# Transforming C&I Energy Storage:

*The Power of Partnership Between Energy Toolbase and Yotta Energy*

# WEBINAR AGENDA

- The Collaboration & Benefits to Customers
- Advantages of Yotta Energy's Solar & Storage Solutions
- Optimize Your System with Acumen EMS™ Controls
- Demo in ETB Developer
- Q&A Session

energy toolbase

# SPEAKERS

**Scott D'Ambrosio**
VP Sales
Energy Toolbase

**Andrew Tanner**
Chief Technology Officer
Yotta Energy

**Stephen McVicar**
Manager, Business Dev
Energy Toolbase

**Mitch Sargent**
Business Dev & Sales Manager
Yotta Energy

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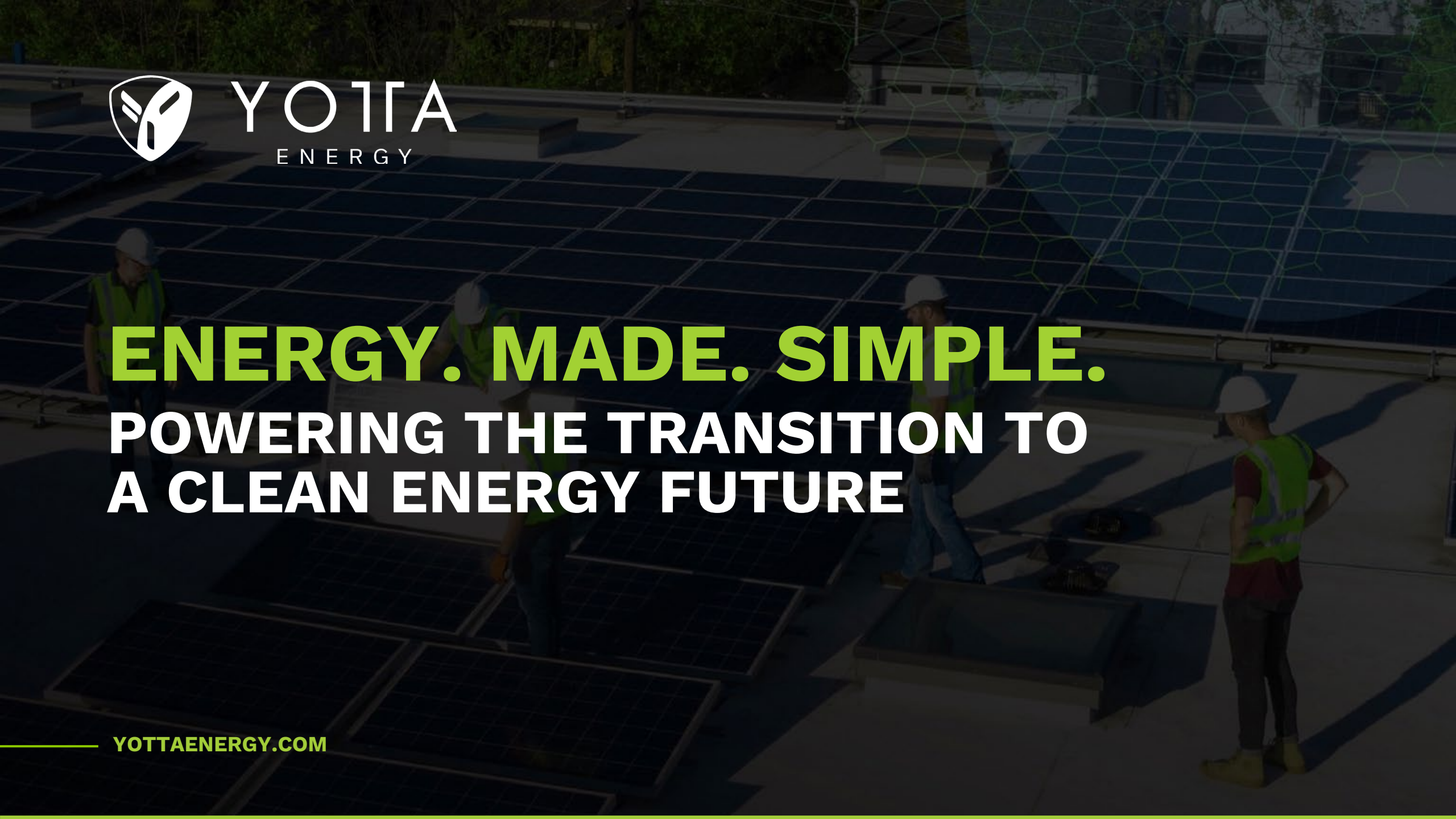



# ENERGY. MADE. SIMPLE.

## POWERING THE TRANSITION TO A CLEAN ENERGY FUTURE

YOTTAENERGY.COM

YOTTA ENERGY

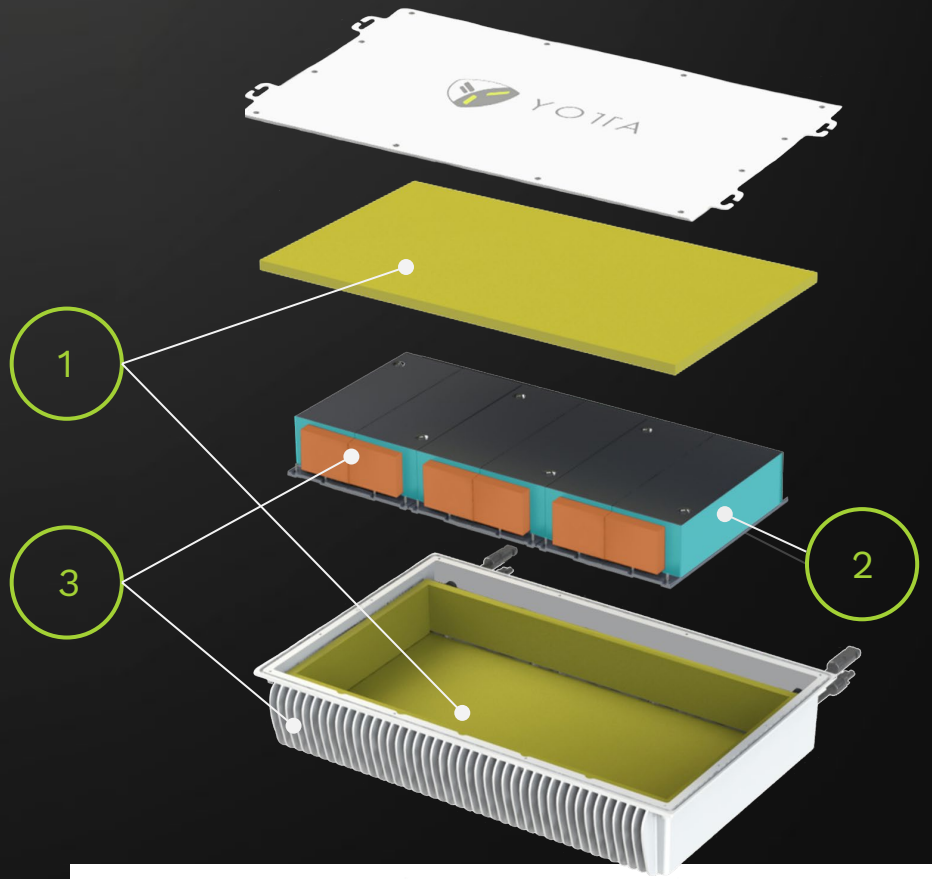
WHO WE ARE

# Simplified Storage

**ENERGY. MADE. SIMPLE.** Yotta is **leading the transition** to clean, renewable energy. We are a **renewable energy company** headquartered in **Austin, Texas**, with a complete range of distributed solar energy technologies for the **Commercial & Industrial Market**. Yotta's technologies are made with the goal to **convert commercial buildings into solar power plants**.

The **electrification of vehicles** will be the most significant paradigm shift in our lifetime. We are committed to supporting this transition with **on and off-grid solutions.** Stepping toward a future where **vehicles can fill up on sunshine**.

