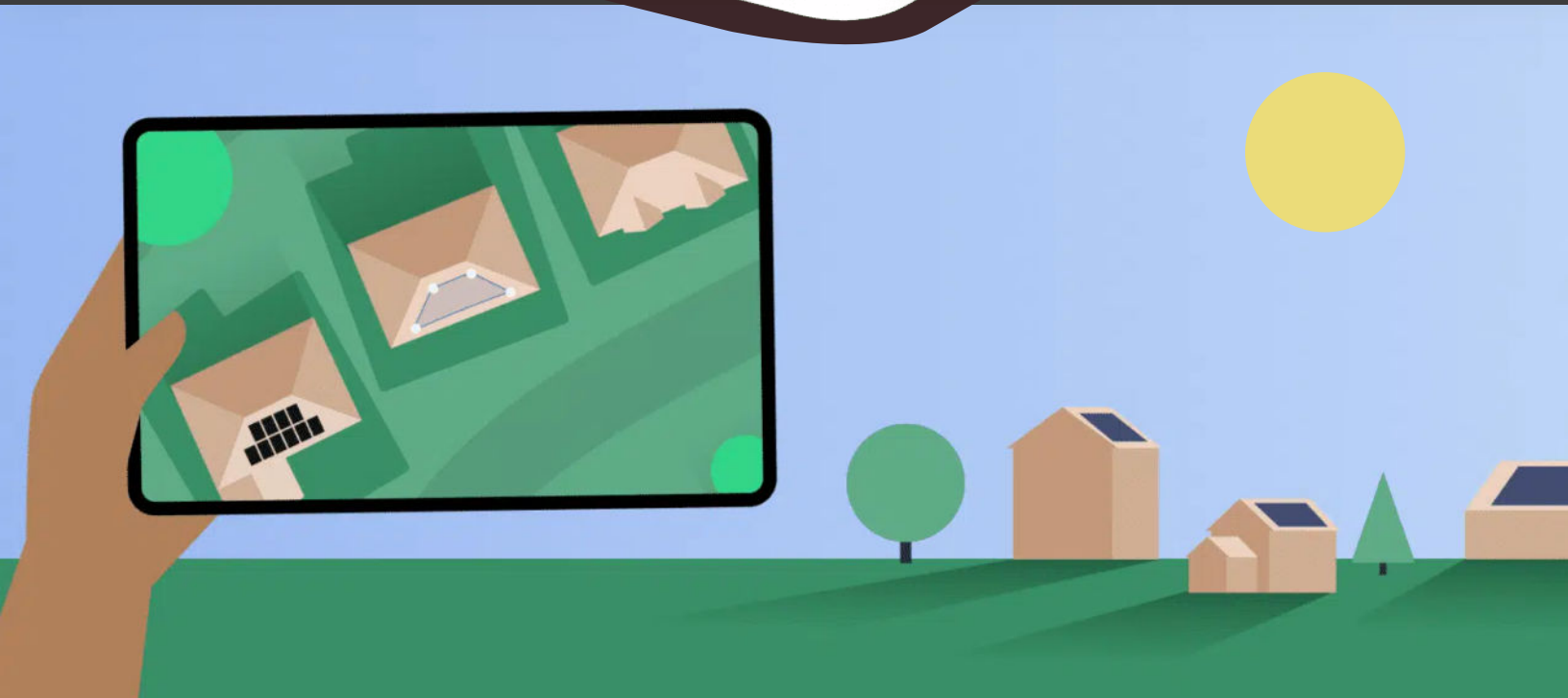
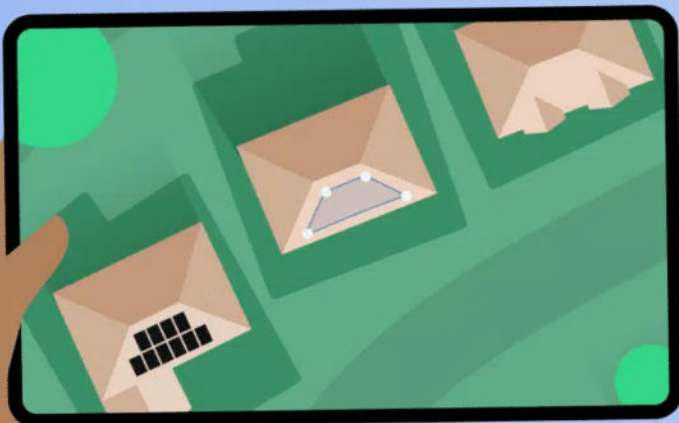
