



**DIRECT  
KINETIC  
SOLUTIONS**

# Everlasting Power

The Persistent Power Solution of Choice

# Limitless Missions



LAND



SEA



SPACE

Extending the life of portable devices allowing them to complete the harshest of missions



DKS offers an ultra-compact **radioisotopic power source** that lasts for decades due to its unfair energy density advantage. Our devices go far beyond current market offerings, and enable missions previously thought of as impossible.





Portable devices

# Run out of Power

PERSISTENT POWER OPTIONS

Need to be

**PLUGGED**

- Need to be connected into the grid to charge
- Require a large infrastructure

INTERMITTENT POWER OPTIONS

Need to be

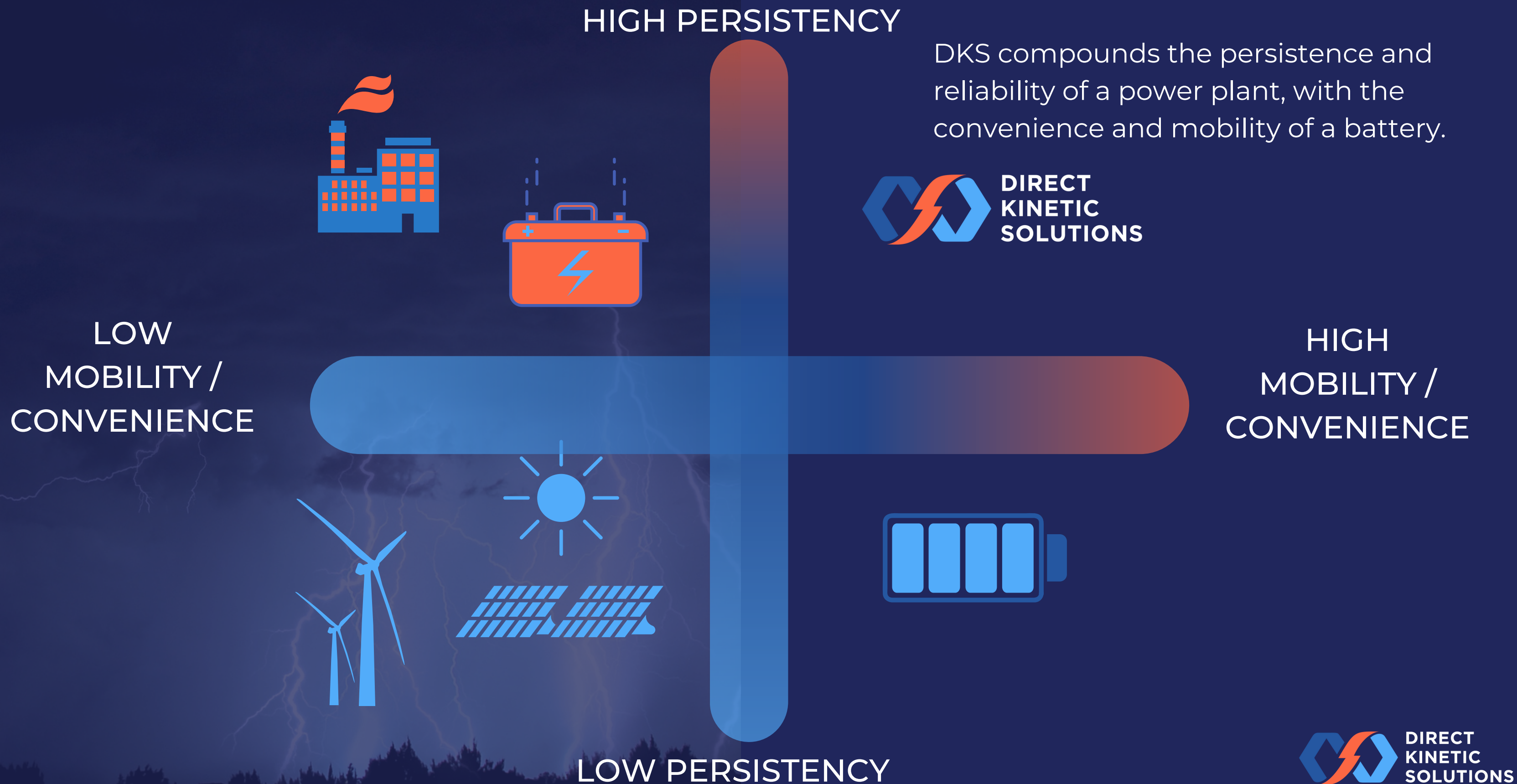
**MAINTAINED**

- Millions of maintenance hours
- Replace batteries and/or devices
- Performance drops in hostile environments