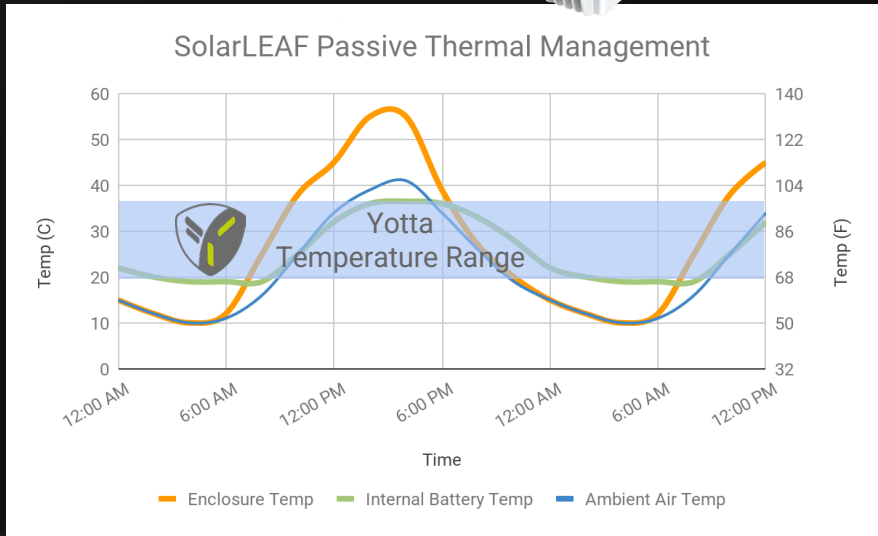
# Enabled by Yotta's Breakthrough Patented Thermal Management




## Yotta's Phase-Change / Heat-Exchange technology:

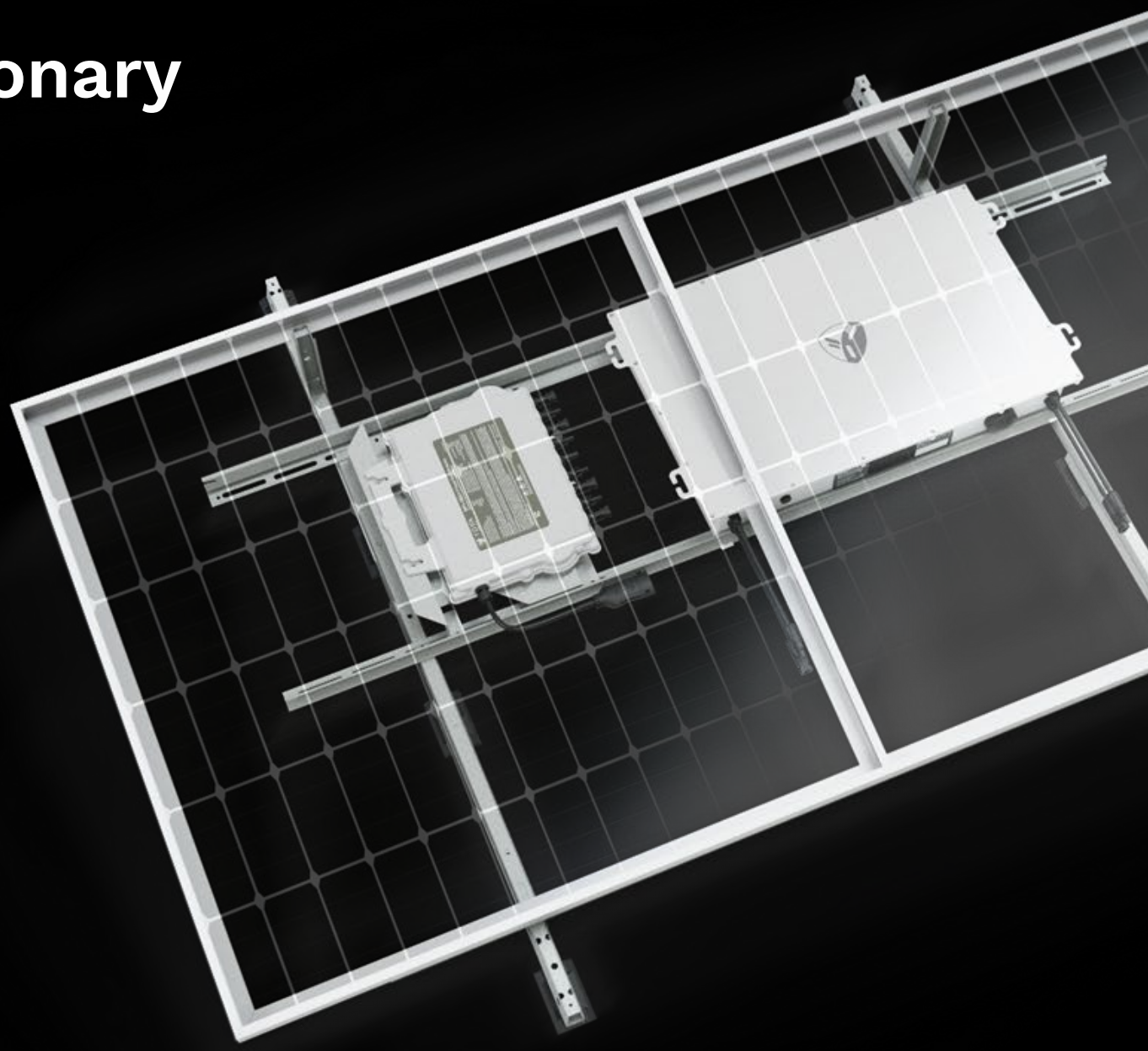
- Passively maintains batteries at their preferred working temperature range (70-100°F) → **prolonged life**
- Is entirely solid-state, with no moving parts, requiring no electricity to thermally regulate → **no maintenance for the life of the product**
- Core patent issued. Two additional patents pending
- Battery Chemistry (LiFePO 4 ("LFP")) = Safest chemistry on the market (no thermal run away), and longer battery life
- 3rd party verified performance and ongoing field testing:

NREL NATIONAL RENEWABLE ENERGY LABORATORY  RETC  SwRI



# Yotta Energy’s Revolutionary Approach

- The World’s first truly integrated Solar+Storage solution
- Simplified installation & minimal maintenance
- Maximum flexibility & highest efficiency
- Architecture that easily grows with energy demand
- Highest safety in application
- Lowest system cost



# Yotta Energy:  Architecture Benefits

## Yotta Energy DPI 208V / 480V Microinverter

- Low voltage, no fire risk
- Higher production
- Panel visibility
- Rapid shutdown compliant
- Easier troubleshooting, higher customer satisfaction

## Yotta Energy SolarLEAF:

- Modular and scalable
- Solves the “Where do we put it?” question
- Energy Arbitrage and/or Real-Time Peak Shaving
- Demand Response Revenue
- Quickens payback times & increases overall savings!