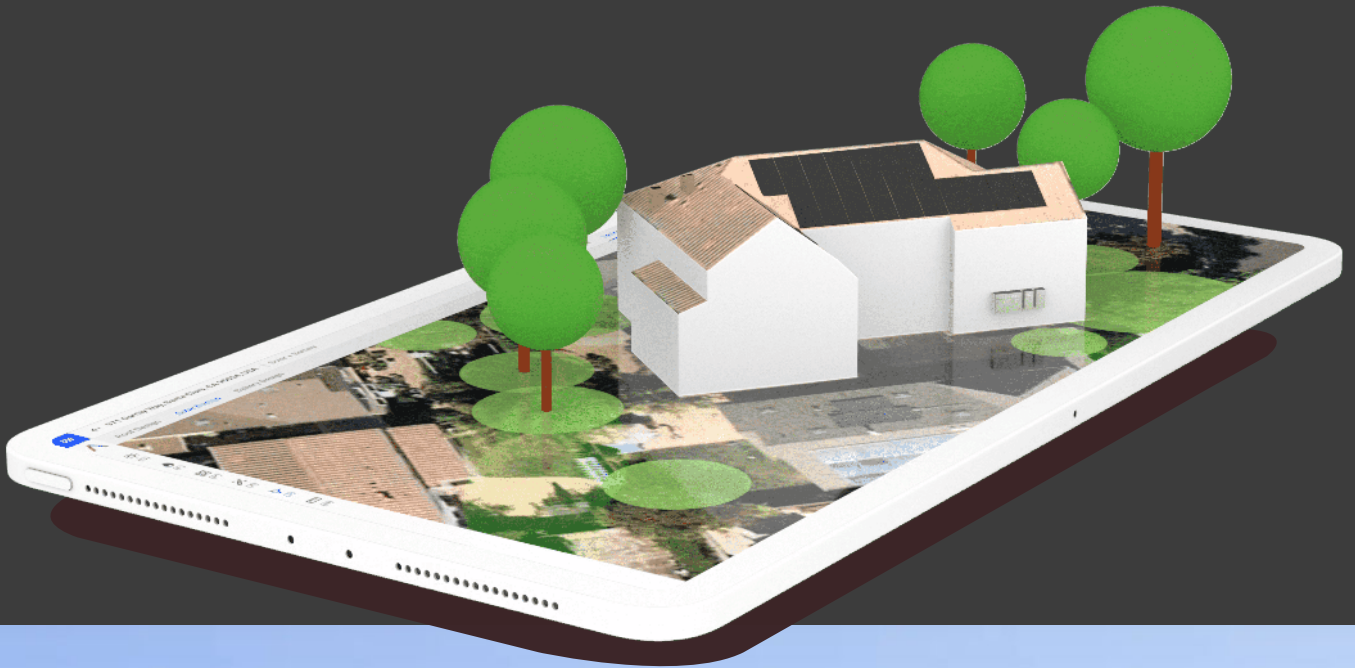


