



## INVESTOR PRESENTATION

August 2024

(Q2 Update)

NASDAQ: POLA



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# Company Overview

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*Polar Power is pioneering technology that can radically change the production, consumption, and environmental impact of power generation.*

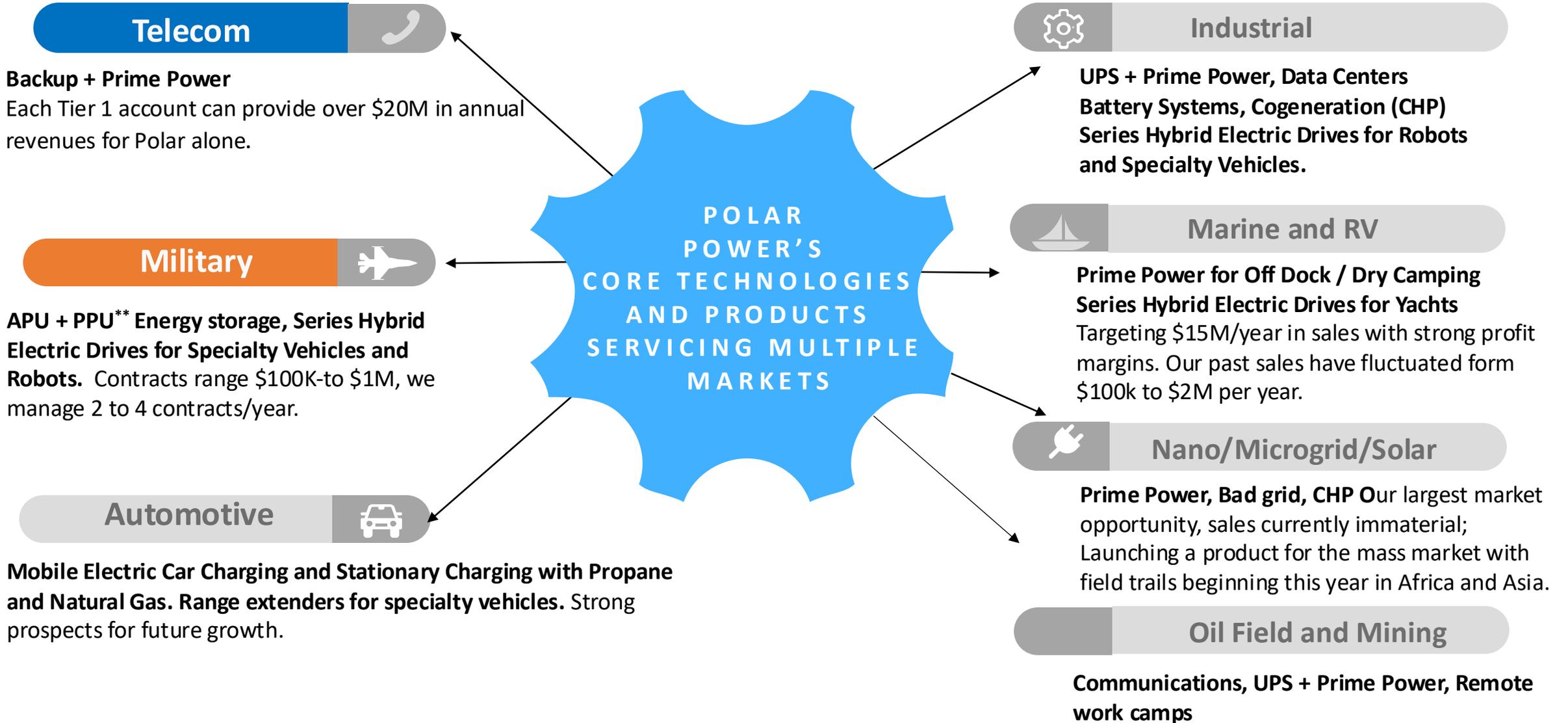
- Starting with an evaluation of the customer's application needs, our **“clean sheet of paper approach”** results in the unique and highly efficient design, manufacture, and integration of power/energy storage/cooling solutions.
- Polar's vertically integrated capabilities from engineering through production uniquely enables us to develop new components and software that utilize all available cutting-edge technologies, including fuel, solar, energy storage and conversion, and heat transfer technologies optimized into a single solution.
- Our engineered solutions provide a **significantly lower total cost of ownership with higher performance than our customers could achieve on their own and enable them to focus on their business and not on power management.**

