# Driving the Energy Transition with Intelligent Electrification

**Corporate Presentation** 

Q3 2022



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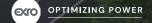
# **Exro Overview**

Visibility into the company and why it matters



# Bringing advanced technology solutions to optimize electrification

**Power Electronics Expertise** 



# What We Do

Deliver next generation power control technology that expands the capabilities of electric motors and batteries enabling e-mobility and energy storage applications to deliver more with less "minimum energy – maximum results"

### Patented technologies:

- → Coil Driver
- $\rightarrow$  BCS
- → Several pending

100+ employees

Public company in US & Canada

Software and electronics R&D, design, and manufacturing

- → Currently piloting with partners such as Linamar, Sea Electric, Vicinity, Zero
- → Demo units on road since Q1 2022 in three countries
- → World-class net-zero manufacturing
- → 2023 production launch

Power electronics technology platforms for e-mobility and energy storage





# **Investment Highlights**

Accelerating the transition to clean energy by solving the most challenging problems in electrification

### Innovative solutions

that address major challenges to the electrification transition in mobility & energy storage

# 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 e-transition market verticals



# **Capital Structure**

Clean structure provides strong foundation for growth



Basic shares outstanding	135,148,864
Stock options outstanding	10,802,217
Warrants outstanding	7,697,922
Fully-diluted shares outstanding	153,649,003

TSX: EXRO OTC: EXROF

Capitalization table numbers as of July 2022

\* Exro has received letter of acceptance to list on Nasdaq. Committed to completing the listing at an opportune time for shareholders.



# Our Core Technology

The Exro ecosystem





# **Battery Control**

Exro Battery Control System provides cellular level control to batteries



# **Powertrain Optimization**

Exro Vehicle Systems offers full engineering services capabilities

Building the Exro ecosystem with end-to-end solutions — from design to repurpose



# Our Core Technology

Bridging the electrification gap with power electronics expertise

### **MOTOR CONTROL**

Exro Coil Driver™ brings electric gearing to EVs by dynamically enabling multiple speed-torque combinations in a single motor with Coil Switching technology

- → Enables greater flexibility for optimizing powertrain solutions
- → Suitable for multiple motor designs and integrated axle designs (E-axles)
- → Core product offerings scalable motor controllers from 48 to 800V+
- → HV coil driver utilizing SiC technology
- → Agnostic to energy supply and motor type

#### **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
- → Unique cell-level control ensures unparalleled safety and up-time
- → Suitable for solar and EV charging applications
- → First or second life battery energy storage systems

#### POWERTRAIN OPTIMIZATION

Exro Vehicle Systems (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



# **Exro Motor Control Solution**

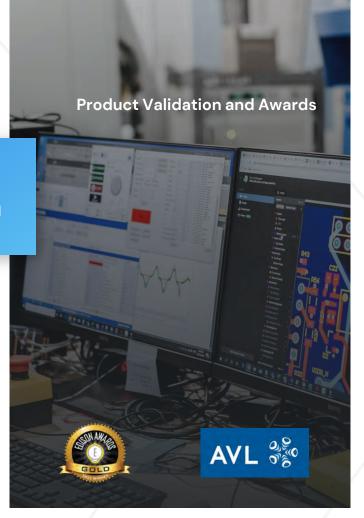
The World's First Intelligent Coil-Switching Drive

### Exro Coil Driver™

Unique coil-switching technology optimizes the performance and efficiency of powertrains and other systems including electric motors and batteries

- → De-risked technology that accelerates the transition toward electrification in mobility by solving performance-cost trade-offs
  - → Expanded motor capabilities
  - → Electric gearing
  - → Scalable and cost-efficient performance
- → Gold award winner for the 2022 Edison Best New Product Awards™ in manufacturing, logistics and transportation

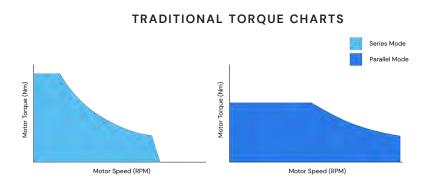
Exro Coil Driver™ is motor type agnostic





