 interconnections are based on a tap of an existing OPALCO 69 kV three phase transmission line and a 69 kV substation with high voltage disconnect switch, circuit breaker and step down transformer at the member's generation facility. Any proposed generation that exceeds the capacity of a Type 3 connection directly to the 7.2/12.5 kV bus of the nearest existing OPALCO substation must be connected at the 69 kV transmission level. OPALCO will require PSS/E modeling of the 69 kV transmission system with the proposed generation and an independent design review before a Type 4 project is approved.~~

~~All costs for the 69 kV transmission tap and substation will be the responsibility of the member. OPALCO will provide normal operation and maintenance of the 69 kV transmission tap.~~

~~15.8.3 Primary Line~~

~~If the member's generation is not in close proximity to an existing OPALCO 69 kV transmission line, a dedicated 69 kV three phase underground or wood pole transmission line will have to be built to the site. OPALCO may require a 69 kV three pole disconnect switch to sectionalize the new line from OPALCO's transmission line in case of an emergency. The member will be required to pay all OPALCO's costs for the 69 kV tap and line extension to the site in accordance with OPALCO's normal line extension policy. The line will be constructed according to RUS standards using new materials that conform to the RUS List of Acceptable Materials (Pub.202.1). OPALCO will provide normal operation and maintenance of the new line.~~

~~15.8.4 Metering~~

~~OPALCO will furnish and install the 69 kV three phase primary metering and make the final connection at the applicant's line termination structure in accordance a with OPALCO's standard services policy. The member shall include provisions for mounting the metering equipment on the line termination structure. The member shall be responsible for all OPALCO costs for the primary connection and metering at the member's facility.~~

~~Primary metering equipment for Type 4 interconnections shall be capable of recording the kWh (in) kWh (out), kVARh (in) and kVARh (out) separately. A backup energy recording device and the capability to do load profiling also is required. Demand metering will be determined by the requirements of the individual installations.~~

~~15.8.5 Lockable Disconnect Switch~~

~~A manual 69 kV three pole lockable disconnect switch with visible open shall be provided at the location shown in Figures 11.7 and 11.8. The 69 kV disconnect switch shall be rated to open the magnetizing current of the transformer and the full load current of the generator. Also, this switch shall simultaneously open all three phases and have an interrupt rating adequate for the available fault current at the interconnection location.~~

~~The 69 kV disconnect switch shall be new, conform to the RUS List of Approved Materials (Pub. 202.1) and shall be furnished with an effectively grounded switch operator's platform.~~

~~15.8.6 Interconnection Circuit Breaker~~

~~A 69 kV three pole circuit breaker is required on the primary side of the interconnection transformer for differential and overcurrent protection of the transformer and synchronizing with the OPALCO transmission system. This circuit breaker shall be rated for the maximum generator current and have an interrupt rating adequate for the available fault current at the interconnection. The protective relays shall trip this circuit breaker for excessive differential current and phase and ground overcurrents. Also, a synchronism check relay and automatic synchronizer is required to supervise the primary circuit breaker closing. The 69 kV circuit breaker shall be furnished, installed and maintained by the member.~~

~~15.8.7 Interconnection Transformer~~

~~The dedicated transformer for a Type 4 interconnection shall have a grounded wye primary winding configuration and a delta secondary winding configuration to protect the generator from ground faults. The transformer should be new and energy efficient. The interconnection transformer shall be protected from excessive phase and neutral currents and differential transformer current by the high side 69 kV circuit breaker. The dedicated interconnection transformer shall be furnished, installed and maintained by the member.~~

~~15.8.8 Grounding~~

~~The member shall ground the winding wye point and case of the interconnection transformer so that the transformer is effectively grounded. Furthermore, the member shall adequately ground secondary circuits in accordance with NEC requirements to prevent hazardous conditions.~~

~~15.8.9 Generator~~

~~All Type 4 generators shall be three phase synchronous machines. Generation equipment used for Type 4 interconnections shall meet the requirements of IEEE 1547-2003 and UL 1741 along with any supporting documents created for testing, clarification or supplement information for each article. Generation equipment shall have adequate ratings for the intended application.~~

~~15.8.10 Generator Circuit Breaker~~

~~All Type 4 generators shall be connected to a three-phase generator circuit breaker that has adequate ratings to meet load and short circuit requirements. Synchronous generators with or without consumer loads shall have protective relays that trip this circuit breaker for excessive over/under voltage, over/under frequency, phase and neutral overcurrent, ground fault, loss of field, directional power and phase sequence~~