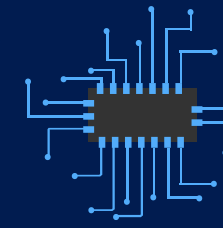


# The World of Power Sources



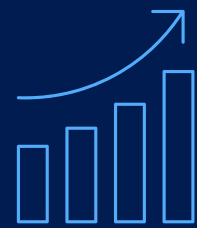


# Pillars to success



## Unique Technology

- + Differentiated deposition method  
3x over competition



## Market Opportunity

- + IoT and Space crave for a solution with extended life, compact form factor, and rugged capabilities

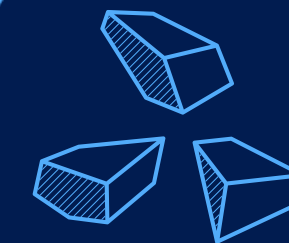


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## Experienced Team

- + 40 + years of experience
- + 30+ relevant publications



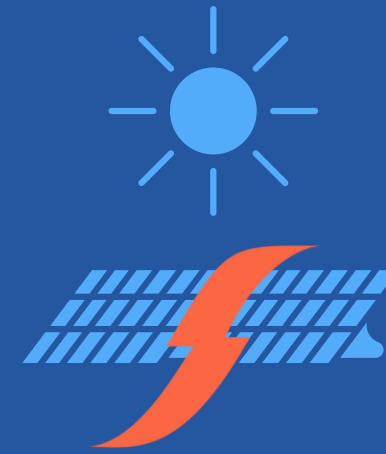
## Better Materials

- + Base materials have orders of magnitude energy density superiority.
- + Compact design, decades of power, environmental immunity.

