

# Driving the Energy Transition with Intelligent Electrification

Corporate Presentation

Q1 2022



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OPTIMIZING POWER

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# Exro Overview

Innovating products that address major energy transition challenges

## WHAT WE DO

Make EV's perform better and cost less

## HOW WE DO IT

Through next generation power electronics control technology for motors and batteries

## WHY WE DO IT

To lead the way to a sustainable electrified world

## CAPITAL STRUCTURE

Basic shares outstanding	133,842,724
Stock options outstanding	11,583,867
Warrants outstanding	8,845,883
Fully-diluted shares outstanding	154,272,474
Cash	~US\$25 million

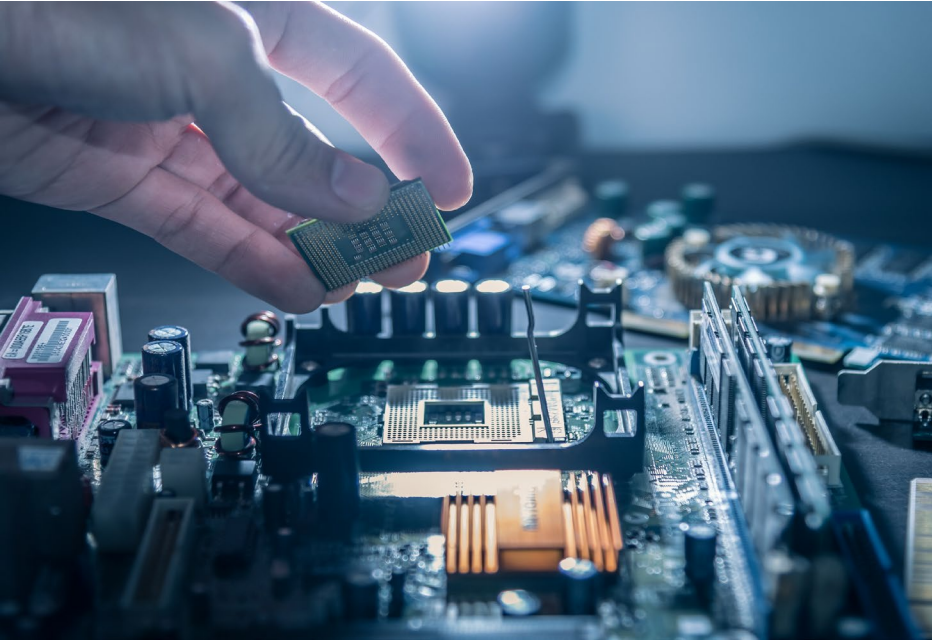
**TSX:** EXRO      **OTC:** EXROF

Capitalization table numbers as of February, 2022.

Exro Technologies has applied to list on NASDAQ on November 8<sup>th</sup>, 2021. For more information, read our press release "[Exro Technologies Announces Application to List on Nasdaq](#)".

# Investment Highlights

Exro is positioned for significant growth while electrifying the world



- Innovative drive solutions that address major challenges to the electrification transition in mobility
- Scalable inverter technology co-developed with industry partners
- Macro sustainability tailwinds driving overwhelming customer demand
- Positioned for material growth with product commercialization in 2022
- Significant upside through continued focus on innovation into market verticals beyond mobility



# What's Ahead for 2022

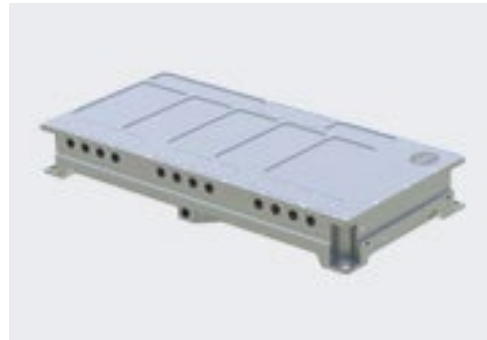
Unlocking shareholder value through execution

- First Pilot deliveries in Q2 for SiC 800V Coil Drivers
- Integration and on road operation for 100V Coil Drivers
- Submit BCS/ESS to UL for certification launching commercialization phase

## Low Voltage Coil Driver™



## High Voltage Coil Driver™



## Battery Control System™



# Industry Problem

How do we bridge the gap to electrification?



