



Panasonic
ECO SOLUTIONS CANADA

RESIDENTIAL ENERGY STORAGE

*Fujisawa, Japan
Panasonic Smart Sustainable Town*

CHBA Net Zero Energy Council Webinar

Yonnas Tecle

Manager, Consumer Sales Channel

Solar & Energy Storage Solutions

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LEADING CANADA'S SOLAR INDUSTRY

- OVER 55MW AC / 70MW DC INSTALLED OR UNDERWAY
- COMMERCIAL, RESIDENTIAL & COMMUNITY MICROGRID
- COMPETITIVE PROJECT FINANCING



NEW: RESIDENTIAL ENERGY STORAGE

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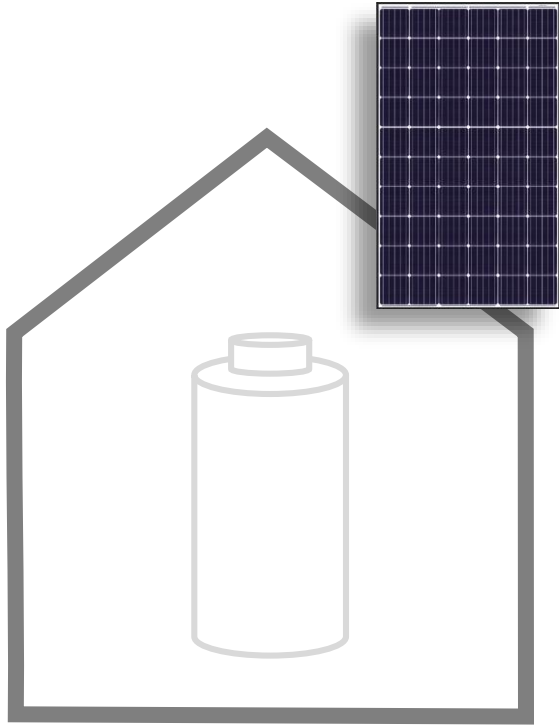


WORLD'S LARGEST PRODUCER OF LITHIUM ION BATTERIES

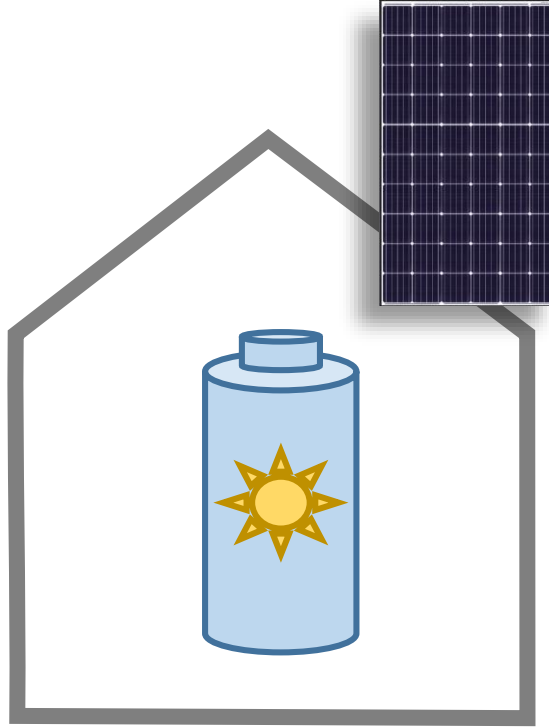
**In the next decade, Lithium-Ion will become mainstream...
more than 80% of global energy storage installations will include the technology by 2025.**

