A Battery Company KAiring About the Future of Energy and the Environment

The Ohio State University

The KAir Battery Team

Mr. John Bair (Interim CEO)
Dr. Yiying Wu (Founder/Advisor)
Mr. Damian Beauchamp (Co-Founder/COO)
Mr. Xiaodi Ren (Co-Founder/CTO)
Ms. Kate Fisher (CFO)
Mr. Mingfu He (Scientist)
Mr. Zhongjie Huang (Scientist)
Ms. Xuanxuan Bi (Scientist)
Student leader: Damian Beauchamp
Phone: (330) - 931 - 7813
E-mail: beauchamp.21@osu.edu 2

Executive Summary

The Need: KAir Battery LLC will address the market of stationary batteries, which represented $2.8 billion in 2012 and is projected to grow to $3.4 billion by 2017, yielding a compound annual growth rate (CAGR) of 3.8% (*BCC Research market report, 2013*). Global industries and government recognize the urgent need for energy storage solutions and have put in place initiatives allocating $279 billion to this sector of energy storage (*Frost & Sullivan, 2014*). Beyond that, the DOE projects the value of the grid storage market to be at $19 billion by 2017 (*DOE, 2013 report on grid storage*). This growth is supported through the following benefits: peak load management, grid stability, rising renewable integration, and government initiatives/mandates. Despite the strong market need, current battery options are either too costly (between $350 to $1300/kWh) or not energy efficient enough (70% to 90% efficiency).

The Solution: KAir has created an innovative solution with their patent-pending potassium-air battery, which is more cost effective ($89/kWh), energy efficient (up to 98%), produces lower toxicity byproducts compared to those of competing technologies, and provides an increased level of storage (310 Wh/kg, average density of current storage options 124 Wh/kg). *KAir will produce 1 kWh potassium-air batteries for the electrical stationary storage systems* (*ESSS) market.* The companies in this sector will use KAir's batteries to build modular units with an industry average storage capacity of 54 kWh (54 batteries per unit). These companies then market/sell their modules to a variety of consumer industries for power backup, renewable energy storage, and peak shaving electrical storage needs. KAir will also produce smaller capacity batteries to pursue the Uninterrupted Power Supply (UPS) market initially, in order to generate revenue to support further development.

Business Model, Customers and Capital Raise: KAir will adhere to the following go-to-market strategy:

- Step 1 - Technical validation to enable KAir to engage key strategic partners/customers. KAir will fund this development through state and federal governmental agencies.
- Step 2 - Engage strategic partners/customers to develop prototype for ESSS market. This step will be funded from the engaged initial customer(s).
- Step 3 - Scale out manufacturing to support initial customer(s) and expand the products into related customers in ESSS. Initial potential customers include AEP, Iberdrola Renewables, Amazon, IBM, Emerson, Convergent Energy+Power, and ABB. KAir has initiated the engagement with AEP. Funds will be raised through the initial customer(s) and venture capitals. KAir has already drawn interest from Honda, BASF, the Ohio Tech Angel Fund, and Asymmetric LLC, including investment funds, leasing, and buyout offers of the IP. Funding for KAir Battery is currently being pursued through non-dilutive sources (SBIR/STTR). KAir is seekingcorporate partner (GE, AEP, Google,

Honda, etc.) buy-in from the beginning. This would allow for an increased rate of development due to that partner's established relationships and resources.

Strategic Partners: KAir has initiated the discussion with AEP to understand AEP's need in energy storage. This conversation has led to a commitment from AEP to investigate various partnering initiatives to promote the commercialization of the battery. Additionally, Honda North America has awarded significant non-restrictive non-encumbered research funding to accelerate the development of the battery. KAir's product development will be accelerated through partnerships with Wildcat Discovery Technologies and BASF. The Jobs Ohio program currently has a BASF executive on retainer who will be evaluating the technology and providing guidance on commercialization. Third party validation with Honda Research Institute, followed by pilot projects with AEP, is KAir's goal. Upon reaching our development milestones, KAir plans to exit or start battery manufacturing through outsourcing to established battery manufacturers such as Emerson Network Power, Energizer, and BASF.