*Helicopter Access only site with Polar propane generators*



Meeting energy needs at a very isolated and difficult location

# Diversified Markets and Customer Base-One Platform Numerous Applications



# Market Dissection-Past, Present, Future



## TELECOM



## MILITARY

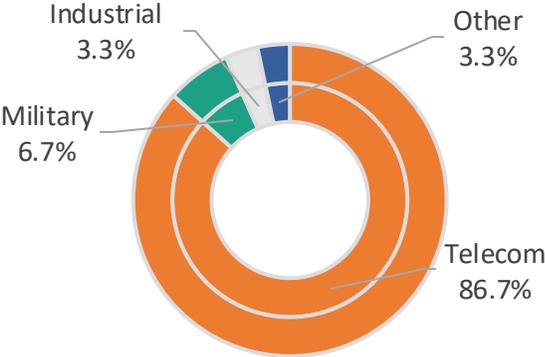


## OTHERS

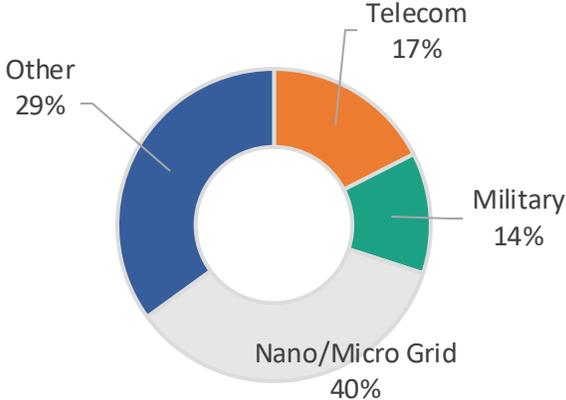


Our ideal business mix is to DIVERSIFY, with Telecom market representing 15% to 20% of our overall sales, military at 10% to 15% Nano/Micro Grid 35% to 45% and the balance EV charging, Marine/RV, Industrial.

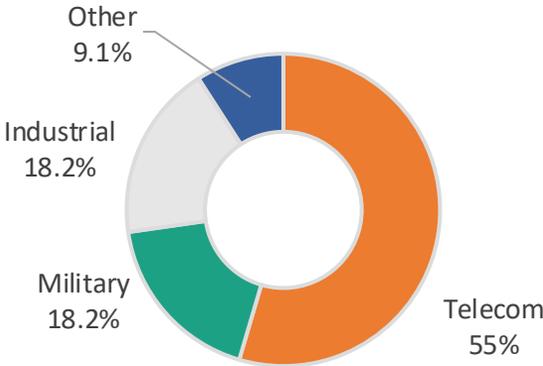
2023 Sales



Long-Term Objectives



Backlog 6.30.2024



# Key Differentiators and Customer Value Proposition



## ALL Polar Power Technology Platforms feature:

- High fuel efficiency
- Low acoustic noise
- Very compact and light weight
- Generator controls have built-in battery charging algorithms
- Remote monitoring and control
- Ultra-reliability operating in extreme temperatures and weather conditions

## Telecom focus is on reducing CAPEX and OPEX:

- Cost Savings in deployment is estimated in the \$10s of millions per year for Tier-1 telcos
  - ✓ Eliminates need to purchase natural gas booster compressors (cost \$18k to \$22k)
  - ✓ Eliminates need to rent large cranes to place generators on the roofs of high-rise buildings (\$60k - \$100k)
  - ✓ Lower permitting and real estate costs (smaller equipment footprint)
  - ✓ Improved fuel economy means greater reserve time on site
- Prime power sites can see a 40% to 70% decrease in fuel costs

***Why DC generator and not AC? Because solar PV, batteries, fuel cells, and most electronics are all DC devices and our DC generators do not suffer the power conversion losses converting from AC to DC.***

## Military focus is on the following:

- Our products:
  - ✓ Reliability, durability and lower maintenance
  - ✓ Significant reductions in space and weight
  - ✓ Custom packaging available as a service
  - ✓ Low RF / EMI emissions, invisible to detection.
- We offer an Ideal platform for automated systems, robotics, drones, communications

# Telecom Generator Market

- U.S has total of 424,960 telecom towers out of 6.9 million sites worldwide, approx. 5.4% (not including the controls, energy storage, maintenance dollar opportunities).
- Globally the backup market is now addressing increasing energy demand, more frequent and longer power outages. Generators need to be more efficient, lower emissions, and longer runtime with lower maintenance.
- In the U.S. 37% of the telecom generator market is less than 25 kw., while 23% is of generators operate between 25 kw – 50 kw
- As the telecom market has changed, Polar product range is continuously expanded to meet market demands. Polar market share is estimated to be 12% in U.S. mainly targeting the less than 27 kW backup market.
- 5G growth expected to increase backup generator replacement market to higher power generators

Reference: <https://www.gminsights.com/industry-analysis/telecom-generator-market>



# Natural Gas/LPG Hybrid Power - Telecom

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- USA and other countries are making broadband services available in rural areas, and Polar's Hybrid power systems lowers the sites operational costs.
- Worldwide telecommunications consumes diesel fuel in tens of billions of liters of every year. Creating significant amounts of pollution.
- Telecom and broadband services currently consumes 4% of the worlds energy and this is expected to grow to 20% with 5G, AI, and Data services.
- LPG with or without solar can annually save individual telecom companies tens of millions of dollars in energy costs annually.
- LPG and NG are considered as transition fuels that could eventually lead to rLPG, rDME, and ammonia fuels that are renewable. Our Toyota engines should have no issues operating on these newer environmentally friendly fuels.

\*According to articles posted,



# EV 27 kW Mobile Car Charger



Two Chrysler / Fiat electric vehicles being charged at the same time during road testing

- Polar has sold Mobile EV Chargers to Chrysler/Fiat, Ford, Bosh, Volkswagen and Mazda.
- Polar projects the need for Mobile chargers for “AAA” type road service is 1 to 2 years into the future. Its faster and lower cost to charge the EV in the field than to transport the EV to the nearest charger via flatbed truck.
- Stationary rapid chargers for home / office vehicle charging fueled by natural gas will overcome buyers' resistance to purchasing EV and help launch micro-cogeneration in the USA.



