



**Tolowa
Dee-ni'
Nation**

Renewable Solar Energy at Rowdy Creek Fish Hatchery

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Tim Hoone – Planning Director

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- Mission – to exert and protect the inherent sovereignty endowed upon the Tolowa Dee-ni' Nation to promote our Tribal identity, and the well-being of our people, community and environment by building a strong foundation managing resources and perpetuating our cultural lifeways and legacy.



TDN ancestral lands extend north to the Sixes River in Oregon, east to the Applegate River drainage in Oregon, south to Wilson Creek in Del Norte California, and west to the sea stacks off the coast.



Tribal Subsistence

Nvn-nvst-'aa~-ta



The TDN Natural Resources Department is responsible for issues and projects pertaining to the air, water, ocean, and cultural and other natural resources. The primary function of the Department is to gather data, and to evaluate and make recommendations to the Tribal Council regarding conservation and stewardship projects and policies.

Rowdy Creek Fish Hatchery



www.tripadvisor.com



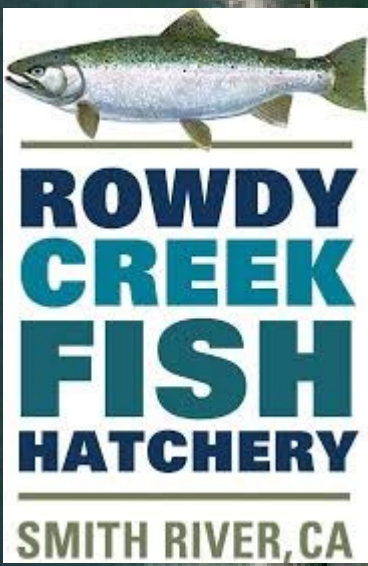
www.tripadvisor.com



www.californiathroughmylens.com



www.californiathroughmylens.com



Project Location



Rowdy Creek
Fish Hatchery

Yontocket

101

Project Overview:



Rowdy Creek Fish Hatchery rears and releases Chinook and steelhead supporting fishing opportunities in the Smith River



Supplies Salmon in the Classroom and tours to the local schools



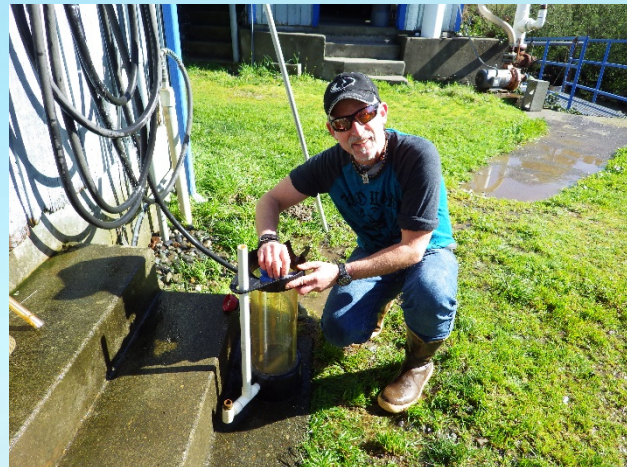
Rowdy Creek Fish Hatchery has an average electric operating expense of ~\$25,000 annually



A reduction in operational costs needed to guarantee long term financial stability



Renewable energy use would contribute to the environmental sustainability



Project Objectives

113.88KW Photovoltaic system includes:

- 312 x 365 watt solar panels

Installation of 28 panel roof mounted system

Installation of 284 panels on 6 different ground mounted solar arrays using ground mount racking system and trenching between solar arrays.

Installation of electric Balance-of-System from arrays to PV inverters

Removal of trees and vegetation in selected areas that will effect solar production.

Installation of landscaping material to impede vegetation growth beneath the arrays post construction and installation of landscaping materials to mitigate potential run off into waterways as a result of construction.

