# AUGWIND ENERGY STORAGE SOLUTIONS

Investor Presentation | May 2021



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### ENABLING A CARBON FREE FUTURE

#### 01

Large and growing addressable markets with strong tailwinds

#### 03

Augwind's unique, cost effective solutions fit the market road map

#### 04

the coming years

#### 05

Developing global infrastructure to achieve growth targets

#### 02

**Energy Storage and Industrial Energy Efficiency** markets seek disruptive solutions

On a path to deliver steep growth in

#### 06

Strong alignment with **ESG** principles





Approx. \$8.5B Current estimated industrial energy efficiency market size<sup>2</sup>



>160mwh of backlog in Israel in 2020

(1) Based on the "Energy Storage Grand Challenge" Market Report by the U.S DoE, December 2020. Assumptions are based on current pricing of \$250/kWh. (2) Based on Company Analysis.



EARTH

### DRIVING INNOVATION FROM THE GROUND UP

We developed a patented technology for underground storage of compressed air at high pressure, providing ground-breaking energy storage solutions for the renewable energy and energy efficiency markets

**Established 2012** Founder: Or Yogev, industry veteran, PhD, Caltech Approx. 40 employees in Israel

Public (TASE: AUGN) Market Cap. 1.5B NIS

Market cap. as of May 13, 2021



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**Technology**: **AirX** Products: AirSmart, AirBattery

**18 patents granted** 13 pending

#### **Select Customers and Projects:**



### **EXPERIENCED LEADERSHIP TEAM**





### The global energy transition: A GROWING NEED FOR AUGWIND'S TECHNOLOGY

# 2

#### **OUR DISRUPTIVE SOLUTIONS**

Enable the energy efficiency and renewables transformation

3

# Our path to achieve **STEEP GROWTH**



### AMBITIOUS CLIMATE TARGETS DRIVE THE HIGH DEMAND FOR RENEWABLE ENERGY AND ENERGY EFFICIENCY



This is the decisive decade...we must make decisions that will avoid the worst consequences of a climate crisis

PRESIDENT BIDEN, APRIL 22, 2021

- **Targets**: cut carbon emissions by 50-52% below 2005 levels by 2030
- Invest \$115B in infrastructure resilience and R&D, including energy storage
- 25 States have mandatory Energy Efficiency Resource Standards or Goals



Target **32% renewable energy** and **32.5%** improvement in **energy efficiency** by 2030





Today, wind and solar are the cheapest ways to generate electricity in many countries



Energy efficiency increases industries' competitiveness and reduces energy bills

Source: President Biden at the Virtual Leaders Summit on Climate Opening Session, Reuters, dsireusa.org



### FAST FORWARD TO 2030



**35%** of global electricity to be supplied by renewable energy



**75%** of renewables from intermittent sources (solar, wind)



**80%** of global electricity demand growth to come from renewables

Source: U.S. Energy Information Administration, Annual Energy Outlook 2021 (AEO2021) and IEA



### THE CONSTANT SHIFT TO RENEWABLES DRIVES STRONG DEMAND FOR ENERGY STORAGE SOLUTIONS

#### CALIFORNIA 2020: >35% RENEWABLES<sup>1</sup>

#### California net-load curve sample (GW)<sup>2</sup>



Need to meet growing demand during evening peak hours

Need flexibility in supply, especially during evening ramp-up

Risk of excess generation during PV peak hours

#### CALIFORNIA 2030 TARGET: 60% RENEWABLES

# ~10GW

of energy storage deployments is required<sup>3</sup>

Wind and solar provide power only when the wind blows and the sun shines.

Storage is crucial to match the demand for intermittent supply.