- IHS Markit, Energy Storage Report 2016

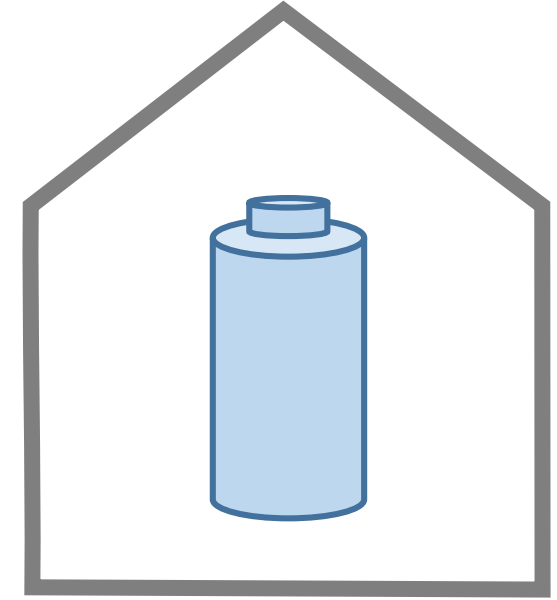
SOLAR + ENERGY STORAGE SOLUTIONS



**SOLAR...
STORAGE-READY**

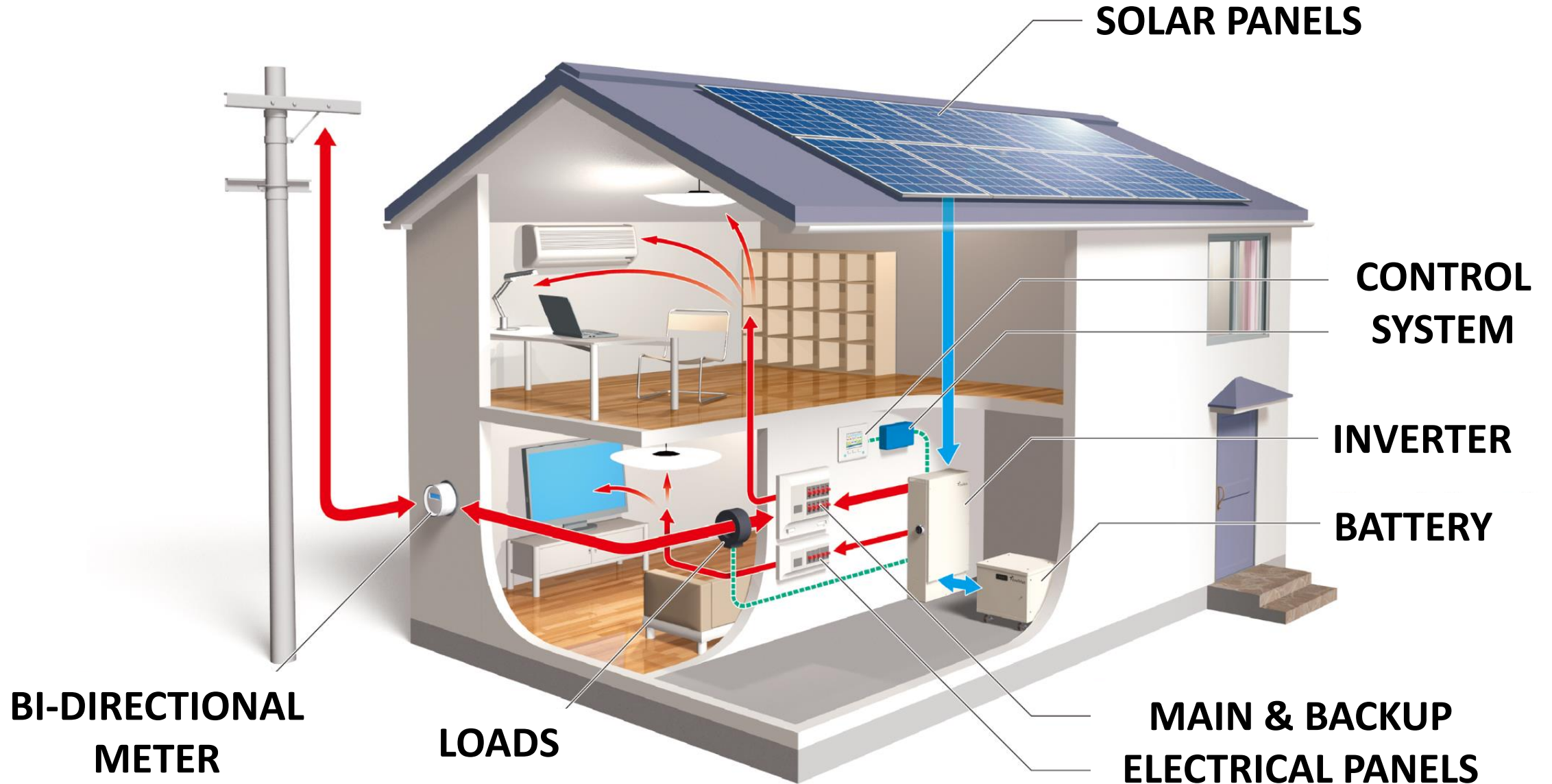


**SOLAR +
STORAGE**



**STORAGE
ONLY**

SOLAR ENERGY STORAGE: SYSTEM OVERVIEW



BENEFITS OF ENERGY STORAGE

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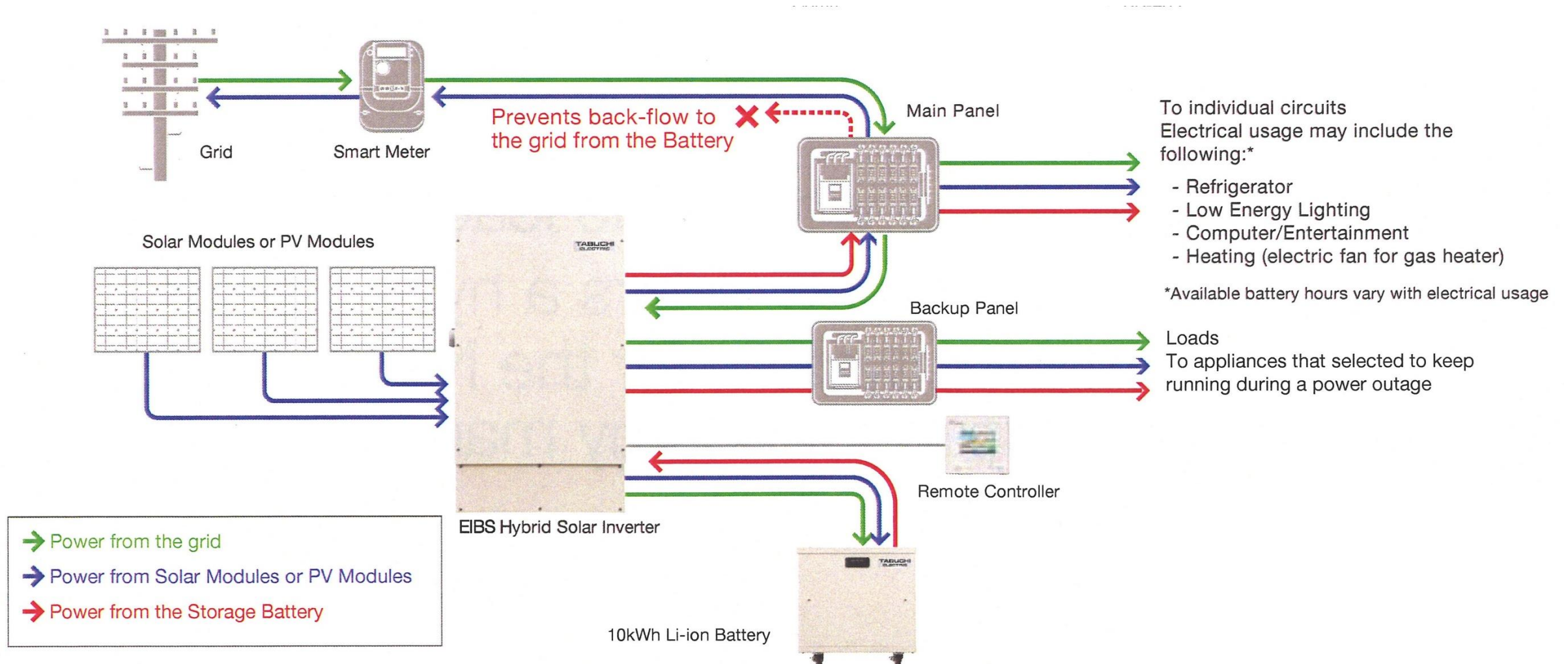
- **SELF-CONSUMPTION: INCREASE USE OF SOLAR IN THE HOME**
- **ENERGY SECURITY: BACKUP PRIORITY LOADS... CLEAN, QUIET, SAFE**
- **PEAK SHAVE: CHARGE OFF-PEAK, DISCHARGE ON-PEAK***