# Solar Hybrid Power Systems-The Future of Nano / Micro Grids / Distributed Power generation

Polar's proposed hybrid energy systems for residential and commercial applications combines DC generation with energy from the electric utility (if available), natural gas / LPG company, and solar PV to provide a lower total energy cost than most electric utilities. A side benefit is a significant reduction of green house gases and pollution.

## Three demand drivers that are here to stay:

- ✓ **EVs:** as EVs continue to proliferate, most homes will not be able to charge EVs at their convenience due to limited electric service from the grid. Also due to limited utility service to the home/office fast EV charging is not possible. **An LPG or natural gas DC generator provides fast charging**
- ✓ **Climate change:** As the climate gets warmer the need for air-conditioning, increases the demand on the electric utility grid.
- ✓ **Failing electric utility** due to increased load demand and an aging infrastructure these problems of utility blackouts, brownouts and peak power charges are increasing.

The solution for a failing grid is distributed power using these small micro power systems creating low-cost sustainable power.

## LPG / PROPANE / NATURAL GAS HYBRID SOLAR POWER SYSTEM

High-Efficiency gas DC genset with heat recovery  
(low capital cost)

+

Zero-emission Solar PV energy  
(low operating costs)

=

LOW-COST SUSTAINABLE POWER

- Provides a lower carbon footprint than traditional on-site generators or grid-supplied power.
- Low maintenance and lower cost of ownership.
- Various applications include: on-grid, off-grid prime power, backup power, micro-grid, EV charging, heating, and air-conditioning.



# Innovating Power Generation- A Better Technology Platform



- The Toyota series of prime power engines in combination with Polar's alternators provides the performance necessary to make nano grids practical using LPG and natural gas as a fuel.
- Diesel is not practical for nano grids, CHP, or micro-cogeneration as diesel has become too expensive and there are increasing concerns over pollution.
- Backup generators are not engineered for prime power. 30 kW and smaller backup LPG generators are typically replaced at 3,000 to 4,000 hours of run time. Their low fuel efficiency also renders them not cost effective.
- The Polar / Toyota prime power generator (model 1KS-CHP) has the oil changed at 4,500 hours. Fuel efficiency is high.



- Most applications for power generation will require an engine and alternator. Increasing the efficiency of the both the engine and alternator (generator) is required to compete with a diesel generator.
- A diesel engine has a higher compression ratio than spark plug ignition engine, and this gives the diesel engine higher fuel efficiencies. The popular "lawn and garden" engines, used by most backup generator companies, have lower compression to reduce engines' production cost, size, and weight.
- To compensate the fuel efficiency difference between the 2 technologies (compression ignition/ diesel and spark ignition / LPG) Polar took the following steps:
  - ✓ Build with Toyota 1KS engines which have a higher compression ratio compared to most LPG engines, approximately 12:1 verses the lower 9:1 found in competitors' products.
  - ✓ Redesign: the coolant pump, fans, and SLI alternator were removed from the engine reducing the parasitic losses in the engine and improving fuel efficiency; coolant pump and fans are electrically driven at optimum speeds improving reliability and efficiency.
  - ✓ Utilize permanent magnet alternators optimized for production of DC current as opposed to AC. This increased efficiency in generating electricity and reduces fuel consumption.
  - ✓ Optimizations to the overall application to further reduce fuel consumption. For example, being able to charge batteries directly from the DC generator as opposed to using battery chargers with AC generators reduces fuel consumption and system cost.
- In a generator application the Toyota 1KS engine has a serviceable life span of 60,000 to 90,000 hours compared to a Diesel engine with life span of 12,000 to 30,000 hours.
- **The overall result is lower maintenance, higher reliability, and lower fuel costs than a diesel fuel AC generator.**