The Team: The KAir Battery team is led by interim CEO John Bair, Advisor/Inventor Dr. Yiying Wu, CFO Kate Fisher, CTO/Inventor Xiaodi Ren, and COO Damian Beauchamp. In addition, KAir has three PhD chemistry students, Mingfu He, Zhongjie Huang, and Xuanxuan Bi, on board with expertise in electrochemistry and energy materials. Expertise to fill sales and engineering roles is needed.

1. Market Need and Our Solution

Opportunity/Need: Today electricity producers have the daunting task of continually balancing electrical supply with demand. This balancing act is costing the US economy $390 billion annually for the following reasons: 1) Capital costs for fossil fuel fired power plants due to inconsistent operating and high ramping rates; 2) Outages; 3) Fresh water withdraw from pumped hydro; 4) Ecological impact due to toxic byproducts (*Galvin Power Initiative*).

Also, there is a lack of electrical storage which stunts implementation of both renewable solar and wind energy. These are predicted by multiple sources to be a large part of the future's energy mix (*DOE, Bloomberg, and The Economist*) and smart grid technologies. The global renewable energy storage market is predicted to be $423 million in 2016 with a CAGR of 5.4%, resulting from the growth of wind and solar power industries (*BCC Research, 2011*). Rapid growth of electricity consumption has an associated increased capital cost of electricity transmission/ distribution, but electricity storage can circumvent these costs by reducing the capital needed for building new power plants. Government initiatives/mandates are another driver of the ESSS market. California, New York, New Jersey, Washington, Oregon, Texas, Colorado, and Hawaii all have mandates in place requiring the utilities to include ESSSs (*Frost & Sullivan, 2014*).

Globally, pumped hydro accounts for 99% of all storage capacity (*Fraunhofer Institute EPRI, Electricity Energy Storage Tec, 2010*). However, pumped hydro is only 75% energy efficient, has

scalability limitations, and has significant environmental impacts with respect to freshwater withdrawal.
Therefore, electrochemical storage technologies or batteries are regarded as the solution to the energy storage problem (*Frost & Sullivan/DOE, 2013*). The reasons supporting this are: 1) ease of implementation at desired capacities and locations, and 2) the unique ability to quickly respond to spikes in demand.
However, all current battery technologies with potential for grid scale storage are either too costly, inefficient, and/or result in toxic byproducts. Today, the main stationary storage battery technologies are lead acid, sodium-sulfur, lithium-ion, and nickel metal hydride with an average energy density of 124 Wh/kg and a round-trip efficiency (RTE) range of 70% to 90%. There are several emerging battery technologies such as manganese-antimony, lithium-sulfur, sodium-ion, zinc-air, and lithium-air.
The limiting factors for the widespread implementation of these storage systems in industry are either the significant cost of the battery cells (between $350 to $1300/kWh), low energy densities, or low round-trip efficiencies (*Bruce Dunn et.al, Science, 2011*). A comparison of these current technologies is summarized in Table 1.

Average Requirements for UPS Customer: 0.5-10 kW, 4-10 years in float service, > 200 cycle life. (*European Commission, 2013*)
Average Requirements for Community Energy Storage: 25 kW; 75 kWh; RTE >85% , 2000-cycle life (*AEP, 2014*)
Average Requirements for ESSS/Utility Scale Customer: 1-10 MW/site, RTE > 75%, 3000-cycle life, footprint < 500 square feet per MW, and low disposal cost *(BCC research, 2011).*
Figure 1: Cost breakdown of 1 kWh battery