STORAGE TECHNOLOGY: TABUCHI

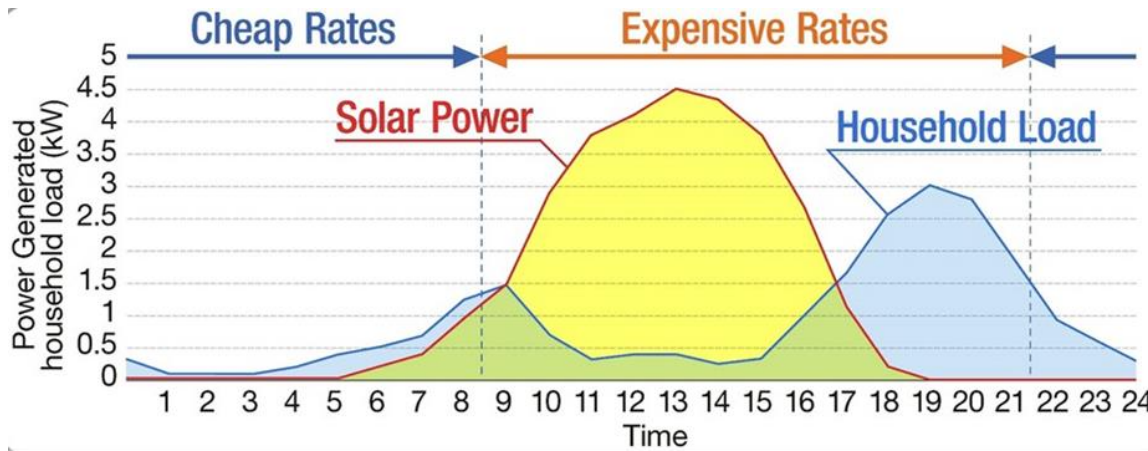
- 6kW – 7kW Solar PV Rooftop System
- 5.5kW Hybrid Inverter
- 10kWh Lithium Ion battery unit
- 6kWh Battery Capacity (usable)
- 2kW Power Output (Discharge)
- 3 MPPT
- 95.5 Peak Solar Efficiency
- 3 Operational Modes
- Remote Controller
- Industry leading monitoring software
- Monitoring of battery, solar PV system and home energy consumption.



STORAGE TECHNOLOGY: TABUCHI

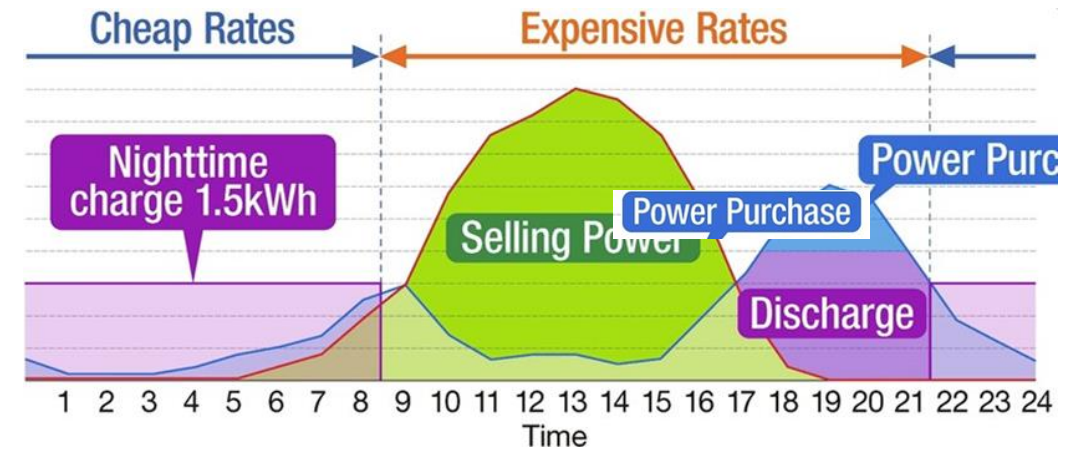


Flexible Operation Modes Provide Best ROI



Max Power
(Charge w/ Grid)

Economy
(Charge w/ Excess Solar)

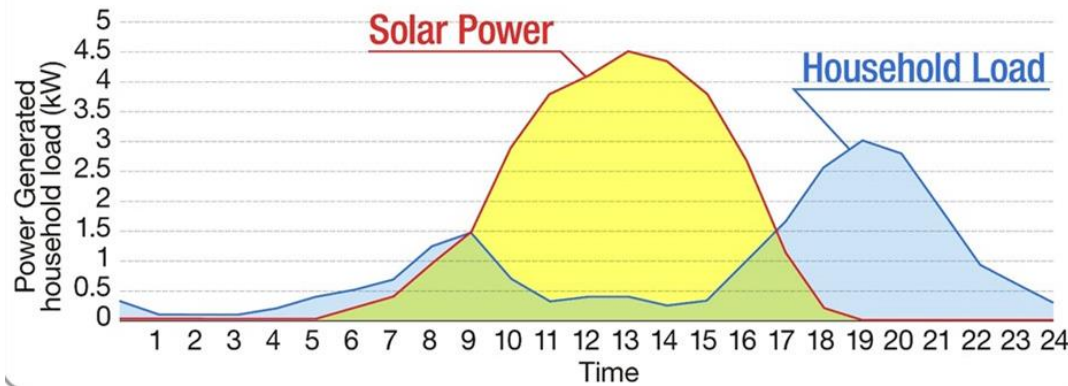


Backup
(Maintain Full Charge)

The battery is charged from the Grid during the night.

- Daytime: Power is sold to the Grid.
- Peak-time: Battery use reduces Demand Charge.
- Night: Battery is charged by the Grid.