**** Together, this is the safest and most productive system on the market!***

# Batteries make sense.

## But what type?

<u>Centralized vs. Yotta's Decentralized</u>

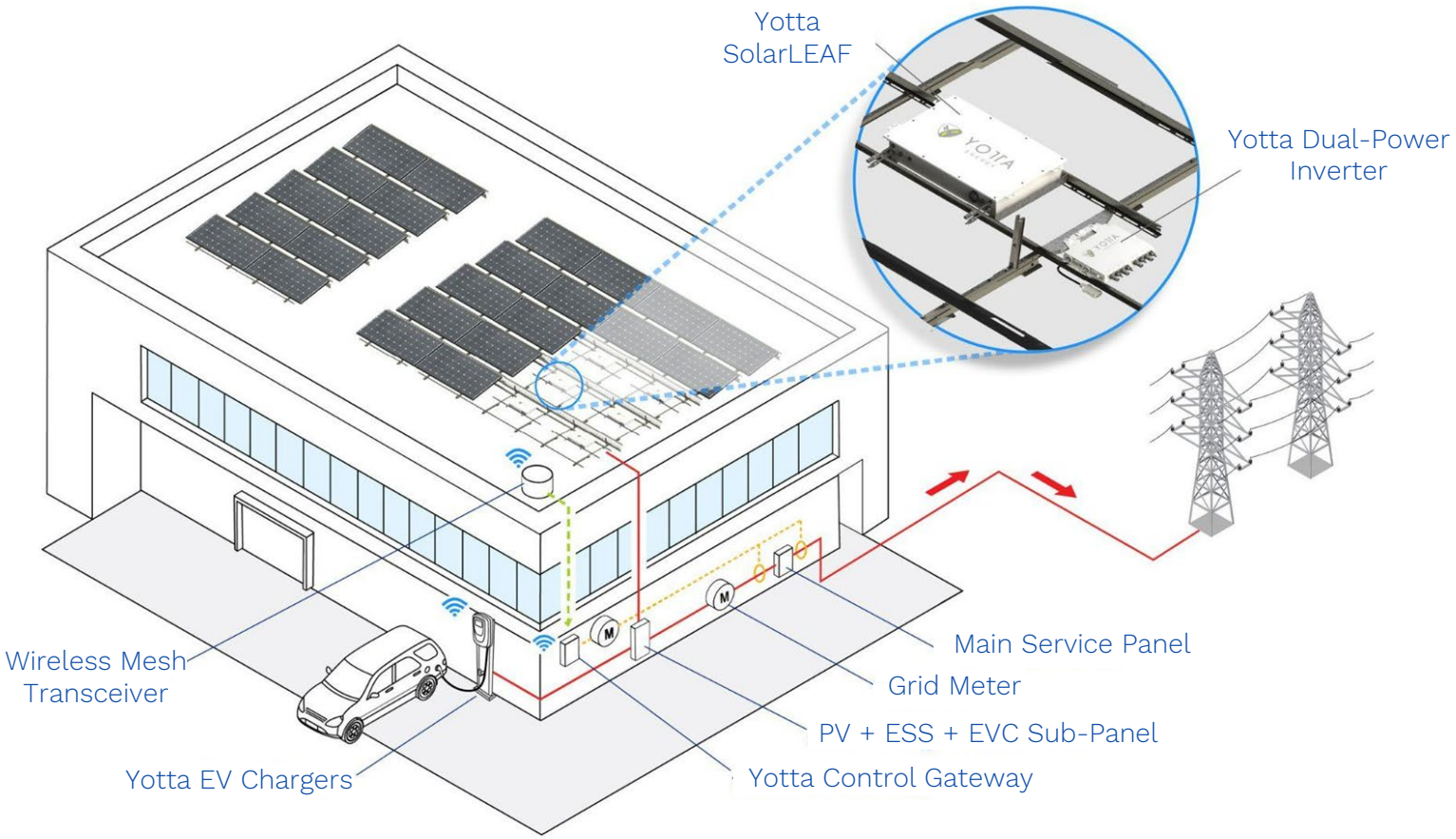
Centralized storage is big, bulky, and has high installation and maintenance costs

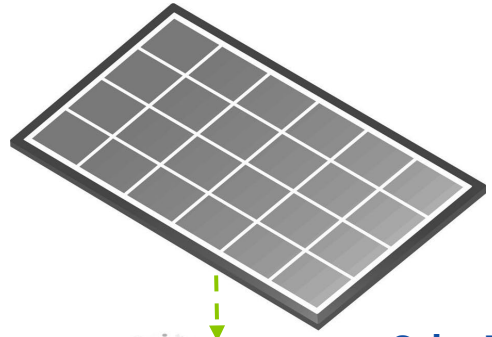
Yotta's decentralized approach makes the process **easier and cheaper**