# Vertical Integration and Global Presence

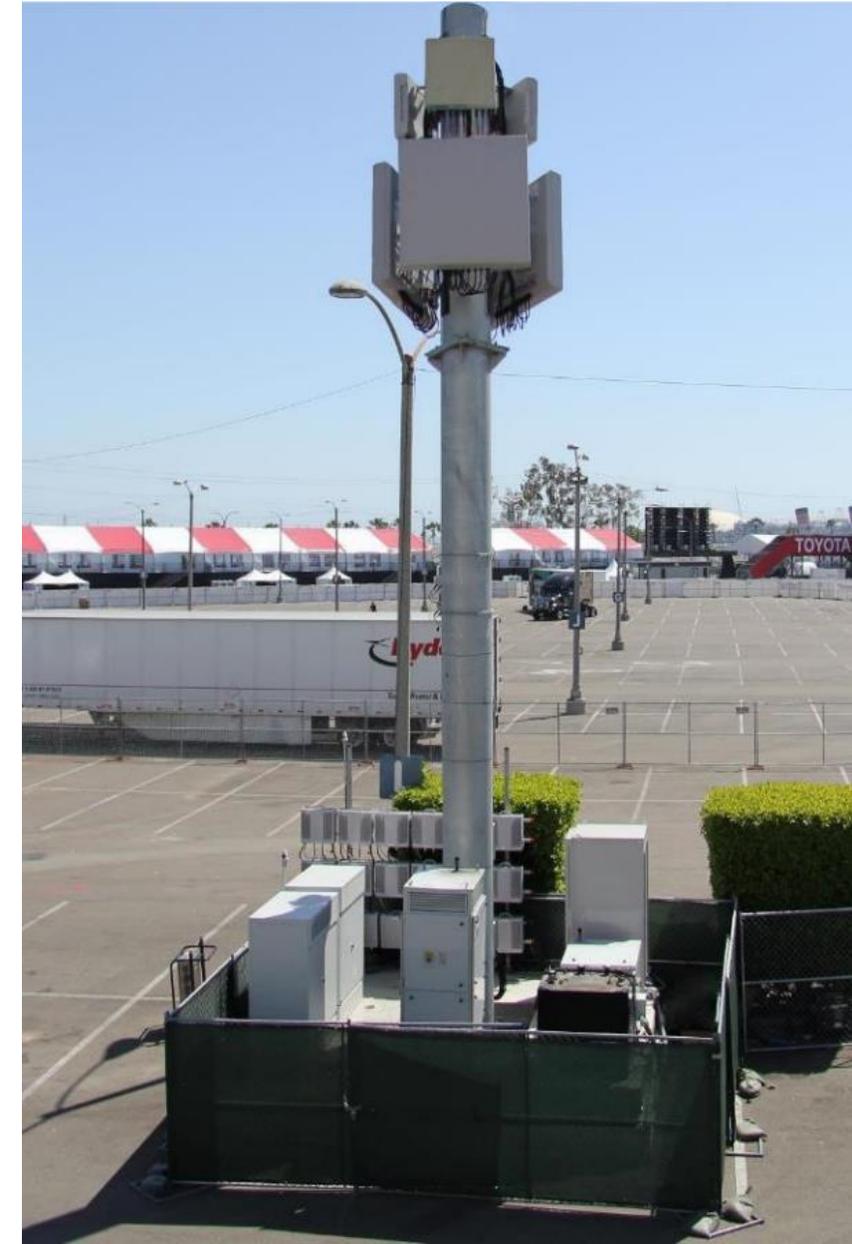
- 70,000 square feet of vertically integrated manufacturing facility, Gardena, CA, with additional 20,000 sq ft warehousing facility:
  - Current configuration has capacity to support \$50 million-plus in total annual revenues
  - \$4.5 million in advanced fabrication equipment, automatic welders, test and inspection equipment
- Direct sales force in six continents
- Rapid prototype, engineering and R&D facilities collocated with manufacturing to build custom products
- Trained and qualified third-party service centers to enhance customer experiences
- Key vendors / partners – Toyota, Bosch, Yanmar and others



POLAR POWER		LOCATION
HEADQUARTERS	★	Gardena, CA, USA
SUPPORT CENTER	▲	Bucharest, Romania, Gardena, Johannesburg SA
SALES OFFICES	★	8 Sales Offices – 3 U.S.; Australia, Dominican Republic; Dubai, U.A.E.; Poland
AUTHORIZED SERVICE FACILITY		15 Third Party Service Centers with over 50 locations

# Investment Highlights

Technology Leader	First-mover advantage in emerging 50 kW DC clean fuel prime power systems into nano grid, telecom, EV charging
Large, growing markets	Backup generator power alone represents \$650 Million/year opportunity
Visibility to higher sales in 2024	<b>Higher new bookings in 1H 2024 has resulted in \$5.7 million in reported backlog as of 6/30/2023</b>
Valuation	Enterprise Value of Approximately \$12 Million vs sales annualized run rate of approximately \$20 Million
Hidden Assets	<ul style="list-style-type: none"><li>• \$3 million-\$5 million Market Value of (fully depreciated) equipment and machinery</li><li>• \$15.8 million in inventory</li><li>• \$18 million in NOL's</li></ul>
Targets	2-3 Year Sales Target of \$50 million Gross Margin Target is 40%



# Key Financial Information:

Stock Symbol	NASDAQ: POLA
Stock Price (as of 7/31/24)	\$0.45
Shares Outstanding (as of 8/14/24)	17,561,612
Market Capitalization	\$7.9M
Total Liquidity Cash and Available Credit (6/30/2024)	\$1.8M
Debt – Line of Credit (6/30/24)	\$5.0 M
Enterprise Value	\$11.8M
Options (6/30/24)	140,000
Insider Ownership %	32%



# Income Statement



(In thousands, except per share data)	Full Year Ended Dec. 31,		Latest Quarter	Year ago Quarter
(Unaudited)	2023	2022	June 2024	June 2023
Net Sales	\$15,293	\$16,056	\$4,660	\$5,587
Cost of Sales	14,598	13,931	2,828	4,112
Gross Profit	695	2,125	1,832	1,475
Total Operating Expenses	6,685	7,658	1,372	1,785
Income (Loss) from Operations	(5,990)	(5,533)	460	(310)
Total Other Income (expense)	(558)	(51)	41	(126)
Net Income (Loss)	(6,548)	(5,584)	501	(436)
Net Income (Loss) per Share – Basic and Diluted	\$(0.49)	\$(0.43)	<b>\$0.03</b>	\$(0.03)

## Quarterly Financial Update:

- **Revenue comp was slightly down y-o-y but up 163% sequentially.** Q2 024 sales were highlighted by international sales and sales of solar hybrid power systems
- **Gross profit increasing:** GM for the Q2 was nearly 40%, driven by international sales and inventory management/utilization
- **Operating expenses remain in check** due to cost controls and other productivity optimization measures
- **Net Income swing of \$937,000 resulted in first profitable quarter in over 2-years**