Source:(1) CAISO & TASC Consultancy (2) CEC, December 2019.(3) Energy Storage News



### ENERGY STORAGE ALSO PLAYS A KEY ROLE IN THE SHIFT TO DECENTRALIZED POWER GENERATION

Tremendous opportunity to stack services and generate multiple revenue streams from energy storage assets



Commercial & Industrial



### Peaking capacity & Energy shifting





harnessing the elements for a **CLEAN FUTURE.** 10



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### THE MARKET TRANSFORMATION DRIVES HUGE POTENTIAL FOR ENERGY STORAGE YET, TODAY'S SOLUTIONS ARE UNABLE TO SUPPORT THE INDUSTRY'S ROADMAP



Source: (1) U.S. DoE (2) NREL, The Four Phases of Storage Deployment: A Framework for the Expanding Role of Storage in the U.S. Power System, hours in the chart refers to discharge duration. TAM – Total Addressable Market, SAM- Serviceable Addressable Market, excluding storage for residential EV and Motive



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280 GWh installed

in 2030

### INTRODUCING AUGWIND'S AirBattery: A REVOLUTION IN ENERGY STORAGE

Augwind's innovative energy storage technology is the only solution that supports the industry's roadmap

- Longer duration 2-12 hr+ and limitless cycles
- Scalable 1-1,000 MW and Flexible
- 75%-81% **Efficiency** (roadmap to >90%)
- Cost Competitive < 250\$/kWh
- **•** Eco-friendly, minimal footprint
- Avoids risk of mineral scarcity



Source: (1) U.S. DoE (2) NREL, The Four Phases of Storage Deployment: A Framework for the Expanding Role of Storage in the U.S. Power System, hours in the chart refers to discharge duration. SAM- Serviceable Addressable Market, excluding storage for residential EV and Motive



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### The global energy transition: **A GROWING NEED FOR AUGWIND'S TECHNOLOGY**

# 2

#### **OUR DISRUPTIVE SOLUTIONS**

Enable the energy efficiency and renewables transformation

3

# Our path to achieve **STEEP GROWTH**



### **REVOLUTIONARY APPROACH** TO THE ENERGY CHALLENGE



(1)TAM: Total Addressable Market. Current estimated industrial energy efficiency TAM is based on Company analysis. (2)Expected AirBattery TAM for 2030 is based on the "Energy Storage Grand Challenge" Market Report by the U.S DoE, December 2020. Assumptions are based on current pricing of \$250/kWh.





### AirBattery DESIGNED FOR SCALABILITY AND DURABILITY



Separate charge, discharge and storage components enable multiple energy storage services

Multiple daily cycles with no degradation





Transmission & Distribution Peaking capacity



Bulk energy & Longer duration



### A SINGLE FACILITY TO GENERATE MULTIPLE REVENUE STREAMS

#### Case Study: ISO New England, USA

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### AirBattery THE MOST COST-EFFECTIVE STORAGE TECHNOLOGY FOR SHORT & LONG DURATIONS



AirBattery cost declines as duration and power increase

<u>Source: Based on U.S DoE 2020 Grid Energy Storage Technology Cost and Performance Assessment &</u> Company analysis for AirBattery



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### COMPETITIVE LANDSCAPE: AirBattery IS A GAME-CHANGER



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### **POSITIONED FOR DISRUPTION:** AirBattery DELIVERS



**AirBattery** 

Life span	12 years/ 4000 cycles	Over 40 years/ unlimited cycles	
Storage system cost*	\$250 / kWh	Cost Competitive < \$250/kWh	
Efficiency	87-90 <b>%</b>	75-81% (Roadmap to >90%)	
Discharge & storage duration	Up to 4 hours (techno-economically)	Significantly longer duration	
<b>OpEx</b> (including parasitic electricity)	High	Low	
Response time	Fast, m/s	Medium, about 10 seconds (w/o extra capacitors) Fast, m/s (with extra capacitor)	
Safety	Flammable, contains chemicals	Closed-circle water, air, soil	
Ecology	Complex life-cycle, toxic,		
Key raw materials	Lithium, cobalt, nickel, massive water	Standard construction materials	
Supply chain	Availability depends on supply and markets		



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### LITHIUM- ION LIMITATIONS CHALLENGE THE MARKET TRANSITION TO RENEWABLES

#### Lithium supply at risk starting 2025



TASC Consultancy estimates, Feb.2021<sup>3</sup>

\* Sourced: (1) Market Report by the U.S DoE, December 2020;



#### EV for transportation: 5x demand increase by 2030<sup>1</sup>



The U.S. is facing a lithium-ion battery shortage as electric vehicle production ramps up

PUBLISHED THU, APR 8, 2021





...in 2030, the market could require 2,500 GWh of capacity. The five biggest battery makers together had 350GWh of capacity at the end of 2020...