Technologies	Energy Density (Wh/kg)	Round-Trip Efficiency (%)	Cost ($/kWh)	Comments
Pumped hydro	0.5-1.5	75	5-100	Large initial investment; availability limited; environmental impact
CAES	30-60	70-80	2-50	Geographic requirements
Lead-acid	30-40	50-75	120	Toxic elements used
Sodium-sulfur	150-240	75	445-555	High working temperature (300°C)
Lithium-ion	120-200	85-90	~1300	Limited Li resources
Zinc-air	220-340	75	350	Expensive reaction catalysts; in development
Potassium-air	**310**	**Up to 98**	**89**	**In development**

Table 1 - Current Technologies with Potential for Grid Scale Storage

KAir's Solution/Differentiation: Batteries with low cost (< $150/kWh), high energy density, and high round-trip efficiency are omnipotent to the electricity industry. Here KAir's potassium air battery can meet the needs of customers through our offering of unprecedented price performance ($89/kWh), round-trip efficiency (up to 98%), energy density (310 Wh/kg), recyclable non-toxic byproducts, and potentially long cycle life.

The Differentiation of Potassium-Air Batteries vs. Competitors:

Unprecedented round-trip efficiency: KAir's potassium air battery can have an overpotential as low as 50 mV, translating into 98% round-trip efficiency, along with a practical energy density of 310 Wh/kg. The result of the high energy density means that fewer batteries are required to store an equivalent amount of electricity, requiring a smaller footprint when KAir's batteries are in place. The increase in efficiency allows for nearly all the energy used in charging the battery to be recovered, differentiating us from all current stationary storage systems on the market. Therefore, besides the reduced capital cost for electricity generation from load leveling, KAir can also greatly reduce the energy loss during storage, further improving the revenue for utility companies.

Cost benefits: The superior performance is achieved without using any electrocatalysts. The revolutionary one-electron oxygen reduction and oxidation reaction processes in KAir's battery cathodes feature low energy barriers and fast reaction kinetics, unlike the sluggish oxygen reduction or oxidation reactions in Li-air batteries, Zn-air batteries, fuel cells and water splitting devices etc., which require exotic catalyst materials. This fact, together with simple and widely-distributed battery materials (potassium and carbon) ensure the significant cost advantages that KAir's potassium-air batteries have over other competitors, costing only $89 for a 1 kWh battery cell. This translates into a product that meets the performance requirements and cost parameters the industry desires (highlighted earlier).

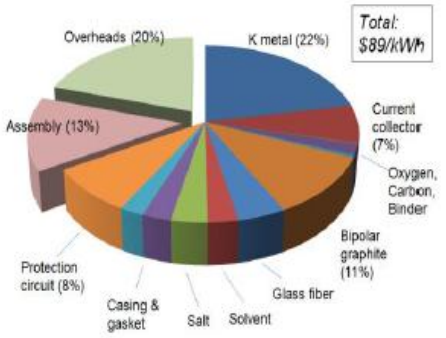

Figure 1: Cost breakdown of 1 kWh battery

KAir's Technical Feasibility/Development Strategy: After extensive document research, it is confirmed that KAir has demonstrated the first utilization of a potassium-based anode in metal-air batteries. KAir has proven the superior efficiency performance of potassium-air batteries based on potassium superoxide and published the research results in one of the world's most prestigious peer-reviewed chemistry journals (*Journal of American Chemical Society, 2013, 135 (8), 2923–2926*). The work was featured on the *Green Car Congress* website and has already been cited by several research groups so far.

The discussion with experts also proves KAir's unique position in the market. For example, Bryan Pivovar, the NREL (National Renewable Energy Laboratory) fuel cell leader, has told the COO of

KAir Battery that if the overpotential of a battery could reach below 100 mV, which KAir has already achieved, it would be revolutionary for the energy industry (this overpotential directly relates to round-trip efficiency).

Milestones:

Current Stage: Within one year of concept demonstration, KAir has enabled a major boost of battery rechargeability (from 3 cycles to 50 cycles). The high cycling coulombic efficiencies (~98%) and the negligible physical degradation of the carbon cathode indicate the huge potential for future cycle life improvement once the anode degradation problem is addressed.