NEM 3.0 in Solargraf



1. Introduction

California's new Net Billing Tariff (NBT), or NEM 3.0, is the successor tariff to NEM 2.0. NEM3.0 incentivizes customers to move from the installation of solar-only systems to solar + battery systems. This evolution of residential solar systems from NEM 2.0 to NEM 3.0 was motivated by the need to match energy supply and demand in the grid through the creation of a market-driven tariff structure.

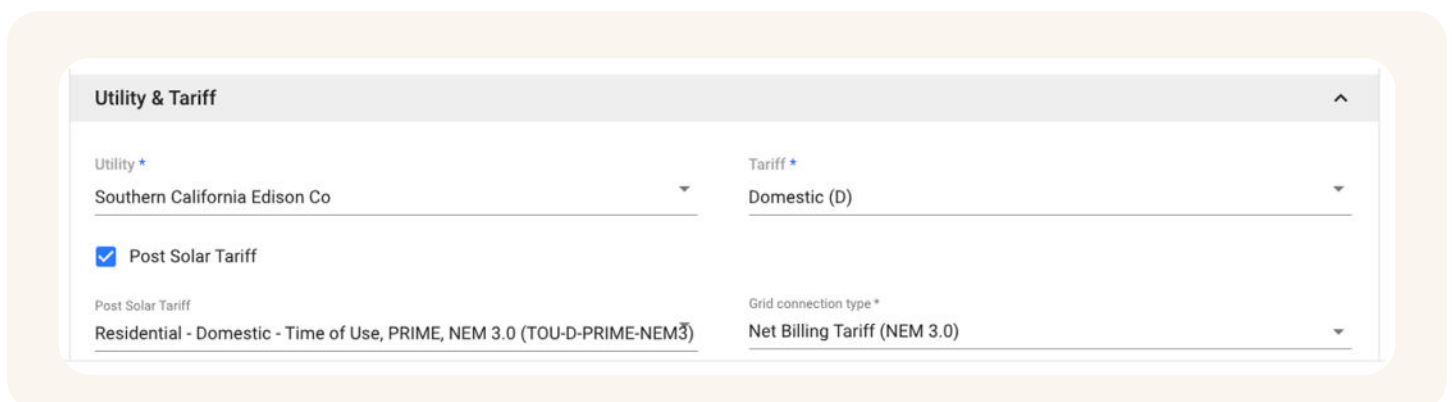
Enphase has developed a comprehensive solution that can improve homeowner ROI under the NEM 3.0 tariff mechanism. We will show that adding a small grid-tied battery to a solar system can significantly improve the homeowner's utility bill offset from 55% for solar-only systems to 70%–90%, while delivering a payback period of about 5 to 7 years. We will also show that this solution is very easy to design, install and commission. Our Solargraf tool will also allow installers to generate quick and easy proposals. Homeowners will still have a choice to opt for a larger solar and battery system that improves payback under NEM 3.0, as well as providing backup power when the grid fails.

The Solargraf design tool from Enphase helps our installer partners to quickly and easily design solar and battery systems to operate under NEM 3.0 tariffs. The key to this tool is the software simulation and optimization engine—the same as the software engine that is part of the Enphase Energy System. This ensures that the proposal generated for the homeowner and its financial analysis matches the system's actual operation. This is possible because the hardware and software are all built by Enphase, and there is an intimate knowledge about the operation of the hardware and software system.

2. Solargraf's capabilities supporting NEM 3.0

2.1 Accurate proposals using exact 25-year CPUC rates

Solargraf offers users a wide range of NEM 3.0 tariffs from the CA utilities which are auto fetched and updated frequently with the tariff rate structure changes. Both commercial and residential NEM 3.0 tariffs are available.



The screenshot shows a configuration panel titled "Utility & Tariff" with a collapse arrow in the top right. It contains the following fields:

- Utility ***: A dropdown menu with "Southern California Edison Co" selected.
- Tariff ***: A dropdown menu with "Domestic (D)" selected.
- Post Solar Tariff**: A checkbox that is checked.
- Post Solar Tariff**: A text field containing "Residential - Domestic - Time of Use, PRIME, NEM 3.0 (TOU-D-PRIME-NEM3)".
- Grid connection type ***: A dropdown menu with "Net Billing Tariff (NEM 3.0)" selected.

Solargraf’s financial calculations utilize the published CPUC 25 year (until 2050) hourly sell rates (8760) and apply year on year fixed sell rate inflation for accurate modelling. The tool auto applies the adder component which is applicable for PGE and SCE residential users for the first 9 years of the simulation. The adder is adjusted based on low-income and non-low-income customers, providing an accurate savings simulation for low- income customers.

