

A hybrid solar thermal technology that is 4x as powerful as traditional options



powerpanel.com

[Infrastructure](#) [Hardware](#) [Technology](#) [Energy](#) [Manufacturing](#)

[OVERVIEW](#) [UPDATES](#) [WHAT PEOPLE SAY](#) [ASK A QUESTION](#)

Highlights

- 1 **LEADING TECHNOLOGY:** PP Technology captures 75% of sun's energy vs 20% for traditional solar tools
- 2 **READY FOR MARKET:** The PP product has 10+ years of R&D behind it and multiple test case studies
- 3 **REVENUE:** \$20M Annual Revenue projected by 2025 (not guaranteed)
- 4 **DIVERSIFIED VERTICALS:** Industrial | Commercial | Agriculture | Military | Residential | Resorts
- 5 **PROFITABILITY:** Project On-Going Gross Margins around 45% (not guaranteed)
- 6 **IMPACT:** PP has committed to donating 5% of gross profits to disaster relief needs globally
- 7 **COMPACT:** 40% smaller than traditional PV with 750W output
- 8 **Made in the USA, Patented Globally**

Our Team



Rob Kornahrens CEO - Visionary / Angel Investor

Rob is Founder, President & CEO of Advanced Roofing, Inc, one of the top 10 Commercial Roofing Contractors in the US. Rob founded Advanced Green Technologies (AGT) and has grown it to be the leading commercial rooftop solar contractor in Florida.



Steven Holtzman



Garth Schultz COO - Founder / Inventor

Garth has over 25 years of experience in design, development, and manufacturing of proprietary intellectual properties to the solar, OEM Automotive (including CNG alternative fuels), defense, and RV industries.

Pitch



DISCLAIMER

THIS PRESENTATION IS BEING FURNISHED SOLELY FOR THE PURPOSE OF CONSIDERING A POTENTIAL TRANSACTION INVOLVING THE COMPANY. THE FOLLOWING CONFIDENTIAL PRESENTATION IS INTENDED SOLELY FOR THE PERSON TO WHOM IT HAS BEEN PROVIDED. ANY REPRODUCTION OR DISTRIBUTION OF THIS PRESENTATION IN WHOLE OR IN PART OR THE DIVULGENCE OF ANY OF ITS CONTENTS WITHOUT THE PRIOR WRITTEN CONSENT OF THE COMPANY IS PROHIBITED. THIS PRESENTATION DOES NOT CONSTITUTE THE OFFER OF ANY SECURITIES OF THE COMPANY, AND THE SECURITIES OF THE COMPANY HAVE NOT BEEN AND WILL NOT BE REGISTERED UNDER ANY FEDERAL OR STATE SECURITIES LAW. THIS PRESENTATION DOES NOT CONSTITUTE AN OFFER TO SELL OR THE SOLICITATION OF AN OFFER TO BUY IN ANY STATE TO ANY PERSON TO WHOM IT IS UNLAWFUL TO MAKE SUCH OFFER OR SOLICITATION IN SUCH STATE OR JURISDICTION.

THE FINANCIAL PROJECTIONS PRESENTED HAVE NOT BEEN AUDITED OR REVIEWED BY ANY ACCOUNTING FIRM. THE ASSUMPTIONS DISCLOSED WITH RESPECT TO THE FINANCIAL PROJECTIONS ARE THOSE THAT MANAGEMENT BELIEVES ARE SIGNIFICANT TO THE PROJECTIONS. THERE WILL USUALLY BE DIFFERENCES BETWEEN PROJECTED AND ACTUAL RESULTS BECAUSE EVENTS AND CIRCUMSTANCES FREQUENTLY DO NOT OCCUR AS EXPECTED, AND THOSE DIFFERENCES MAY BE MATERIAL.

