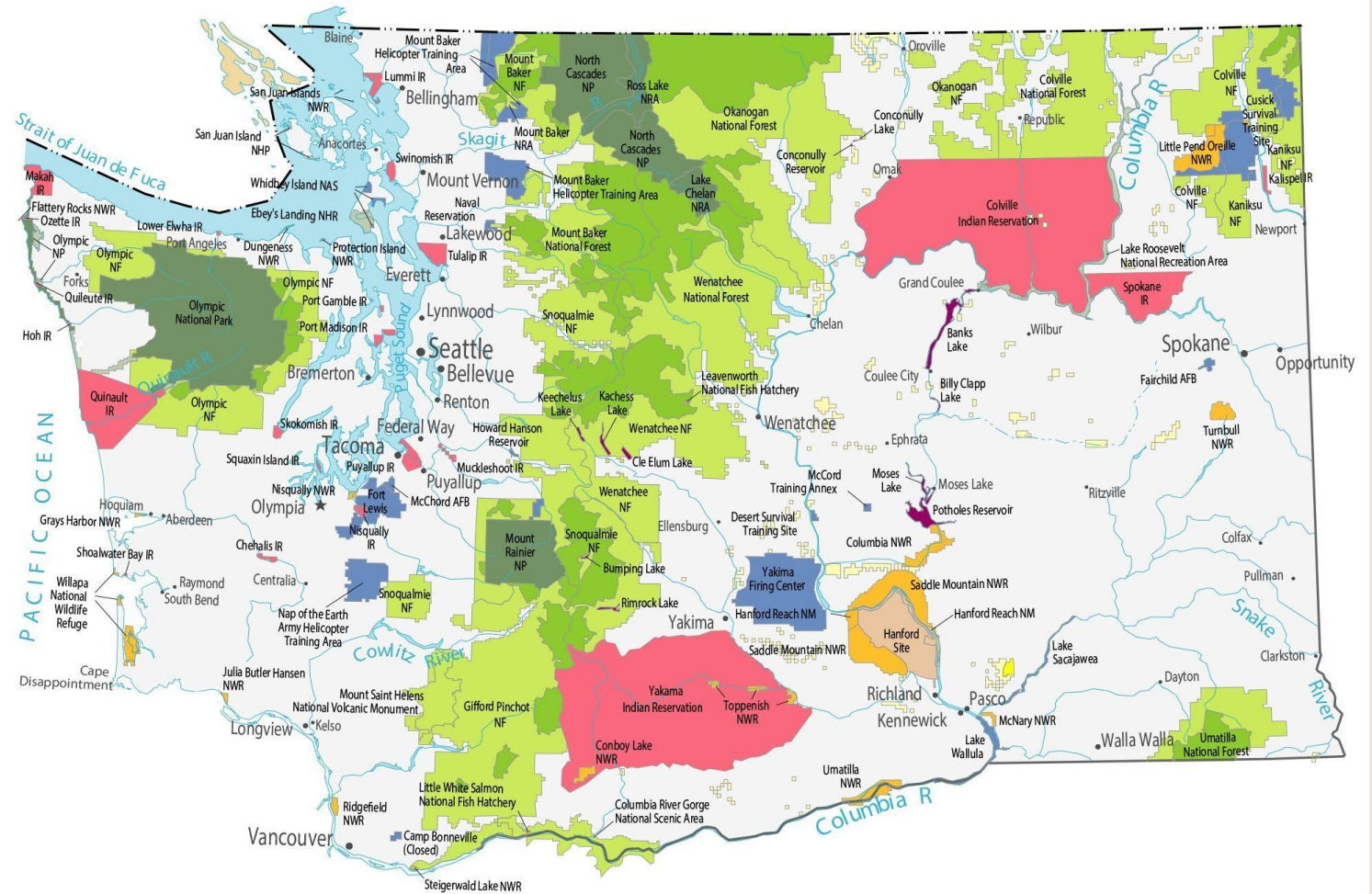


Spokane Indian Housing Authority Solar Projects



Tribes in the State of Washington



History

Spokane Indian Housing Authority?

- Established in 1972 By the Spokane Tribe and HUD.
- The Children of the Sun Solar Initiative started in 2018 through the Spokane Indian Housing Authority (SIHA).