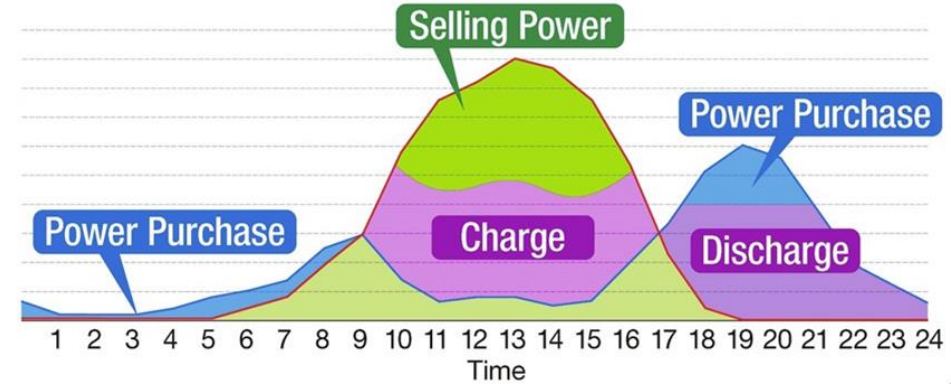
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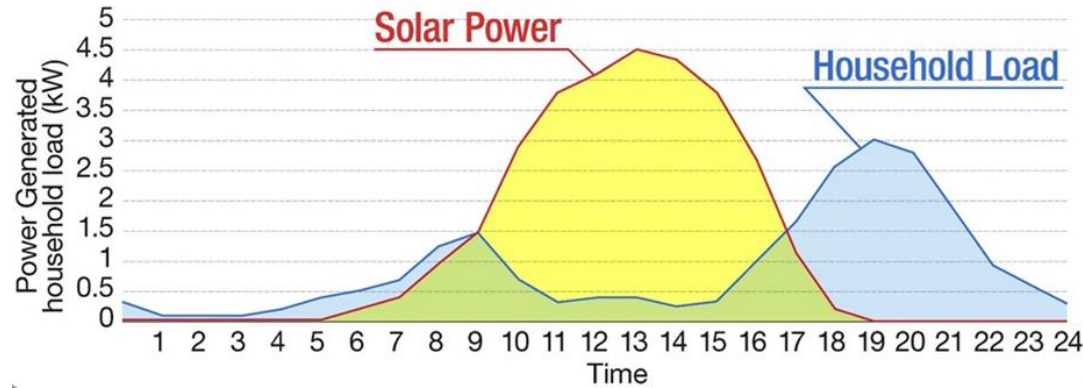
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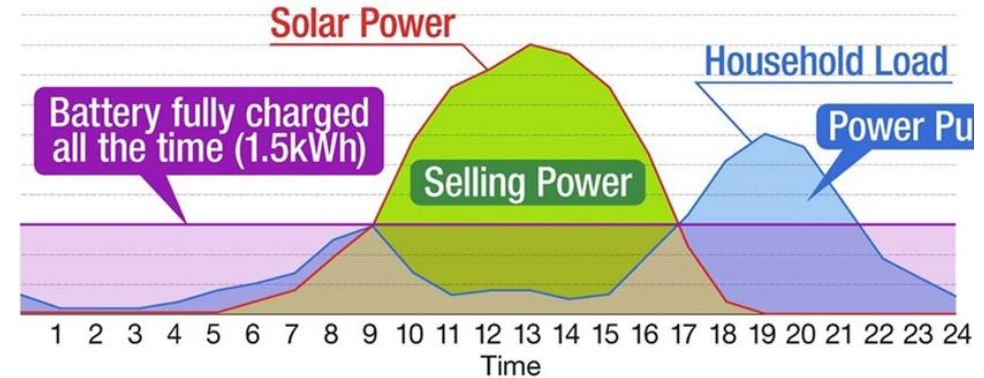
Battery is charged by PV and excess power is sold to Grid.

- Daytime: PV charges the battery and excess power is sold to the Grid.
- Night: Power is supplied by the battery.

Flexible Operation Modes Provide Best ROI



Max Power
(Charge w/ Grid)