ANY INVESTMENT IN OR PURCHASE OF ANY SECURITIES OF THE COMPANY IS SPECULATIVE AND INVOLVES A HIGH DEGREE OF RISK AND UNCERTAINTY. CERTAIN STATEMENTS IN THIS PRESENTATION MAY CONSTITUTE FORWARD-LOOKING STATEMENTS WITHIN THE MEANING OF SECTION 27A OF THE SECURITIES ACT OF 1933. FORWARD-LOOKING STATEMENTS PROVIDE CURRENT EXPECTATIONS OF FUTURE EVENTS AND INCLUDE ANY STATEMENT THAT DOES NOT DIRECTLY RELATE TO ANY HISTORICAL OR CURRENT FACT. WORDS SUCH AS "ANTICIPATES," "BELIEVES," "EXPECTS," "INTENDS," "PLANS," "PROJECTS," OR OTHER SIMILAR EXPRESSIONS MAY IDENTIFY SUCH FORWARD-LOOKING STATEMENTS.

POWERPANEL

Why POWERPANEL?

With the environmental demand for decreasing carbon emissions and consumers' need for access to affordable electricity and hot water, Power Panel provides unmatched and patented PVT Technology:

Primary Advantages of Power Panel:

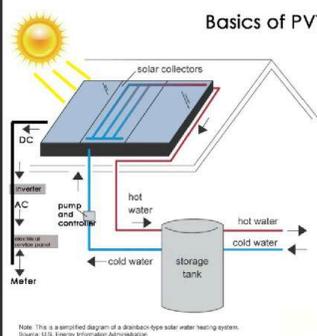
1. **Energy Capture** - Maximizes the sun capture and generates energy streams of both electricity and hot water that are needed in industrial, commercial, agricultural and residential applications.
2. **Patents** - Hybrid collector and thermal storage technology patents issued in the USA, Canada, the EU, China, Japan, South Korea and Australia.
3. **Manufactured in the USA** – Made in the USA and has established partnerships in North and South America plus Asia to distribute and manufacture under license.
4. **Leading Thermal Performance** - Application specific high temperature capable plastics, insulating foams, silicone adhesives and silicone solar cell encapsulants make

up the PVT1, a module that produces electrical energy on par with a standard PV module plus thermal output equivalent to that of a top rated glazed thermal collector.

PVT captures 75% of the sun's energy vs. 20% for PV only.

Solar thermal power/electric generation systems collect and concentrate sunlight to produce the high temperature heat needed to generate electricity and hot water for applications including:

- Off-grid Military Operations
- Construction + Mining Sites
- Hotels + Resorts
- Residential + Rural Communities
- Swimming Pools
- Disaster Relief Efforts



POWERPANEL

What is POWERPANEL?

With Power Panel, the future of energy is today.

Power Panel's unique technology takes solar thermal energy to the next level with patented thermal technology 4X as powerful as PV, capturing 80% of the sun's energy PLUS:



Compact -
40% less space than PV with 750W output



Designed for easy mobility and onsite deployment



Simple Installation: Easy + efficient assembly



Eligible for Green Loan Program and ITC 26%

*Competitively Priced and Green Loan Program Eligible; qualifies for US Federal Investment Tax Credit (ITC) of 26% at 100% depreciation

POWERPANEL

REVENUE FORECAST



		2021	2022	2023	2024	2025	5 Year Total
 PVT1	Units Sold	5,110	5,475	6,844	8,555	10,693	36,677
	Revenue	\$3,679,200	\$3,843,450	\$4,681,125	\$5,705,977	\$6,950,684	\$24,860,436
 Gen-2-O	Units Sold	158	203	304	456	683	1,804
	Revenue	\$1,181,250	\$1,518,750	\$2,278,125	\$3,417,188	\$5,125,781	\$13,521,094
 PVT2	Units Sold		1,800	2,700	4,050	6,075	14,625
	Revenue		\$1,374,930	\$2,062,395	\$3,093,593	\$4,640,388	\$11,171,307
 Thermal Edge Storage Tanks	Units Sold	434	744	1,484	2,972	5,940	11,574
	Revenue	\$233,752	\$400,718	\$799,282	\$1,600,719	\$3,199,284	\$6,233,755
Royalty & Licensing Agreements	Revenue		\$1,440,000	\$2,140,000	\$1,110,000	\$1,393,500	\$6,083,500
	Total Income	\$5,094,202	\$8,577,848	\$11,960,927	\$14,927,476	\$21,309,638	\$61,870,091
	Gross Margin	35%	46%	47%	41%	40%	

*The above slide contains forward looking projections and are not guaranteed.