~~protection. Also, an automatic synchronizer that supervises all circuit breaker closing and a synchronism check relay shall be provided. OPALCO may require additional protective relays for large generators.~~

~~15.8.11 Protective Relays~~

~~The member shall submit a one-line diagram with the proposed relay protection to OPALCO for review. In addition, member relays shall be coordinated with OPALCO relays to ensure proper function. Adequate protective devices shall be provided to detect and clear short circuits or grounds on the OPALCO system and to detect and disconnect the generator from abnormal voltages, frequencies and other detrimental conditions. If necessary, OPALCO may require additional protective devices, depending on the specific system conditions at the member's generation facility.~~

~~Utility grade protective relays shall be furnished for all Type 4 interconnections. Protective relays shall be equipped with operation indicators (targets) or shall be connected to an annunciator or event recorder in order to determine the cause of misoperations. Instrument transformers shall meet ANSI Standards for C200 relay accuracy. Circuit design and specific equipment shall be reviewed by OPALCO prior to installation.~~

~~15.8.12 Anti-Islanding Protection~~

~~The member shall provide isolation detection and anti-islanding protection for Type 4 synchronous generators and shall coordinate those protection schemes so that OPALCO circuit reclosing will not be adversely affected. Furthermore, the method to prevent reparalleling of member generation shall be provided. Member generation shall not be reparalleled after disconnection unless conditions return to normal and approval is received from the OPALCO control center.~~

~~15.8.13 Telephone Communications~~

~~The member shall provide and maintain on site, 24 hour voice dedicated telephone facilities for communication between the generating station and the OPALCO control center so that emergency information can be conveyed to the member.~~

~~15.8.14 Remote Control~~

~~Remote control of member equipment or devices by the OPALCO control center shall be required for Type 4 interconnections. Types of OPALCO control includes: close permissive control, transfer trip capabilities, interconnect breaker tripping and SCADA. OPALCO shall require telemetry capability to allow continuous monitoring of the installation and to verify at a minimum on-line/off-line status of the tie point circuit breaker and measurement of amps, watts, vars and voltage output.~~

~~The member shall furnish and install a Remote Terminal Unit (RTU) compatible with OPALCO's SCADA system along with any necessary transducers. Transducers shall be~~

~~utility grade and subject to OPALCO approval. Space for communication and control equipment and all necessary communications lines shall be provided by the member.~~

~~15.8.15 Harmonics~~

~~The member is required to install power quality monitoring equipment on Type 4 interconnections. If the harmonic output exceeds recommended specifications in IEEE 519, the member will be required to install filtering to bring the harmonic output to an acceptable level.~~

~~15.8.16 Operational Records~~

~~The member is required to install equipment for export power control, operational data logging, sequence of event reporting and fault recording on Type 4 interconnections. OPALCO will review the member's generation facility to determine what equipment is necessary. All costs for this equipment will be the responsibility of the member.~~

~~15.8.17 Safety and Practices~~

~~The member shall design and install an adequate facility and equipment grounding system that conforms to NEC, NESC and IEEE recommended standards and current OPALCO and RUS practices for safe utility grounding. The member's facilities shall be fenced and secure in order to prevent unauthorized personnel access.~~

## ~~15.9 GENERATION FACILITY TESTING AND INSPECTION~~

~~15.9.1 Testing Standards~~

~~Generation equipment used for Type 1-4 interconnections shall meet the requirements of IEEE 1547.1-2005 "Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems" and UL 1741 "Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources". Also, any supporting documents created for testing, clarification or supplemental information for each article shall be included.~~

~~15.9.2 Relay Settings~~

~~After review of the member's one line diagram with the proposed relay protection, OPALCO will provide a range of basic relay specifications that are appropriate for each protective relay. The member shall set all relays within the specified ranges in the OPALCO specifications and coordinate these relays with upstream OPALCO relays. A certified test report shall be submitted to OPALCO prior to the preparallel inspection.~~

~~15.9.3 Power Flow and Transient Stability Modeling~~

~~OPALCO may request that the member provide PSS/E power flow and transient stability modeling for large generators. The test results provided to OPALCO shall include generator, governor and automatic voltage regulator parameters needed for the relay coordination.~~

~~15.9.4 Preparallel Inspection~~

~~The member shall notify OPALCO after the generation facilities are ready to energize but before the generator is paralleled with the OPALCO system. The preparallel inspection includes but not limited to the following initial checks: a) proper relay settings, b) appropriate relay tripping of each circuit breaker, c) proper secondary voltage applied to voltage and frequency relays, d) proper operation of the synchronizer e) verification of generator phase rotation, and f) proper grounding.~~