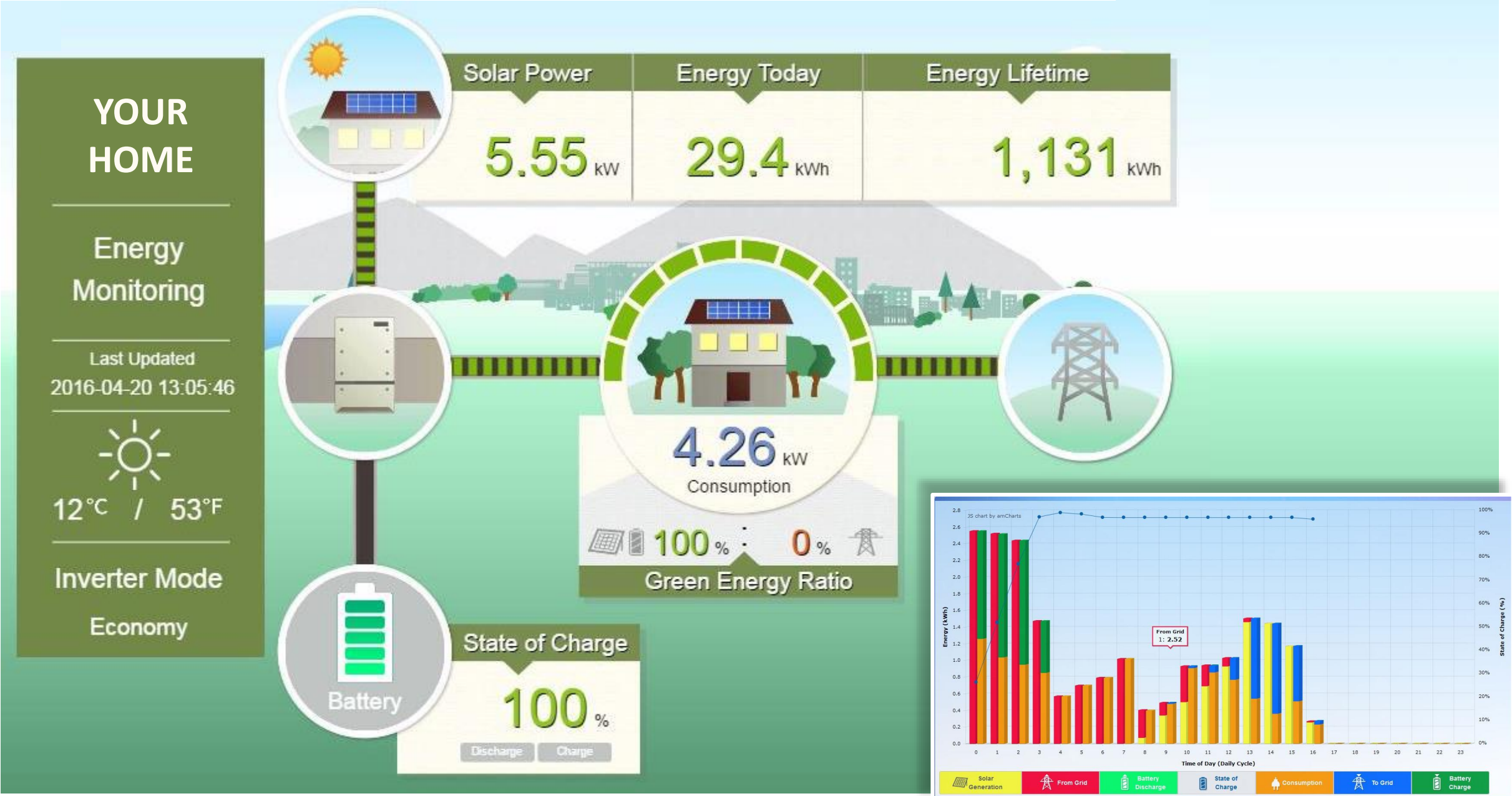
Economy
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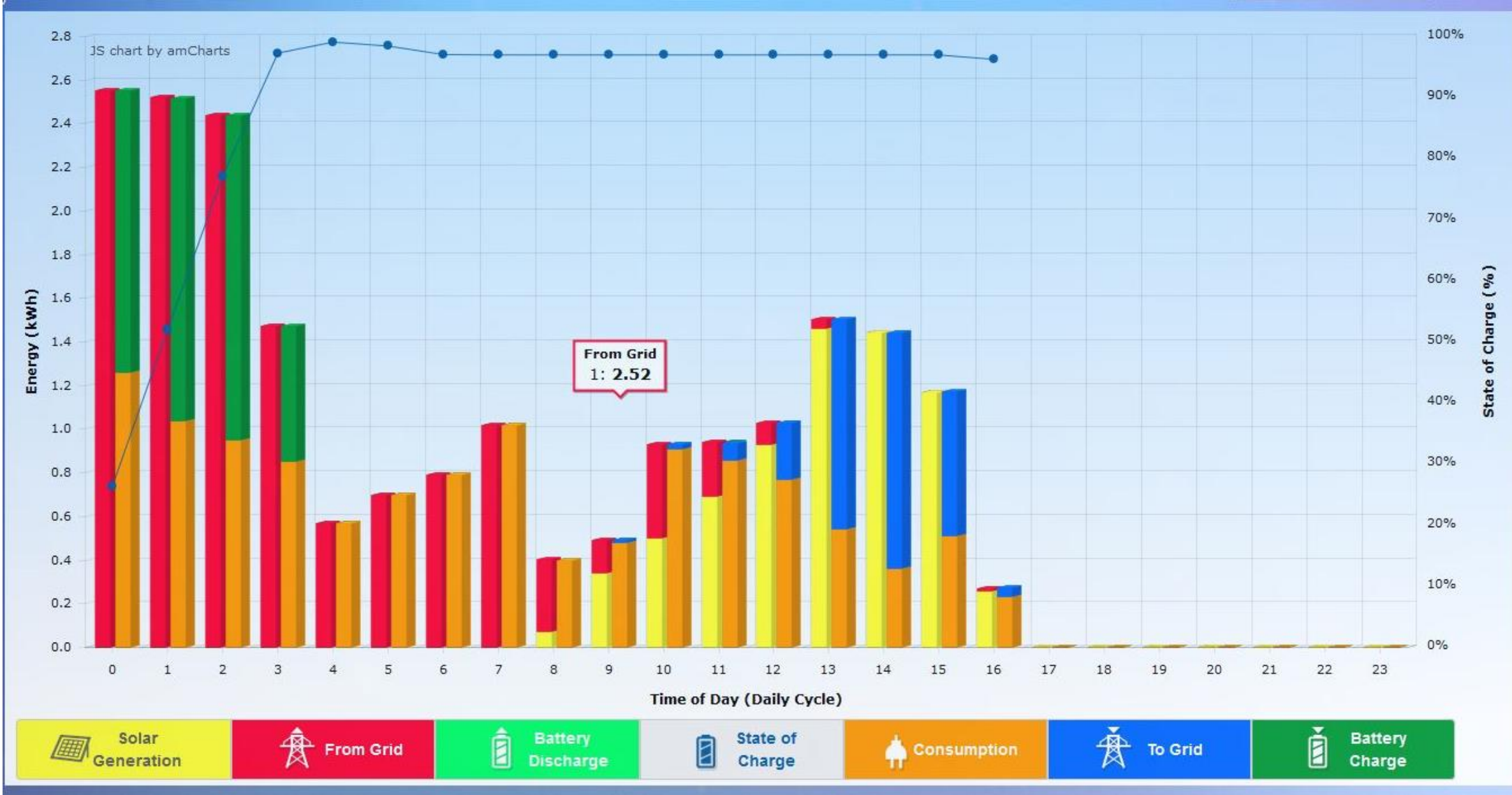
Battery used only for grid outages

- Daytime: Power is sold to the Grid.
- Night: Power supplied by the Grid
- Once the battery is fully charged, it is only used in case of a grid outage.