THE POWER PANEL®

The Power Panel® module revolutionizes solar technology by combining it with thermal harvesting. Traditional solar panel efficiency drops as heat rises, but the The Power Panel® offers else



performance even in extreme conditions.

GEN-2-O™ PORTABLE

Swift to deploy, this compact device sets up in less than an hour, making it a frontline choice for emergency response teams and military support. With so many parts of our world still lacking in hot water and basic electricity, the Gen-2-O is an ideal candidate for supporting aid in developing nations.

THERMAL EDGE™ STORAGE

Power Panel®'s patented thermal storage tanks enhance solar technology by offering a second way to save resources and money: hot water. Our unique solar thermal hybrid technology uses a cooling system to keep The Power Panel® modules operating at peak efficiency.

TURNKEY ARRAYS

Two groundbreaking technologies are better than one. You can save twice as much when compared to traditional solar panels with one of Power Panel®'s unique solar thermal hybrid complete turnkey systems.

PRODUCT LINE

Key Product Advantages:

- Top-rated PVT panel with unmatched efficiency
- World's leading battery for thermal storage
- The only portable + electrical thermal generator on the market (Gen-2-O)
- Custom engineered solutions

FUTURE PRODUCTS

Products

- **Ice Storage**
 - Utilize existing patented thermal storage tanks to facilitate thermal cooling (air conditioning)
- Large-scale Custom Commercial Solutions
- Water Purification System
- Wind Turbines for existing Solar Tracking system to produce 8x more energy output from wind
- Lithium batteries included in patented enclosure for easy deployment
- Glass on Glass panel for thermal only
 - Opens opportunity to take 10% of existing thermal market

POWERPANEL®

POWERPANEL® VS. COMPETITION

Up to 67% More Power
Save up to 25% per watt vs. competition

PRODUCT	PRICE
POWERPANEL®	\$2.20 per watt <i>(installed cost)</i>
	\$2.95 per watt
	\$2.95 per watt

Source: Energy Sage

Top 20 Markets for Power Panel

Leading potential markets identified and based upon electrical pricing; natural gas consumption; solar irradiance; population density are as follows:

1. Mexico	6. Egypt	11. Algeria	16. Japan
2. India	7. Australia	12. Spain	17. Portugal
3. Brazil	8. Kenya	13. Philippines	18. Iran
4. Pakistan	9. Thailand	14. Nigeria	19. S. Africa
5. United States	10. Malaysia	15. Guatemala	20. Italy

Additional Regions of Interest: Jamaica - Barbados - Bermuda

POWERPANEL®

Power Panel provides an ideal energy and

Global Market

not water solution for regions with one or a combination of the following identifying factors:

- High Population Density
- High Solar Irradiance
- High Electricity Rates
- Low Natural Gas Consumption

POWERPANEL®

SALES CHANNELS

- International Distributor/Partner
Partial manufacturing by Power Panel and partner
- Distributor/Partner
 - AET
 - Beacon
- Royalty Agreement Partner
Manufactures with Power Panel's IP for royalty
- Power Panel Sales Team



POWERPANEL®

International Distributors

- RECH
 - 520 Dedicated Employees
 - 26 Years of Experience in Brazil
 - Annual Revenue: \$200M per year (Importer/distributor)
- Attack Audio Systems
 - 250 Dedicated Employees
 - ~35 Years of Experience in Brazil
 - Annual Revenue: \$110M per year (mfr./distributor)
- Region-specific Website: <https://br.powerpanel.com>



POWERPANEL®

Domestic Distributors

- **Beacon**
 - 7,000+ Dedicated Employees
 - 90+ Years of Experience
 - Annual Sales: \$7B+ (2018)
- **AET**
 - 60+ Dedicated Employees, 400 Independent Dealers
 - 45 Years of Experience
 - Annual Revenue: \$10M+ (source: Solar World)

"As a supplier that has existing relationships with top tier industry leaders such as Advanced Roofing and Advanced Green Technologies, we have a high standard to meet with our products and service to our customers. We are proud to offer Power Panel's innovative technology, enabling contractors to provide high-quality, sustainable and energy efficient solutions for commercial and residential projects."
— Ben Handley, Beacon