Q2 2021 EQUITY MARKET OUTLOOK

#### BlackRock



**Lithium prices continue to soar – up 88% in 2021** MARCH 15, 2021

MINING.COM

### LITHIUM- ION LIMITATIONS CHALLENGE THE MARKET TRANSITION TO RENEWABLES



#### Supply chain stability?

#### China is the world's Lithium battery supplier:

80% of raw mineral refining 77% of battery cell production 60% of battery component production



#### **Environmentally friendly?**

Water and land pollution High water consumption in extraction Recycling is limited



..Production of raw materials like lithium, cobalt and nickel that are essential to these technologies are often ruinous to land, water, wildlife and people...

PUBLISHED MAY 6, 2021

### The New York Times

<u>\* Sourced: ICCT</u>. Lithium Mine - Carbonate from Evaporation Ponds Mined in Nevada Desert - Shallow Depth of Field



# AirSmart

### ENABLING OPERATIONAL CONTINUITY THROUGH SIGNIFICANT POWER CONSUMPTION REDUCTION

Select customers and projects:









### **AirSmart ENERGY EFFICIENCY**

Compressed air systems are one of the most inefficient systems used in industry, with 10%-15% overall efficiency. Yet, they're widely used across sectors.

Augwind's solution can save up to 40% of power consumption to an air delivery system.

48	2	10M+
Units installed in Israel	Units to start construction in the US by Q3 21	kWh saved





### **AirSmart**

Secure production continuity, reduce costs AND improve performance, WITH zero footprint

#### **Flow Chart**



#### **Case Study : Cement Producer**

#### **Energy efficiency**

- 35% energy savings ~\$300K a year
- 2,400,000 kWh saving ~ 550 tons of  $CO_2$  savings
- Average Horsepower reduction 480

#### **Process efficiency**

- Reduction of artificial demand by 15%
- Pressure reduction from 7.5 to 4.5 Bar

#### **Process stabilization**

- Zero pressure drops
- Improve up-time to 100%





#### **AirSmart** SECURE PRODUCTION CONTINUITY, REDUCE COSTS AND IMPROVE PERFORMANCE, WITH ZERO FOOTPRINT

**Reduce operational costs** Save up to 40% in power consumption **Save valuable space with** Underground installation

Reduce compressor maintenance costs

**Safer than above-ground containers** Fortified by design, no hazards

**Mechanical longevity** Motor runs on the best efficiency curve, improving MTBF significantly







up to 600PSI

**Certified, safely stores** 





### The global energy transition: **A GROWING NEED FOR AUGWIND'S TECHNOLOGY**

#### **OUR DISRUPTIVE SOLUTIONS**

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# Our path to achieve **STEEP GROWTH**



### AirSmart STRONG MARKET OPPORTUNITY IN LEADING INDUSTRIES



(1) TAM: Total addressable market, SAM: Serviceable Addressable Market; Current estimated industrial energy efficiency TAM and SAM are based on Company analysis



### **AirSmart BUSINESS MODEL**

**CapEx Business Model** 

**Revenue streams:** System sale 0&M services (10-15 years)

**Typical deal size:** \$250k-\$350k 0&M: \$80k (10-15 years)

**OpEx Business Model** 

**Revenue streams:** Shared savings (15 years)

**Typical deal size:** \$1.0M-\$1.25M



Expecting hundreds of installations over the coming years



Steel









Plastic

Glass



**Chemical & Petroleum** 



Cement



Paper & Pulp

Automotive

Food & Beverages



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### **TREMENDOUS MARKET OPPORTUNITY FOR AirBattery**