Projects

- First Project was a joint project with the Spokane Tribe and Spokane Indian Housing Authority, 640kW on a combination of 32 Public and Residential buildings.
- Second project and current project is the Spokane Reservation Residential Solar Energy Project, 699kW on 119 SIHA managed low-income rental homes. AKA, COSSI-2.0.



Project Objectives COSSI-2.0



- 1) Design, build and operate approximately 699 kW of solar PV serving 119 Tribal Residences.
- 2) Provide an estimated 24,440 MWh of electricity over the Project's life to Residences.
- 3) Provide 6 local Tribal members with construction and operation and maintenance (O&M) training.
- 4) Create 2 permanent positions for administration and O&M.

History COSSI-2.0

Prior to European colonization, the land we now call the United States was indigenized, it was influenced and actively managed by its original inhabitants Native Americans who were both the first farmers and the first land stewards. The indigenized systems that was in place developed over thousands of years, were discarded.



- 1) Reduce Tribal and SIHA managed homes energy costs.**
- 2) Work to achieve energy independence using clean energy technologies.**
- 3) Provide beneficial training and jobs for Tribal members.**
- 4) Increase the resiliency of the electrical grid on the Spokane Reservation.**
- 5) Become a leader in reliable clean energy deployment and encourage other Tribal communities to do the same.**



COSSI-2.0 Funding

about the Project Funding.

- **Total DOE funds: \$2,529,474:** to be used for the project and for prepayment of PPA with the Tax Credit Investor (\$2,521,242) also for travel (\$8,232)
- **Cost Share Reduction: \$843,158**
- **SIHA Chose to use the FY22 ARP IHBG Abbreviated Indian Housing Plan instead of a Tax Credit Investor.**
- **\$843,549 Match needed approvals from the Funding Agency, NAHASDA: stands for Native American Housing Assistance and Self Determination Act.**