"Alternate Energy Technologies (AET), a pioneer in solar thermal manufacturing and solutions, is excited to partner with Power Panel to distribute its groundbreaking energy solutions through its network of factory authorized dealers. Power Panel will be a game changer for our dealers and partners."
— Peter Voghel, Chairman (AET)

POWERPANEL®



Royalty/Licensing Agreements

- 3-5% Royalty/Licensing Fee
- International Opportunities Only
- ~\$6 Million in Revenue – 5-year projection

India Opportunity

- Over 100 Years of Experience in India
- Distribution Outlets: 3 Continents
- Company Revenue: \$28+ per year
- Royalty Fee in Negotiation for India distribution
- Revenue Forecast Not Included
- Projected Start Date: 2022
- New Manufacturing Plant in Process
- Modules in Test Phase
- PVT2 Module in Co-development – cost reduction + installation efficiency for Southeast Asia Market
- Region-specific Website: <https://in.powerpanel.com>

Additional Opportunities

- Brazil – Current manufacturer for balance of systems parts
- Mexico – Seeking partners in Mexico to commence 2023

Active and under the control of Foreign and Indian States
© 2018 SolarPanel

*The above slide contains forward looking projections and are not guaranteed.

Target Verticals

1. Multi-Residential Housing (Int'l High-rise Urban)
2. Hotel Industry
3. Energy Savings Contracts
4. Military Contracts
5. NGO Contracts
6. Construction/Mining Sites
7. Industrial Commercial Agriculture
8. Multi-Residential Housing (Domestic/US Condos)
9. Commercial Pools
10. Residential

Windward Passage Hotel, St. T

POWERPAN

POWERPANEL DISTRIBUTION MAP

Exclusive Distribution

Active Distribution

In Progress Distribution

Top 20 Markets for Power Panel

Leading potential markets identified and based upon electrical pricing, natural gas consumption, solar irradiance, population density, and so forth.

1. Mexico	4. Egypt	12. Algeria
2. India	7. Australia	13. Spain
3. Brazil	8. Kenya	14. Philippines
4. Pakistan	9. Thailand	14. Nigeria
5. United States	10. Malaysia	15. Guatemala
		16. South Africa
		17. Portugal
		18. Iran
		19. South Africa
		20. Italy

Additional Regions of Interest: Jamaica, Barbados, Bermuda

DISTRIBUTOR TESTIMONIALS

Power Panel is an innovative technology that arrives in Brazil with a great mission, to expand the way of using the sun to heat water with durability and excellence, under a performance never seen before. It is a hybrid system that generates electricity while promoting adequate water heating. This is technology! " - Erick Viera, President

"Renewable Energy is the best investment to be made in Brazil these days. Bringing Power Panel products will open up even more business opportunities. It is a unique system, off and on grid, generating

electricity and thermal energy. The best of the both worlds!!" - Gilberto Rech, President



Power Panel is coming to facilitate my installations, two solutions using only one system: pool heating and domestic water - Just what we needed!" - Alessandro Lopes, President

"Power Panel is easy to assemble and professional in its performance. Power Panel makes the sun more efficient" - Antton Azpiazu, Técnicas del Agua y del Sol



Executive Team



Rob Kornahrens, Visionary/Angel Investor



Rob received his BS in Business Administration from the University of Arizona in 1979. Robert is the Founder, President and CEO of Advanced Roofing, Inc., headquartered in Fort Lauderdale, Florida. Advanced Roofing has nearly 40 years of commercial roofing experience; the company has been listed as one of the top 10 Commercial Roofing Contractors in the United States and #1 in Florida. Currently Advanced Roofing has seven branches throughout the State of Florida and employs more than 500 people.

In 2007, Rob started Advanced Green Technologies (AGT) as a solar distributor for a thin film solar panel, while starting his solar contracting business simultaneously. Today, AGT is the top commercial rooftop solar contractor in the State of Florida, having installed over 250 MW of solar systems and ranked #1 Solar EPC in Florida by Solar Power World (2020). Mr. Kornahrens was recently noted as one of the most powerful people in Broward County Florida by Gold Coast Magazine.