Not only cheaper to install, but also ***maintain***

# Yotta's PV-Coupled Architecture

Decentralized Approach, Scalable by Design

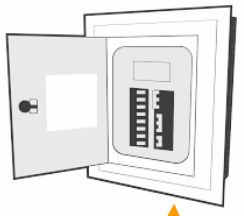


**Solar PV Module (up to 600W)**

**Yotta SolarLEAF Energy Storage**

**Yotta Dual-Power Inverter (DPI)**
- 208V or 480V
- +600W panel

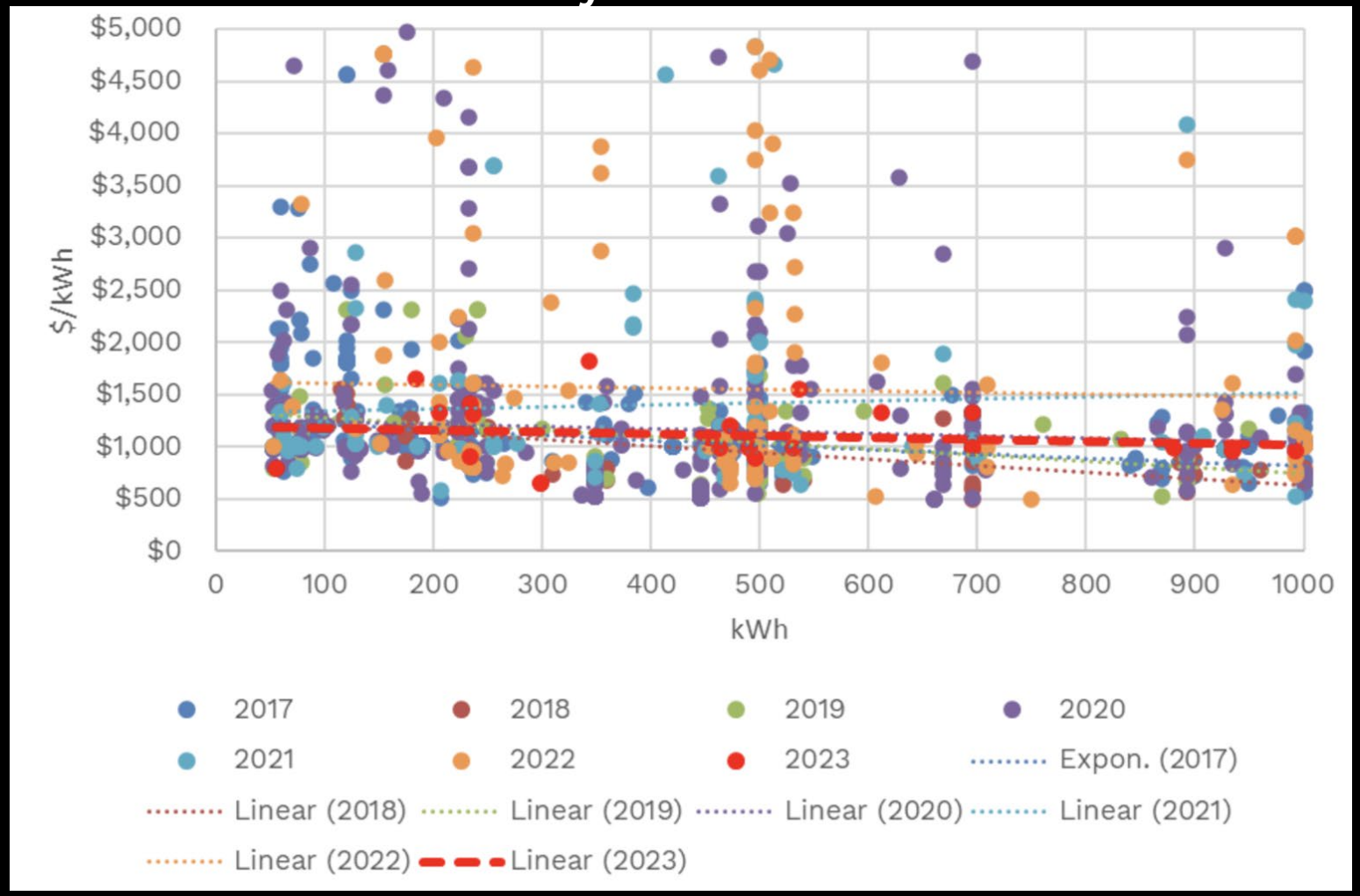


**Solar + ESS + EVC Electrical Sub-Panel**

**Main Service Supply**

# California "Installed Cost" Data

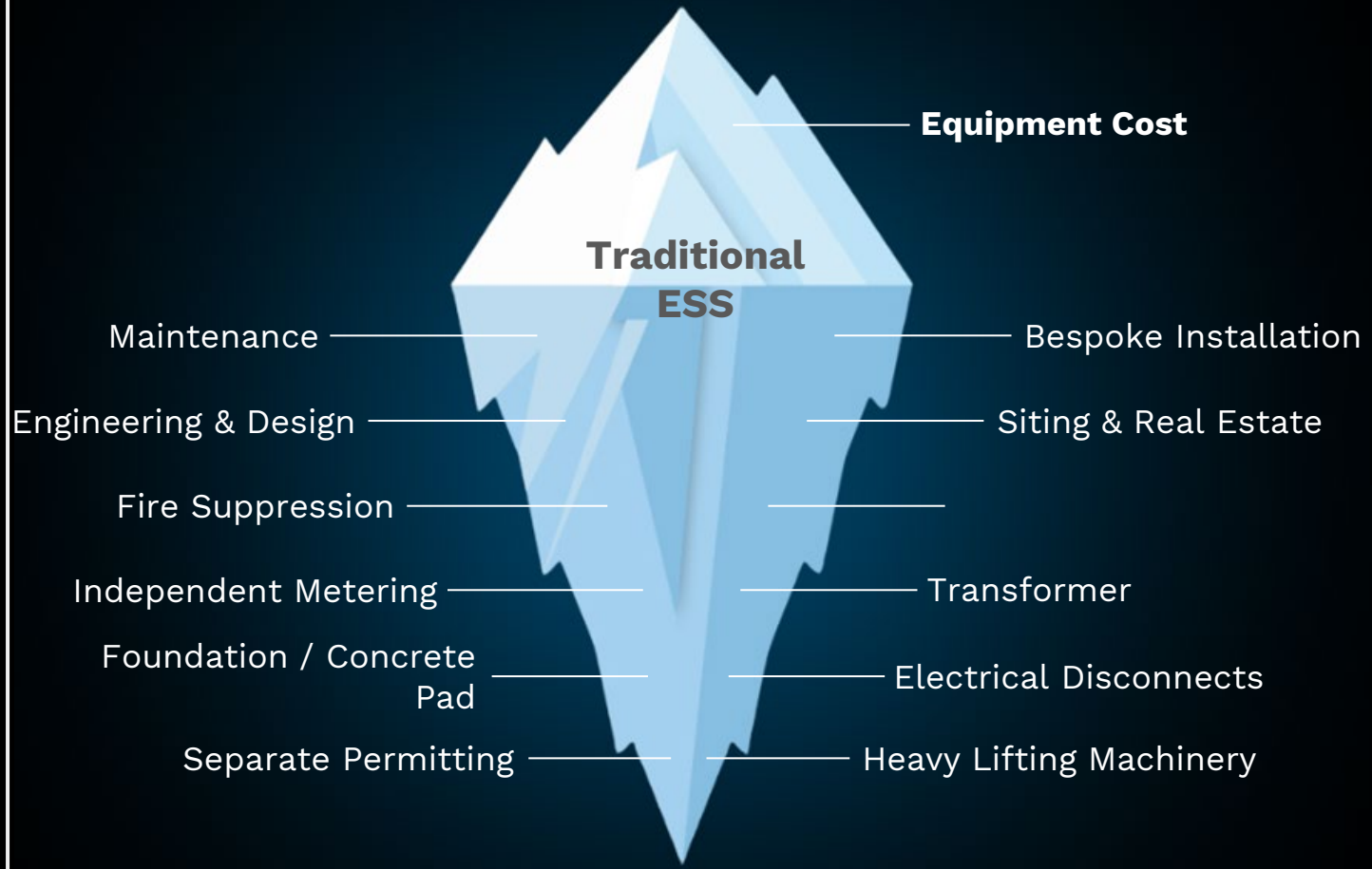
## California SGIP Installed System Cost Data

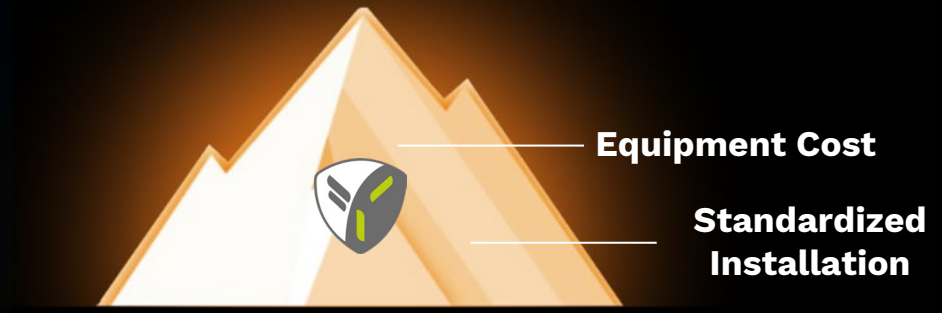



- More than 1500 systems data have been analyzed to show market prices.
- Huge variations in actual installed when factoring in all variables

# Standardization of ESS integration

*Yotta solves the complexities of ESS*




Yotta's approach **standardizes** the engineering design and installation of the energy storage system through **direct integration** with the solar system.

Yotta also **solves** one of the biggest challenges for C&I: **Where** are you going to put the battery?

# Why Yotta Batteries?

1. **Energy Arbitrage:** The PV charges the battery in the morning, when energy is cheap, and discharges it later in the afternoon when TOU rates are high. Also can help reduce exports.

1. **Peak Shaving:** Reduces non-coincident demands using AI to determine how best to dispatch the batteries. This system works in real-time. It also does arbitrage.

1. **Demand Response Revenue:** ETB unlocks the ability to participate in Utility Demand Response Programs, bridging your client more revenue.

1. **New Utility Rate Plans:** Adding an ESS may allow your customer to switch to a more beneficial rate plan

***NOT FOR BACKUP***

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# Why Yotta Batteries?

## To Reduce Energy AND Demand Charges!

**Utilities charge commercial customers in 2 ways:**

1. Energy consumed ("How much water did you use to fill your pool?")
2. Demand charges ("Did you fill your pool with a firehose or garden hose?)

**** Yotta's ESS can reduce demands and make clients eligible for tariff swaps***

**Typically this works out to be:**

50% Energy Charges

50% Demand Charges

SDGE
A Sempra Energy utility

ACCOUNT NUMBER DATE DUE

DATE MAILED Jul 31, 2014 Page 2 of 4

**1-800-336-SDGE (7343)** *English*
1-800-311-SDGE (7343) *Español*
1-877-889-SDGE (7343) *TTY*
**www.sdge.com**

### Detail of Current Charges

***Electric Service***

Rate: ALTOUCP2-Industrial Climate Zone: Coastal
Billing Period: 6/26/14 - 7/28/14 Total Days: 32
Meter Number: *(Next scheduled read date Aug 27, 2014)* Cycle: 20
Meter Constant: 4,000.000 Billing Voltage Level: Primary
Circuit: 1077 Block: 133A
Total Usage: 785,100 *(Usage based on interval data)*

**ELECTRIC CHARGES** Amount($)

Time of Use Customer Charge 37.35

Electricity Delivery *(Details below)* 785,100 kWh

| SUMMER USAGE | On-Peak | | Semi-Peak | | Off-Peak | | |
|---|---|---|---|---|---|---|---|
| kWh used | 203,892 | | 242,952 | | 338,256 | | |
| Rate/kWh | $.00632 | | $.00632 | | $.00632 | | |
| Charge | $1,288.60 | + | $1,535.46 | + | $2,137.78 | = | 4,961.84 |

| | | |
|---|---|---|
| Summer On-Peak Demand | 1,632.0 kW x $9.72 | 15,863.04 |
| Summer Non-Coincident Demand | 1,632.0 kW x $21.33 | 34,810.56 |
| DWR Bond Charge | 785,100 kWh x $.00513 | 4,027.56 |