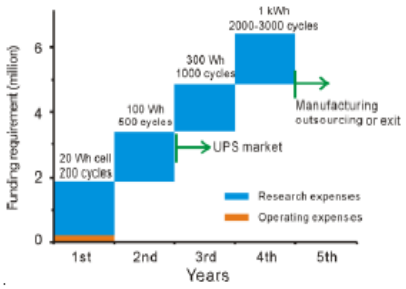

Figure 2: KAir's projected milestones.

Year 1:
Funding needed: $1.8 million.
Effort: (i) purchasing necessary equipment, materials, and ensuring office and laboratory space; (ii) development of the electrolyte of the battery.
Target: 20 Wh battery prototype with 200 rechargeable cycles, ready for third party validation (Honda Research Institute); set up partnership with technology accelerators (Wildcat Discovery Technologies).

Year 2:
Funding needed: $1.4 million.
Effort: development of potassium protection materials for stable anode.
Target: 100 Wh battery with 500 cycles, cells ready for small-scale UPS products.

Year 3:
Funding needed: $1.4 million.
Effort: optimization of the battery design for efficient and safe operation.
Target: 300 Wh battery with 1000 cycles.

Year 4:
Funding needed: $1.4 million.
Effort: final R&D stage and pursuing partnership and sale of the battery.
Target: 1 kWh battery with 2000-3000 cycles, outsourcing

manufacturing, market battery to ESSS companies for building large modules.

2. Go-To-Market-Strategy

KAir's Market/Deployment Strategy: *KAir intends to produce potassium air batteries for the UPS market initially, followed by the ESSS market for use in their modular storage units.* KAir's primary customers will consist of the companies in this sector that can use KAir's batteries to build large modular units. These UPS/ESSS companies market and sell their modules to large-scale electrical consuming/producing industries (such as: hotels, grocery stores, malls, manufacturers, data centers, security system companies, utility companies, and others). Applications for KAir's batteries within the utilities market include the following: load leveling and frequency regulation, spinning reserve, voltage support, transmission and distribution deferral, community energy storage, renewable storage, and load leveling.

First, KAir will target the UPS, micro-grid and grid-edge community energy storage (CES) sectors of energy storage. This segment is penetrable early by KAir because of these areas' reduced parameter requirements (see page 4 above). This will be the most challenging point in the deployment strategy, but the initial pilot project is expected to reduce this challenge. The advantage of targeting smaller scale deployment will likely mean that revenue streams can begin at the end of year two.

During year four KAir intends to develop its battery further in order to access the substation level storage (few MWs/4-6 h service duration). These systems are located near larger electricity consumers. The access to this arena will be easier than initial penetration as KAir will have established relationships with the ESSS/UPS and utility industries at this point. Large bulk systems will follow at the end of year four to middle of year five (100 MWs/min-h). Finally, because of the high energy density of KAir's energy efficient and cost effective batteries, the electric vehicle (EV) market will be the frontier from years six to ten after further development.

Customer Access/Recruitment/Management: In the ESSS market, 25 companies have been identified as the main players (*Grid-Scale Energy Storage in North America, GTM Research, 2013*). The list of the 25 companies is ABB*, AES Energy Storage*, Convergent Energy+Power*, EOS*, S&C Electric*, SEEO*, 1Energy Systems, Apex Compressed Air Energy Storage, Aquion, BASF, Calmac, Demand Energy, Dresser-Rand, EnerVault, IBM, NRG Energy, PolyPlus Battery Co., Primus Power, QuantumScape, Saft America, Sion Power Corporation, Stem, Sun Edison, Solar City*, and Xtreme Power. *(Companies denoted with * are identified as the potential market leaders.)*

Early adopters: KAir's primary potential customers are viewed to be companies comparable to IBM, Emerson, Convergent Energy+Power, and ABB in the UPS/ESSS market as they are trendsetters in this space. The game changing nature of KAir's batteries will afford these early adopters significant

advantages over the rest of the market. In addition, savings will be realized due to the superior price performance.