WEB-BASED MONITORING



PERFORMANCE TRACKING

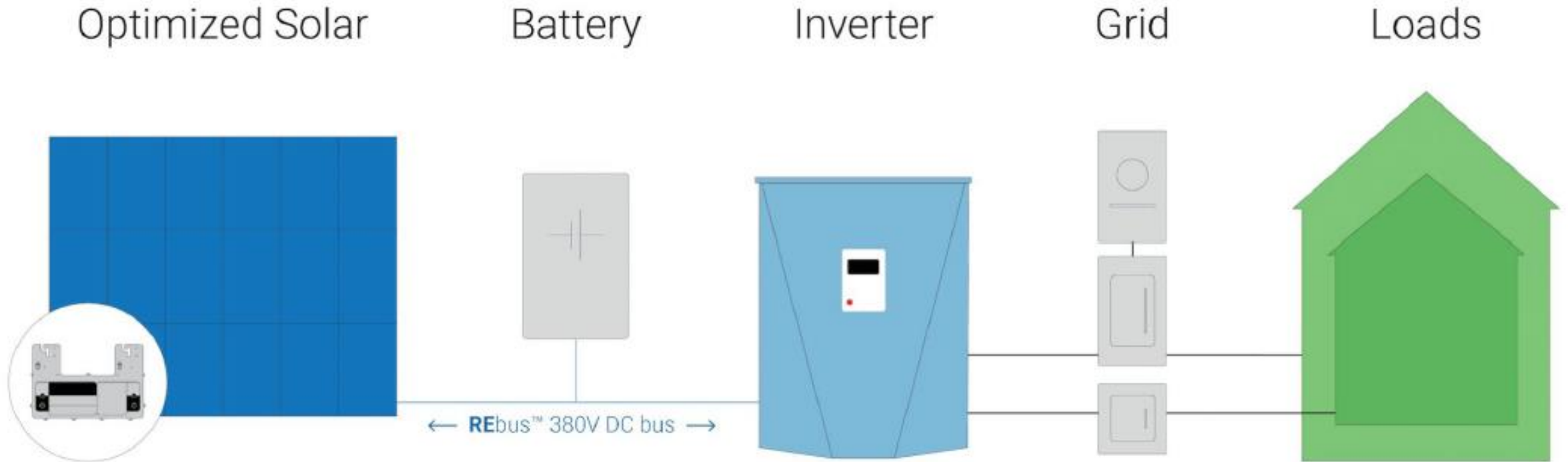


STORAGE TECHNOLOGY: PIKA ENERGY

- 7.6kW DC-Coupled Smart Inverter
- 10kWh, 15kWh Li-Ion Battery
- 6.7kW Power
- 98% Peak Efficiency
- PV Link™: 2500W substring optimizer
- REBus™ Nanogrid Solution with 4 breakers
- Panasonic Lithium Ion cells