2023 Weekday Base Export Compensation (no adders)												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1	0.053	0.056	0.049	0.047	0.050	0.049	0.051	0.054	0.053	0.050	0.054	0.051
2	0.053	0.056	0.049	0.048	0.052	0.050	0.052	0.053	0.052	0.051	0.057	0.050
3	0.051	0.056	0.050	0.047	0.051	0.051	0.050	0.053	0.051	0.050	0.054	0.049
4	0.051	0.055	0.050	0.048	0.051	0.052	0.050	0.052	0.051	0.050	0.053	0.049
5	0.051	0.056	0.051	0.049	0.055	0.050	0.051	0.053	0.050	0.050	0.054	0.048
6	0.053	0.057	0.052	0.050	0.053	0.052	0.053	0.053	0.052	0.051	0.056	0.051
7	0.056	0.058	0.053	0.040	0.036	0.052	0.054	0.055	0.053	0.052	0.058	0.056
8	0.057	0.060	0.048	0.014	0.018	0.045	0.050	0.056	0.048	0.051	0.061	0.061
9	0.055	0.048	0.032	0.009	0.007	0.038	0.050	0.055	0.039	0.043	0.048	0.055
10	0.048	0.031	0.020	0.011	0.011	0.037	0.050	0.055	0.040	0.043	0.046	0.048
11	0.046	0.026	0.018	0.008	0.012	0.039	0.050	0.055	0.040	0.043	0.041	0.045
12	0.046	0.028	0.018	0.004	0.009	0.039	0.050	0.055	0.040	0.043	0.037	0.042
13	0.045	0.027	0.018	0.002	0.008	0.041	0.049	0.056	0.042	0.044	0.038	0.042
14	0.044	0.028	0.018	0.001	0.008	0.088	0.051	0.060	0.045	0.047	0.039	0.043
15	0.046	0.029	0.021	0.001	0.009	0.143	0.060	0.117	0.057	0.099	0.042	0.046
16	0.052	0.041	0.032	0.006	0.019	0.207	0.075	0.133	0.116	0.120	0.069	0.059
17	0.061	0.062	0.051	0.024	0.038	0.225	0.213	0.315	0.135	0.167	0.067	0.063
18	0.063	0.062	0.063	0.064	0.068	0.285	0.227	0.499	2.372	0.126	0.070	0.067
19	0.066	0.064	0.073	0.072	0.074	0.251	0.226	0.727	2.680	0.126	0.071	0.069
20	0.065	0.064	0.075	0.090	0.088	0.195	0.134	0.340	0.202	0.072	0.068	0.069
21	0.062	0.063	0.067	0.068	0.076	0.088	0.092	0.281	0.089	0.066	0.065	0.067
22	0.059	0.061	0.059	0.060	0.062	0.074	0.083	0.192	0.081	0.059	0.062	0.065
23	0.056	0.059	0.052	0.056	0.057	0.058	0.055	0.061	0.061	0.054	0.060	0.057
24	0.055	0.058	0.051	0.052	0.055	0.054	0.054	0.060	0.061	0.056	0.057	0.055