# Growth Strategy - Diversification

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## Domestic Strategic Overview

- Further develop the Tier 2 / 3 wireless phone companies, there are more that 200 companies in the USA mostly serving the last mile.
- Expand field services and commissioning
- Expand marketing / sales efforts on our 27 KW product line to Tier-1 wireless – 50% higher ASP than our existing DC power systems (offers 40% lower fuel consumption and lower emissions than competition)
- Expand LPG / Solar Hybrid product line for off-grid and UPS applications
- Market low emission Natural gas and LPG EV chargers

## International Strategic Overview

- Expand LPG / Solar Hybrid product line for off-grid and UPS applications
- Promote low emission natural gas and LPG product line Globally, targeting bad grid in urban markets
- Partner with LPG Producers and distributors to market and promote lower cost fuel alternatives to diesel
- Target OPEX models jointly with LPG distribution companies
- Provide lease of equipment so telecoms can operate on a OPEX model

# Key Management

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**ARTHUR D. SAMS**  
*CEO and President*

- Since 1979, President, Chief Executive Officer and Chairman.
- 45 years experience in engineering, machinery, sales, marketing, project manager & CTO and President roles, consulting to the U.S. Department of Defense and U.S. Department of Energy, and numerous Fortune 500 companies



**LUIS ZAVALA**  
*CFO*

- Chief Financial Officer of Polar Power, since 2016
- 2009 – 2016 - Vice President of Finance – Polar Power
- 2006 – 2009 - President of Sky Limited Enterprises (General Contractor)
- 2001 – 2006 - Director of Finance for Legacy Long Distance International
- 30+ years experience in managing accounting and finance departments



## Investor & Media Relations

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**NASDAQ: POLA**

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# MARKETS

# Company History



Polar Power is launched with the introduction of solar powered vaccine refrigerators for cold chain in rural areas

Contracts for power systems – US Navy, US Army, Hughes, Martin Marietta, NASA, Aramco

Introduced DC generators and hybrid solar systems for telecom and off grid markets. ATT, Bell Groups, APS

1979



1980



1990



Received production contracts from top 3 tier-1 telecom companies

Produced mobile EV chargers for Ford, Chrysler/Fiat, Mazda, Volkswagen, Bosch

2010



IPO

Expanded global sales infrastructure

Grew sales to \$24 million

2016



Introduced Toyota line of Propane / NG Prime Power and 27KW DC generators for 5G market

2023



# Solar Hybrid Power System

- **Most homes will not be able to fast charge EVs due to limited electric service; an LPG or natural gas DC generator provides fast charging** and if the engine's waste heat utilized, this system can offer a lower carbon footprint than most electric utilities.
- **As the climate gets warmer the need for air-conditioning increases the demand on the electric utility grid.** Japan faced a utility problem due to a rapid rise in air-conditioning demand, **to solve for this problem, engine driven heat pumps were developed to use Japan's NG grid.** Other Pacific Nations pursued same solutions using LPG.
- **In the early 1990's Polar engineered and manufactured power systems for Arizona Public Service (APS) to provided electric service to off grid homes and farms.** These small self-contained shelters were dropped off at the site and then connected to the properties power panel. Today we see a more efficient and expanded version that is applicable to on-grid, off-grid, and bad-grid locations. A great opportunity for homes in the USA that are still using fuel oil for heating.
- **Polar's proposed system allows the home or office to draw its energy needs from the electric utility, gas company, and solar.** It solves the issues of fast charging an electric vehicle at home, utility blackouts, peak power charges.
- **Applications making the use of solar, LPG or NG, and the engine's waste heat will typically have both a lower carbon footprint and a lower energy cost than most electric utilities.**
- **Many utilities continue to burn diesel, fuel oil, and coal to produce the electricity they sell.** There are also energy losses in the power lines that add to the fuel consumption.

NASDAQ: POLA

## LPG / PROPANE / NATURAL GAS HYBRID SOLAR POWER SYSTEM

High-Efficiency gas  
DC genset with  
heat recovery  
(low capital cost)

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Zero-emission  
Solar PV energy  
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POWER

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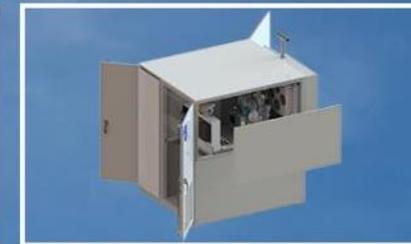
# Solar Hybrid Applications

- There are many applications that run the AC generator 24 hours a day without using solar this presents a huge consumption of diesel. And other applications the AC generator is run for a limited time each day powering the load while charging a battery, eventually shutting down and allowing the battery to power the load. When the battery charge is low the cycle repeats. First example consumes large volumes of diesel fuel, and second example will lower the fuel consumption.
- The lowest CAPEX and OPEX costs, most reliable operation, and environmentally friendly technology is combining solar with LPG.
- Its not a cost-effective solution for most applications to use 100% solar (PV). 100% solar typically requires the solar array to double in size and the battery bank to triple in size to manage those periods of low sunlight. To reduce the battery requirement and land space for the solar, a DC generator is included. The fuel used for the generator is typically lower in cost over increasing the battery size.
- The solar hybrid sites are typically designed for 80% to 90% solar energy with fuel providing 20% to 10% of the site's energy requirements. With lower fuel consumption, LPG presents a significant advantage over diesel.
- Prewired / prepackaged equipment reduces installation costs and improves serviceably. Its too costly to send engineers in the field to supervise the wiring of solar hybrid systems.