## Traditional ICE

- Limited to operating range
- Reliant on heavy duty gearboxes
- Peak efficiency is a relatively small



## Traditional EV

- Reliance on multiple motors, heavy two speed gearboxes or increased battery size
- All equal an increased cost for auto OEMs



## Tomorrows EV

- EV's are not new and adoption hesitancy is real. Solutions for tomorrow's EV's:
- Cost-effective by reducing the overall component cost drives down the sticker price
- Performance improvement in the commercial truck industry aids the Total Cost of Ownership
- The adoption gap can be bridged through technology experts like Exro

*Existing technologies do not meet power & cost requirements to drive EV adoption*

# Our Core Technology

Bridging the electrification gap with power electronics expertise

## Motor Control

Exro Coil Driver brings electric gearing to EV's by dynamically enabling multiple power settings in a single motor with Coil Switching technology

- Core Product offerings – scalable motor controllers from 100 to 800V
- HV Coil Driver SiC Technology
- Available as motor drive system for optimum performance
- Suitable for multiple motor designs and integrated axle designs (E-axles)

## Power Train Optimization

Exro Vehicle Services (EVS) offers full engineering services capabilities. In house design and power electronics expertise provide optimum efficiency designs

- Full Engineering Design Services to develop next generation cost saving power train designs
- Co-development platform design to customize inverter controls that reduce reliance on multiple motors and/or gearboxes
- Optimize battery usage
- Licencing opportunities available

## Battery Control

Exro Battery Control System extends batteries into a second life by enabling next-generation battery management with cell-level control

- Stationary Energy Storage solutions for commercial and industrial applications
- Suitable for solar and EV charging applications
- First or second life battery energy storage systems

# Exro Solutions

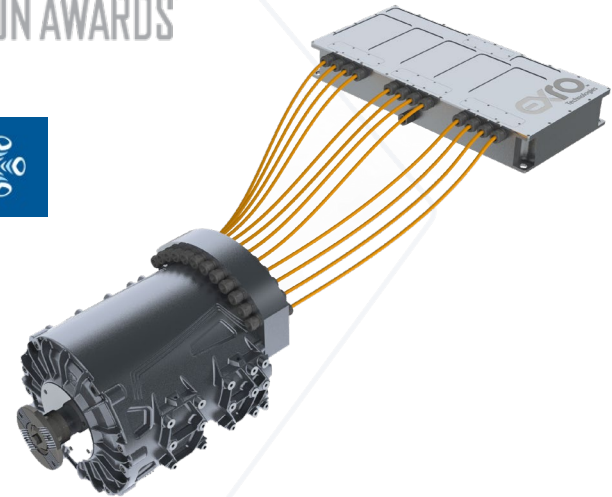
Award-winning “coil driver” innovations that can enable increased adoption

## The World's First Intelligent Coil-Switching Drive

- Expanded motor capabilities
- Electric Gearing
- Scalable and cost-efficient performance

*Reducing the cost of electric powertrains and bridging the gap for the transition to electric vehicles*

## Product Validation and Awards



# Product Development

## Functional demonstration vehicles



*Vehicle demonstrators provide insight into how these EVs can outperform their equivalents, simply by adding Exro technology inside*

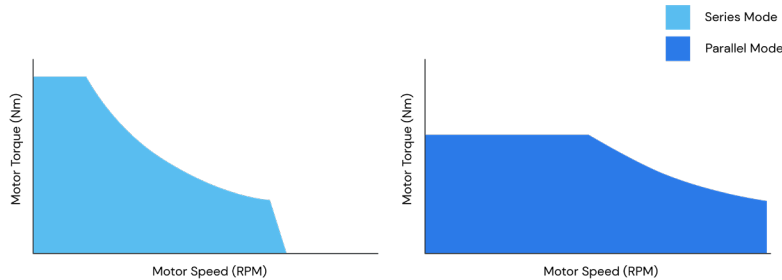
800V Systems	Exro	Tesla	GMC
Motors	1	2	3
Power	900 kW	500 kW	750 kW
Peak Torque	4300 Nm	1000 Nm	1285 Nm

Data shown compares Exro's optimized HUMVEE's system to relative equivalents in the market. HUMVEE® is a registered trademark of AM General, LLC.