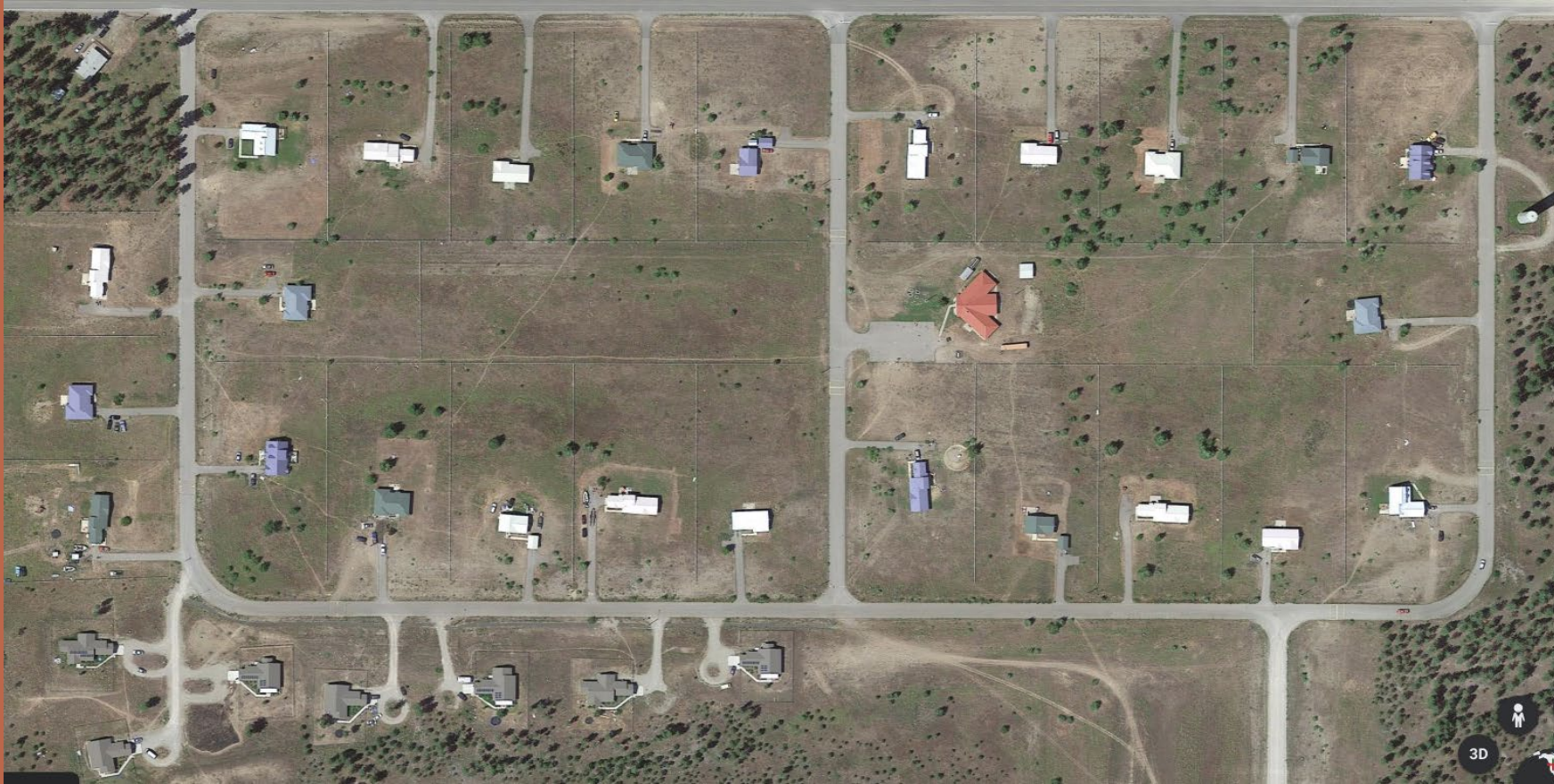
Project Specifics & Locations

The Project Consists of 119 homes in 4 communities on the Spokane Reservation.

- The Martha Boardman area also located on the East side of the Spokane Reservation, 64 Homes
- The McCoy Lake site located on the West side of the Spokane Reservation, 24 Homes



Project Specifics, & Locations



The Project Consists of 119 homes in 4 communities on the Spokane Reservation.

- The **New House Lane site** located on the East side of the Spokane Reservation, 25 Homes
- The **Sherwood Loop site** located in Wellpinit the Center of the Spokane Reservation, 6 Homes

Focus on the Maintenance of the 151 installs to date.

29 Homes with Solar, what energy they produced as of 10/12.

Status	System ID	Location & Unit-#	City	State	7 Days kWh	This Month	Lifetime	Microinve
Normal	4547233	Spokane MB-13	Wellpinit	WA	137495	231339	283338	15
Normal	4549730	Spokane MB-12	Wellpinit	WA	120911	208943	272378	15
Normal	4549625	Spokane MB-15	Wellpinit	WA	119408	200472	261132	13
Normal	4549732	Spokane MB-28	Wellpinit	WA	117722	202892	273124	15
Normal	4549639	Spokane MB-11L	Wellpinit	WA	118351	199525	258684	13
Normal	4588421	Spokane MB-17	Wellpinit	WA	121758	150880	561112	13
Normal	4549255	Spokane MB-16	Wellpinit	WA	163120	275537	870862	18
Normal	4570163	Spokane MB-09	Wellpinit	WA	131916	224385	674649	15
Normal	4549513	Spokane MB-08	Wellpinit	WA	137540	237406	288332	19
Normal	4573525	Spokane MB-20	Wellpinit	WA	134471	165630	364678	16
Normal	4549510	Spokane MB-10	Wellpinit	WA	82834	148012	483043	18
Normal	4570498	Spokane MB-18	Wellpinit	WA	117190	204086	264905	17
Normal	4549678	Spokane MB-27	Wellpinit	WA	172327	291701	380442	19
Normal	4549830	Spokane MB-14	Wellpinit	WA	166149	279709	336949	18
Normal	4584602	Spokane MB-19	Wellpinit	WA	143666	242065	293940	16
Not Reporti	4621013	Spokane NHL-38	Ford	WA	0	0	15698	15
Normal	4621093	Spokane NHL-40	Ford	WA	103712	117850	136098	11
Normal	4621055	Spokane NHL-39	Ford	WA	130279	146846	210695	13
Normal	4628358	Spokane NHL-29	Ford	WA	102124	113611	172598	15
Normal	4621129	Spokane NHL-41	Ford	WA	121574	139680	217925	17
Normal	4624778	Spokane NHL-21	Ford	WA	108771	125204	187336	17
Normal	4624960	Spokane NHL-25	Ford	WA	138428	158968	226255	15
Normal	4616622	Spokane NHL-28	Ford	WA	163476	181847	258972	17
Normal	4624839	Spokane NHL-23	Ford	WA	93356	107764	137659	15
Normal	4628507	Spokane NHL-32	Ford	WA	132038	147335	187242	17
Normal	4616467	Spokane NHL-22	Ford	WA	165405	199998	259167	22
Normal	4616698	Spokane NHL-36	Ford	WA	105839	119642	139038	11
Normal	4621208	Spokane NHL-42	Ford	WA	112928	128756	142776	13
Normal	4621237	Spokane NHL-44	Ford	WA	16762	16762	18202	20