STORAGE TECHNOLOGY: PIKA ENERGY



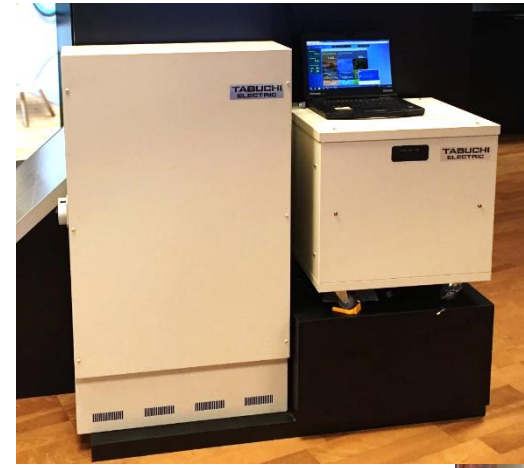
INSTALLATION CONSIDERATIONS

Roof structure, condition, azimuth, roof obstructions

Rough-in, conduit, spacing for equipment

Design and aesthetic preferences of PV
E.g. Black on black modules

Load requirements – which loads,
duration, number of expected outages

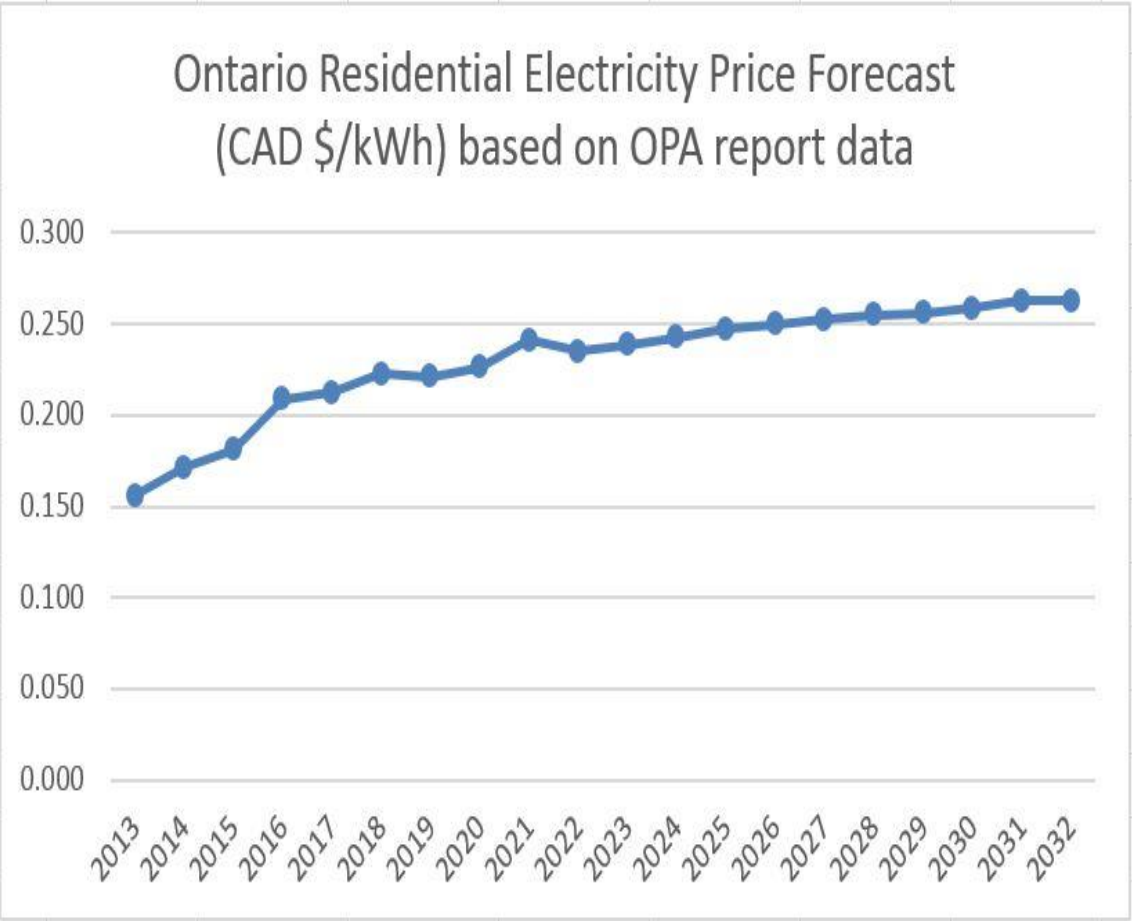
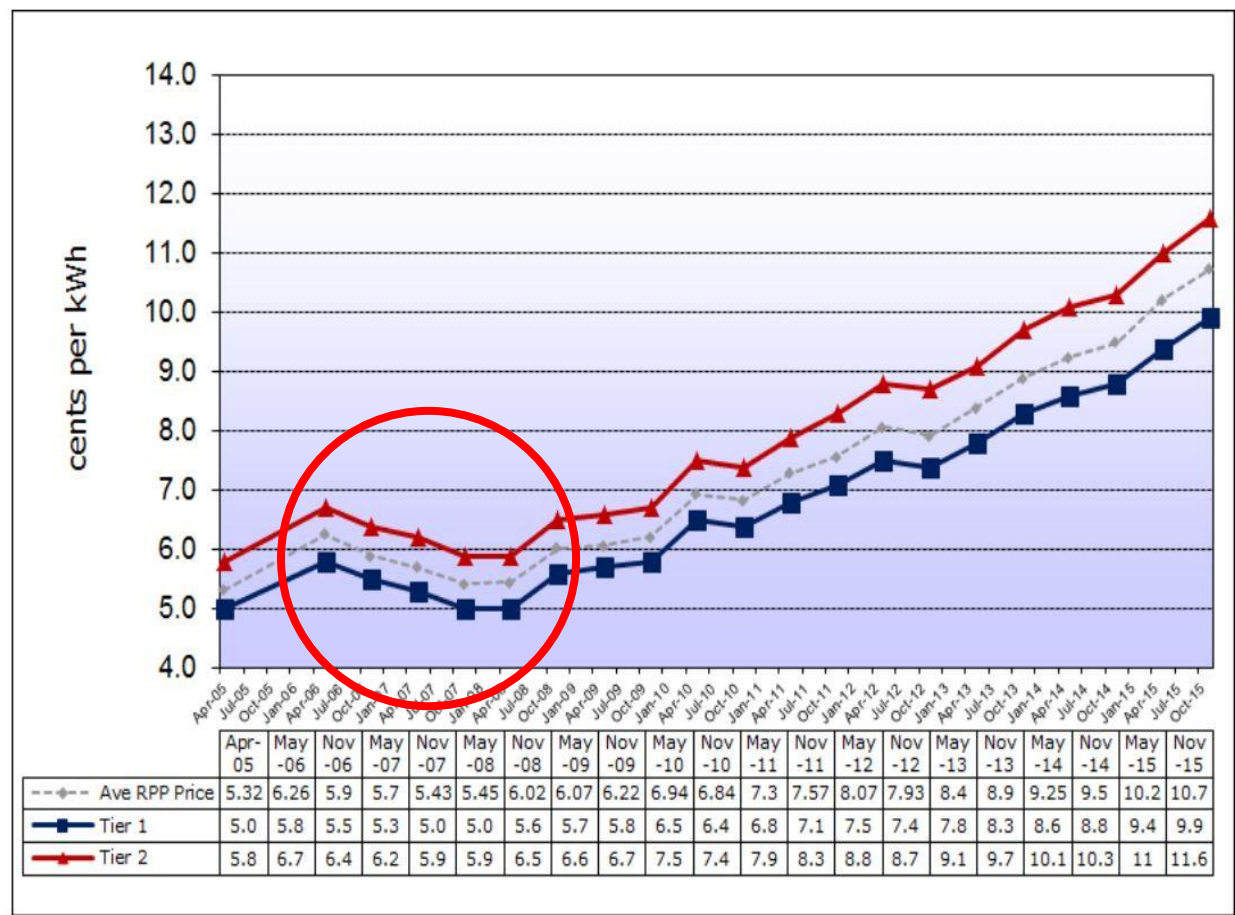


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ONTARIO RATES: HISTORY & FORECAST

14-Year Average Increase = 7.5%



Sources:
<https://cpi.probeinternational.org/2016/04/15/ontario-electricity-rate-increases-continue-to-blow-past-inflation/>
<http://www.torontosun.com/2016/02/29/ontario-electricity-rates-fastest-rising-in-north-america>
Historical Electricity Prices, Ontario Energy Board
Cost of Electricity Service Report, Ontario Power Authority

ENVIRONMENTAL BENEFITS



**~3,000
TREES PLANTED**



**> 115
TONNES OF CO₂**



**> 540,000
KILOMETRES**

WARRANTY



Industry Standard:

- Installation Labour: 3 years
- Battery, Inverter: 10 years
- Racking: 20 years
- Solar Modules:
 - 10 years workmanship
 - 25 years performance

PROCESS

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TURNKEY SERVICES



ENGINEERING + PROCUREMENT + CONSTRUCTION + MARKETING SUPPORT

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VISION: SUSTAINABLE SMART COMMUNITIES

FUJISAWA, JAPAN

- Panasonic: Lead Developer
- 19 Hectare Brownfield Redevelopment
- 600 Detached, 400 Apartments
- Opened 2014, 100 Year Growth Plan