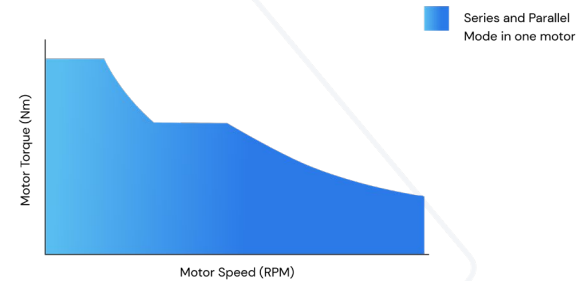
# How it Works

Coil Driver: not a standard 3 phase inverter

## TRADITIONAL TORQUE CHARTS



## COIL DRIVER TORQUE CHART



### Traditional OEMs needed to make a choice

- Two separate modes, two separate motors
  - Series mode = high torque applications
  - Parallel mode = high speed applications
- Left a gap to fill for performance

### Electric drives are now transforming for EVs

- Coil Driver brings a next-generation of power electronics that fills the gap
- Electric drive technology are differentiators for EVs
- Now one inverter can do the job of two

# Why it Matters

Exro's technology enables electric vehicles to do more with less

## CASE STUDY: ELECTRIC BUS

→ **Electrification** in commercial vehicles is still emerging

→ **Cost reduction**

→ **Optimize performance**

- increase gradeability
- manage battery drain
- decrease weight

*Significant value proposition to  
e-mobility market*

Base	Coil Driver™	
21.9 s 0-60 km/h	8.0 s 0-60 km/h	More acceleration, <b>more responsive</b>
4% Avg Gradeability @ 60 kph	12% Avg Gradeability @ 60 kph	<b>Better climbing</b> at speed
193 mi Peak Efficiency	+200 mi Range Increase*	<b>More pickups,</b> less charge ups

\*Potential based on similar application in HD-UDDS drive cycle



# Exro's Value Proposition

More Speed | More Torque | More Power | Less Cost

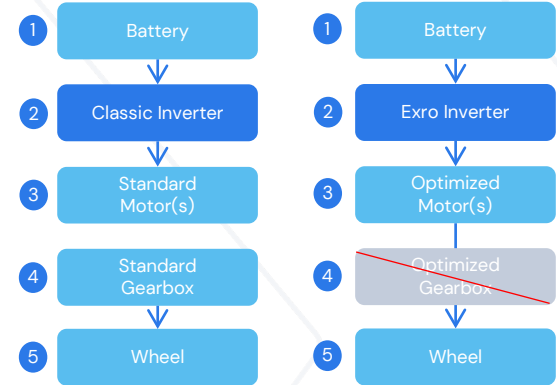
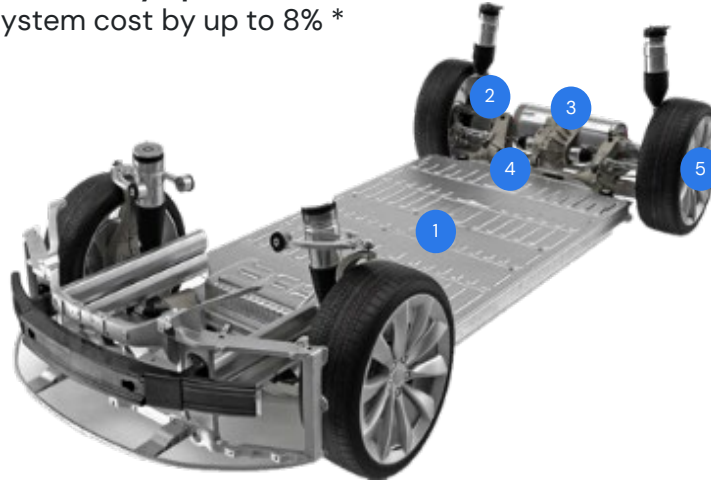