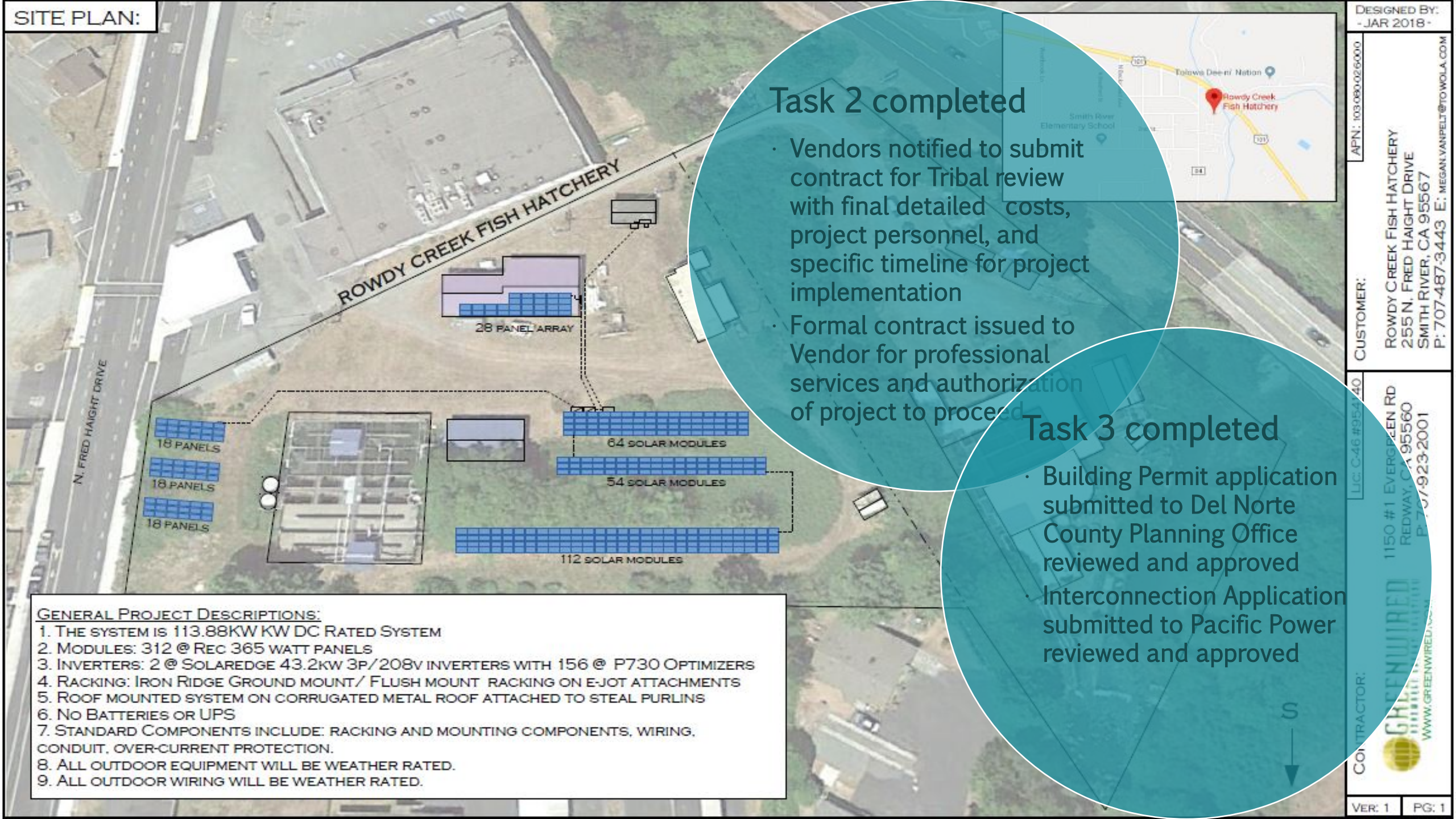
Progress to Date

Task 1 completed

Completed pre-award negotiation process with DOE

- Biological Assessment Completed
- Elevation Certificate Submitted
- Contractor getting under contract
- Tribal administrative and fiscal responsibilities assigned
- Kickoff meeting convened
- Tribal Council informed on project progress





Task 2 completed

- Vendors notified to submit contract for Tribal review with final detailed costs, project personnel, and specific timeline for project implementation
- Formal contract issued to Vendor for professional services and authorization of project to proceed

Task 3 completed

- Building Permit application submitted to Del Norte County Planning Office reviewed and approved
- Interconnection Application submitted to Pacific Power reviewed and approved

GENERAL PROJECT DESCRIPTIONS:

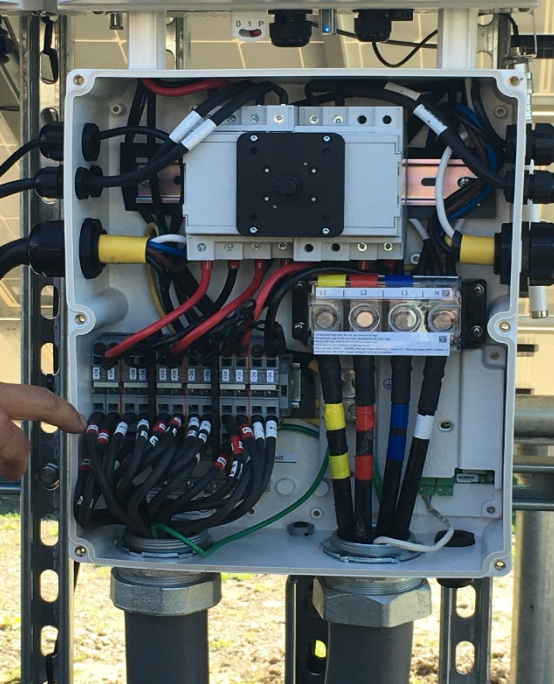
1. THE SYSTEM IS 113.88KW KW DC RATED SYSTEM
2. MODULES: 312 @ REC 365 WATT PANELS
3. INVERTERS: 2 @ SOLAREGE 43.2KW 3P/208V INVERTERS WITH 156 @ P730 OPTIMIZERS
4. RACKING: IRON RIDGE GROUND MOUNT/ FLUSH MOUNT RACKING ON E-JOT ATTACHMENTS
5. ROOF MOUNTED SYSTEM ON CORRUGATED METAL ROOF ATTACHED TO STEEL PURLINS
6. NO BATTERIES OR UPS
7. STANDARD COMPONENTS INCLUDE: RACKING AND MOUNTING COMPONENTS, WIRING, CONDUIT, OVER-CURRENT PROTECTION.
8. ALL OUTDOOR EQUIPMENT WILL BE WEATHER RATED.
9. ALL OUTDOOR WIRING WILL BE WEATHER RATED.