Electricity Generation *(Details below)* 785,100 kWh

| SUMMER USAGE | On-Peak | | Semi-Peak | | Off-Peak | | |
|---|---|---|---|---|---|---|---|
| kWh used | 203,892 | | 242,952 | | 338,256 | | |
| Rate/kWh | $.10608 | | $.09713 | | $.07094 | | |
| Charge | $21,628.86 | + | $23,597.93 | + | $23,995.88 | = | 69,222.67 |

| | | |
|---|---|---|
| DWR Revenue Adjustment | | -1,193.35 |
| Capacity Reservation Demand | 0.0 kW x $5.41 | .00 |
| | ***Total Electric Charges*** | **$127,729.67** |

**Other Important Phone Numbers**

For emergencies and to report outages, please call 24 hours a day, 7 days a week . . . . . **1-800-611-7343**

To locate underground cables & gas pipes, please call DigAlert, Monday-Friday, 6am-7pm . . . . . **8-1-1**

**Payment Options $**

**Online:** It's fast, easy and free. Just register or sign into My Account at https://myaccount.sdge.com

**Home banking:** If you pay bills online through your bank, check with them to see if you can receive your bill online.

**Automatic Pay:** Have your payment automatically deducted from your account. For more information, call 1-800-411-SDGE (7343) or visit www.sdge.com

**Pay by Phone:** Call 1-800-411-SDGE or visit www.sdge.com to enroll. Once enrolled, you may authorize a payment from your checking account any day up to and including the bill due date.

**By Mail:** Mail your check or money order, along with the payment stub at the bottom of your bill, in the enclosed envelope to SDG&E, PO Box 25111, Santa Ana, CA 92799-5111

**ATM/Debit/Credit Card or Electronic Check:** You can use most major ATM/Debit cards, MasterCard and Visa credit cards, or the Electronic Check thru BillMatrix. A convenience fee is charged. Contact BillMatrix at 1-800-386-0067 or visit www.sdge.com/epay.

**In Person:** To find the nearest location and hours of operation, call 1-800-411-SDGE (7343) or visit www.sdge.com.

**Need help paying your bill?** Call us for programs and services at 1-800-411-SDGE (7343) or visit www.sdge.com.

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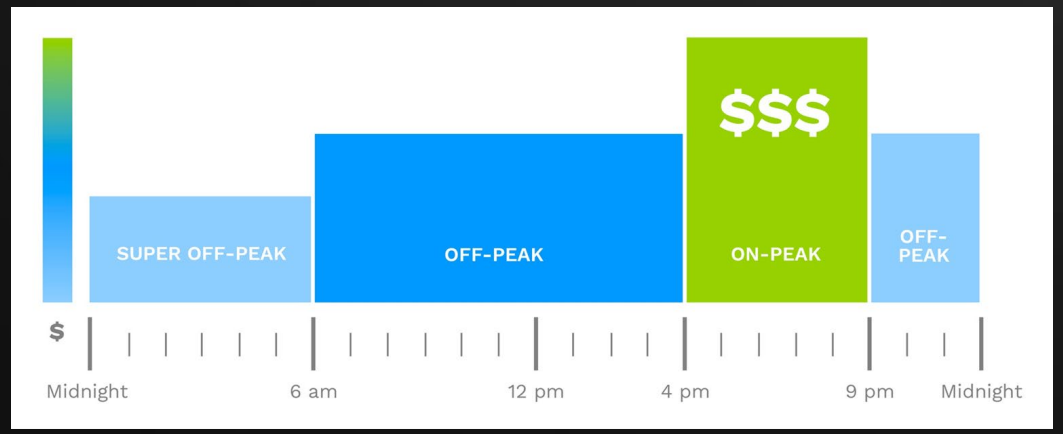
# Demand Escalation & Tariff Reforms:

## "Future Proofing with Batteries"

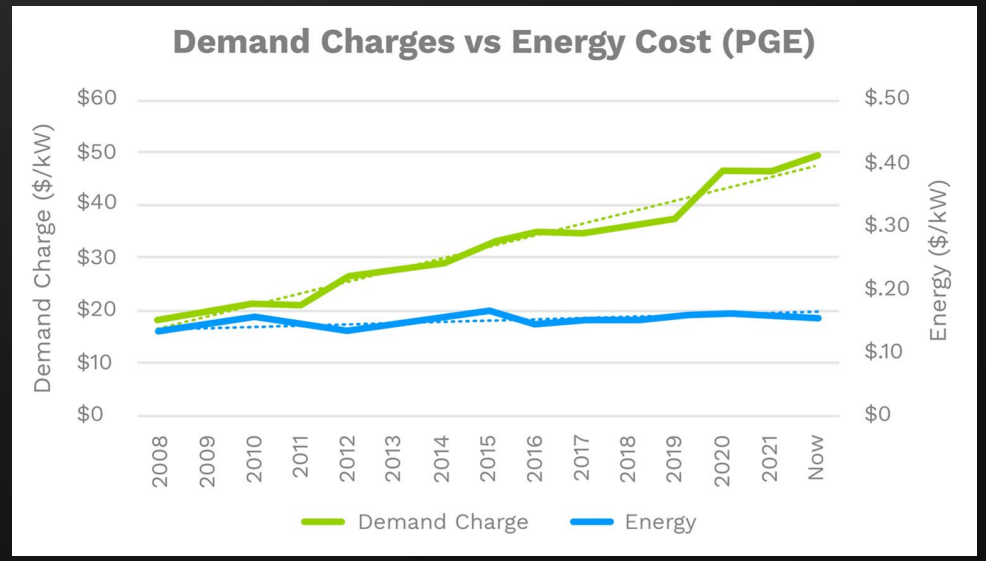
**Utilities are constantly shifting the goalposts to preserve their bottom-line and the fact that so many consumers are going solar.**

**Two key things have been happening:**




**1.** The peak period has shifted to later in the day, decreasing the value of the solar but also increasing the cost of electricity considerably late in the day.

- ★ *Yotta's ESS can discharge the batteries when it makes most financial sense for the customer.*




**2.** Demand charges have been escalating annually at an average of 8%, compared to only 2% for energy.

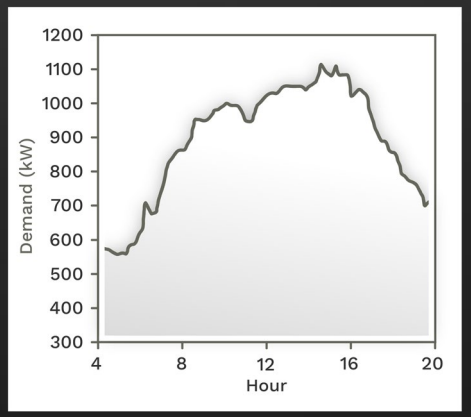
- ★ *Yotta's ESS "peak shave," or discharge the battery at times of high demands; saving the customer a lot of money!*

# Solar + Storage:
# The 1 + 1 = 3 Combination

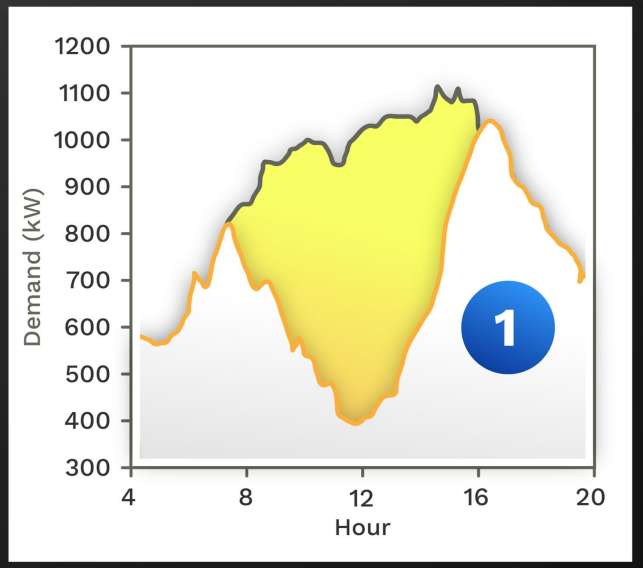
**How to win against your utility and protect your future savings**