Garth Schultz, Founder/Inventor



Co-Founder and President of Power Panel, Garth received his Bachelors of Science in Mechanical Engineering from the University of Saskatchewan in 1984. An entrepreneur with over 25 years engineering and management experience in design, development, and manufacturing of proprietary intellectual properties to the solar, OEM Automotive (including CNG alternative fuels), defense, and RV industries. Leads the multi-disciplinary team delivering the Power Panel solar renewable energy systems including power generation, thermal storage, and controls.



POWER PANEL TEAM



The organizational chart shows the following structure:

- CEO:** Rob Kornahrens (Visionary/Angel Investor)
- VP of Sales & Marketing:** (Open)
- COO:** Garth Schultz (Founder/Inventor)
- Director of Procurement & Purchasing:** Lisa DeCampos
- Product Development Team/R&D:** (2021 Hire)
- Administration:** Cynthia Schultz
- Production Staff:**
- Sales Team:** (2021 Hires)
- Marketing Manager:** Erika Carruth



GLOBAL IMPACT

POWERPANEL Donates 5% of Gross Profits



- 5-Year Value = \$1.5 Million
- Humanitarian Relief provided through distribution of Gen-2-O to NGOs/nonprofit partners for:
 - Disaster Recovery
 - Hurricane Relief & Preparedness
 - Emergency Aid
- Gen-2-O provides on-demand electricity and hot water for immediate use:
 - Space heating/cooling
 - Hot showers and cleaning
 - Cooking
 - Charging phones and computers



*Donation in form of Gen-2-O. Program will begin once Power Panel reaches forecasted positive net profitability.

*The above slide contains forward looking projections and are not guaranteed.

SALES OVERVIEW

Trailing Sales (last 12 months)

- Cleveland Project Q4-2019: 96 units, \$101k

Sales Pipeline \$4 Million

- RECH Deal – 500 units (immediate), plus 240/month starting June 2021
- 2 Large US Solar Providers: 500 units each in 2021 (1,000 units total)

POWERPANEL®

Topline P&L

Income	2021	2022	2023	2024	2025
Product Sales	\$5,094,202	\$7,137,848	\$9,820,927	\$13,817,476	\$19,918,138
Royalty Payments	\$0	\$150,000	\$850,000	\$1,110,000	\$1,393,500
Licensing Fees	\$0	\$1,290,000	\$1,290,000	\$0	\$0
Total Income	\$5,094,202	\$8,677,848	\$11,960,927	\$14,927,476	\$21,309,638
Cost of Sales	\$3,324,907	\$4,635,503	\$6,332,889	\$8,851,765	\$12,697,334
Gross Profit	\$1,769,236	\$3,942,346	\$5,628,038	\$6,075,711	\$8,612,304
Gross Margin	35%	46%	47%	41%	40%
Selling, General & Administrative Costs	\$1,151,352	\$2,118,399	\$2,653,005	\$2,870,456	\$3,663,215
Operating Income (EBIT)	\$617,883	\$1,823,947	\$2,965,033	\$3,205,255	\$4,949,089
Operating Margin	12%	21%	25%	21%	23%
Net Changes in Working Capital	\$1,136,740	\$203,108	-\$321,367	-\$485,422	-\$705,509
Capital Expenditures	\$625,000	\$330,000	\$100,000	\$100,000	\$100,000
Capital Contribution	\$2,270,034	\$0	\$0	\$0	\$0
Unlevered Free Cash Flow	\$1,126,178	\$1,697,056	\$2,543,667	\$2,619,833	\$4,140,580
Debt Service	\$0	\$0	\$0	\$0	\$0
Levered Free Cash Flow	\$1,126,178	\$1,697,056	\$2,543,667	\$2,619,833	\$4,140,580
Cash at Beginning of Period	\$23,494	\$1,149,671	\$2,846,726	\$5,390,393	\$8,010,225
Cash at End of Period	\$1,149,671	\$2,846,726	\$5,390,393	\$8,010,225	\$12,150,806

POWERPANEL®

*The above slide contains forward looking projections and are not guaranteed.

