# FARASIS ENERGY

## THINKING BATTERIES FURTHER

A GLOBAL PIONEER IN BATTERIES POWERING
CLEAN AND SUSTAINABLE ENERGY

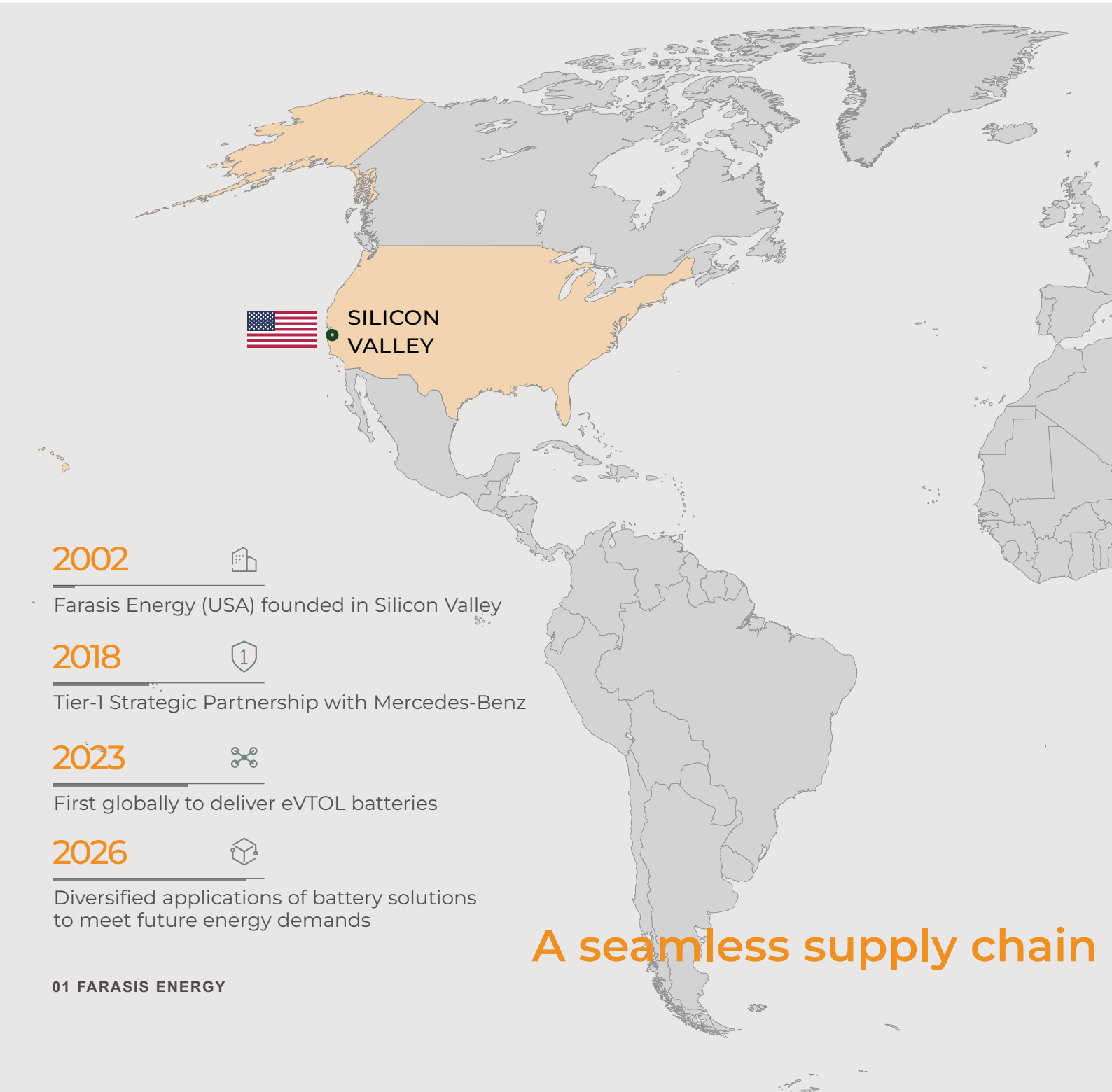
farasis-energy.com
linkedin.com/company/farasis