Maintenance of 151 installs.



RESIDENTIAL SYSTEMS

Senior Units

Operating as expected

2L, 2R, 3L,3R, 4R, 7L and 7R

These systems are functioning normally with power outputs of approximately 1.5-5kW power on a cloudy morning day, 42-50kWh energy over the course of 3 days, all of which were cloudy, and 1.5-2MWh energy production from January to May.

Further maintenance recommended

4L, 5L, 6R, 6L

4L - The optimizers in this system are not communicating. However, production is still as expected so the issue is likely a communications and not a production error. This is a non-urgent problem. SolarEdge Case# 3142173.

5L - This inverter had a hardware error and voltage surge. We recommend that the inverter be replaced. The system will not produce any power until the issue is fixed. SolarEdge Case# 3141531.

6R - There are a few hanging wires in the middle of the array. This is a non urgent problem and can be easily fixed by sending a technician to manage the wires under the array.

6L - There are a few hanging wires in the middle of the array. This is a non urgent problem and can be easily fixed by sending a technician to manage the wires under the array. Additionally this system is underproducing in comparison to 6R. Since this system has to be manually restarted after a brown out; it is likely that the underproduction is simply a reflection of the decreased time the system is on. We would recommend promptly turning the system back on after the power is out, and recording any errors on the inverter after shut down, at the time of our inspection, all systems were normal and producing as expected.



Solar O&M Manager Plan

- The Sample O&M Plan was modeled after NREL sample plan. SIHA plans to use the SolarEdge and Enphase Dashboard Apps to monitor the systems needing immediate attention.

Solar Operation & Maintenance Plan Example			
Scheduled Task	As Required	Monthly	Semiannual
Check Safety concerns on systems prior to maintenance	√	√	√
View Solar App, to check for inconsistencies	√	√	√
Inspect modules for damage	√		√
Address array shading issues	√		√
Remove debris around mounting & array	√		√
Inspect racking & mounting system	√	√	
Check inverter for correct settings	√		√
Check controls for correct settings	√		√
Have Electrician inspect systems	√		√



Enphase Enlighten Manager

- Current Homes on the Enphase Dashboard that are currently producing energy and not all are working correctly, snapshot on October 18, 2023

<input checked="" type="checkbox"/> Normal	4616698	Spokane NHL-36	Ford	09/25/2023 10:33 AM PDT	1.99 kWh	60.8 kWh	180 kWh	199 kWh	Cellular	11
<input checked="" type="checkbox"/> Normal	4628618	Spokane NHL-37	Ford	09/25/2023 11:14 AM PDT	811 Wh	76.9 kWh	218 kWh	241 kWh	Cellular	17
<input type="checkbox"/> Gateway Not Reporting	4621013	Spokane NHL-38	Ford	09/20/2023 09:45 AM PDT	0 Wh	0 Wh	0 Wh	15.7 kWh	Cellular	15
<input checked="" type="checkbox"/> Normal	4621055	Spokane NHL-39	Ford	09/20/2023 10:20 AM PDT	1.97 kWh	72.4 kWh	219 kWh	283 kWh	Cellular	13
<input checked="" type="checkbox"/> Normal	4621093	Spokane NHL-40	Ford	09/20/2023 10:17 AM PDT	1.87 kWh	59.7 kWh	177 kWh	195 kWh	Cellular	11
<input checked="" type="checkbox"/> Normal	4621129	Spokane NHL-41	Ford	09/20/2023 03:26 PM PDT	512 Wh	75.9 kWh	215 kWh	293 kWh	Cellular	17
<input checked="" type="checkbox"/> Normal	4621208	Spokane NHL-42	Ford	09/25/2023 01:35 PM PDT	1.99 kWh	66.7 kWh	195 kWh	209 kWh	Cellular	13
<input checked="" type="checkbox"/> Normal	4621237	Spokane NHL-44	Ford	09/26/2023 11:09 AM PDT	2.18 kWh	88.5 kWh	95.5 kWh	96.9 kWh	Cellular	20
<input checked="" type="checkbox"/> Normal	4628697	Spokane NHL-48	Ford	09/25/2023 11:06 AM PDT	2.02 kWh	95.8 kWh	265 kWh	287 kWh	Cellular	21