1. The combination of solar and storage is your winning combination because it changes the shape of your load creating an afternoon peak
2. Charges the battery when energy is cheapest
3. Then discharges it when electricity is the most expensive AND your demand is the highest
4. The two technologies combine to deliver substantial Demand Charge Reduction savings on your utility bill

Baseline Load




Load with Solar PV




Solar PV Production

Battery Charges

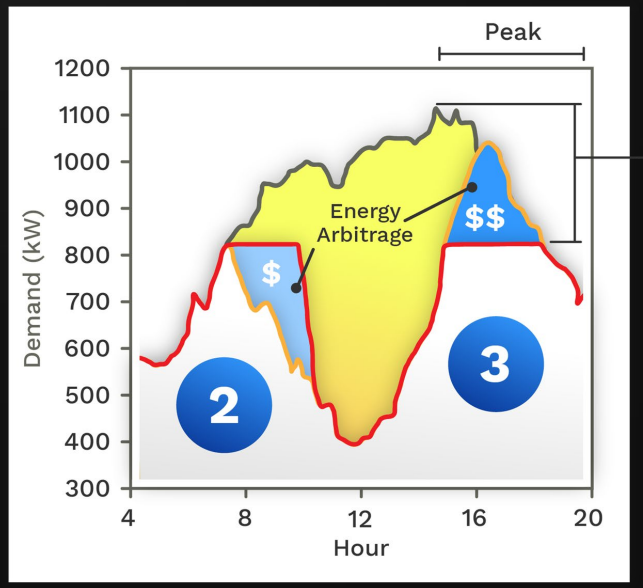
Battery Discharges

Gross Building Load

Net Building Load Post-Solar

Net Building Load Post-Solar + Storage

Load with Solar + Storage




Yotta Energy | **Solar + Storage**

# PV ONLY vs PV + ESS

For this building in SCE Territory (GS-3-D CPP), adding our ESS to their PV array added over **$5 million in additional savings** for just $91,700 of additional capex (after incentives)

## PROJECT SUMMARY SOLAR ONLY

| Payment Options | Cash Purchase |
|---|---|
| Year 1 Bill Savings | $57,647 |
| Payback Period | 6.0 Years |
| IRR - Term | 15.0% |
| LCOE PV Generation | $0.034 /kWh |
| Net Present Value | $868,959 |
| Total Payments | $869,940 |
| Total Incentives | $493,256 |
| Net Payments | $376,684 |
| Electric Bill Savings - Term | $2,783,788 |
| Upfront Payment | $869,940 |

**COMBINED SOLAR PV RATING**
Power Rating: 241,650 W-DC
Power Rating: 210,492 W-AC-CEC

**COMBINED ESS RATINGS**
Energy Capacity: 0.0 kWh
Power Rating: 0.0 kW

## PROJECT SUMMARY PV + ESS

| Payment Options | Cash Purchase |
|---|---|
| Year 1 Bill Savings | $144,603 |
| Payback Period | 3.4 Years |
| IRR - Term | 25.0% |
| LCOE PV Generation | $0.042 /kWh |
| Net Present Value | $2,726,737 |
| Total Payments | $1,219,940 |
| Total Incentives | $751,556 |
| Net Payments | $468,384 |
| Electric Bill Savings - Term | $7,105,446 |
| Upfront Payment | $1,219,940 |

**COMBINED SOLAR PV RATING**
Power Rating: 241,650 W-DC
Power Rating: 210,492 W-AC-CEC

**COMBINED ESS RATINGS**
Energy Capacity: 280.0 kWh
Power Rating: 126.0 kW

In addition to peak shaving, limiting export, and arbitrage, our ESS also allowed the customer to switch from their current rate to GS-2-E! **The payback went from 6 yrs to 3.4 yrs!**

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# Batteries always make sense!

- Multi-Tenant building, all PG&E B-1 metered
- NET Cost is LOWER than PV ONLY (thanks to demand response revenue)
- Batteries always make sense!

**PV + Large ESS (400kWh):**
*Year 1 Bill Savings* *$197,071*
*Payback Period* *3.5 Years*
*IRR - Term* *24.3%*
*LCOE PV Generation* *$0.024/kWh*
*Net Present Value* *$3,573,302*
*Total Payments* *$1,707,380*
*Total Incentives* *$1,223,168*
*Net Payments* *$484,212*
*Electric Bill Savings - Term* *$9,165,784*
*Upfront Payment* *$1,707,380*

**PV + Smaller ESS (251kWh):**
*Year 1 Bill Savings* *$182,377*
*Payback Period* *3.5 Years*
*IRR - Term* *24.5%*
*LCOE PV Generation* *$0.023/kWh*
*Net Present Value* *$3,315,703*
*Total Payments* *$1,530,070*
*Total Incentives* *$1,050,548*
*Net Payments* *$479,522*
*Electric Bill Savings - Term* *$8,532,717*
*Upfront Payment* *$1,530,070*

**PV Only:**
*Year 1 Bill Savings* *$129,705*
*Payback Period* *4.1 Years*
*IRR - Term* *21.7%*
*LCOE PV Generation* *$0.026/kWh*
*Net Present Value* *$2,303,486*
*Total Payments* *$1,219,800*
*Total Incentives* *$691,505*
*Net Payments* *$528,295*
*Electric Bill Savings - Term* *$6,263,485*
*Upfront Payment* *$1,219,800*

# Adding Yotta Batteries in ETB


# Racking Compatibility (Updated 5.15.24)

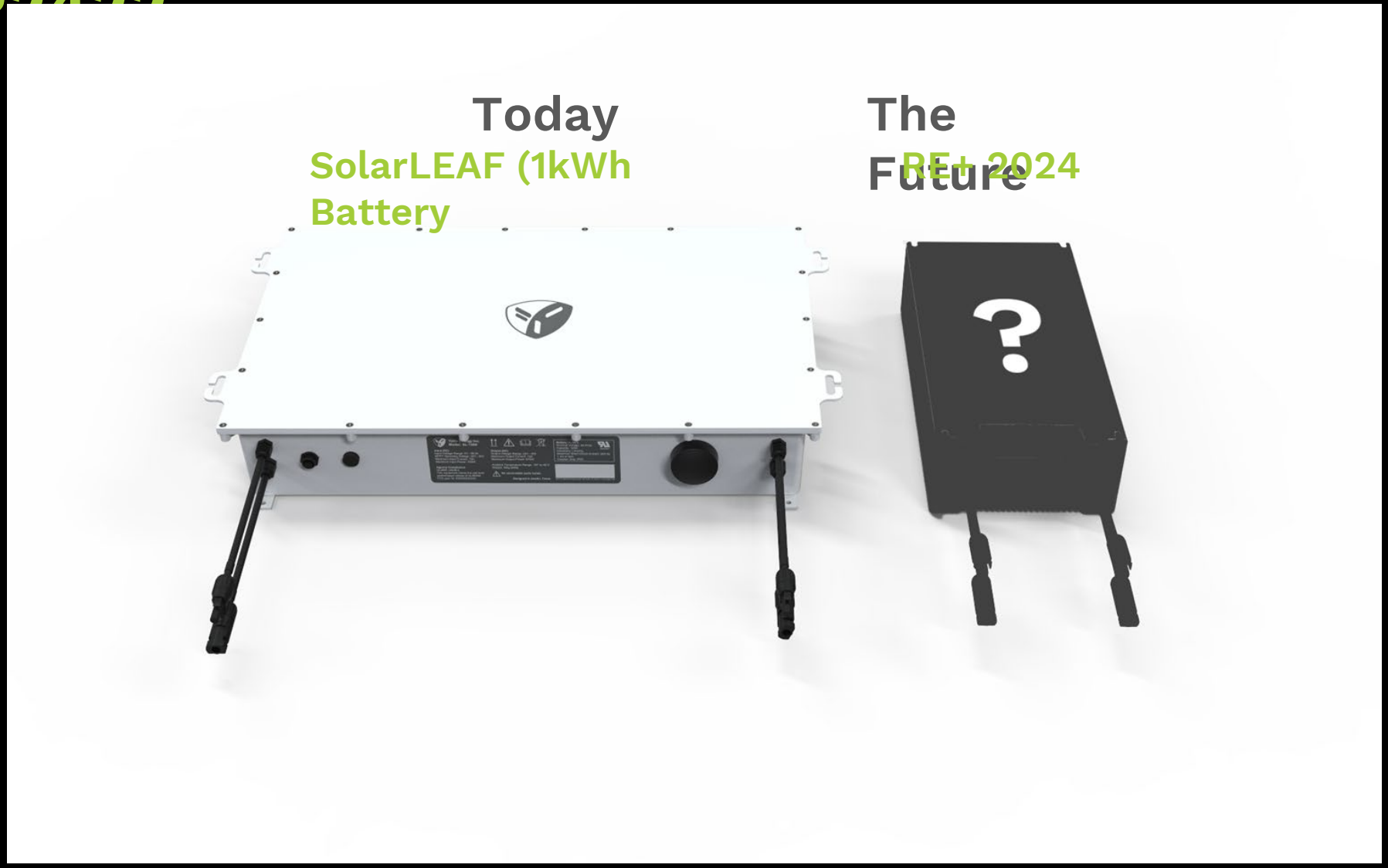
**DPI Microinverter and SolarLEAF compatibility:**