# POUCH CELL AUTHORITY

## Global innovation at industrial scale

**20+ years**
Pioneering battery R&D

**400+ Patents**
Thinking batteries further




**2002**
Farasis Energy (USA) founded in Silicon Valley

**2018**
Tier-1 Strategic Partnership with Mercedes-Benz

**2023**
First globally to deliver eVTOL batteries

**2026**
Diversified applications of battery solutions to meet future energy demands

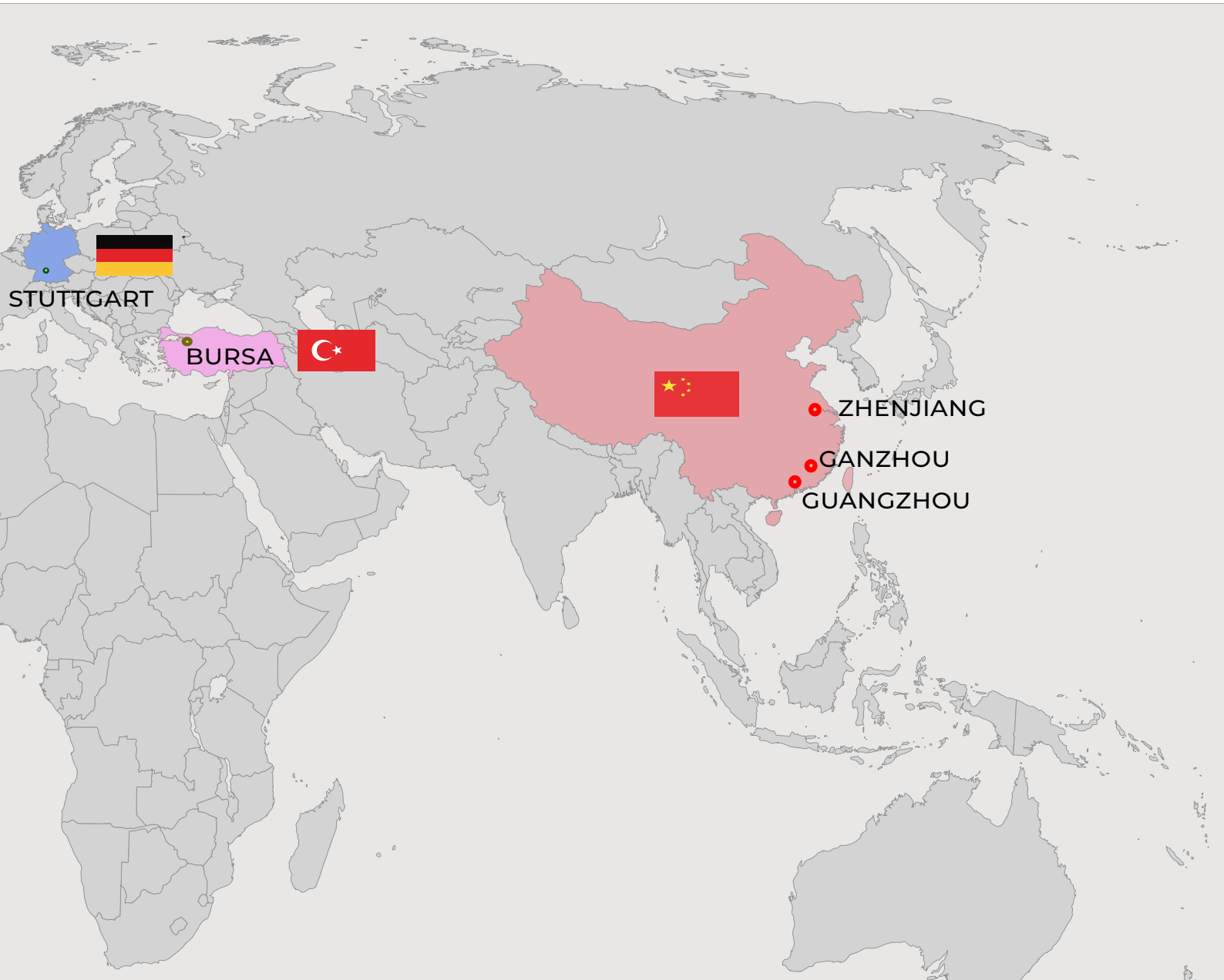
## A seamless supply chain

Farasis Energy is a global leader in high-performance pouch cell technology, delivering the energy density and safety required by world-class automotive, aerospace, and energy storage partners.

Founded in Silicon Valley in 2002 by Dr. Keith Kepler and Dr. Yu Wang, we combine California-born innovation with the industrial resources of a Fortune Global 500 powerhouse to ensure long-term stability. Through our European Headquarters and R&D Center in Stuttgart, we provide localized engineering leadership, project management, and quality assurance to safeguard international programs and offer direct, real-time support to our global customer base.