**Reduce system cost by over 20%**  
and **maintain** same performance \*

OR



**Increase performance by up to 50%**  
and **increase** system cost by up to 8% \*



# Case Study

Commercial trucking: more speed | more torque | unmatched power



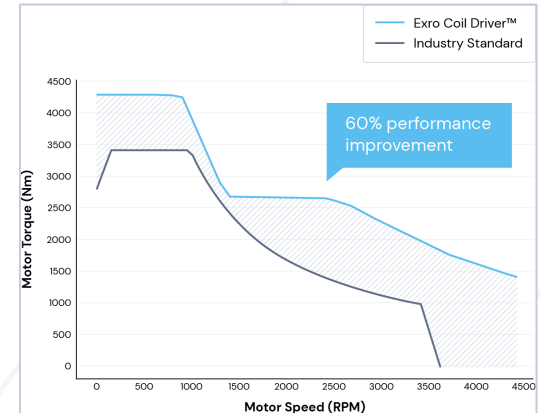
For every passenger vehicle, a range of **1-3 inverters** are needed.



For every commercial vehicle, a range of **2-4 inverters** are needed.



*The Coil Driver enables opportunities to replace the existing inverters and eliminate multiple inverters and/or reduce the motor size*



# Total Addressable Market

Applications across significant e-mobility industries

## EXRO DRIVES



Total Addressable Automotive Inverter Market for Electric Vehicles:

- *Every vehicle has at least 1 inverter*  
**USD \$7.7B by 2025 – Global CAGR of 17.6%<sup>1</sup>**
- *Global Inverter Market – All Segments*  
**USD \$26B by 2025 – Global CAGR of 15.6%<sup>2</sup>**

“The automakers are supporting Biden’s new target, announcing their shared aspiration that 40-50% of their cars sold by 2030 will be electric vehicles.”

“The future of America’s car manufacturing is electric and there’s no turning back.”

– **JOE BIDEN**, PRESIDENT OF THE US

Sources:

<sup>1</sup> <https://www.marketsandmarkets.com/Market-Reports/vehicle-inverter-market-59207794.html>

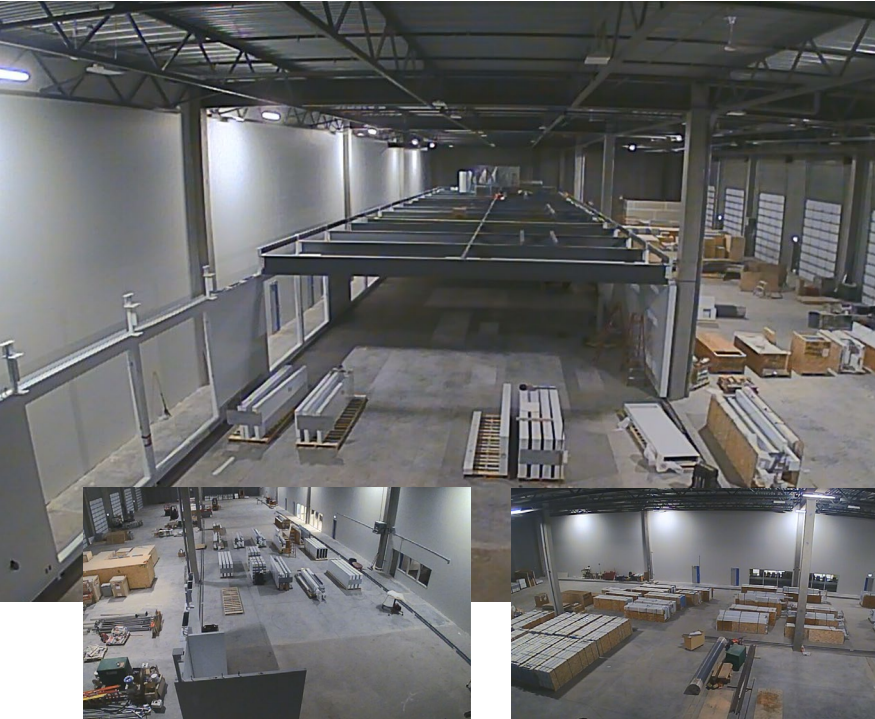
<sup>2</sup> <https://www.globenewswire.com/news-release/2020/03/18/2002292/0/en/The-global-inverter-market-is-projected-to-grow-from-USD-12-8-billion-in-2020-to-USD-26-5-billion-by-2025-it-is-expected-to-grow-at-a-CAGR-of-15-6-from-2020-to-2025.html>