- PanelClaw FR10 and Dual Tilt (ballasted or mechanically attached) - Available through Yotta
- Sollega baskets
- Ironridge XR Series (tilt leg, flush mount with 6” stand off (needs approval), ground mount)
- Aerocompact SN2 (ballasted or mechanically attached)
- Opsun Systems - Sunrail Performance
- Most carports
- More compatibility options in 2025!

**Adapters:**

Strut Mount SolarLEAF Tray
IronRidge XR Rail / SolarLEAF tray
Sollega / Yotta DPI and SolarLEAF Schematic
Unirac EVO / DPI Attachment Diagram
PanelClaw DPI Bracket.pdf

# RE+ Anaheim Come visit us at Booth MOP2422



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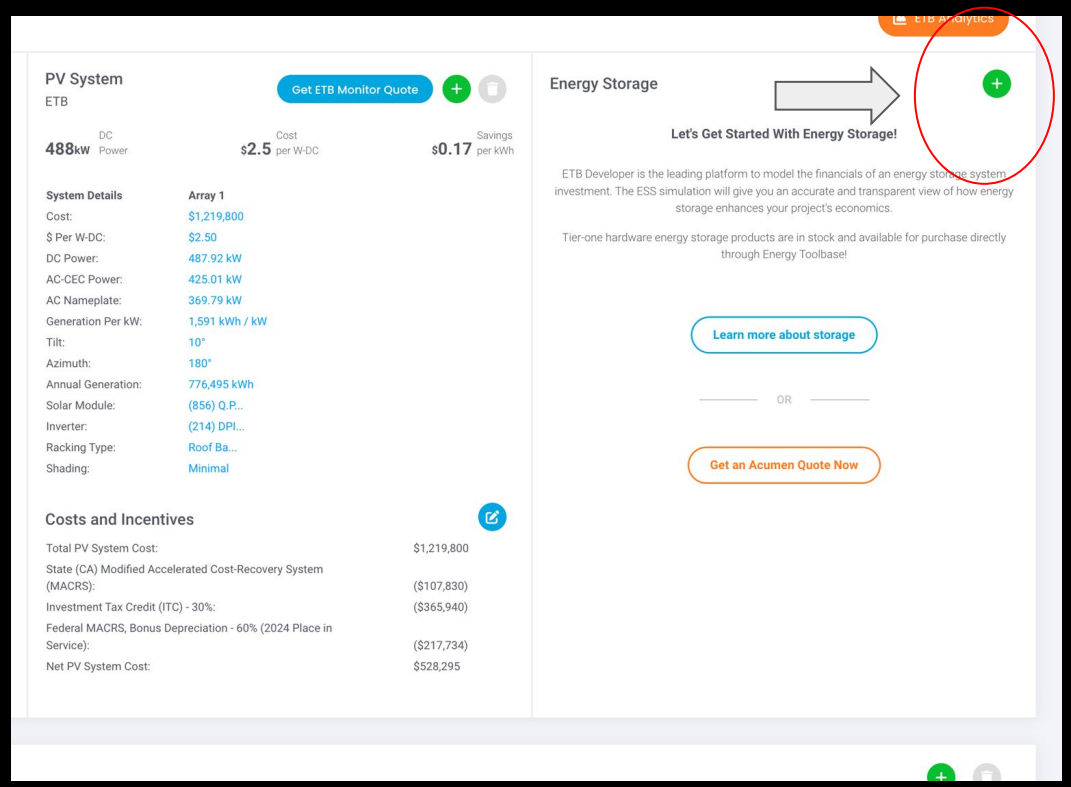
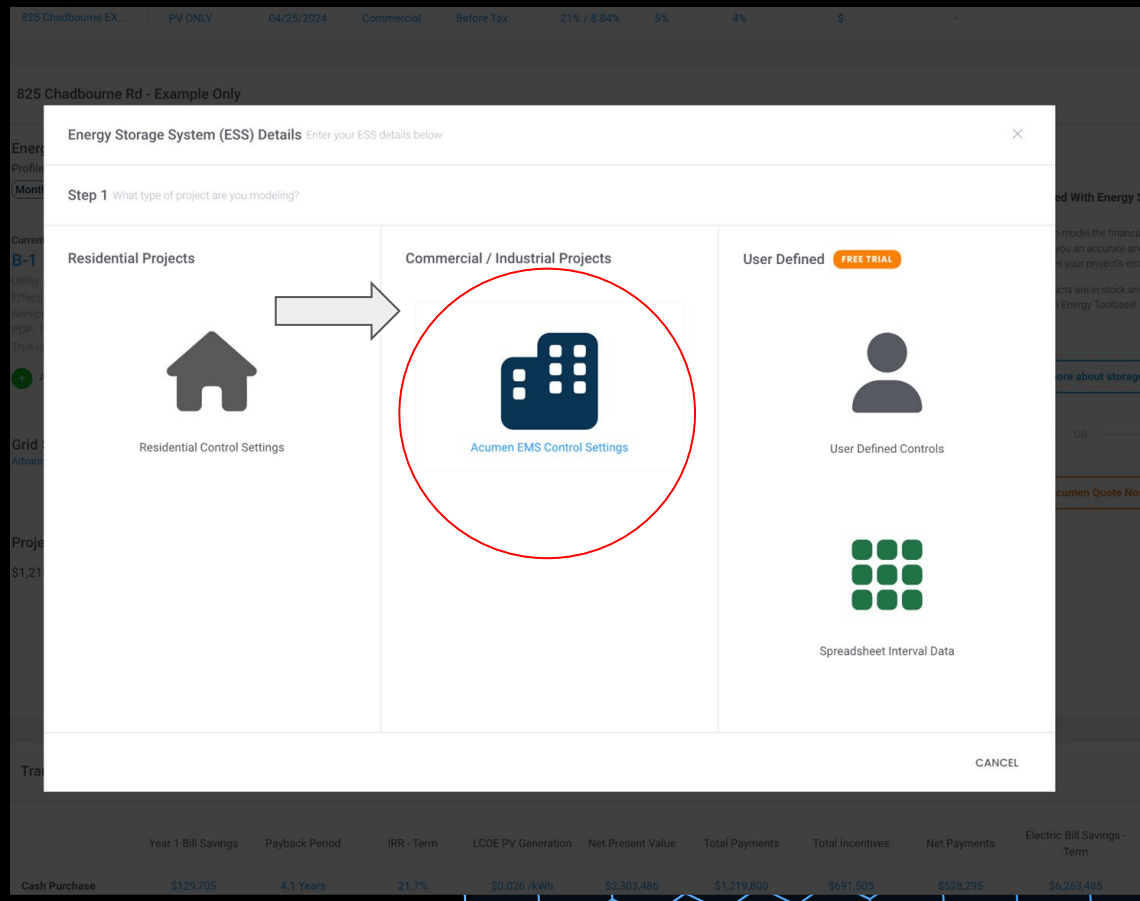
# Adding Yotta Batteries in ETB