**5000+**
Employees worldwide

**100+ GWh**
Global production capacity




## for energy solutions worldwide

# ONE PARTNER

## From chemistry to intelligence...

01 ▶ 02

## CHEMISTRY 01

### CELL TECHNOLOGY

*No supply-chain lock-in, ever*

**NCM: High Energy Density**
*The highest energy density in our portfolio.*
*330 Wh/kg in production today, 400 Wh/kg scaling.*

**LFP: High-Cycle, Cost-Efficient**
*5,000+ cycle durability with inherent thermal stability.*
*Thousands of cycles at lower total cost of ownership.*

**Sodium-Ion: Lithium-Free Chemistry**
*The path to affordable EVs and mass-market storage.*
*Wide operating range from -40°C to 60°C.*

**330 Wh/kg**
*in mass production today*

**400 Wh/kg**
*scaling for volume programs*

## ARCHITECTURE 02

### SYSTEM INTEGRATION

*Chassis-ready in months, not years*

**Super Pouch Solution (SPS)**
*Custom Cell-to-Pack architecture. No module layer.*
*Chassis-specific design, OEM-validated.*

**Off-the-Shelf Solutions**
*Standard Pack & VDA 355/590 modules.*
*Certification-ready, deployable in months, not years.*

**Built for Demanding Applications**
*Commercial, marine, industrial, eVTOL, robotics.*
*Automotive standards are the floor, not the ceiling.*

**-30°C to 55°C**
*All-weather operating window*

**800 V**
*Platform ready*

# EVERY LAYER

## Validated at scale

03 ▶ 04

## INTELLIGENCE 03

### INTELLIGENT CONTROL

*AI-BMS & Battery Health Platform*

**Predictive Fleet Intelligence**
*Real-time SoC and SoH monitoring.*
*Reduces warranty costs and extends pack service life.*

**Proactive Safety Analytics**
*Cell-level self-shutdown and thermal monitoring.*
*Prevents runaway events before they occur.*

**15-Year Lifecycle Prediction**
*Ageing simulation powered by proprietary algorithms.*
*Built for warranty confidence.*

**15 year**
*Lifecycle prediction*

**AI-BMS**
*Real-time SoC/SoH diagnostics*

## PROVEN 04

### VALIDATED BY PARTNERS

*Proof, not claims*

**Tier-1 OEM Partnership**
*Certified to the world's most demanding OEM standards.*
*No thermal propagation 24 hrs post-runaway.*

**eVTOL: World First**
*First globally to deliver certified eVTOL batteries (2023).*
*Extreme-duty validation carries over to every program.*

**Solid-State: In Production**
*Solid-state is not a roadmap promise; it is in production.*
*In OEM programs since 2022.*

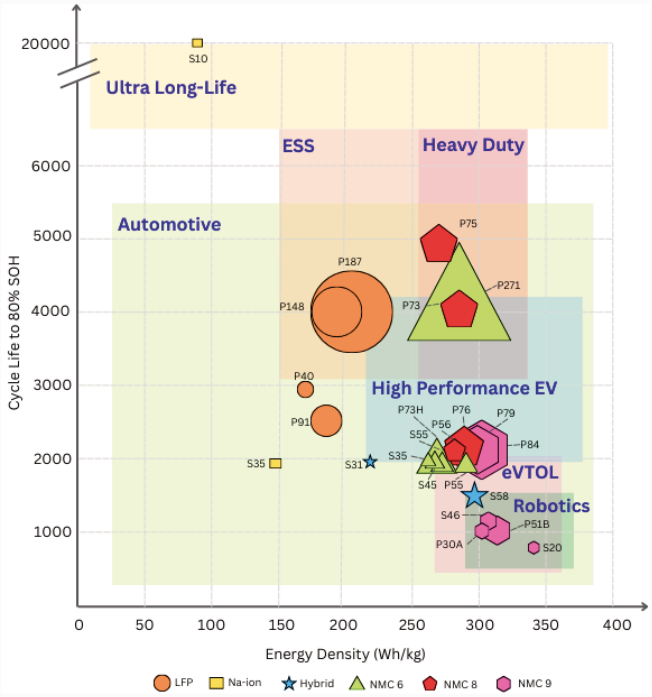
**2018**
*Tier-1 OEM partnership*

**2023**
*World-first eVTOL delivery*

# THE STRATEGIC EDGE

## Defining the pouch cell benchmark

### FARASIS CELL MATRIX




Choosing a cell chemistry should not mean choosing a new supplier. Farasis covers the full spectrum, from sodium-ion and LFP through to ultra-high-nickel NCM9, all through a single qualification process and a single engineering team.