(1)TAM: Total addressable market, SAM: Serviceable Addressable Market; Expected TAM and SAM for 2030 estimates are based on the "Energy Storage Grand Challenge" Market Report by the U.S DoE, December 2020 Israel SAM for 2030 is based on Israel's Ministry of Energy market report, April 2021. Assumptions are based on current pricing of \$250/kWh



### AirBattery: RECURRING REVENUE BUSINESS MODEL CREATES PREDICTABILITY

CapEx Business Model	Market Focus	Commercial and industrial (Behind the meter),	
<b>Revenue streams:</b> System sale O&M services (20 years) Future: Storage management system	market i ocus	Energy shifting (Co-location), Peaking, Transmission & Distribution and, Ancillary	
	Types of Partners & Customers	<b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contraction</b> <b>Contr</b>	
<b>Equity Business Model</b> Equity : between 10% and 25%	Channels Developers and EPC contractors through direct sales and JVs		
<b>Revenue streams:</b> System sale Recurring revenues (20 years) O&M services (20 years) Equity gains (20 years)	Customer Segmentation	Developers, Utilities, C&I	



### AirBattery: RECURRING REVENUE BUSINESS MODEL **CREATES PREDICTABILITY**

#### **Example: 3 Types of Revenue Streams** 20MW/80MWh project

Typical deal size: CapEx \$18M-\$22M Typical deal size: **Equity - 1 cycle** \$18M-\$22M 3 **Equity - 2 cycles** \$18M-\$22M

Plus \$0.5M- \$0.8M ARR (20 years)

Typical project size: Plus \$0.6M - \$1.0M ARR (20 years)

**Expecting significant** growth in C&I applications

\$**40**в

**Global SAM** 

**Tremendous** 

market opportunity

Expected in 2030



**\$9.5**<sup>B</sup>

SAM

**\$7.8**<sub>B</sub>

SAM

S1<sub>B</sub>

SAM



**S4.8**<sub>B</sub>

SAM

Industrial factories

#### **Example-Notes:**

- Deal/projects size is based on project's configurations
- Augwind's share in the equity ranges between 10% and 25%
- ARR (Annual Recurring Revenue) for 1 cycle or 2 cycles are based on a combined energy rate of \$70/MWh / \$100/MWh, respectively, and additional revenues from O&M services

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### **TECHNOLOGY ROADMAP**

#### **Product improvements** to maintain competitive edge

#### System cost reduction

Increase energy density by increasing AirX operating pressure

Target > 90% efficiency Increased durability & efficiency of Charge cycle Improving discharge efficiency and longevity Product development to expand our offering

#### Support 24/7 monetization

Develop energy management system to maximise profitability of existing AirBattery and AirSmart based facilities

#### **Future products** Support additional energy efficiency applications



### **REVISED GO-TO-MARKET STRATEGY**



## Establish revised organization structure to support globalization and steep growth over the next several years:

- Globally increase headcount in areas defined as company core competencies
- Significantly strengthen company HQ as source of knowledge and methodology
- Establish fully function regional subsidiaries: sales, marketing, support, operations, legal, finance and HR
- Sign agreements with local engineering companies
- Combine direct and channel sales in the sales process; provide strong support to channels to broaden market reach



#### Establish collaborations with major energy developers to leverage unique value proposition



Support growth with cash on hand, project financing and capital raises



### ENABLING A CARBON FREE FUTURE

Large, addressable market with strong tailwinds

Energy storage market is on the verge of disruption

Augwind offers significant technical and commercial advantages

Enabling the transition to a carbon free future

Organizational scale-up to support aggressive business plan

Experienced leadership team to deliver steep growth



# HARNESSING THE ELEMENTS FOR A CLEAN FUTURE

## Thank you!

For more information: Tamir Vieman, CFO tamir@aug-wind.com