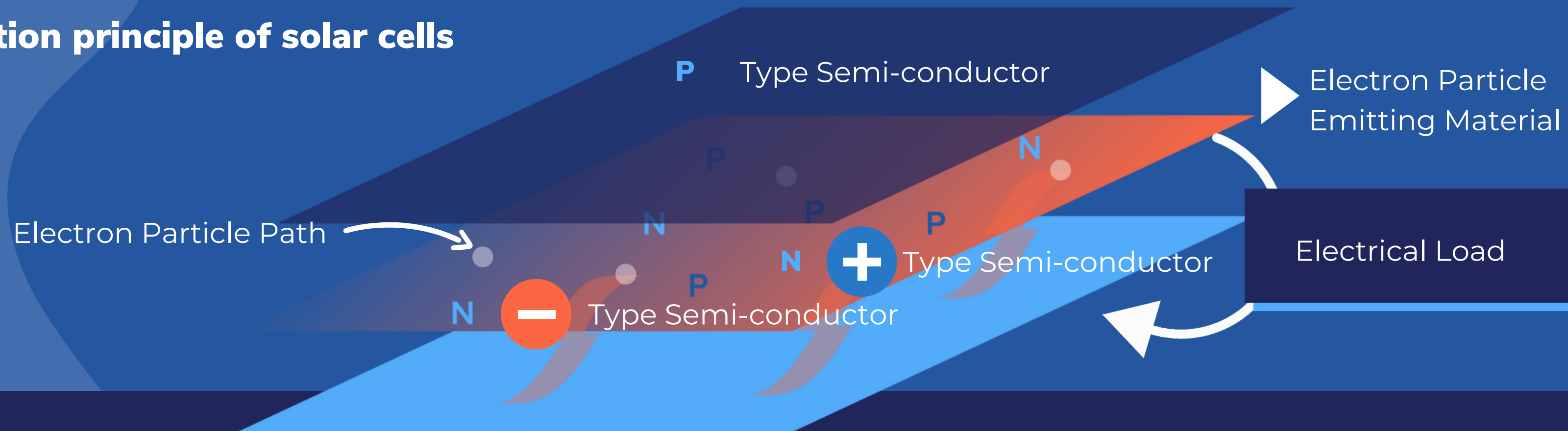


# How our technology works

Same generation principle of solar cells



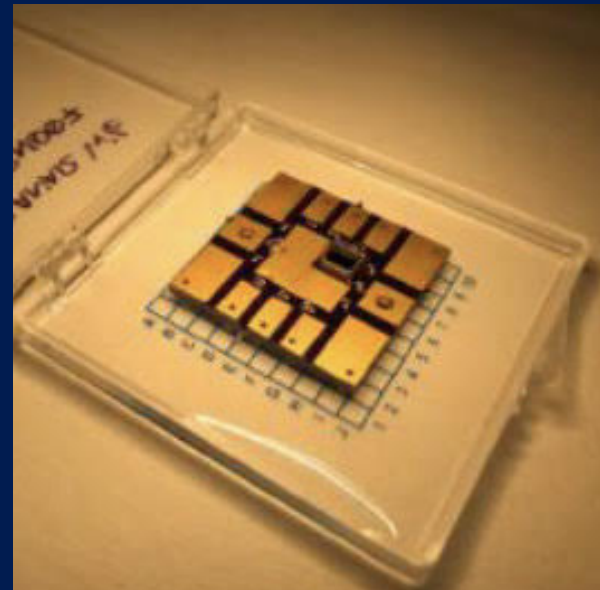
We place a small sun on top of a solar panel and capture its energy rain or shine, day or night.



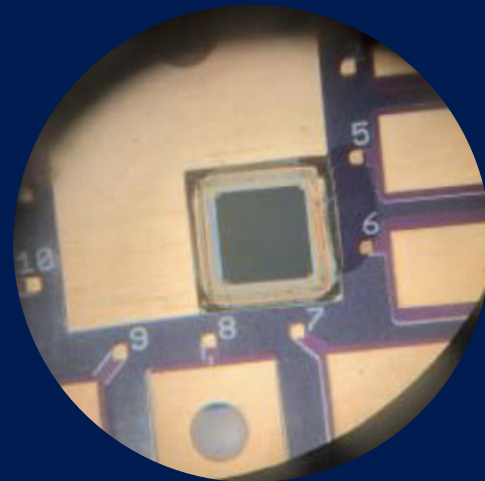
In the Persistent Power Source (PPS), the power generating material (in orange) is surrounded by semiconductors to capture the decay and generate current