### CHEMISTRY RANGE

| | |
|---|---|
| Na-ion | Cost efficient |
| LFP | Long Life |
| NCM-LMFP | Versatile |
| NCM 6 | Auto · Comm. |
| NCM 8 | Auto · Perf. |
| NCM 9 | Highest Energy |

### CELL SPECIFICATIONS

**NCM 6**

**S45**

ENERGY DENSITY
270 Wh/kg
CYCLE LIFE ●●●
FAST CHARGE ●●○

**NCM 8**

**P73**

ENERGY DENSITY
283 Wh/kg
CYCLE LIFE ●●●
FAST CHARGE ●●○

**NCM 9**

**P30A**

ENERGY DENSITY
306 Wh/kg
CYCLE LIFE ●●○
FAST CHARGE ●●●

**LFP**

**P187**

ENERGY DENSITY
200 Wh/kg
CYCLE LIFE ●●●
FAST CHARGE ●●○

### POUCH CELL ADVANTAGE

Farasis pouch cells deliver up to **15% higher energy density** than comparable prismatic formats, with no thermal propagation confirmed across all chemistry variants, including high-energy density NCM, LFP, Na-ion, and 400+ patents spanning cell chemistry, electrode design, and battery management. Qualified by leading OEMs, including premium European automotive brands.

Full specs: farasis-energy.com/en/products

# VDA & BESPOKE

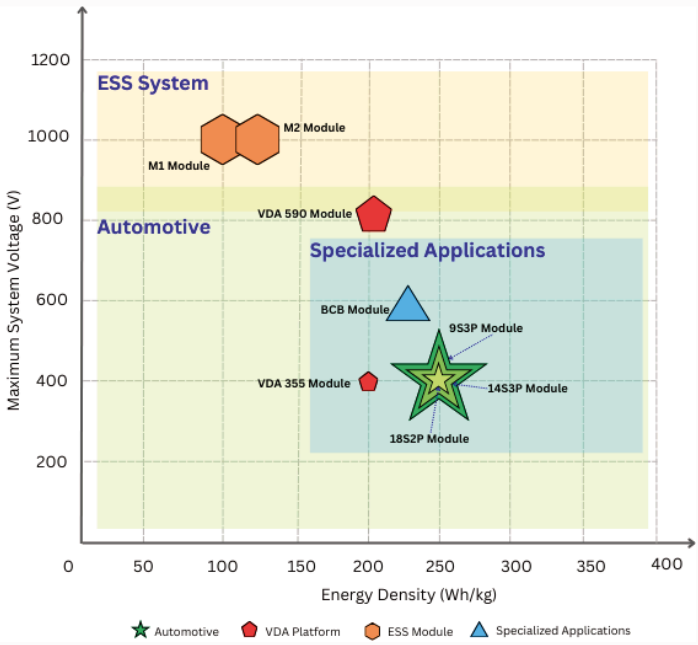
## Off-the-shelf and custom modules

Farasis modules are qualified for passenger vehicles, commercial transport, industrial equipment, and stationary storage. VDA-format designs integrate directly with standard automotive architectures, cutting qualification time and mechanical integration risk.

No thermal propagation is a design requirement on every platform, validated through nail penetration at 100% SoC, crush testing, and thermal stability testing.

The VDA modules support 800V high-voltage platforms. Our BCB module adds an IP65-rated enclosure for superior environmental protection.

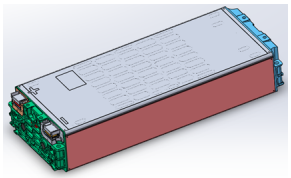
**FARASIS MODULE MATRIX**




### OFF THE SHELF MODULES

NCM 6 · OTS

**VDA 590**



ENERGY DENSITY
**215.5** Wh/kg

CHARGE TIME (10–80%)
**25** min

12s2p · IP54 · >2,000 cycles

800V PLATFORM

NCM 6 · OTS

**VDA 355**

ENERGY DENSITY
**214** Wh/kg

CYCLE LIFE
**>2,000** cycles

6s2p · IP54 · 43.8 min charge

800V PLATFORM

NCM 8 · FARASIS SIGNATURE

**BCB**

ENERGY DENSITY
**225** Wh/kg

CHARGE TIME (10–80%)
**31** min

14s2p · 560V · IP65 · >1,500 cycles

800V AVAILABLE LATE 2026

### SAFETY & COMPLIANCE

All modules are tested beyond **UN 38.3,** US, Canada, and EU **PFAS Regulation & Certification**, and automotive-grade abuse protocols. AI-BMS integration provides real-time monitoring and proactive diagnostics across all voltage topologies with modular height options.