Figure 1: PGE sell rate structure

2.2 Optimized and improved Payback

1. Modelling export mode

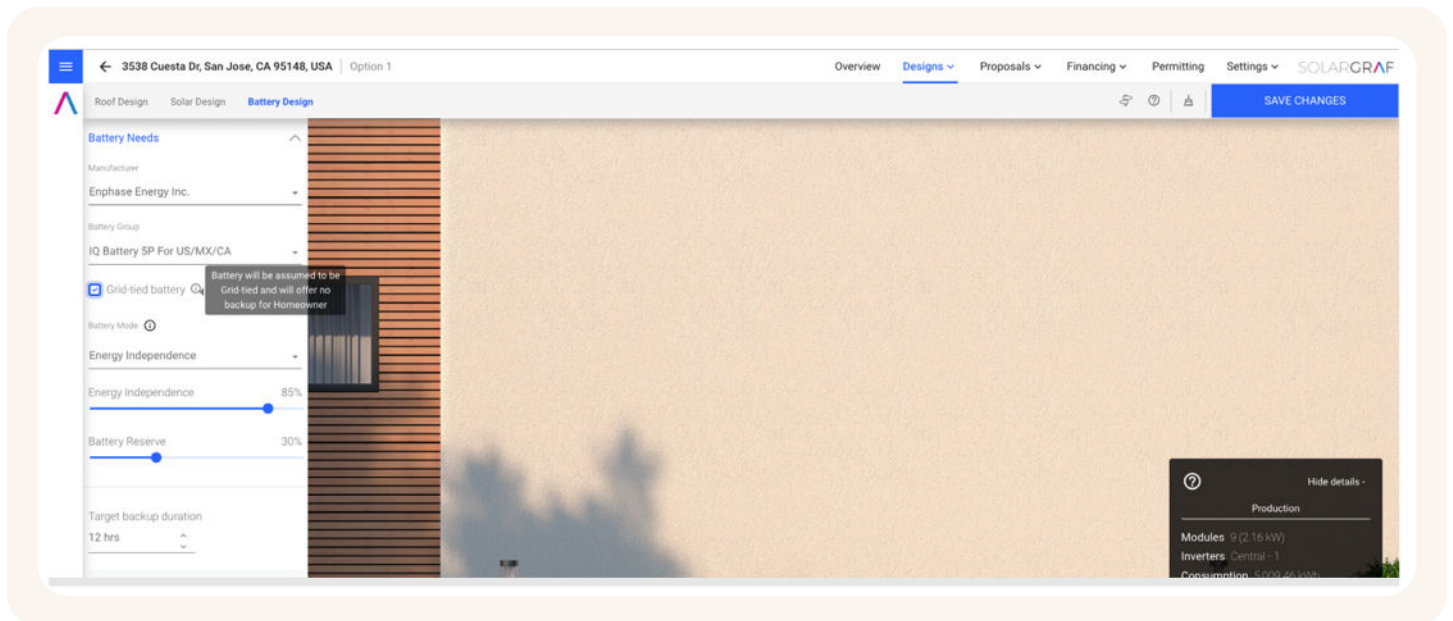
Under NEM 3.0, solar systems that sell excess energy to the grid, in the middle of the day, are poorly compensated, at near wholesale rates. However, selling energy during certain periods of the year, when demand on the grid is high, the compensation is also very high. Homeowners with a battery will be able to capitalize on this opportunity by earning high \$ credits that can be used for future bill offsets.

Solargraf offers modelling of battery in export mode which allows discharging during the peak export rate hours, providing users monetary export credits. The battery then operates in a self-consumption mode and prioritizes discharge as soon as energy is needed at home, allowing total energy independence.