Task 4 completed

Rowdy Creek Fish Hatchery project site ready for project implementation

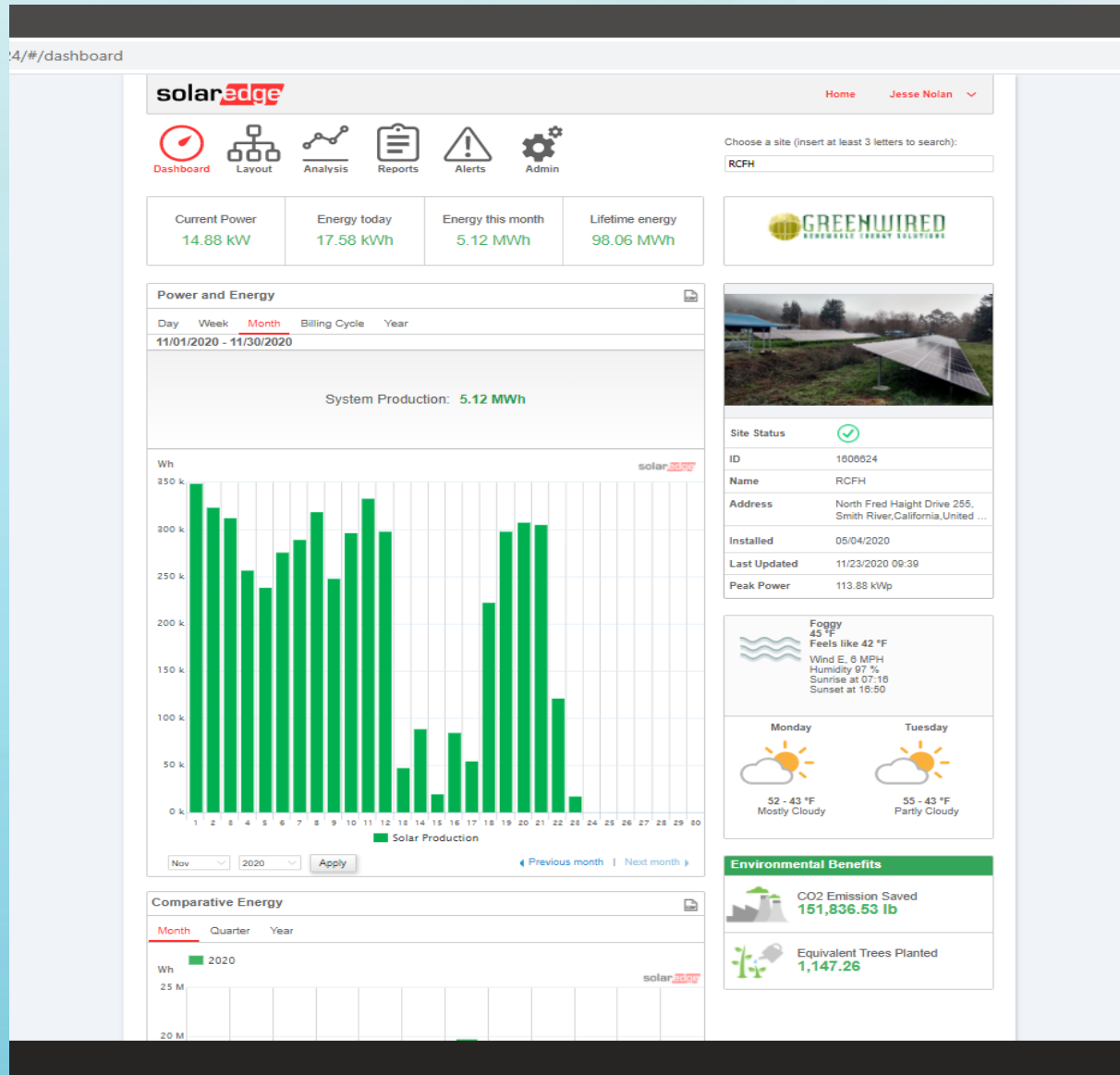
- Heavy equipment brought in for removal of blackberry bushes, trees, and grading
- Debris removed from roof of building
- Trenches prepared to accommodate solar arrays





  The system went into operation on 5/4/2020!  