<sup>3</sup> <https://www.mdpi.com/2673-4079/2/1/111/pdf>

<sup>4</sup> <https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/second-life-ev-batteries-the-newest-value-pool-in-energy-storage>

# In-House Manufacturing

World-class automated inverter facility under construction in Calgary, AB



## Ability to supply from in-house automotive-duty manufacturing

- Capacity of ~100,000 units/year per 8-hour shift
- Class 10,000 clean room with SMT line(s)
- Automotive ready by end of 2022
- 37,000 Sq. Ft.

## Standards & Compliance



**ISO 9001**  
Quality Management System



**ISO 14001**  
Health & Safety



**ISO 45001**  
Environmental Management



**ISO 26262**  
Automotive Functional Safety



**IATF 16949**  
Global Automotive Quality Management System

# Competitive Landscape

Ahead of the competition

## HV COMPETITION

- Dana-TM4
- Borgwarner – Cascadia Motion
- Danfoss
- LG-Magna

## LV COMPETITION

- Dana-TM4
- Borgwarner
- Curtis Instruments
- SiliXcon

## EXRO ADVANTAGE

- Proprietary technology that offers superior performance across the applications range
- Versatile for various operating conditions based on the need for better performance or lower cost while improving system efficiency
- Unique features such as AC fast charging and V2X capability
- State-of-the-art product design and manufacturing
- Optimal size for fast product development, while staying responsive to shifts in the market

# Intellectual Property Overview

Extensive patent-protection

## # OF PATENTS

37+ patents published and pending

## NATURE

Technology dense Intellectual Property and trade secrets on hardware and software

## PATENT STATUS

Global portfolio coverage including US, CA, CN, DE, DK, EP, FR, GB, HK, IN, IT, JP, SK, +++



# Business Strategy

Roadmap to unlocking shareholder value



**Focus on e-mobility with commercial, retrofit, and recreational vehicles**

- Pilots – Validation – Commercialization
- EV Services division provides early-stage design incorporation with customers
- Functional demonstration vehicles to showcase products



**Development into OEM and Tier 1 supplier passenger vehicle and high volume automotive for 2024**

- E-Axle and custom designed inverters / technology (licence or build in house)
- Progressing high-profile projects with Linamar, Sea Electric, and others



**Expanding into emerging industries with the versatility of innovative power electronic**

- Leverage expertise in power electronics and coil driver physics into other valuable applications
  - Stationary energy storage solutions
  - Vehicle-to-grid & fast charging solutions



# Business Model

Multi-path revenue



Value Chain



Partners

# Major Milestones Achieved

Technology de-risking over two years via industry partners

## Our accomplishments

### 2020

- delivered first POC for 2-wheel e-bike
- opened Calgary Innovation HQ
- delivered first POC for BCS

### 2021

- Matured POC to 100V with POC to Heinzmann
- Signed first commercial partners with Zero, SEA, Vicinity
- Signed first automotive co development with Tier 1 Linamar

## What's coming next

- Test bench results for LV & HV
- Customer purchase orders
- Production ready CM and facility
- First deliveries of HV 800 and 400V drives
- Successful integrations of LV applications
- NASDAQ up-list

## The big vision – 2023+

- Accelerated product deployment
- EBITDA positive

# Tier 1 Development Update

Developing an advanced e-Axle with Coil Driver technology

The e-Axle is a **compact, cost-attractive electric drive solution for battery-electric vehicles and hybrid applications**. The electric motor, power electronics and transmission are combined in a compact unit directly powering the vehicle's axle. This aids in making electric drives less complex but simpler.