Full specs: farasis-energy.com/en/products

# STANDARD PACK

## Modular platform for commercial vehicles

Designed for commercial vehicle programs, our Standard Packs connect in series as a string to reach the voltage and energy each application needs, without multiplying SKUs, development cost, or integration risk.

### PACK S · 800 × 600 × 150 MM

| Specification | NCM 2P30S | NCM 1P60S | LFP 1P36S |
|---|---|---|---|
| Pack Energy | 20.8 kWh | 20.8 kWh | 16.7 kWh |
| Energy Density | 196 Wh/kg | 196 Wh/kg | 151.7 Wh/kg |
| Nominal Voltage | 112.3 V | 224.6 V | 115.6 V |
| Fast Charge (10–80%) | 30 min | 30 min | 30 min |
| Service Life | 2 Mio km / 15 yrs | *2 Mio km / 15 yrs* | 1.5 Mio km / 15 yrs |
| 800V compatible | Yes | Yes | Yes |
| B-sample / SOP | Q3 2026 / Q1 2027 | Q3 2026 / Q1 2027 | Q4 2026 / Q2 2027 |

### INTEGRATION

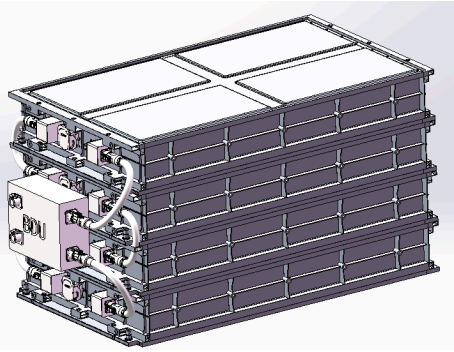
**Pack S**

- Cell Stack
- Housing
- Cooling Plate
- Inlet / Outlet cooling pipes
- HV Connectors
- LV Connectors
- MSD (Manual Service Disconnect)
- CMC (Cell Monitoring Circuit)

**String** (3 or 4 packs connected in series)

- BMS (Battery Management System)
- BDU (Battery Disconnect Unit)*
- Contactors & Fuses
- Sensors

** Customizable in shape, position and connector type.*
*BDU positioning options: XZ surface / XY surface / decoupled*




Pack S
String config. with BDU

### KEY FEATURES

**No Thermal Propagation**
24 H after thermal event

**2M**
km service life
15-Year Rating
NCM · 80 MWh throughput

**30**
min fast charge
10–80% SoC
Both NCM and LFP

# SUPER POUCH SOLUTION

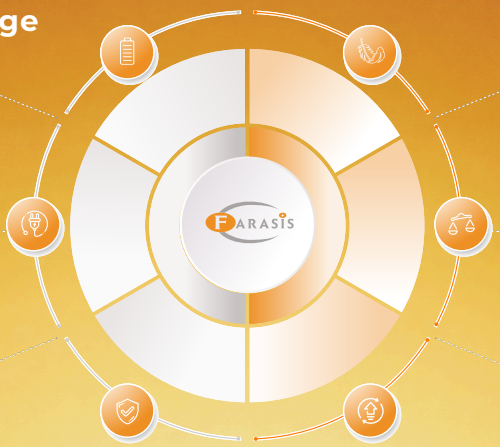
## SPS · Cell-to-Pack (CTP) platform

SPS is a cell-to-pack platform architecture that adapts to custom form factors and vehicle-level constraints. Its chemistry-agnostic line design scales from current NCM and LFP to future solid-state cell designs without a platform redesign.