## THE SIMPLEST AND MOST EFFICIENT WAY TO INSTALL A HYBRID SOLAR SYSTEM

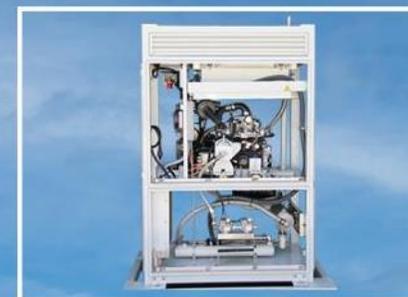
### ALL-IN-ONE INTEGRATED SYSTEM INCLUDES:

- DC Generator is the most efficient means of combining Solar Energy with Clean Fuel
- Capacitor is used in place of a Battery for more reliable starting of the DC Generator
- Batteries store the excess energy produced by the Solar Array
- MPPT Solar Control optimizing the energy from the Solar Array
- Inverter converts energy from the Solar, Battery, and DC Generator to AC
- Heat Exchangers capture the waste heat from the DC Generator for heating water and space
- Digital Controls automate the process and provide remote monitoring and control
- Optional Air-Conditioning for homes and offices



### DC GENERATOR WITH WASTE HEAT RECOVERY

- DC Generator operates on Natural Gas, LPG, and Propane
- Powder Coated Aluminium Cabinet with stainless steel hardware
- Units can be combined to increase capacity
- Remote Monitoring and Control
- 15 kW Electrical Output
- Up to 37,000 kcal/hr of Heat
- Up to 30 KVA in AC Electrical Output
- Up to 6 Tons of Refrigeration / Air-Conditioning



# Specialty Hybrid Vehicles

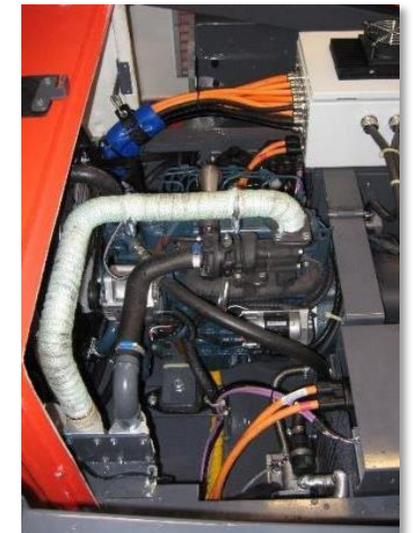


Installed on this vehicle is the Polar 8340P-40415 generator with output power of 20 kW at 320 VDC nominal. Crew have the option of operating all electric in stealth mode then switching over to the Polar DC generator for long range cruising.

In this application Polar Power Inc. is supplying DC generators to Raytheon for its Hy-DRA vehicle.



This Kalmar hybrid tow tractor incorporates a Polar Power 26 kW DC generator. Hybrid tow tractors can cost less to manufacture than conventional technology.



## Marine Hybrid Electric



Saving energy while making recreation safer and more pleasurable

- Series hybrid electric propulsion
- Powering air-conditioning, communications, water-makers, autopilots and other electrical appliances

## Oshkosh Firefighting Vehicle



A Polar DC 5.5 kW DC auxiliary power unit (APU) provides military grade DC power to operate communications, air-conditioning, a backup means to start the vehicle engine and other equipment.

APU's are extensively used in all types of military vehicles



Seen here is a rugged 6x6 load-carrier (Mule) for dismounted infantry. Closely matching the mobility of infantry, the Hunter WOLF can traverse narrow trails, steep slopes, and dense jungles. Using only internal fuel, the vehicle has a 100 km (60 mile) range and 72-hour endurance. The vehicle's JP-8 / electric hybrid powertrain provides both a "silent drive" and "silent watch" capability. Included in this robot is a Polar 20 kW DC generator.

*In the near future we can expect to see hundreds of thousands of robotic drones, mules, and vessels operating on land sea, and air.*

HDT's Hunter 6 X 6 Wheeled Offload Logistics Follower (WOLF)



# Mobile Solar Hybrid SUSS Trailer

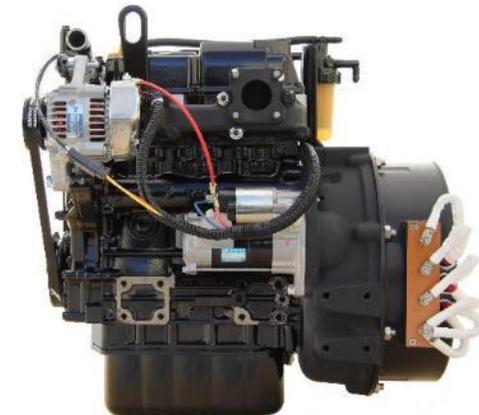


Small Unit Sustainment System, or SUSS, provides temporary power for shelters, communications, oil and mining work camps, and military expeditions.

Enables emergency service teams and first responders to quickly set up a command center or emergency shelter in time-critical situations.

This SUSS is powered by Polar 10kW diesel generator with solar array assembled and presented to the military by HDT Global.