~~15.9.5 Generator Load Tests~~

~~The following load tests shall be performed after the generator picks up load: a) correct load current in all relay current coils, b) proper generator operation at 0.90 power factor lag and 0.95 power factor lead c) proposed generator operation at 0.95% to 105% nominal voltage, d) proper load balance of differential relays and e) proper operation of impedance and directional relays.~~

~~15.9.6 Relay Testing and Adjustment~~

~~The member shall be responsible to ensure that all relays and other protective devices are adjusted and working properly for the preparallel inspection. After completion of this test, the member shall notify OPALCO that the generating facility is ready for a parallel operation test and the OPALCO control center will schedule the test at a convenient time.~~

~~15.9.7 Parallel Operation Tests~~

~~The parallel operation tests consist of procedures to functionally test all protective equipment including: a) proper synchronizing with the OPALCO system, b) proper tripping of the interconnection and generator circuit breakers and c) testing the anti-islanding protection and d) proper shutdown after loss of power on the OPALCO system.~~

~~15.9.8 Commencement of Operation~~

~~The member shall not begin parallel operation of the generation facility until written permission is received from OPALCO.~~

## ~~15.10 OPERATING PROCEDURES~~

~~15.10.1 OPALCO Permission~~

~~The member shall obtain written permission from OPALCO to begin parallel operation of the generation facility and shall be familiar with the procedures and conditions of parallel operation with OPALCO.~~

~~15.10.2 Equipment Maintenance~~

~~The member is responsible for the maintenance of the generator and control and protective equipment. The member shall maintain records of all maintenance activities that OPALCO may review upon request.~~

~~15.10.3 Operation Log~~

~~A log of generator operations shall be kept that OPALCO may review upon request. The log shall include date, generator time on, generator time off, generator output and unusual events.~~

~~15.10.4 Communications with OPALCO~~

~~The member shall maintain telephone communications with the OPALCO control center and shall provide a 24 hour per day access phone number.~~

~~The member shall notify the OPALCO control center prior to paralleling or separating from the OPALCO system. For unexpected separations, the member shall inform the OPALCO control center of the nature of the problem and any relay operations that have occurred. Also, the member shall report any unusual operating conditions that affect the output, reliability or safety of the generation facility.~~

~~15.10.5 Automatic Reparalleling of Generator~~

~~For unattended facilities, automatic reparalleling must be accomplished in less that 5 minutes after the initial trip. If the reparallel attempt was unsuccessful, the equipment shall lock out and no subsequent reparallel attempt shall be made without permission from the OPALCO control center.~~

~~15.10.6 Event Recorder~~

~~All unattended generation facilities greater than 500 kVA shall have an event recorder that will give OPALCO the ability to make an after-the-fact determination of the status of the facility. The event recorder shall provide the targets of the relay that caused the generator to separate and the time of all paralleling and separations.~~

~~15.10.7 Operating Reports~~

~~Unattended facilities greater than 1000 kVA shall provide daily operating reports of delivered energy and power to OPALCO via telemetry.~~

## ~~15.11 INTERCONNECTION ONE LINE DIAGRAMS~~

~~Figure 11.0 IEEE Protective Device Numbers (Typical protective device numbers per ANSI C37.2)~~

~~4 Master Contactor~~
~~25 Synchronism Check~~
~~25A Automatic Synchronizer~~
~~27 Under-voltage~~
~~32 Directional Power~~
~~40 Loss of Field Detection~~
~~46 Phase Balance Current~~
~~47 Voltage Phase Sequence~~

~~50 Instantaneous Overcurrent~~
~~51 Phase Time Over-current~~
~~51G Ground Time Over-current~~
~~51N Neutral Time Over-current~~
~~51V Voltage Restrained/Controlled Time Phase Over-current~~
~~52 Circuit Breaker~~
~~59 Over-voltage~~
~~59N Residual Over-voltage (Ground Fault Detection)~~
~~79 Reclosing Relay~~
~~81O Over-frequency~~
~~81U Under-frequency~~
~~86 Lockout~~
~~87 Current Differential~~

~~Figure 11.1 Type 1 Grid Interactive or Induction machine with customer load 200-500 kVA installed capacity at secondary voltages~~

~~Figure 11.2 Type 1 Synchronous machine with customer load 200-500 kVA installed capacity at secondary voltages~~

~~Figure 11.3 Type 2 Synchronous machine with customer load 500-1000 kVA installed capacity at distribution voltages~~