**Extended Driving Range**
≥1000 km

**Ultra-Fast Charging**
600 km range 8 min

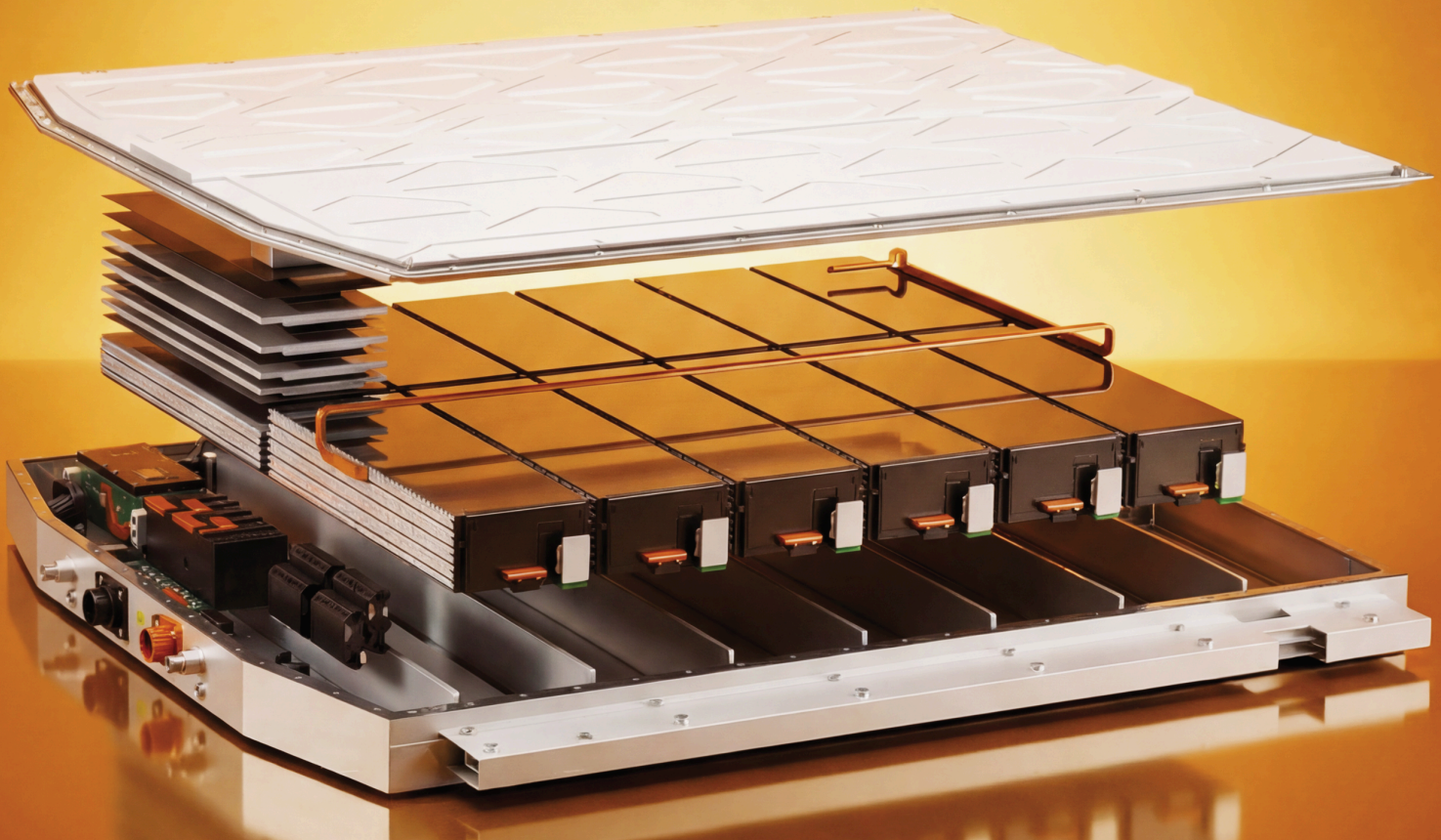
**Chemistry**
LFP & NCM




**Lightweight Design**
85% Volumetric Efficiency
50% Component Reduction

**Cost Efficiency**
35% Mfg. Energy Reduction
44% Cost Reduction

**Capacity**
180 Ah to 270 Ah & more



# STORED SMARTER

## Safe, scalable, cost-efficient

Most ESS hardware is specified for ideal conditions. Farasis ESS is built for the ones you actually encounter: variable loads, long warranty windows, and clients who expect the system to still be running for fifteen years and beyond.

### OUR ESS MODULES

**M1 MODULE**

**9.21** kWh

RESIDENTIAL

1P16S · 51.2 V nom.

92 kg · 825x167x442 mm

Natural cooling · IP67

10 yr (≥70% SOH)

-10°C to 50°Cvv

LFP Na-ion

**M2 MODULE**

**18.43** kWh

COMMERCIAL & INDUSTRIAL

1P32S · 102.4 V nom.