# How it Works

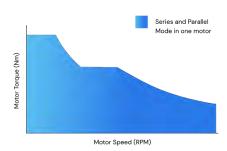
# Coil Driver™: Not a standard 3 phase inverter



### Traditional OEMs needed to make a choice

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

### COIL DRIVER TORQUE CHART



# 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

Significant Value Proposition for E-Mobility Market

Increase performance by up to 50%

with minimal system cost increase

Algorithm performs real-time optimization

ONO

Reduce system cost by up to more than 15% while maintaining same performance

Speed
Torque
Power
Performance

Consumption
Weight
Cost

Energy

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

otes: Heavy-duty urban dynamometer driving schedule.

Total cost of ownership.



# **De-Risked Product Development**

Functional demonstration vehicles plus pilots in vehicles in three countries



Simulation • Product Testing • On-Road Validation

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



# Driven by Disciplined Innovation

# Minimum energy for maximum results



### What we have done

- → Enhanced performance at high speed, better start ability and gradeability at low speed
- → Improved operational efficiency & extended range
- → Motor and energy supply agnostic, adaptable across mobility applications
- ightarrow Scalable technology developed systems from 48V-20 KW to 800V-1.3 MW

# Where we are going









# Coil Driver™ Supports AC Fast Charging and V2X Capabilities

Unlocks attractive fleet electrification economics



### BENEFITS FOR OEMS AND AUTOMOTIVE MANUFACTURERS

- ightarrow Native technology can deliver up to level 4 fast charging capabilities and capable of V2X  $^{(2)}$
- → Eliminates need for on-board charger
- → AC vs. DC significantly reduces environmental impact due to smaller infrastructure foot-print

#### BENEFITS FOR EV FLEET AND CHARGING OPERATORS

- → Materially reduces TCO for fleet operators
- ightarrow Unlocks access to AC fast charging network meeting larger per-mile energy demands of E-MHDV  $^{(1)}$
- → V2X capability has potential to further reduce TCO by transforming EV fleet into revenue-generative asset



V2X: vehicle to everything.

MHDV = Medium - & Heavy-Duty Vehicles.

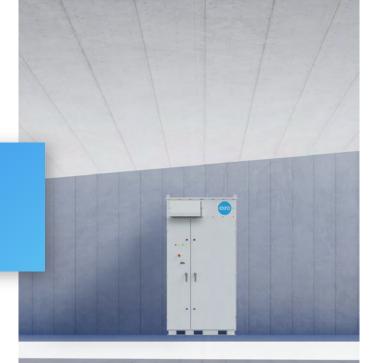
# Exro Energy

Safer, more efficient battery energy storage systems

# Exro Battery Control System (BCS)

Unique technology that establishes greater depth of control in managing to the cell level in a battery for first & second life applications including commercial & industrial buildings, solar/wind farms, etc.

- → BCS enables a next generation of Energy Storage System (ESS) solutions for EV batteries
- ightarrow Exro's unique BCS extends batteries into second life for an extra 5-10 years in an ESS application
- → Leader in thermal management & preventing thermal runaway
  - → BCS connects electronics to individual battery cells
- → Enables greater use of existing resources and recycling to promote a circular economy



Exro battery control is battery type agnostic



# Exro's Technology Advantages



### **CELL LEVEL CONTROL**

- → Enhanced safety with individual cell monitoring
- → Full cell control with ability to adjust current per cell
- → Safely increases depth of discharge
- → Negate cell balancing circuits and traditional BMS
- → Dynamically isolate defect cells or modules while operating ESS

### MODULAR SYSTEM ARCHITECTURE

- → Reduce system maintenance and down-time in case of failure with quick modular replacement
- → Minimal installation time

Design ready for 2nd life cell utilization = significant cost benefit



# **Powertrain Optimization**

Exro Vehicle Systems (EVS), Ann Arbour MI

- → EVS provides critical electric vehicle integration support and provides a platform to onboard clients early in the design
- → Secured purchase order from a leading tier-1 automotive supplier to provide more than \$1 Million in engineering design and consulting services