## Joint Technology Development & Selling

- Demonstrated ability to scale our technology and customize to Tier 1 and/or automotive OEM requirements

Who	Focus	Technology
Exro	<b>Electrification</b> MD Commercial Vehicle	Gear Box & Inverter E-axle Solutions for <b>High-Speed Low Torque AND Low-Speed High Torque</b> Applications



Taken from Linamar's Corporate Deck: Joint Technology Development Initiatives and Manufacturing Partnerships – Green Technologies

# Project Updates – High Voltage

Q2/22 delivery of several high priority projects



- TIER 1 development
- Developing an advanced eAxle utilizing HV CD technology to improve cost and performance of Linamar's eAxle product line
- Completed testing and validation of prototypes is on track for Q2 2022



- 800V drive system with our TSA motor; upfitted into a Mack LR garbage Truck
- 400V drive system with our TSA motor partner; upfitted into a F59 Delivery truck for UPS
- Vehicle integration for Q2 2022



- 400V motor and drive system
- On schedule to deliver Q2 2022 followed by 6 months of testing
- Purchase orders for VMC 2023 next generation e-bus



- Key partner for HV product line
- Collaboration delivers a full powertrain system and enables a broad product range with increased performance in the growing commercial electric vehicle markets

*Potential to unlock shareholder value through commercialization announcements in Q2 & H2 2022*

# Project Updates – Low Voltage

Several value drivers to be achieved in 2022



- 100V CD automotive application
- Technology integrated and now road testing for 6+ months



- 100V CD for District motorcycle
- In final stages of validation testing



- 100V CD for ZF75-10
- Exro integration for future Zero models



- 100V CD for eSled
- Q2 2022 targeted delivery



- Key partner for LV product line
- Motor tested and validated now optimizing the drive in this class

# Significant Upside Through Perpetual Innovation

Translatable power electronics expertise

## Motor Control

Exro Coil Driver brings electric gearing to EV's by dynamically enabling multiple power settings in a single motor with Coil Switching technology

- AC Fast Charging to deliver cost-effective solutions to automotive industry
- V2X for bidirectional charging
- Substantial infrastructure savings through AC vs DC chargers

## Power Train Optimization

Exro Vehicle Services (EVS) offers full engineering services capabilities. In house design and power electronics expertise provide optimum efficiency designs

- Battery packs design
- VCU design
- Wiring and harness
- Under 100V custom designs

## Battery Control

Exro Battery Control System extends batteries into a second life by enabling next-generation battery management with cell-level control.

- Stationary Energy Storage solutions for commercial and industrial applications
- Versatility to expand energy storage applications
- First or second life battery energy storage systems

# Battery Control System (BCS)

Breathing second-life into used EV batteries

## Integrating a battery management system (BMS) with a Coil-Driver inverter

- BCS enables a next generation of Energy Storage System (ESS) solutions for first and second life batteries
  - EV battery cells reach end of life within 8-12 years
  - Exro's unique BCS technology extends batteries into second life for an extra 5-10 years in an ESS application
  - Enables greater use of existing resources and recycling to promote a circular economy



90kW 192 kWh Energy Storage System with a BCS

*The new brain for energy storage BCS enables next generation ESS*



# Battery Control System (BCS)

Imagine the potential!