144 kg · 890x624x218 mm

Liquid cooling · IP67

6,000 cycles (≥70% SOH)

-20°C to 60°C

LFP

### M1 LFP SYSTEM CONFIGURATIONS

| | M1-9 | M1-18 | M1-27 |
|---|---|---|---|
| Configuration | 1P16S | 2P x 1P16S | 3P x 1P16S |
| Nominal Energy | 9.21 kWh | 18.43 kWh | 27.65 kWh |
| Voltage Range | | 40 V - 58.4 V | |

### WHY INTEGRATORS CHOOSE FARASIS

**CERTIFIED WORLDWIDE**

UL 1973 UL 9540A IEC 62619 GB/T 40165 UN 38.3 ROHS

*Certified for all major markets. No re-qualification required.*

*"Qualified once & deployable at any scale."*

### ESS ADVANTAGE

Same cell chemistry as our automotive line,
Same quality standard & supply chain,
**Now powering your ESS.**



Full specs: farasis-energy.com/en/products

# BUILT TO SCALE

## Designed for real-world conditions

LONG-TERM RELIABILITY

*16+ years at one cycle/day.*

*No mid-life replacements. No surprises for your client.*

### F150 CABINET SPECIFICATIONS

| | |
|---|---|
| **Configuration** | 1P256S (8 * M2 Module) |
| **Cabinet Weight** | < 2,650 kg |
| **Nominal Energy** | 147.45 kWh |
| **Nominal Voltage** | 819.2 V |
| **Cycle Life** | > 6000 cycles · 70% SOH · 90% DOD at 25°C |
| **Temp. Range** | -20°C to 60°C |
| **Cooling / IP** | Liquid Cooling · >90% capacity at -20°C · IP54 |
| **Certifications** | UL 1973 · UL 9540A · IEC 62619 · ROHS<br>GB/T 36276 · GB/T 44420 · UN 38.3 |

### F150 CABINET

MULTI-CABINET SYSTEMS AVAILABLE


### 5 MWh BESS CONTAINER

#### High Energy Efficiency

- Premium 552 Ah-Battery
- Up to 3000 LFP cells · ~3.2 V
- Nominal energy: 5 MWh

#### Intelligent System

- BMS: CAN · RS485 · Ethernet
- Nominal voltage: ~1350 V
- Liquid cooling · Active thermal mgmt.

#### Built for the Field

- 20-foot standard container
- Max load: 45 tons · IP54
- Operating env: -20°C to 60°C · 2,000 m

#### Environmental Certification

- GB/T 36276 · IEC 62619 · UN 38.3
- UL1973 · UL9540A · RoHS · REACH
- 100% cobalt-free

# SODIUM-ION CHEMISTRY

## Matched to the application

Two sodium-ion cell families, each targeting distinct applications. **Polyanionic (NFPP)** for stationary storage and 12V starter batteries. **Layered oxide (NFM)** for passenger car programs.

### POLYANION (NFPP)

#### Energy Storage (ESS)

Grid-scale storage and backup power.
Reliable performance across wide temperature swings.

| 20,000 | 90% |
|---|---|
| cycles at 25°C | capacity retention at –30°C |

#### 12V Starter Battery

Designed for the short, high-current bursts that 12V starter applications demand.

| –40 to 60°C | 5 min |
|---|---|
| operating range | quick charge · 25°C · 10–80% SoC |


### LAYERED OXIDE (NFM)

#### Passenger Car · Gen-2 Active Development

A higher energy density cell for vehicle range.
Gen-1 mass-produced automotive-grade cells since 2023.
Gen-2 samples with improved energy density available for qualified programs.

Polyanion sodium-ion is thermally stable by design,
less prone to thermal runaway than conventional lithium chemistries.

Full specs: [farasis-energy.com/en/products](farasis-energy.com/en/products)

# SOLID-STATE IS HERE

## The new baseline for energy & safety

In production at gigawatt-hour scale since 2022.
The same manufacturing infrastructure now supports every step of the roadmap ahead.