Hard Rock Hotel Punta Cana

Investment Ask

- \$2 Million for 20% Equity
 - Private Offering
 - WeFunder
- Capital to be utilized for:
 - Working Capital – 50%+
 - Management Team
 - Sales and Marketing Team
 - Operational Overhead (3 months)

POWERPANEL®

Appendix

- Case Studies
- Product Performance
- About BASF
- Power Panel Patents
- History of Solar Thermal
- PV vs. PVT
- Background – Power Panel PVT
- Thermal Storage Tanks
- Energy CIO Insights Article



Windward Passage Hotel - Charlotte Amalie, St. Thomas USVI

Proposal:
The project proposal includes a 64 panel system to be installed on the roof of the Windward Passage Hotel. Thermal storage specified for the project is equivalent to 362 kWh.

Outcomes:
Assuming a constant electric utility rate of 0.40 \$/kWh, the annual gross savings of the system is \$38,081, with an ROI of 2.02 years and IRR of 51.3%. When factoring in O&M costs, the 10 year revenue is \$437,002 and 25 year revenue is \$1,136,023. The 64 panel system will save the Windward Passage Hotel \$37,921 in the first year, resulting in a lifetime savings of \$1,016,797 over 25 years.*

*Based on average utility rates available in the USVI

Project: Windward Passage Hotel
Location: Charlotte Amalie, St. Thomas USVI
System: 64 Panel Solar Thermal Array
Hot Water Usage (gal/day): 2,051
Hot Water Thermal Consumption (kWh/month): 8,993
Current Installation: 16 Panels (Phase I)

System Specifications:
64 PVT Panels Modules with 2,000 gallons of thermal storage
\$1,400,000
\$ 8,000 electrical

CASE STUDY:
Windward Passage Hotel

- Location: Charlotte Amalie, St. Thomas
- Alternative: 40¢/kWh
- Water usage: 2,051 gallons/day
- Thermal consumption: 8,993 kWh/month
- ROI: 2 years
- IRR: 51.3%

POWERPANEL

Project: Lighthouse Point Residence
Location: Lighthouse Point, Florida
Modules: 14 PVT1 (2x7 module)
Outdoor Pool Heating: 10,000 Gallons
Additions: AquaCal T75 Air/Water Heat Pump

System Specifications:
14 PVT Panels Modules with 350 gallons of thermal storage
\$100,000
\$10,000 electrical

POWERPANEL

Residence - Lighthouse Point, Florida

Proposal:
The project proposal includes a 14 panel PVT system and a 350-gallon Power Panel Thermal Edge storage tank with internal passive loop heat exchanger to be installed at a residence in Lighthouse Point, Florida.

The objective of the installation is to reduce the electric bill and thermal costs for pool heat and domestic hot water in a single-family home.

Outcomes:
The 14 panel system will cover 80.3% of thermal demand and offset 0.8% of the annual electrical energy demand. The ROI for the system is 9.3 years.

CASE STUDY:
Lighthouse Point Residence

- Location: Lighthouse Point, Florida
- Modules: 14 PVT1 panels
- Thermal Storage: 350 gallons
- AquaCal Capacity: 74,000 BTU/hour
- ROI: 9.3 years

CASE STUDY:
J. Spang Building

- Savings from Tax Credit/Incentives: 45%
- 25-year Total Savings: \$155,392

Project: J. Spang Building
Location: Cleveland, Ohio
System: 96 Panel Solar Thermal Array
Estimated Electrical Consumption (kWh/day): 1,260
Estimated Thermal Consumption (kWh/day): 375
Average Tank Temperature (F): 95 degrees



J. Spang Building

System Specifications:
96 PVT Hybrid Modules with 2,100 gallons of thermal storage
60.2kW Thermal
12.1kW electrical