Continue the Maintenance in a Rural setting.

- We are currently using Solar Edge and Enphase components.
- Inverters and microinverters
- Where an there is an internet connection, we can use Wi-Fi to monitor the systems.
- SIHA's contract states Grid Alternatives will provide the training for the installation and the maintenance of the systems.
- SIHA has the funding for maintenance for the first 5-years, but we still need to develop a plan to fund product and personnel for future maintenance when the warranty is up.



Solar Edge, Production

Building Name	Spokane Indian Housing Authority & Spokane Tribal Buildings Addresses	kW installed	Production Year	12 month Energy Production	\$ Value
Senior Housing 3R	6401 Sherwood Addition Wellpinit, WA	5.4	1/2021 -12/2021	6933.23	\$623.99
Long House	6386 Sherwood Loop Wellpinit, WA	23.4	1/2020 -12/2020	24709.18	\$2,470.91
Senior Center	6403B Sherwood Loop Rd, Wellpinit, WA	29.4	1/2020 -12/2020	34015.65	\$3,401.56
Spokane Tribe Admin (McCoy)	6195 Ford-Wellpinit Rd, Wellpinit, WA	129.6	1/2020 -12/2020	98972.47	\$9,897.24
Tribal Fish Hatchery	5629 Hatchery Rd, Ford, WA 99013	129.6	1/2020 -12/2020	145453.25	\$14,545.33
Public Safety	6203A Ford Wellpinit, WA	46.8	1/2021 -12/2021	64639.451	\$6,463.94
West End Community Center	6421 Selena Ct Bldg Community Center, Fruitland, WA 99129	29.7	1/2021 -12/2021	33708.581	\$3,370.85
Sockeye House 2	5638 Sockeye St, Wellpinit WA 99040	12.3	1/2020 -12/2020	12386.419	\$1,114.77
*Sockeye House 6	5623 Sockeye St, Wellpinit WA 99040	12.3	1/2021 -12/2021	14219.554	\$1,279.76
Sockeye House 7	5627 Sockeye St, Wellpinit WA 99040	12.3	1/2021 -12/2021	15834.65	\$1,425.11
*Sockeye House 9	5635 Sockeye St, Wellpinit WA 99040	12.3	1/2021 -12/2021	15563.885	\$1,400.75
Sockeye House 4	5632 Sockeye St, Wellpinit WA 99040	7.5	1/2021 -12/2021	9383.823	\$844.54
Sockeye House 8	5629 Sockeye St, Wellpinit WA 99040	7.5	1/2021 -12/2021	9986.215	\$898.75
5098 Tshimakian Way Loop	5098 Tshimakian Way Loop, Ford, WA 99013	12.3	1/2021 -12/2021	14834.111	\$1,335.07

Training Day



MB On Site Training for the Local crew



MB On Site Training for the Local crew



MB Completed product on a Duplex



MB Completed product on Single Family



Moving forward, SIHA and their stakeholders feel pretty good about the project.

The Spokane Indian Housing Authority had the opportunities and circumstance to make these past projects a reality due to the funding opportunities and from assistance of professional partners that belong to organizations like DOE office of Indian Energy who are willing to assist those who need direction to move forward with energy projects that will reduce the energy burden and preserve our planet for our youth.



- 1) We want to thank DOE, Office of Indian Energy.
- 2) Godfrey and Kahn Attorneys.
- 3) Grid Alternatives, Tribal Program.

Questions & Answers

Invite questions from the perceptive audience.

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