# Capabilities

### CONSULTING

Market analysis, systems architecture definition, component selection, safety-critical analysis, strategic sourcing

### **ENGINEERING**

System definition, detailed engineering design & development, verification & validation of electrified power systems, production software systems

### **TESTING**

Relevant capital equipment available to test electronics, software, batteries and vehicles

Packaged system solutions from a variety of top supplier and preferred partners



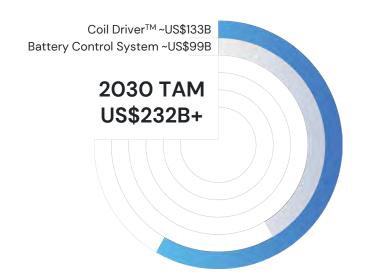


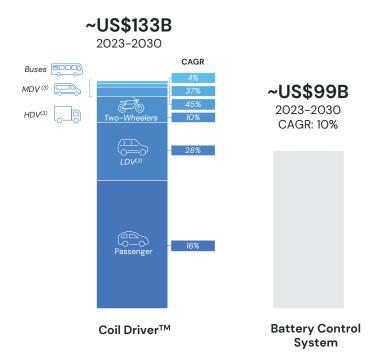
# Outlook

Market Strategy | Our Capabilities | Our People

# Large TAM Opportunity Supported by Secular Tailwinds

Exro's Coil Driver and BCS are positioned to capture rapidly expanding use case markets





Exro's propulsion-agnostic design significantly increases its market opportunity across all e-mobility classes



Bloomberg NEF Electric Vehicle Outlook 2022.



<sup>2.</sup> Bloomherg NEF, Global Energy Storage Market 2022

<sup>3.</sup> HDV: Heavy-Duty Vehicles; MDV: Medium-Duty Vehicles; LDV: Light-Duty Vehicles.

# A Systematic Go-to-Market Strategy

Roadmap to capitalize on a rapidly growing and changing electrification ecosystem



Attack market in waves: build on momentum with key ecosystem players



Expand technology offering through core products partnerships



Continue successful track record of innovation



Increase penetration of engineering, testing and consulting with OEMs



Expand other ancillary revenue opportunities



# **Attack Market in Waves**

Roadmap to grow market share and unlock shareholder value





TARGETED MARKET PENETRATION

MASS PRODUCTION

OFFERING DIVERSIFICATION

Coil Driver™ for low and high voltage applications

Custom inverter and eAxle solutions for high-profile OEM partners

Turnkey electrification solutions including vehicle services







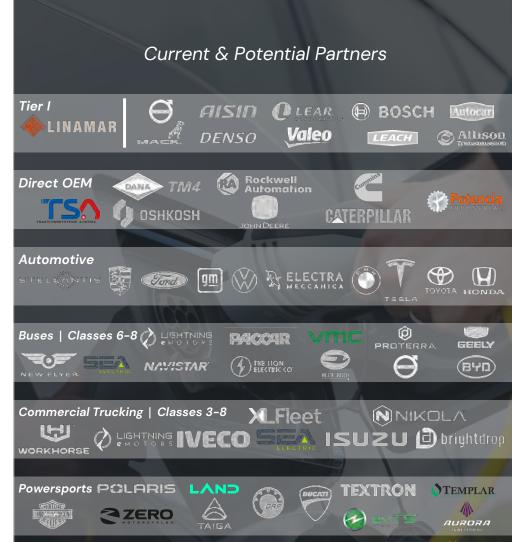




# Targeted Market Penetration

- → Positioned to evolve and engage alongside the electrification of transportation regardless of propulsion technology market direction
- → Technology is highly adaptable and will optimize a wide range of e-mobility applications
- → Next generation platform of power electronic solutions for multiple applications

Motor and propulsion agnostic technology to capitalize on electrification trends and drive Exro's growth