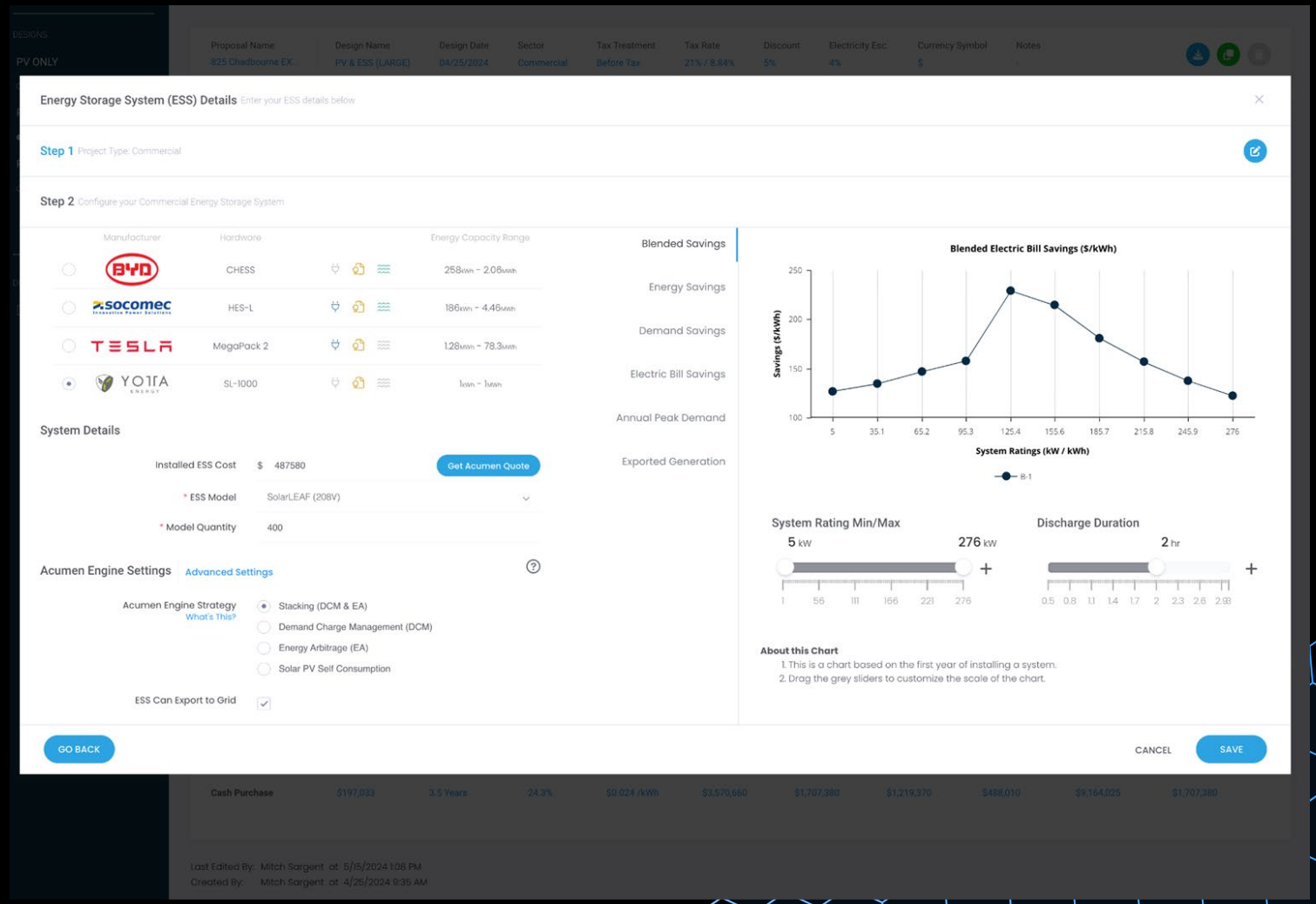
FIRST: Schedule a training with your ETB rep and your Yotta rep!



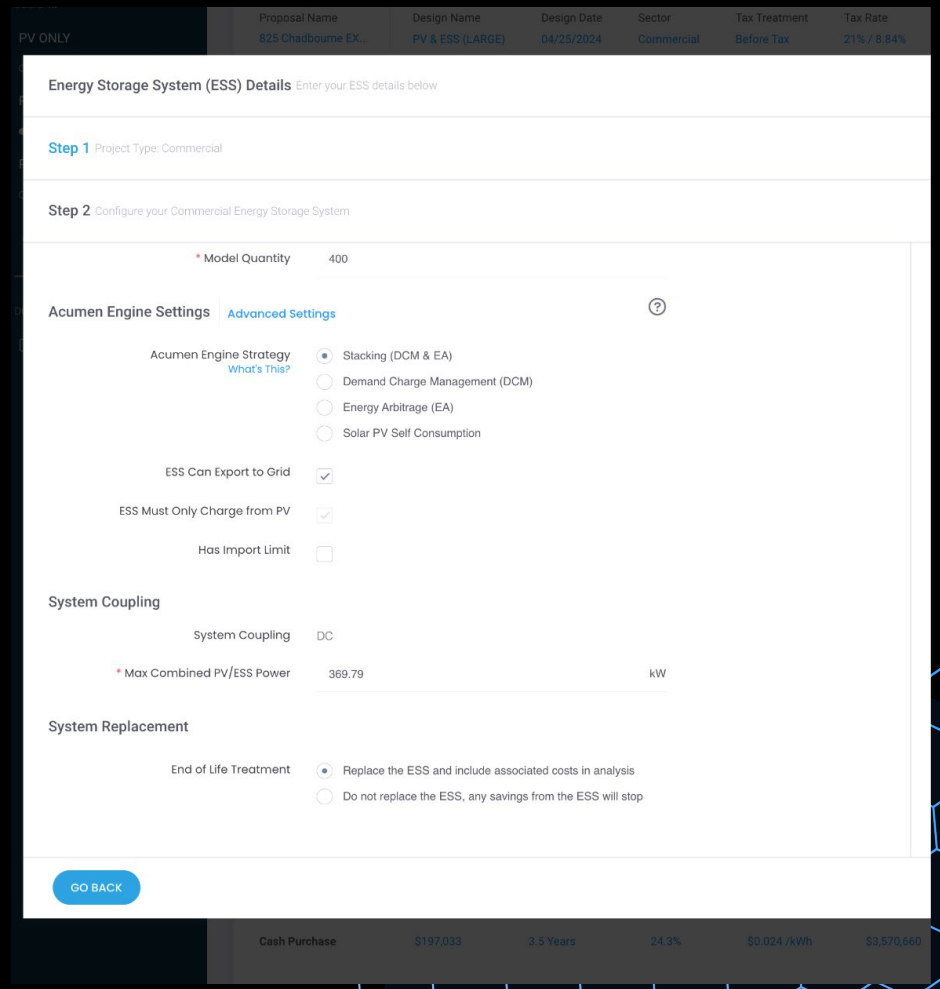
# Adding Yotta Batteries in ETB

- Select the Yotta Energy SL-1000
- Select the voltage type (208V or 480V)
- Select the “Control Strategy”
- Run the optimizer and/or enter the quantity for the number of batteries (1 battery = 1kWh)



# Adding Yotta Batteries in ETB

- More: Acumen Control Strategy
  - Depending on the Utility and Rate, you may wish to experiment with different strategies and quantities of batteries
- Select “ESS can export to grid” (where available)
- Max Combined PV/ESS Power = **AC NAMEPLATE** of the PV system
- The number of Yotta batteries cannot exceed the number of solar modules
- Module wattage = 600W or less



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**What's Next?**

- Sign up for a free trial of ETB Developer!
- Contact us: sales@yottaenergy.com

Q & A