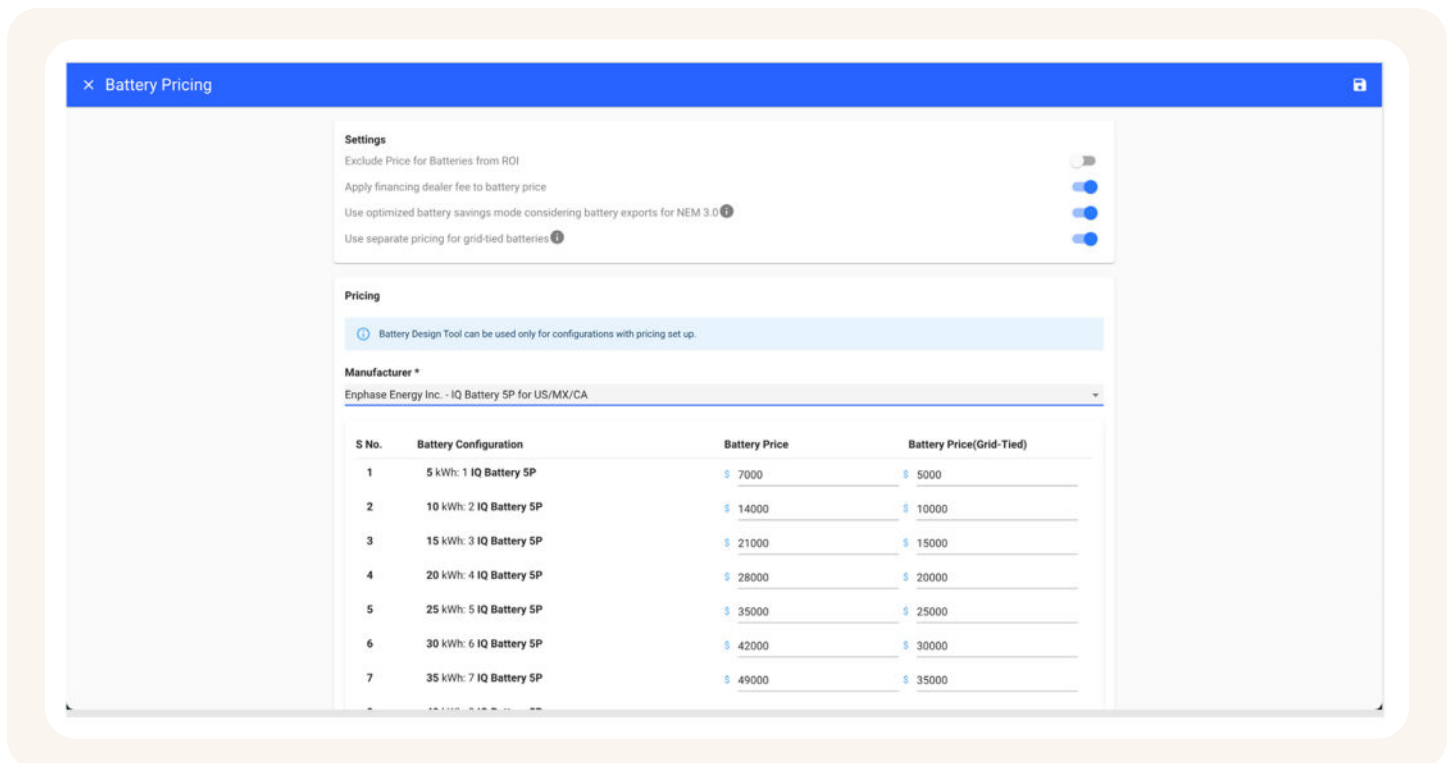
2. Modelling grid tied solutions

Grid-tied storage solutions help homeowners reduce the overall cost and installation complexities while providing the benefits of self-consumption. Grid tied systems typically reduce the cost of installations by almost \$4K.

The Solargraf platform offers a customized, grid-tied battery storage solution in the modelling tool with a single click. Solargraf tailors the web-quote to reflect the reduced grid-tied pricing and calculates the benefits of self-consumption and bill savings.

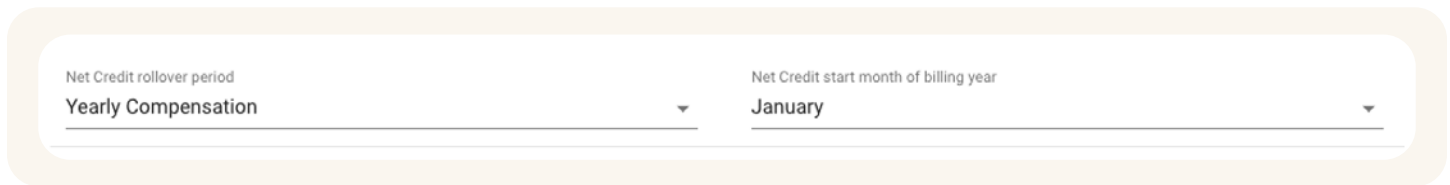


Users can perform a one-time administrative activity to customize both the grid-tied and grid-agnostic pricing structure in account settings. This allows Solargraf to automatically pick the appropriate pricing for the added battery to the project. Users then save time by editing the price at the project level each time a grid-tied battery is included.