# Mass Production Through Partnerships



- → Major Tier 1 supplier to global OEMs
- → 26,000+ employees across 60+ global facilities
- → C\$6.5B 2021 revenue
- → June 2021: announced partnership to co-develop a lower cost/ higher performance eAxle using Exro's Coil Driver™ technology
- → Technology developed has a wide range of potential EV applications

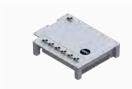


Product	Coil Driver™ eAxle for medium-duty commercial vehicles
Timing	<ul> <li>→ Finalization of testing and validation of prototypes expected in 2022</li> <li>→ Following testing, Exro and Linamar plan to commercialize the Coil Driver™ eAxle into series production</li> <li>→ Delivery of prototypes is expected in Q3 2022</li> </ul>
Sales/ Volume	First revenue expected in 2023/ 2024



# Offering Diversification

Innovative core technology solutions across broad applications



### LOW VOLTAGE DRIVES

 $\rightarrow$  evTS



→ NDA Europe



#### HIGH VOLTAGE DRIVES

→ Vicinity Motor Corp



→ SEA Electric





### **INTEGRATED EAXLE MODULE**

- → Strategic Partner
- → Linamar



→ eAxle September product sample delivery



### **DESIGN SERVICES**

- → Partner announced >1M in revenue in 2022
- → Multiple projects under review



### **EXRO ENERGY STORAGE SYSTEM**

- → C&I integrators
- → Pilot partner H2 2022
- → First production 2023



















# **Customer Momentum Building**

Recent purchase order announcements backed by multiyear supply agreements

### VICINITY LIGHTNING E-BUS



- → Exro will supply high-voltage Coil Drive Systems beginning with a pilot in 2022
- → The agreement includes up to 2,500 units for delivery over the 36-month term
- → The partnership will make electric buses for public transit more sustainable, cost-effective, and efficient

### **EVTS FIREFLY ESV**



- → Purchase order for a first lot of 1,000 low -voltage Coil Drive Systems with initial deliveries beginning in 2023
- → The agreement includes additional units for delivery over the 36-month term
- → The partnership will make urban essential services and last mile delivery applications more sustainable, cost-effective and efficient



# Our Capabilities



### **Manufacturing Center**

CALGARY, AB, CANADA

- → World-class automated manufacturing facility with functional safety team
- → Automated assembly processes with minimal operator intervention
- → Complete clean room with SMT line(s)
- → Commissioned by end of 2022
- → Launch of commercial non-auto production Q3 2023
- → Automotive certified by end of 2024 (post 12 months of production)
- $\rightarrow$  37,000 ft<sup>2</sup>



### Innovation Center

CALGARY, AB, CANADA

- → Advanced Power Electronics design
- → Full product development with validation and sample assembly
- → Medium & small dyno testing capacity (1 large to be installed in Q4/22)
- ightarrow Dedicated engineering team of 35+
- $\rightarrow$  15,000 ft<sup>2</sup>



### **Innovation Center**

PHOENIX, AZ, USA

- → Advanced Power Electronics and Energy Storage design
- → Full product development with validation and sample assembly
- → HQ for Energy Storage
- → Medium dyno testing bay
- → Product demonstration center for USA
- $\rightarrow$  15,000 ft<sup>2</sup>



### **Exro Vehicle Systems**

ANN ARBOUR, MI, USA

- → Provides vehicle integration solutions for automakers pursuing electrification, including end-to-end electric vehicle design and engineering services
- Focuses on complete
   powertrain designs that
   integrate Exro's core
   technology with vehicle
   powertrains including
   embedded software, Vehicle
   Control Units (VCUs) and
   batteries

Exro's testing capabilities includes 4 dynos and 8,000+ hrs of in-house testing capabilities per annum

# **World-Class Manufacturing Center**

Inverter facility near completion in Calgary, AB with net-zero targets

## **Ability to Supply**

- → Capacity of ~100,000 units/year
- → Technical cleanliness
- → Track and trace
- → Class 10,000 clean room with SMT line(s)
- → Net-zero building:
  - → solar power roof
  - → water conservation
  - → zero waste production