SolarEdge's Monitoring Portal

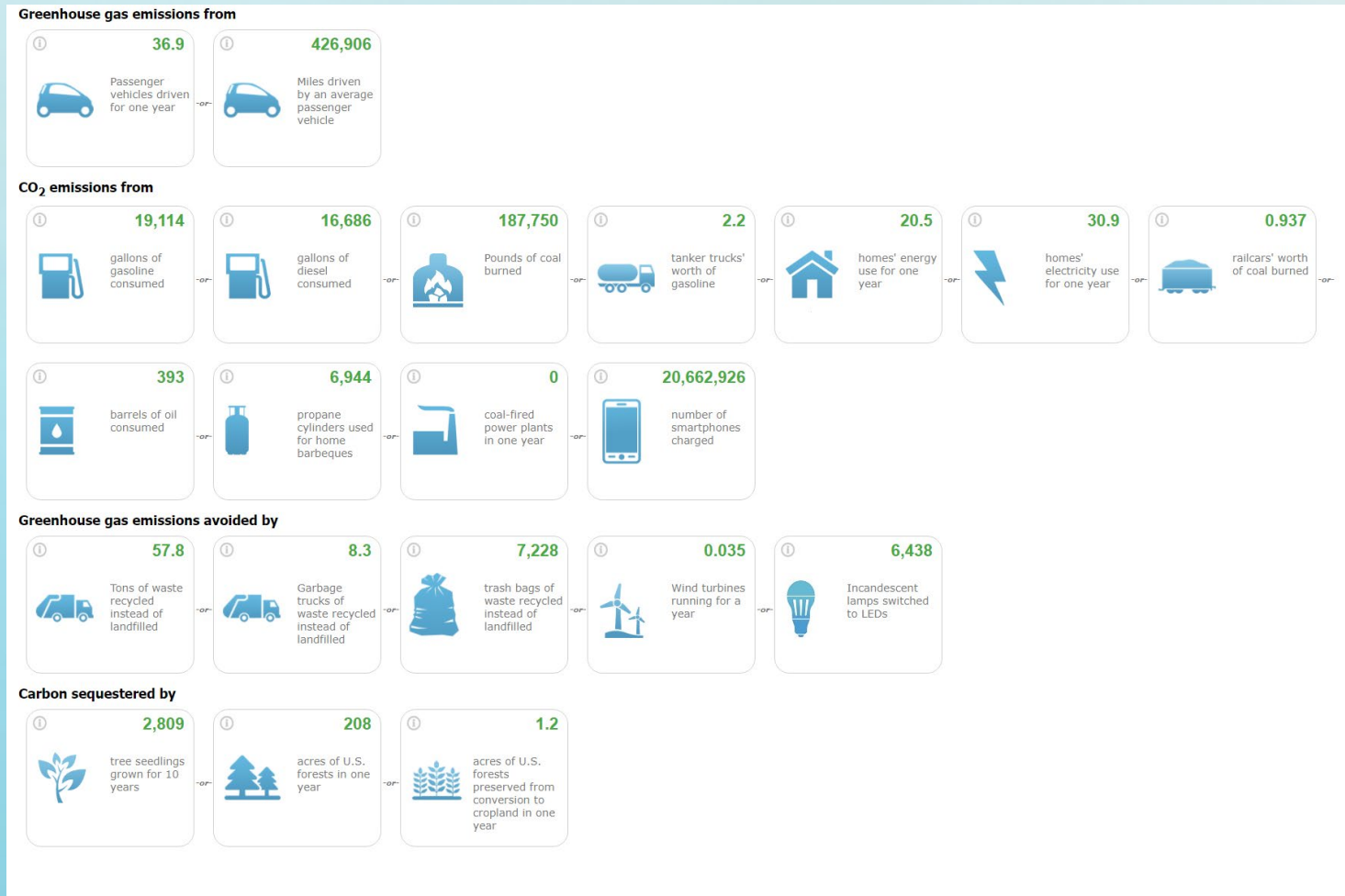


Monitoring of the system is conducted via SolarEdge's online platform:

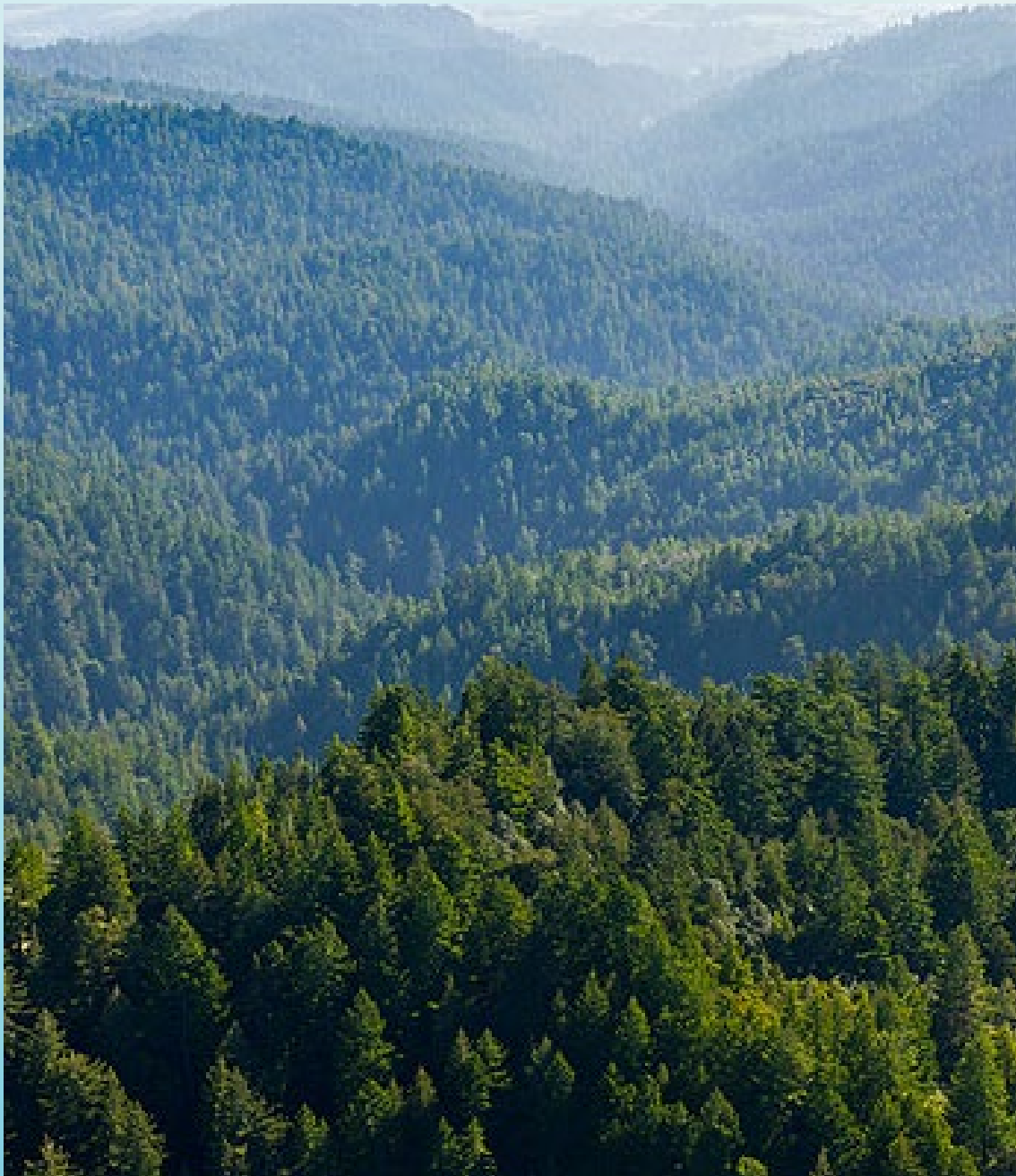
- Daily Solar Power Generation
- Monthly Power Generation
- Carbon Emissions Saved
- Equivalent Trees Planted
- System Overview