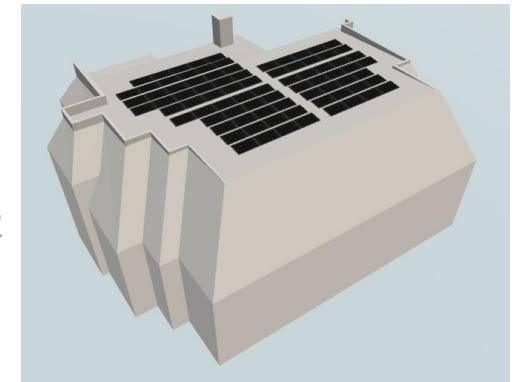
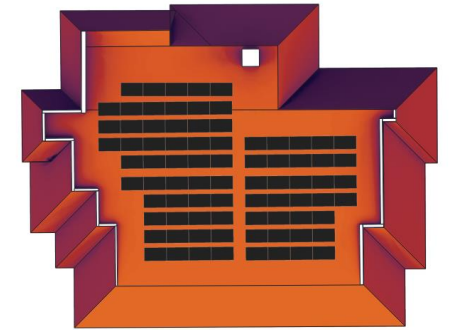
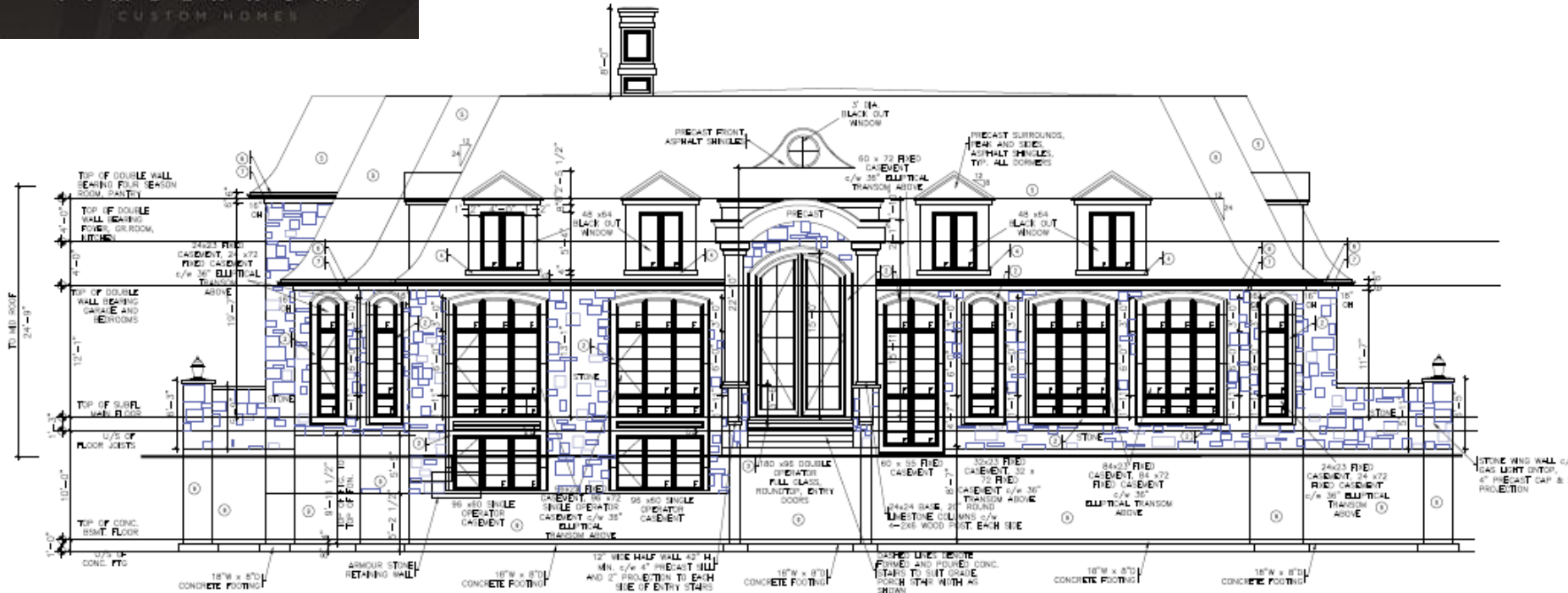
SUSTAINABILITY TARGETS

- 70% Reduction in CO₂
- 30% Reduction in Water Consumption
- 30% Renewable Energy Use
- 3-Day Off-Grid Capability

SMART SERVICES

- Energy
- Security
- Health
- Community
- Mobility
- Leisure
- Financial Management
- Asset Management

CASE STUDY: TIMBERWORX



~9,000SF Net Zero, Guelph ON
25kW Solar + 27kWh Energy Storage
Model for Canada's First Net Zero Estate Subdivision

CASE STUDY: ROYALPARK HOMES

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ROYALPARK'S **POWERHAUS**



8 Detached Units, Simcoe Shores - Barrie, ON
6.875 – 7.15kW Solar + 6kWh Storage
Day One Sold Out



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Manager, Consumer Sales Channel

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Hybrid All-in-One Solar + Storage System optimized for easy and efficient installation and energy management.

EIBS Eco Intelligent Battery System



All-in-One Solution includes:

- Solar and battery control
- High efficiency AC/DC conversion
- Automatic transfer switch
- 3 Solar MPPTs
- Lithium-ion Battery
- Monitoring of battery, solar, and whole house

Optimized Energy Management Settings:

- Self-consumption
- Dynamic Demand Response
- Time-of-Use (TOU)
- Backup



Hybrid Inverter & Battery Specifications

Input (DC: Photovoltaic)

Max. open-circuit PV input voltage	800V
Max. usable input power per string	2500W
MPPT operating voltage range	80 to 580V
Number of independent MPPTs	3
Max. operating input current per string	12A
Max. short-circuit PV input current	15A

Output (AC: Grid-tied)

Connection Type	Single split phase 2-wire (L1, L2, N)
Nominal AC power*	8000W
Nominal AC voltage	240V
Operating AC voltage range	AC 21.12V-265V
Grid frequency range	60Hz / 50.0Hz to 61.0Hz
Max. output current	22.0A
Power Factor at rated output power	≥ 0.95

Output (AC: Stand-alone)

Connection Type	Single phase 2-wire (L-N)
Max. output power	2400W*
Nominal output voltage	120V/9V

Charge / Discharge (DC: Battery)

	Grid-tied operation	Stand-alone operation
Number of input circuits	1 circuit	1 circuit
Charge power	1.5kW [†]	1.5kW [†]
Discharge power	2.0kW [†]	2.0kW [†]
Only discharge	B/W [‡]	

Efficiency

Max. efficiency (voter)	95.5%
Round-trip efficiency	91.3%
CEC efficiency	94.5%

General Data

Inverter dimensions (WxHxD)	688 mm x 1300 mm x 280 mm (26.8 x 51.2 x 9.8 in)
Inverter weight	65 kg (143.8 lbs) [§]
Battery dimensions W x H x D	688 mm x 800 mm x 551.5 mm (26.7 x 23.6 x 21.7 in)
Battery weight	11 bags (242.8 lbs) [§]
Operating temperature range (inverter)	-20° C to +50° C (-4° F to +122° F)
Topology	Transistorless
Inverter cooling	Active cooling (fan)
Enclosure rating	Inverter = NEMA 3R, Battery = Indoor

Features

Monitoring	Handheld and remote monitoring
Certifications (Inverter)	UL1741/1099B, ROHS-1, CSE, C22.2, No. 137.17 No. ROHS-1, IEEE 1547a, CEC, FCC class B
Certifications (Battery)	UL 1975, CSA C22.2 No. 60600-1
Advanced Inverter Location	Upgradable