Currently under US Army field trials in Hawaii. For more info see: <https://www.army.mil/article/179906> .



Comparison	Diesel	LPG
<b>ENVIRONMENTAL</b>	<ul style="list-style-type: none"> <li>• Rapidly changing emission standards reduce engine availability to OEM’s and increases engine cost</li> <li>• Strict emission controls is increasing Diesel engine complexity thereby reducing reliability and making maintenance more difficult</li> <li>• Diesel is carcinogenic and causes respiratory issues</li> </ul>	<ul style="list-style-type: none"> <li>✓ Environmentally Clean Fuel, rarely effected by change in environmental regulations</li> <li>✓ Clean exhaust ideal for use near population centers</li> <li>✓ LPG has 14% to 18% less carbon emissions</li> </ul>
<b>STORAGE, SHELF LIFE TRANSPORTATON</b>	<ul style="list-style-type: none"> <li>• Diesel fuel has limited storage life and sometimes requires additives. Transportation of Diesel to the site exposes the fuel to water contamination which can damage the engine</li> <li>• Diesel engines require clean and moisture free fuel to operate reliably</li> </ul>	<ul style="list-style-type: none"> <li>✓ LPG has virtually unlimited shelf life which leads to greater engine reliability</li> <li>✓ During emergencies LPG may be more Obtainable</li> <li>✓ Using Vapor feed contaminants remain in the tank</li> </ul>
<b>ENGINE NOISE</b>	<ul style="list-style-type: none"> <li>• Due to compression ignition, Diesel engines produce much higher noise (knock) thereby requiring a noise attenuation system. Noise is a concern when systems are installed close to population centers or in the backyards</li> </ul>	<ul style="list-style-type: none"> <li>✓ Low operating noise of LPG engine allows for deployment of engines in close proximity to population centers and indoor facilities</li> </ul>
<b>FUEL THEFT</b>	<ul style="list-style-type: none"> <li>• Diesel theft is a key factor increasing operating costs by 10% to 25%. In addition, the practice of diluting diesel fuel as a means of pilferage leads to premature engine failure</li> </ul>	<ul style="list-style-type: none"> <li>✓ LPG is more difficult to steal; making it the ideal fuel for telecom applications</li> </ul>
<b>LIFE CYCLE COSTING</b>	<ul style="list-style-type: none"> <li>• Diesel engines are subject to damage (wet stacking) if run with light loads</li> <li>• Quality Diesel engines will have a service life of 14,000 to 30,000 hours</li> </ul>	<ul style="list-style-type: none"> <li>✓ The service life of a “quality” LPG engine is 60,000 to 90,000 hours</li> <li>✓ Due to environmental benefits most nations provide subsidies to use of LPG thereby reducing operating costs</li> </ul>

Polar expects its diesel DC Generators to continue to increase in sales. We also expect the LPG/NG models to increase in sales at a substantially faster pace.

# Vertical Integration Provides Competitive Edge

## Manufacturing

- Fabrication, machining, and Welding
- Motor Winding and Testing
- Electronics and Harness
- Semi-Automated Machines
- Functional Testing

## R&D, Design Engineering

## Design, R&D

- Proprietary Alternator Design
- Proprietary Control Systems
- Lithium Battery Management Sys
- Proprietary Engine Modifications
- Cooling System designs



## Global Sourcing

- 55% Global Content
- Decades Supply Chain Experience
- 80% Purchase Direct OEM
- Qualified Supplier Base
- Dual Sourced - Critical Components

## Direct Sales, Service

- Direct Global Sales Force – Customer Focus
- Maximized training and Product Knowledge
- Early Market Knowledge

# DC Power Market Trends

- Continued expansion of telecom infrastructure globally, especially in all rural areas, including the USA.
- As diesel fuel costs rise along with the theft of diesel the migration to LPG and natural gas fuels will increase. We can expect local governments make a push toward these clean fuels.
- In developing nations the governments are beginning to encourage a more decentralized power (nano / micro grid) and solar to compensate for failing grids.
- Aging grid infrastructure, increasing consumer power demand is driving many good grids to bad grids driving the need for backup and nano grid generation
- Military increased usage of drones, robotic mules, electronic warfare, automated systems, unmanned surveillance, hybrid specialty vehicles is driving the need for DC generators and energy storage.
- Increased use of solar power, energy storage, and DC generators in RV, marine and off grid housing.
- Being able to fast charge EVs using grid and natural gas could elevate range fear in purchasing an EV. Providing emergency roadside charging at a reasonable cost will also elevate range fear.