Carbon Offsets Generated By Hatchery Solar

Offsets generated at the Hatchery through November 8th are 374,490 pounds of CO₂



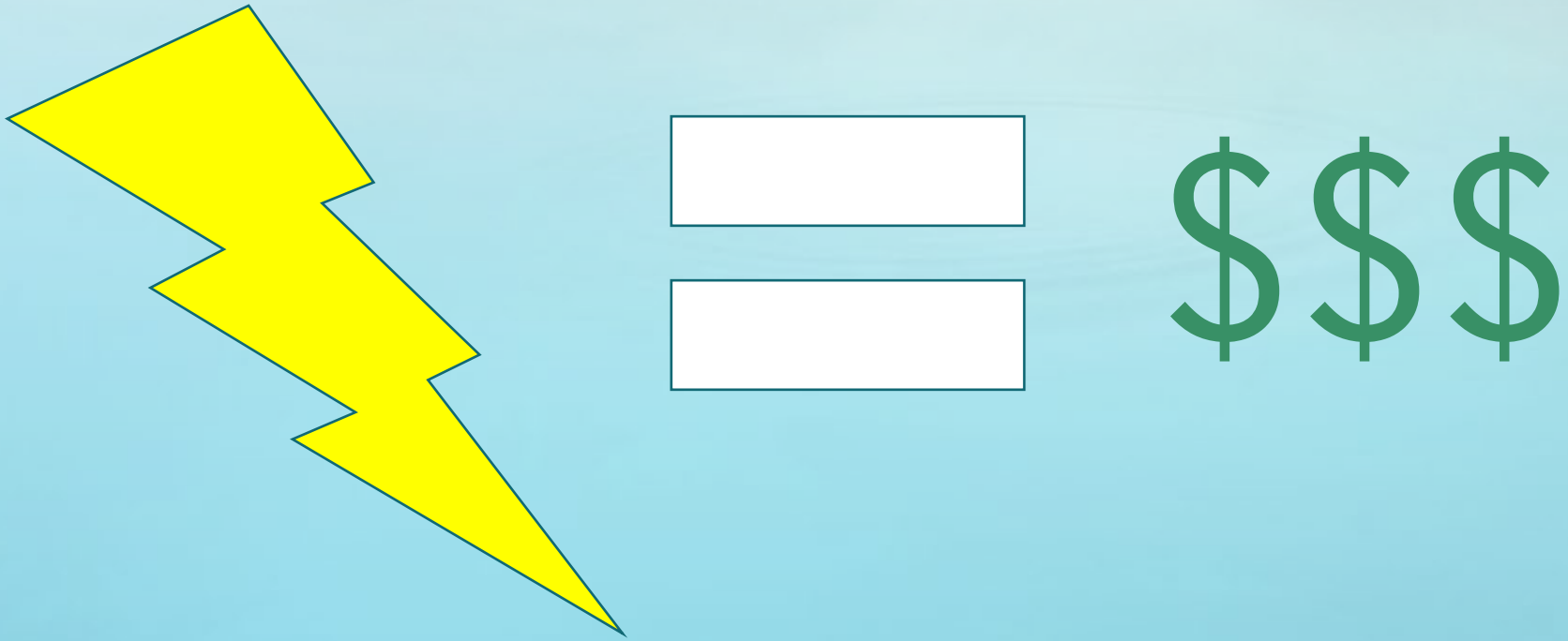
<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>



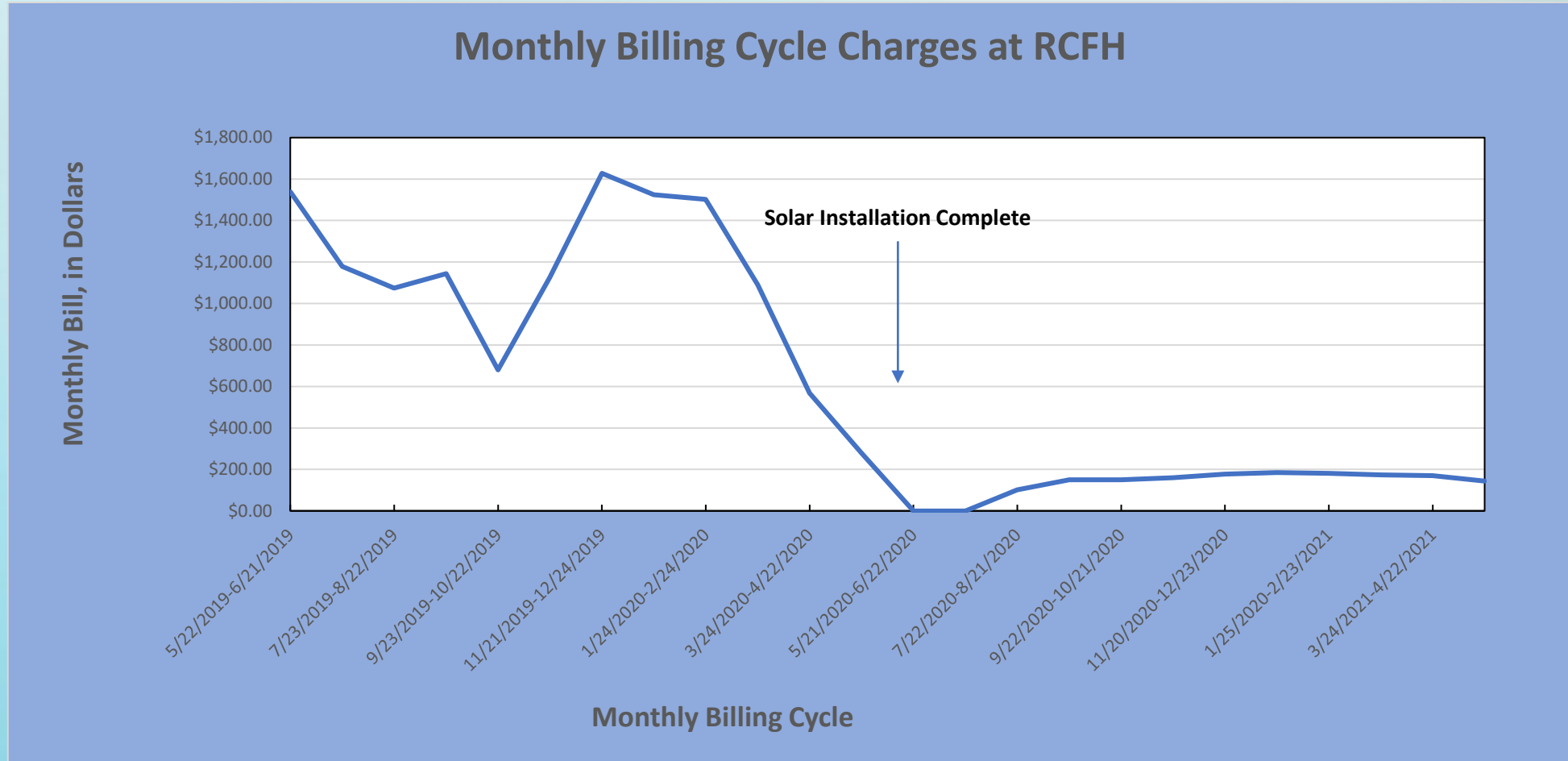
solar project has
resulted in the
equivalent of
2,829 trees
planted