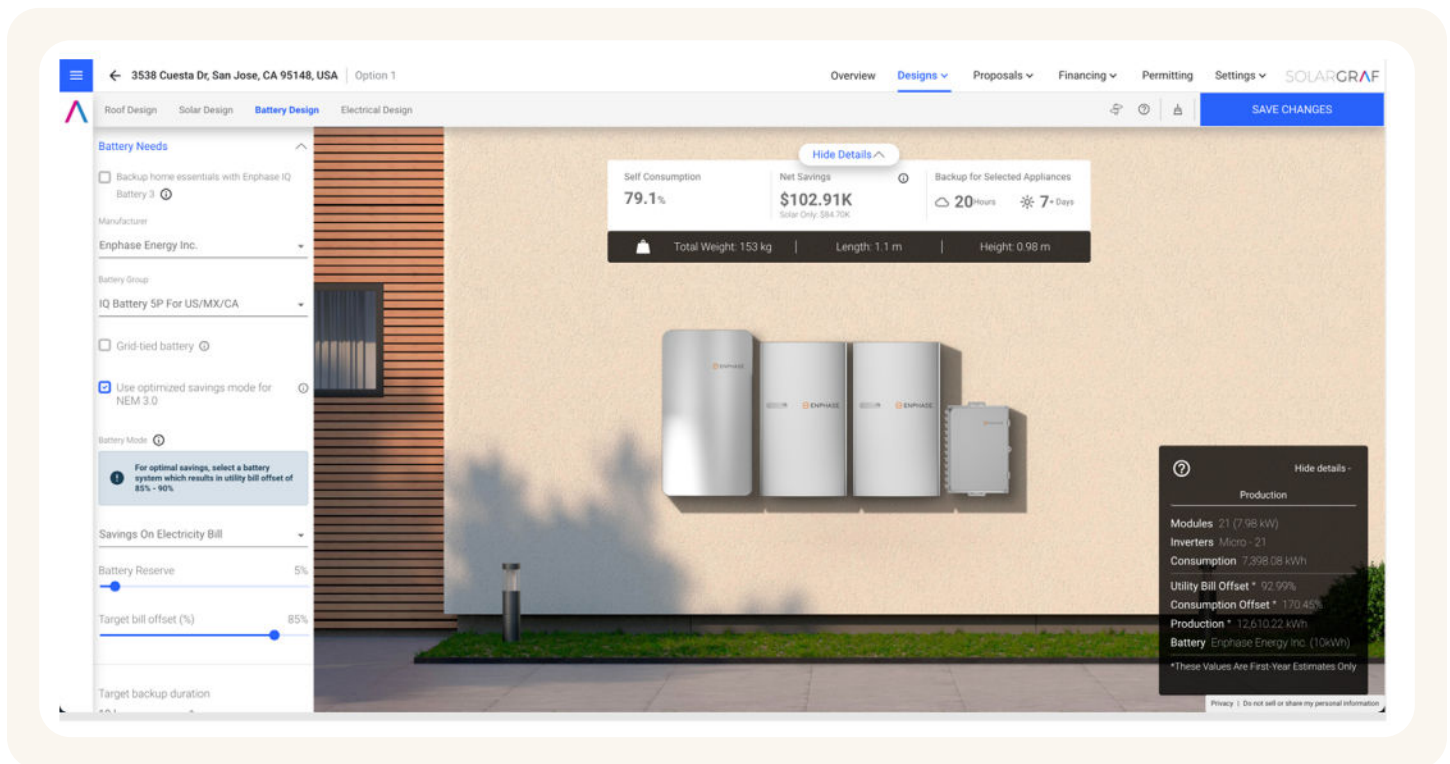
3. Setting up Annual True-up period correctly

Solargraf utility settings offer users the flexibility to set the yearly true up period. Financial simulations are adjusted according to the user's selection for annual true-up and credit roll over calculations. The platform will help determine the best true up month for the Homeowner.



2.3 Comprehensive storage modelling with recommendations

The Solargraf platform comes with detailed storage modelling capability. Users can add from a wide range of ESS devices offered by various manufacturers. If Homeowner wants to use the storage for “Home Energy Backup”, Solargraf enables installers to model various home appliances to accurately size the battery for backup needs. Similarly, Solargraf can recommend a battery based on “Self-consumption” or “Savings” needs.



3. Conclusion

The future of California’s solar industry is bright. As we move towards whole home electrification, the need for solar, batteries, and EV chargers will continue to increase along with market-based utility pricing.

Solargraf allows installers to model complex interactions between solar, batteries, consumption, and NEM 3.0 tariff, to provide simple yet compelling proposals. The key to this tool is the software simulation and optimization engine—the same as the software engine that is part of the Enphase Energy System. This ensures that the proposal generated for the homeowner, and its financial analysis, matches the system’s actual operation.

Solargraf provides a comprehensive solution to model an proposal that can provide a quick payback to homeowners under NEM 3.0. The platform provides actual CPUC rates to accurately model financials , battery export mode to monetize peak export rates, grid-tied solutions to lower cost and definition of true-up period that helps to optimize returns.

Revision history

REVISION	DATE	DESCRIPTION
DSH-00105-1.0	October 2023	Initial release

Needs to be updated

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