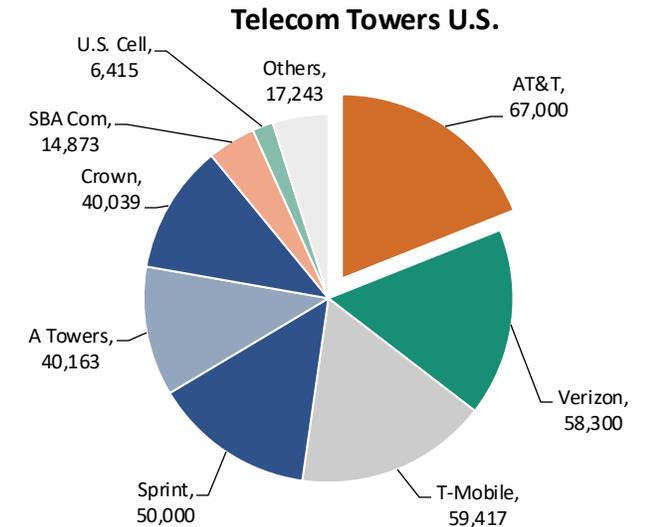
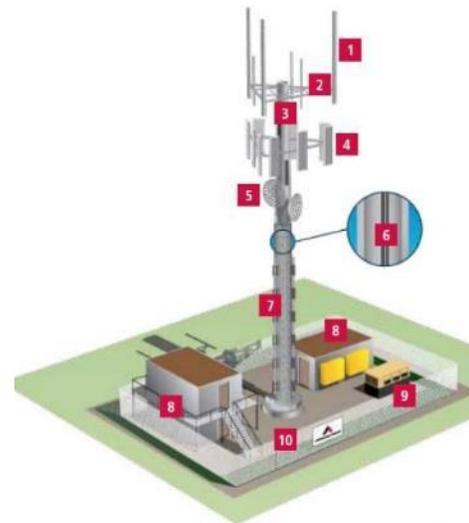
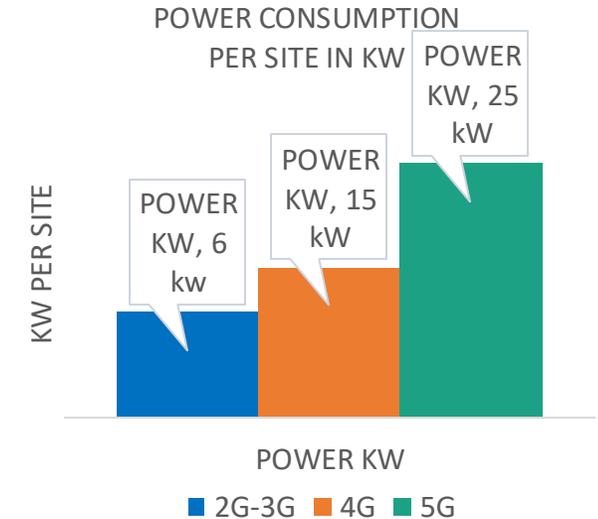
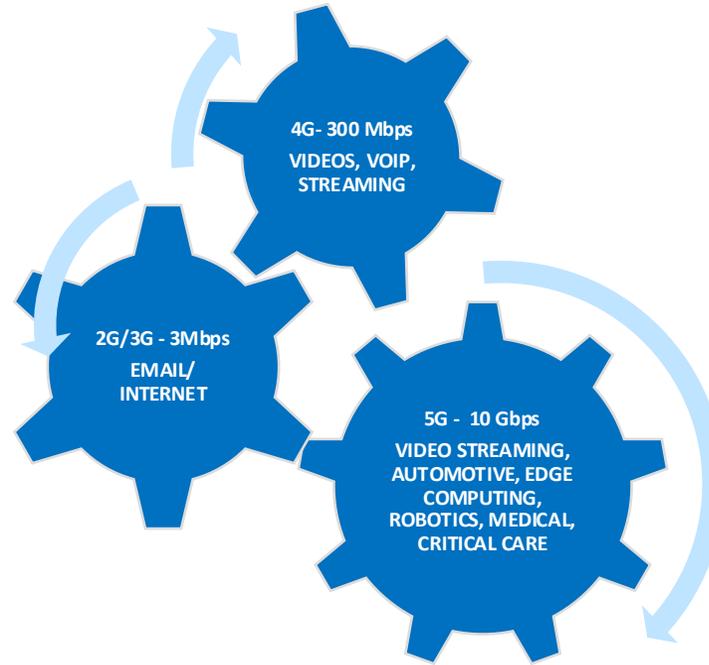
# Natural Gas/LPG Hybrid Power

- Natural gas and LPG globally available in abundance and most regions lower cost than diesel
- Hybrid power combining dc generator, battery storage and solar power to provide 24/7 energy for remote locations
- Lowest emissions with 24/7 power solar power and combination of battery storage and LP/natural gas generator
- Remote EV charging faculties near major interstate highways, off-grid homes or peak shaving during EV charging
- Residential power for off-grid homes equipped with solar and energy storage. LPG/natural gas DC generator for peak shaving or backup power
- Remote bad grid or off-grid telecom towers prime power applications low emissions and low operating cost



# 5G Market Outlook

- Higher power needs – 5G technology is 3 times more energy efficient, but transfers 16 times more data, thereby increasing power needs by 1.7 times
- High growth – 5G impacts cable tv and land line market adding the need for additional telecom towers worldwide and growing the demand for local data storage
- Critical use applications – deployment in automotive mobility self driving vehicles, critical patient care, robotics makes backup generators mandatory
- Always-on application – higher use time gives advantage for fuel efficient technologies like DC power systems (40% more efficient)
- Global impact – global growth in telecom towers will provide up to 25% growth rate in telecom infrastructure equipment demand
- 5G upgrades anticipated to increase fuel usage due to higher power requirements. Polar 27 KW product targets 5G facilities with fuel efficient product



Reference – Power Consumption of 5G base station  
<https://www.huawei.com/en/huaweitech/publication/89/5g-power-green-grid-slashes-costs-emissions-energy-use>

Reference – Top U.S. Tower Companies  
<https://wirelesstimator.com/top-100-us-tower-companies-list/>