The number of trees per acre in a healthy forest vary by forest type, here in the Pacific Northwest the values range from ~50-150, which translates into roughly 28 acres of forest (ranges from 18-58) equivalent in just the first 18 months of the project

Financial Benefits of Solar

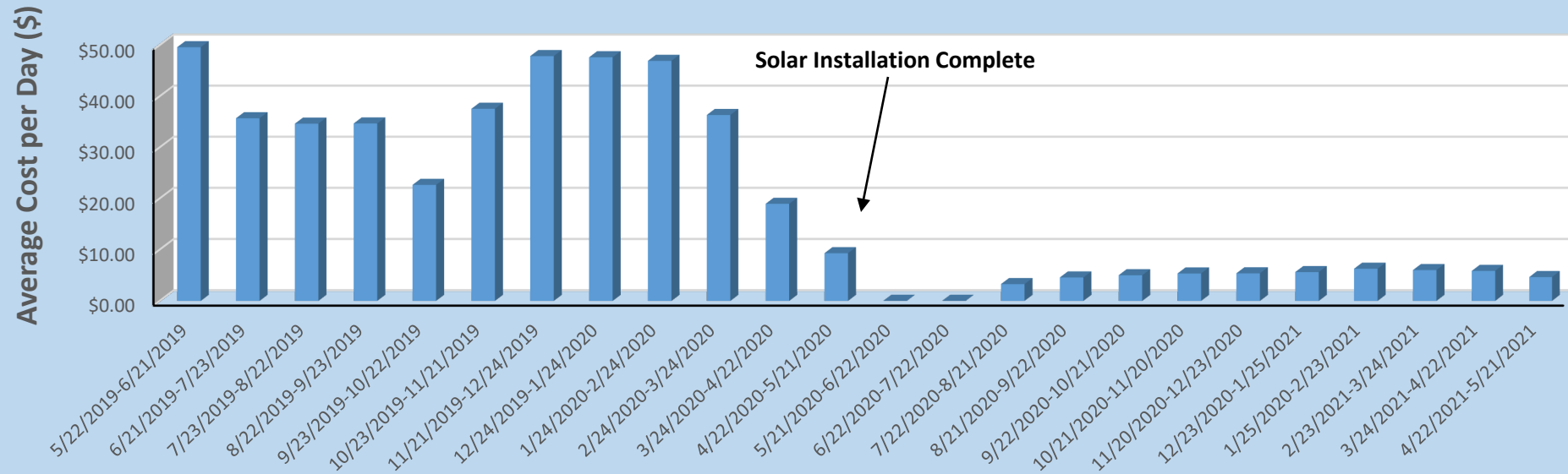


Monthly Power Bills Pre and Post Solar Installation



Pre solar monthly power bills averaged \$1,110; after installation the average bill was \$132.