## REPURPOSE

**10 buses that can power a future office building\***

## IMPACT

**Creating a resource of energy from discarded batteries**

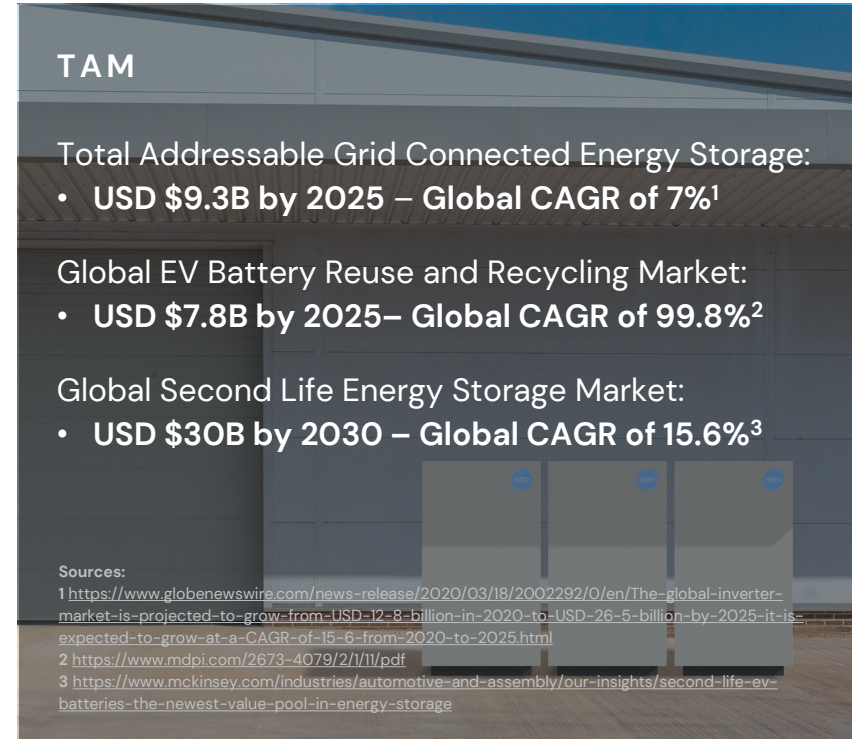
Batteries have +60% operating life in second life storage application after an entire first life in an EV. Until now, second life had a plethora of technical and bankable challenges.

\*Power of buses and size of office buildings will vary

## OPEX BENEFITS

**A remote ESS that tells you when a battery is going down**

Predictively replace without downtime



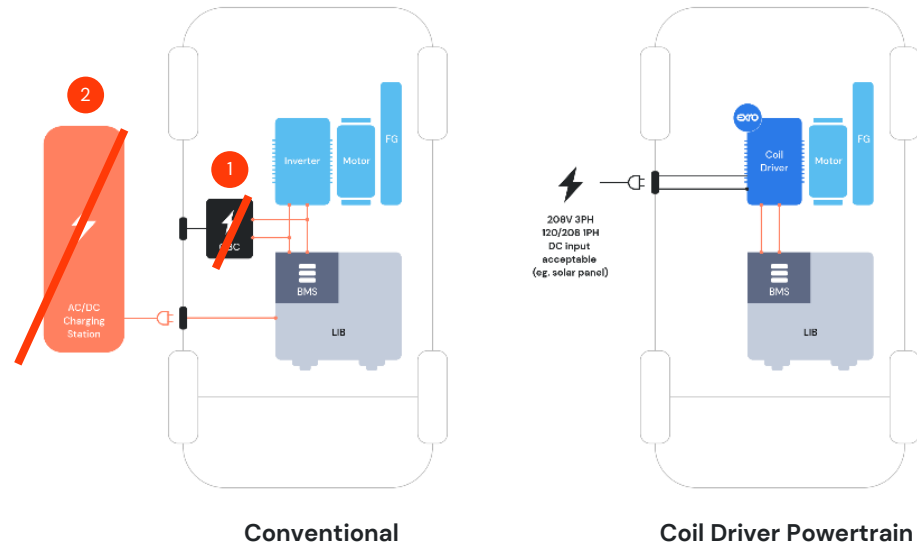
# Coil-Drive Charging

New powertrain solution for onboard and remote charging

## Next Generation Charging Solutions

- 1 → Remove the onboard charger (OBC)
  - 2 → Remove the external AC/DC charger
- Add Vehicle to Everything (V2X) capabilities
    - Vehicle to Grid (V2G)
    - Vehicle to Building (V2B)
    - Vehicle to Application (V2A)

BMS = Battery management system  
LiB = Lithium-ion battery  
FG = Fixed gear



*AC fast charging can scale the EV charging infrastructure exponentially faster and cheaper*