# Structure OF THE CELL

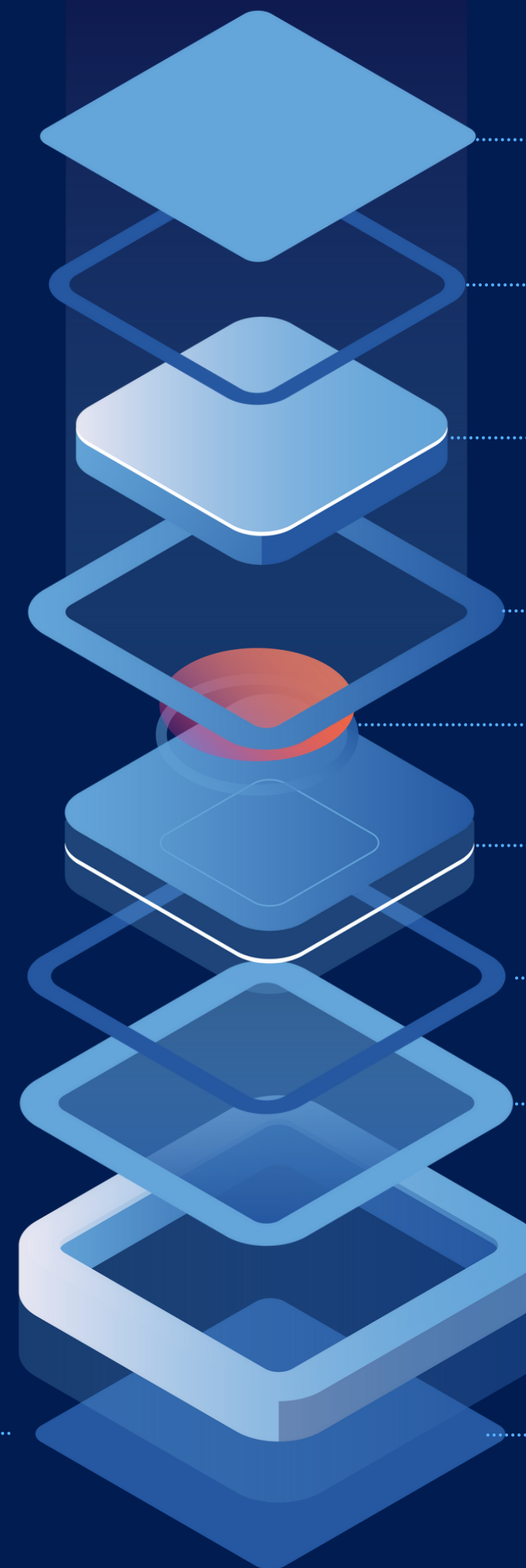


POWER SOURCE



CELL

EXPANDED VIEW OF THE CELL



Negative Lead

Alignment Piece

Semiconductor

Positive Lead

Radioisotope

Epoxy Boundary

Positive Lead

Semiconductor

Alignment Piece

Negative Lead



Looking for **Li-ion** alternatives due to material, safety, and charging



**\$ 2B** A YEAR  
Invested in batteries

**25%** OF WEIGHT IN A  
72H MISSION  
30 lbs > 70 batteries

# Our Beach Head

EXPECTED TO  
BALLOON BY **31%** by 2023

**2ND** HIGHEST COST  
to an infantry battalion

**\$ 617M** 2022 BUDGET FOR  
BATTERY R&D

Source: xTech Innovation Combine Meeting on 6/11/2021



# Solution for USAF

CURRENT CONTRACT WITH US AIR FORCE

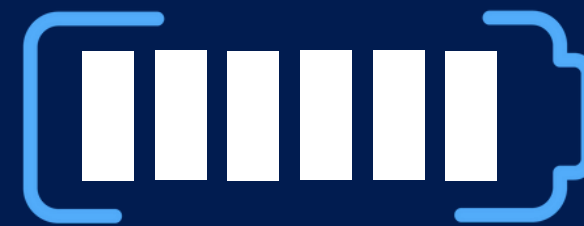
Prototype for field testing due Q3 2023

Estimated production of 6,000 units by 2024



## Problem

GPS tags failing after 6 months to a year of use lead to high costs in the form of productivity losses and unnecessary maintenance activities



## Solution

With the DKS products, the tags will last for a decade ensuring the equipment is ready to go on as needed



COMMERCIAL  
TRACTION



### SILO MONITORING



1 year  
1 transmission/day

5 years  
24 transmissions/day

24x improvement in data  
quality  
5x revenue/device



### OIL PIPELINE MONITORING



Need a solar panel to  
power the sensor

Remove the solar panel  
3x expected sensor life

Increased revenue per device by  
opening new markets such as  
Alaska and extending the time  
horizon



### SPACE



Combination of solar arrays  
and chemical batteries power  
small satellites

Third alternative that can  
complement current offerings  
or power critical systems  
redundantly

PPS built into structure so  
minimal volume and weight  
increase, can stand in a hangar  
without draining the main battery,  
extended missions