ISO 9001

Quality Management System

ISO 26262

Automotive Functional Safety

ISO 14001

Health & Safety Envi

ISO 45001 Environmental Management

IATF 16949

Global Automotive Quality Management System



# Comprehensive Intellectual Property Protection Program

Exro's patented control technology expands the capabilities of electric motors, generators and batteries

40

# Patents published and pending

- ightarrow 25 issued patents and 15 pending applications
- → IP wholly owned in 13 patent families providing or seeking global protection in strategic countries
- → Global portfolio coverage including US, CA, CN, DE, DK, EP, FR, GB, HK, IN, IT, JP, SK
- ightarrow Trade secrets to protect proprietary software and algorithms

### JULY 2022

# Exro Refutes Unsubstantiated Claims of Patent Infringement

#### CONTEXT

→ ePropelled filed a patent infringement lawsuit against Exro in January 2022

#### REVIEW

→ Independent analysis conducted by a MIT professor and power electronics expert

#### OUTCOME

- → Results of the independent review indicate unlike the patents held by Exro, there are numerous prior art references that demonstrate ePropelled's '103 patent is invalid
- Exro anticipates the '103 patent assigned to ePropelled can be cancelled, leading to an immediate resolution of the claim and a full vindication of Exro

# Managing Risks Through Well Defined Supply Chain Program

### 10+ Years of Relationship with Leading Suppliers

- → Commitment to long-term partnerships with quality suppliers, which includes global Tier 1 OEMs
- → Development partners lead to long-term partnerships with suppliers

### **Strong Demand Plan**

- → Production agility leading to scalability
- → Early purchases for product development bear fruit for supplier relationships

### **Global Chip Shortage Mitigation Program**

- → Secured major components for 2023 production
- → Supplier redundancy limits concentration risk and ensures timely sourcing





# Environmental, Social, Governance

# Committed to the highest standards

### **ENVIRONMENTAL**

Environmental matters are at the core of Exro's operations and are embedded across the organization's activities

- → World class net-zero automated manufacturing facility in Calgary, AB
- → Optimized energy efficiency, with all lights converted to LED format in its main facility
- Responsible sourcing and procurement, with exclusive utilization of recyclable, renewable products in the workplace

#### SOCIAL

Exro fosters a cohesive and inclusive corporate culture, enabling positive social change

- → Manufacturing facilities ISO 9001, 14001 and 45001 certified, implementing safety best practices
- → Emphasis on gender equality and diversity, with an employee diversity target in place
- → 2021 net employee score of 90%+
- → Partnerships with leading global Tier I automotive suppliers to ensure sustainability integration across the supply chain
- → Involved in community support and charitable endeavors

#### **GOVERNANCE**

Rigorous and impactful governance is foundational to Exro's board and executive team mandates

- → Board Diversity, both in backgrounds, gender, and area of expertise
- → Business ethics underscored by robust internal policies and track record of the team
- → Comprehensive risk management oversight
- → Sound corporate governance, underpinned by diligent executive team



# 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



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



**Eric Hustedt**Chief Technology Officer

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



John Meekison
Chief Financial Officer

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



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



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

- → 10+ Years Experience in Investment Banking and Capital Markets
- → Previous Capital Experience Peters & Co Limited, Haywood Securities, National Bank
- → 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 F&Y



**Rod Copes** 

Director

→ Former Chief Operating Officer at Rivian electric vehicles; Former division President at Harley-Davidson

→ 30+ years automotive executive



**Terence Johnsson** 

Director

→ Former Vice President at Audi, Volkswagen, General Motors

→ 35+ years automotive sales experience

# **Investment Attributes**

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

Innovative solutions that address major challenges to the electrification transition in e-mobility & energy storage

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 e-transition market verticals

# Thank you

**Sue Ozdemir** 

**Chief Executive Officer** 

John Meekison

Chief Financial Officer

**Darrell Bishop** 

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