POWERPANEL



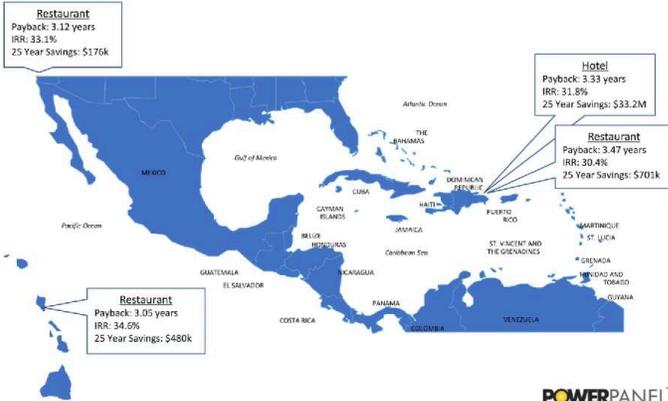
Project: Corner Brewery
Location: Ypsilanti, Michigan
System: 144 Panel PVT Generation I
Thermal Yearly Outputs:
19,000 kWh AC | 79,000 kW Thermal



Installation:
Corner Brewery

POWERPANEL

PowerPanel: Resort and Restaurant Case Studies



POWERPANEL

PowerPanel: Designed for Performance and Deployability



- System**
- Smaller footprint than other solar thermal modules
 - Plug and play i.e. no technical expertise required for install
 - Can run at higher heat, as there is no copper in tubing/heat exchanger

- Panel**
- BASF material set
 - Unpressurized system, lowers maintenance cost and # of failure points
 - Embedded thermal capture, creates efficiencies and lower BOM
 - No glycol, prevents loss in heat transfer increasing output ~15%
 - Melts snow -> better winter performance

- Tank**
- Rapid deployment (<5 mins)
 - No outside labor required
 - All plastic construction enables internal and external placement with no corrosion

POWERPANEL

BASF contributes to sustainable construction for the world's largest concentrated solar plant in Morocco

- Specialized solutions to secure the construction of the largest solar plant in the world
- Master Business Developer* helps to ensure a durable and long service life for the Noor solar plant

Overseas, Morocco, April 28, 2017 - Stage one of the three phase construction project of the Noor solar collector was set to proceed in February 2016. However, conditions based on the BASF Construction Chemicals Division's special knowledge and experience are used in the construction of the concentrated solar power system - a new construction process to install the solar used photovoltaic panels.




BASF – Power Panel's First Partner

- Provided the NRE to develop the resin chemistry
- Contribution of \$40-50k for an unproven startup
- Enabled PowerPanel to operate both outside in UV light and underwater
- Developed racking
- PowerPanel has royalty free access to the technology

POWERPANEL® Product Patents

Product	Patent #, Date	Country	Status
Power Panel	2701754, 15-Nov-2016	Canada	Granted
Hybrid Solar Panel	602080446506, 08-Jun-2016	Germany	Granted
Hybrid Solar Panel	2206160, 08-Jun-2016	European Patent Convention + France	Granted
Power Panel	8476522, 02-Jul-2013	United States of America	Granted
Photovoltaic Panel for Power Panel	201262313, 14-Jul-2016	Australia	Granted
Photovoltaic Panel for Power Panel	ZL 201280038237.8, 15-May-2018	China (People's Republic)	Granted
Photovoltaic Panel for Power Panel	602012040644.5, 06-Dec-2017	Germany	Granted
Photovoltaic Panel for Power Panel	2715800, 06-Dec-2017	European Patent Convention + United Kingdom	Granted
Photovoltaic Panel for Power Panel	6152096, 02-Jun-2017	Japan	Granted
Photovoltaic Panel for Power Panel	J/003217, 13-Nov-2018	Macau	Granted
Insulated Storage Tank	2752673, 17-Nov-2015	Canada	Granted
Insulated Storage Tank	ZL2010800170163, 12-Jun-2013	China (People's Republic)	Granted
Insulated Storage Tank	602010039794.7, 25-Jan-2017	Germany	Granted
Insulated Storage Tank	2398719, 25-Jan-2017	European Patent Convention + France	Granted
Insulated Storage Tank	5686746, 30-Jan-2015	Japan	Granted

POWERPANEL® Product Patents (continued)