CURRENT  
STATE

WITH PPS



RESULTS





# Design Flexibility

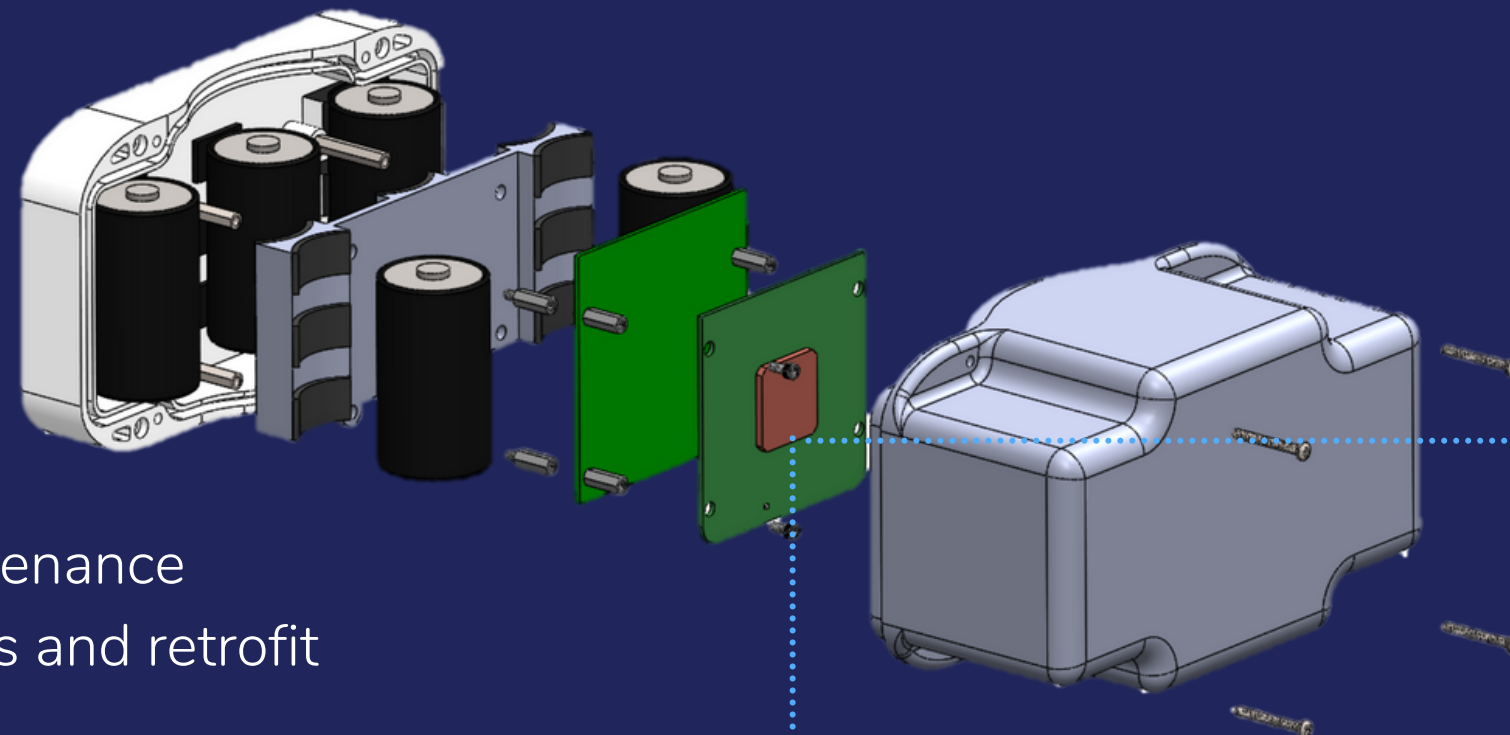
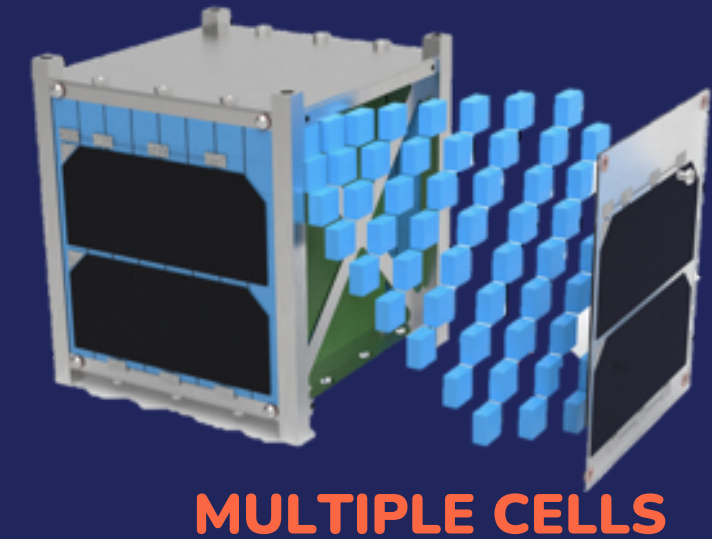
Our power generation capability scales with available area, from a simple one-cell device to power an IoT sensor, to multiple multi devices to generate power for a CubeSat.