### SEMI-SOLID-STATE ROADMAP

Proven System Safety

NEXT GENERATION TARGET
**400 Wh/kg**

**2026 · Development**

**GEN-3 SEMI-SOLID-STATE**
- 400 Wh/kg | >5C ultra-fast charge target
- High-conductivity solid electrolyte
- Nail Penetration: Pass (3mm & 5mm)
- 200°C Thermal Box: Pass

**2026 · Targeted SOP**

**GEN-2 SEMI-SOLID-STATE**
- 330-350 Wh/kg | Over 3C ultra-fast charge
- Oxide-polymer hybrid
- Nail Penetration: Pass (1mm & 3mm)
- >90% capacity retention at -20°C

**2022 · SOP**

**GEN-1 SEMI-SOLID-STATE**
- 280-300 Wh/kg | 2C fast charge
- Gel-based electrolyte
- Nail Penetration: Pass (1mm & 3mm)
- Validated by Dongfeng VOYAH and GAC Hyper

FUTURE

### ALL-SOLID-STATE ROADMAP

Intrinsic Material Safety

NEXT GENERATION TARGET
**500+ Wh/kg**

**2026 · R&D**

**GEN-2 ALL-SOLID-STATE (Oxide-Polymer)**
- 500+ Wh/kg target
- Reduced operating pressure
- High-nickel cathodes | Lithium-metal anodes
- Application: Long-Range · Aerospace

**2026 · Industrialization**

**GEN-1 ALL-SOLID-STATE (Sulfide)**
- 400 Wh/kg
- Cell-level self-shutdown
- High-nickel cathodes | High-silicon anodes
- Application: Robotics · Long-Range · UAV

**INHERENTLY SAFE**

THERMAL BOX
**250°C PASS**

STEEL NAIL PENETRATION
**5mm PASS**

SHEAR TEST
**NO FIRE PASS**

# VERSATILE BY DESIGN

## From robotics to grid-scale storage

### Autonomous Systems

*Humanoids*

*Autonomous Mobile Robots (AMRs)*

*Precision Service Robots*

### Sustainable Mobility

*Passenger Vehicles*

*Marine*

*e-Aviation*

### Industrial Power

*Electric Cranes*

*Zero-Emission Mining Haulers*

*e-Agriculture*

### Advanced Storage

*Residential Energy Storage*

*Critical Infrastructure Backup*

*Grid-Scale Storage*

# COMPLIANCE & ESG

## Responsible from source to end of life

### EU REGULATORY COMPLIANCE

**CE Marked**

EU Battery Regulation 2023/1542

- **TÜV SÜD-verified system**
  Article 6, 10, 13, 14, 17–20; CE-marked batteries
- **Battery Passport (Article 77)** in active dev.
  On track for Feb 2027 enforcement deadline.
- **REACH, RoHS, POPs & PFAS**
  Substance restrictions compliant
- **UNECE R100.3 Type approval**

### LIFECYCLE & DECARBONIZATION

**69% Reduction**

Carbon footprint target by 2030

- **LCA (cradle-to-grave):** NCM footprint
  65 kg $CO_2$/kWh → 20 kg $CO_2$/kWh
- **Patented direct recycling**
  U.S. DOE validated
- 2nd-life program: **17-18 year total lifecycle**
  Circular economy aligned

### RECYCLED CONTENT & CIRCULARITY

**Co >40% / Ni >22%**

Exceeds 2031 EU thresholds

- **Pack-level content under investigation:**
  Secondary aluminum, steel & polymer targeted
- **EPR registration** & waste battery collection:
  Article 55–75
- **No performance compromise**
  25% recycled active material

### SUPPLY CHAIN & TRACEABILITY

**OECD Aligned**

RCS Global & TÜV Rheinland

- **Full traceability: Co, Li, Ni, graphite; Circulor** · Article 48–53
- Published **Due Diligence Policy** &
  Supplier Code of Conduct enforced
- **SA8000** labor standards; active
  **UN Global Compact** participant

### ESG PERFORMANCE & CERTIFICATIONS

**2030** Decarbonization Roadmap: 2023 → 2030

NCM cell carbon footprint: 65 kg $CO_2$/kWh (2023) → 20 kg $CO_2$/kWh by 2030
via renewables, process efficiency & recycled materials. Article 7 threshold ready.

| CDP | CDP | S&P | WIND | ECOVADIS |
|---|---|---|---|---|
| B | B | 50 | AA | 60 |
| WATER | CLIMATE | ESG | ESG | SILVER |

ISO 14068 · Zero Carbon Factory · Ganzhou

ISO 50001 · Energy Mgmt · Ganzhou & Zhenjiang

ISO 14064 · GHG Verification · 3 consec. yrs

CARBON NEUTRAL · 4 CONSECUTIVE YEARS · SELECT PRODUCT LINES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