Product	Patent #, Date	Country	Status
Insulated Storage Tank	101617817, 27-Apr-2016	Korea, Republic of	Granted
Insulated Storage Tank	8381939, 26-Feb-2013	United States of America	Granted
POWER PANEL ASSEMBLY INCL. SOLAR PANEL + SOLAR THERMAL HEAT EXCHANGER, & METHOD FOR MAKING POWER PANEL ASSEMBLY	201814011652, 28-Mar-2018	India	Published
POWER PANEL ASSEMBLY INCL. SOLAR PANEL + SOLAR THERMAL HEAT EXCHANGER, & METHOD FOR MAKING POWER PANEL ASSEMBLY	15/888,297, 05-Feb-2018	United States of America	Published
AquaGrow Fish and Water Drop (Design Only)	Trademark 5625702, 11-Dec-2018	United States of America	Registered
Gen-2-O (stylized/design)	Trademark 88847100, 25-Mar-2020	United States of America	Published
Gen-2-O	Trademark 4497174	India	Registered
Gen-2-O	Trademark 919510493	Brazil	Registered
Power Panel	Trademark 5687756, 26-Feb-2019	United States of America	Registered
Power Panel	Trademark 919459048, 24-Mar-2020	Brazil	Published
Power Panel	Trademark 4497175, 7-May-2020	India	Pending
Power Panel (stylized/design)	Trademark 5597785, 30-Oct-2018	United States of America	Registered
Power Panel Logo	Trademark 919459064, 24-Mar-2020	Brazil	Published

Background – Power Panel PVT Technology:

The idea of a hybrid solar collector that generates both electricity and thermal energy in a single module is not new. Several attempts by notable companies have been tried and most have failed due to the lack of thermal performance. These previous products attempted to adapt a thermal capture mechanism to a standard electrical producing Photovoltaic (PV) module with the result being little if any thermal energy generation from the collector.

To ensure that both electricity and thermal energy are delivered to full potential, a ground up design approach was taken by Power Panel. Application specific high temperature capable plastics, insulating foams along with silicone adhesives and silicone solar cell encapsulants are utilized to build the Power Panel PVT1 collector. The result is a module that produces electrical energy on par as a standard PV module plus thermal output as would be expected from a top rated glazed thermal collector.

In addition to the PVT1 Collector, Power Panel developed a thermal storage tank as the cornerstone technology of the Balance of System for engineered rooftop solutions. The thermal storage tank utilizes engineered foam sections that form the sidewall, base and tank lid. These foam sections are contained by an outer membrane hoop with working fluid (water) contained by a high temperature PVC liner. The design allows the tank to be located on a rooftop, under the PVT1 collector, or in basement or crawl space.

the PVT collector, on a basement or crawl space.

With the building blocks of the PVT1 collector and Thermal Storage Tank, Power Panel has developed array systems as small as 4 modules (Gen-2-O) to as large as 16 modules. The larger array systems can be expanded and grouped to provide base thermal for industrial, commercial, agricultural and residential applications.



Thermal Storage Tank - Think of it as a battery:

Hot Water

The thermal storage tank energy storage capacity is equal to 60 kWh at a temperature difference of 40° C . This temperature difference represents the incoming cold water to the delivered hot water temperature of 55° C (131° F)

The energy storage capacity of 60 kWh is an important number compared to the amount of chemical battery storage capacity (lithium ion or AGM) required. Assume a COP for a heat pump of 3.5 – the chemical battery storage requirement is 17 kWh to generate the 60kWh of hot water. The chemical battery cost is \$13,000 plus cost of the heat pump, while the Power Panel storage tank Installed cost is under \$3,000.

Ice Storage for Air Conditioning (active product development)

Incorporated into a chiller system that provides air conditioning for a building, the Thermal Storage Tank can be used to build ice using either off-peak and low-cost energy (nighttime) or energy generated from a renewable energy source (solar, wind, hydro)

Benchmark technology and systems for Ice storage include Calmac/Trane. The advantage that Power Panel has over incumbent technology is lower cost and ease of deployment.



Top 10 Solar Energy Tech Solution Providers - 2019

A company ranked in to include the list... (text continues describing the company's performance and technology solutions)



Company: Power Panel
Description: The company offers all-in-one... (text continues describing the company's offerings)

POWER PANEL Cost-Effective Sustainable Energy Solutions

The solar industry continues to be at the forefront of the energy revolution... (text continues describing the company's role in the industry)



Understanding the customer requirements is paramount to us and we continually thrive for delivering a solution that caters to their needs... (text continues describing the company's customer focus)

Click here to read more...