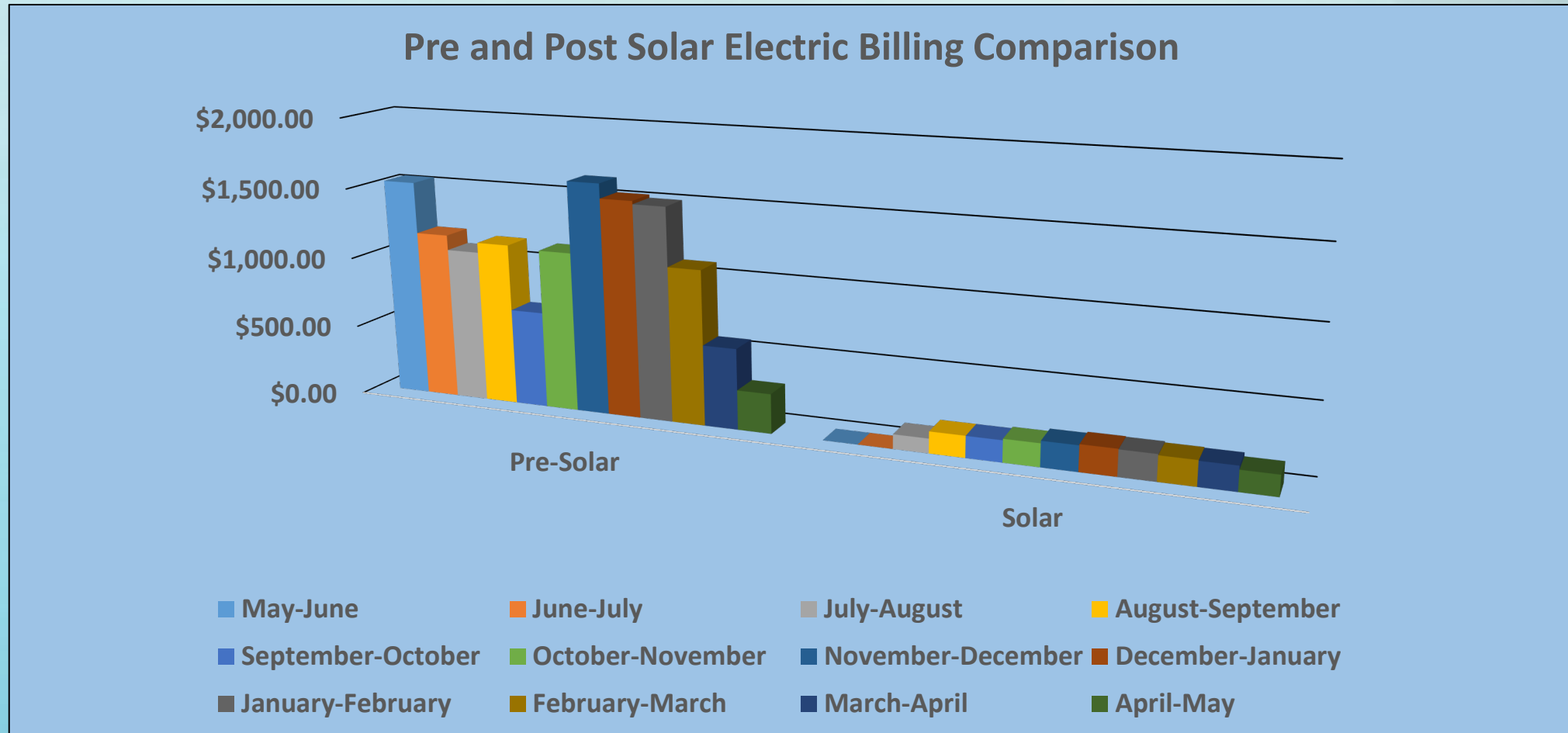
Electric Cost Per Day to Operate RCFH



Average Cost per Day, in Dollars, by Billing Month Period, to Operate RCFH

Pre solar daily electric cost averaged \$35.15; after installation the cost dropped to \$4.33.

Year over Year Comparison



Financials... The Buck Stops Here

➤ Pre Solar Electric Bill Total: \$13,330.59

➤ Yearly Electric Bill with Solar: \$1,595.07

➤ Savings: \$ 11,734.89



www.pinterest.com

What Can We Do With The Money Saved On Electricity?

- The money saved by switching to solar can be used to buy fish food – a lot of it!
 - RCFH currently spends ~\$750 per year on fish food.
 - \$11,734.89 money saved by solar
\$750 per year food costs
= **over 15 years of fish food!**
- The money saved could be used for payroll:
 - The hatchery spends ~\$55,000 per year on labor.
 - \$11,734.89 money saved by solar
\$55,000 payroll per year
= **2.1 months of payroll!**



<https://www.bio-oregon.com/>



<https://www.pymnts.com/>

Project Participants

Tolowa Dee-ni' Nation

- Grant Administrators
- Prepared the landscape for panel installation along with guidance from Greenwired
- Will assist in maintaining the system

Rowdy Creek Fish Hatchery

- Provided site knowledge to Greenwired
- Will assist in maintaining the system

Greenwired Renewable Energy Solutions

- Designed and constructed the system
- Assisted with getting the required permits
- Obtaining interconnection agreement with Pacific Power
- Assisted with any additional needs required to construct and operate the PV system



SPECIAL THANKS



U.S. DEPARTMENT OF
ENERGY

Office of
Indian Energy



GREENWIRED[®]
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