# Management

Strong team in place to see Exro through accelerated growth



**Sue Ozdemir**  
Chief Executive Officer

- Former CEO of GE's Small Industrial Motors Division – General Electric (NYSE: GE) (“GE”).
- \$160M revenue enterprise



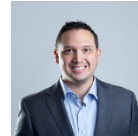
**John Meekison**  
Chief Financial Officer

- 20+ Years Experience as CFO in Capital and Small Cap Markets.
- Previous Capital Experience– Haywood Securities



**Josh Sobil**  
Chief Commercial Officer

- 10+ Years Experience in electric motors and power electronics as Siemens (NSEI: SIEMENS) segment leader from 2016–2019 and sales leader at GE (NYSE: GE)
- Mechanical Engineer & MBA



**Richard Meaux**  
Chief Operating Officer

- Diverse experience as Director of Marketing and Digital Operations at GE (NYSE: GE) and GE Industrial Motors, a Wolong Company
- Mechanical & Aerospace Engineer



**Eric Hustedt**  
Chief Engineer

- 20+ Years Experience – Automotive Inverter Design and Manufacturing
- International Rectifiers Automotive
- KSR International,
- Vishay Intertechnology (NYSE: VSH)



**Darrell Bishop**  
President, Finance & Investor Relations

- 10+ Years Experience in Investment Banking and Capital Markets
- Previous Capital Experience – Peters & Co Limited, Haywood Securities
- Mechanical Engineer & MBA

# Board of Directors

Extensive automotive industry experience & connections



**Mark Godsy**

Executive Chairman

- Co-Founder ID BioMedical
- Co-Founder AngioTech Pharmaceuticals



**Sue Ozdemir**

Chief Executive Officer



**Frank Borowicz**

Director

- 40+ years exp corporate governance, regulatory compliance and risk management



**Jill Bodkin**

Director

- Former Director at Westport (NASDAQ: WPRT)
- Former Partner at E&Y



**Julie McCoy Wurmlinger**

Director

- Former Chief Engineer at Ford Motor Company
- 30+ years automotive executive



**Terence Johnson**

Director

- Former Vice President at Audi, Volkswagen, General Motors
- 35+ years automotive sales experience



**Alan Gaines**

Director

- Chairman and CEO of ALG Corp.
- 35+ years transactional investment banker and M&A advisor

# Environmental, Social, Governance

Our entire company is committed to the highest standards



## Environmental

Exro is committed to environmental factors through creating innovative ways to reduce energy consumption

- Converted all lights to LED format in its main facility to reduce congestion and carbon footprint
- Only utilizes recyclable, renewable products in its workplace



## Social

Exro is committed to positive social change through a cohesive and inclusive team culture

- Emphasizes gender equality and diversity in workplace
- Involved in community support and charitable endeavors
- Supply chain focuses on long-term sustainable management



## Governance

Exro is committed to strong, positive and impactful governance and has a management team and board of directors aligned on this mission

- Board Diversity, both in backgrounds, gender and disciplines
- Business Ethics, solidified by impeccable track record of team
- Risk Management, learned through experience
- Sound Corporate Governance, as demonstrated by ESG initiatives taken

# Investment Attributes

A unique high-growth technology opportunity in the electrification transition race



Innovative drive solutions that address major challenges to the electrification transition in mobility



Scalable inverter technology co-developed with diverse industry partners



Macro sustainability tailwinds driving growth in multiple addressable markets



Positioned for significant value realization and growth with commercialization in 2022



Significant upside through continued focus on innovation into market verticals beyond mobility

# Thank you

## **Sue Ozdemir**

Chief Executive Officer

12-21 Highfield Circle SE  
Calgary, AB, T2G 5N6 Canada

## **John Meekison**

Chief Financial Officer

7853 E Ray Rd,  
Mesa, AZ 85212, USA

## **Darrell Bishop**

President, Finance & Investor Relations

[www.exro.com](http://www.exro.com)

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Questions? [ir@exro.com](mailto:ir@exro.com)