## IoT APPLICATIONS

- Increase asset utilization & reduce maintenance
- B2B direct sales model, custom solutions and retrofit product

## CUBESAT & SMALL SATELLITES

- Reduce weight, optimize payload and elongate missions
- B2B direct sales model, custom solutions and plug and play catalog



# Milestones

OUR CONTRACTS  
+ ACHIEVEMENTS





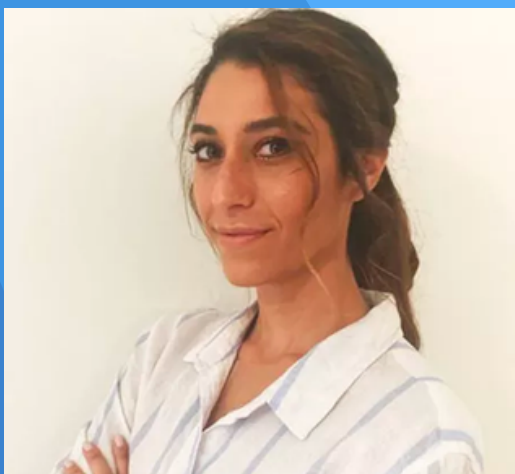
# Leadership



## **EKHI MUNIATEGUI, CEO**

MBA, Harvard Business School  
BSIE, University of Texas at El Paso

Experienced in the manufacturing, commercialization, and development of semiconductors and components for IoT industries.



## **JOANNA PATSALIS, COO**

MBA, Stern School of Business  
BSB, University of Nottingham, UK

Expert on global supply chain operations, and has led development and optimization projects in various industries.

# Advisory Board

## **RICARDO RODRIGUEZ**

Finance

CFO at Aspen Aerogels NYSE: ASPN

## **DAVID SCOTT ESQ**

DoD Relationships & Contracting

Managing Director at OCEAN

Accelerator Techlink

## **BRAD JENKINS & AUSTIN HILL**

Sales & Strategy

Co-founders & Managing Directors at Seed Round Capital

## **DANIEL DUBOIS**

Growth

Co-founder & President at Key

30 under 30 , Airbnb

# Technical Team

## **DR. MARC LITZ** **ARL CRADA LIAISON**

Ph.D. iBS, MS, PhD  
Catholic University of America

Physicist in the Energy Sciences Division of the Army Research Laboratory. Expert in radioisotope power sources, and the study of advanced energetics utilizing nuclear materials.

## **MARK DUDLEY** **JUNIOR PRODUCT DEVELOPMENT CHEMIST**

B.S. in Chemistry, University of Maryland

Mark has 8 years of experience working in Northrop Grumman and Walter Reed Army Institute of Research where he has developed and maintained processes in production of Printed Circuit Boards, procured equipment and materials for manufacturing and experiments with deep understanding of statistical process controls, and 6 Sigma concepts.

## **DR. JOHNNY RUSSO** **NUCLEAR ENGINEER**

PhD, MS, BSME, University of Maryland

An ARL alumni with over 10 years of experience in nuclear technology. Extensive work on quantum mechanics and a patent holder for the base technology. He has experience with direct Beta emitting direct conversion radioisotopic power sources and has ideated indirect photovoltaic Alpha power sources.

## **DR. BRENDA SMITH** **PRODUCT DEVELOPMENT SCIENTIST**

Ph.D., Inorganic Chemistry, University of Tennessee  
B.S. Chemistry, Kent State University

Former Oakridge National Labs (ORNL) Chemistry scientist, Brenda brings over a decade of experience in synthetic chemistry, radiochemistry, applied science, chemical processing, and energy converter systems, and designing novel radio- and photo-luminescent materials.

## **WILLIAM RAY** **ELECTRICAL ENGINEER**

BSEE, BSCS, MSEE, Texas Tech University

Over 10 years of experience with power electronics, wide bandgap semiconductors, and RPS technologies. He has authored 31 publications and 1 patent for the base technology. He has worked along with Dr. Litz and Dr. Russo on the analysis and improvement of semiconductors for betavoltaic operation.





# Contact us

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