Late adopters: Late adopters have been identified in the form of smaller companies in the ESSS. These companies can still realize significant benefits from KAir's batteries in cost savings and customer satisfaction, but their reluctance to adopt new technology will be overcome once there has been significant penetration of KAir's batteries.

On the secondary customer front, KAir has started conversations with AEP who is likely to be an early adopter of KAir's product. This is because AEP is a dominant force in the electrical utility arena and is highly motivated in the areas of renewable energy and storage space. In addition, John Bair, KAir's interim CEO, has relationships with AEP that will prove valuable as KAir begins to enter the market. John Westerman, from KAir's Board of Advisors, owns several small businesses **that integrate stationary storage into micro-grids. These relationships give KAir potential real world entry points to the market. In relation to the EV market, KAir's relationship with Honda will prove invaluable when the EV market is pursued. KAir's market entry plan starts with a pilot project in partnership with either AEP, Honda Research Institute, or Emerson, all of which are located conveniently in the Columbus, Ohio, area.**

KAir's Battery Value Chain and Benefits to Each Segment:

- ESSS and UPS – reduced cost of core cost component (battery) of product, thus increased profit margins, increased competitive advantage due to reduced unit cost and higher efficiency systems
- Electrical Utility/Service – dynamic Value-at-Risk support, improved service reliability, firming & shifting renewables, distribution capital deferral
- Electrical Utility/Market – energy arbitrage, frequency regulation and ancillary value, generation capacity
- End Electrical Consumer/Local – empower customer to reduce cost, backup power, renewable integration, voltage regulation
- End Electrical Consumer/Grid – load leveling, power factor correction, ancillary services

Funding Requirements, Acquisition, and Staging: 4 year total development funding requirements: $6 million / annual burn rate: $1.5 million.

Honda has agreed to support Wu's research group with $200k a year for the development of potassium-air batteries. Honda's interest stems from their desire for the technology to develop for use in the EV market. In addition KAir has been offered a leasing option ($750k for 3 years) and investment funding ($500k for 50% equity) from Asymmetric Technologies. KAir declined both offers as the potential is believed to have been severely undervalued.
KAir is currently pursuing non-dilutive funding through SBIR and STTR grants (Energy Efficiency & Renewable Energy Program from DOE) in order to increase valuation and reduce risk to potential investors. The grants issue over $1 million to develop the prototype for the first 3 years, and then KAir can be funded by private sector or federal agencies for commercialization. In parallel investors, both venture capital (VC) and angel are being solicited for the first round of investment. KAir has already presented to the Ohio Tech Angel Fund (OTAF), which resulted in several valuable and viable investment options from individual high very high net worth qualified investors. Curtis Crocker of Reservoir Venture Partners and Aaron Bates of Signet Ventures are working with KAir and have offered to lead syndication of the series A round of financing.

Manufacturing/Production Strategy: Once the 1 kWh prototype battery cell is demonstrated in the lab by the end of year four, KAir will outsource the manufacture of its batteries. This is due to the high capital barrier to establish a manufacturing facility. Such manufacturers exist in the Ohio area where KAir is located and will be engaged very early in the commercialization process. They include, but are not limited to, Emerson Network Power, Energizer, and BASF. KAir plans to tailor our design to meet the specific needs of the customers, provide the design to the manufacturer, and supervise the quality control of the final products.
The production process for the potassium air battery is expected to be similar to fuel cells, due to the similarity in the stacking assembly of electrodes and membranes, as well as the design of the air (oxygen) management system. The ready-to-use battery materials and the automated pick-and-place assembly manufacturing process will greatly improve the work efficiency and save labor costs. This process, along with a role-to-role approach for the cathode and anode processing, will significantly enhance production rates.
KAir can quickly reach economies of scale because of: 1) high demand in the stationary battery market for low cost highly energy efficient batteries; 2) a simplified manufacturing process increasing rate of unit production, allowing for the cost per unit to decrease as the fixed costs are spread out over more units and 3) outsourcing manufacturing to highly experienced and high volume capable companies.

Barriers to Competition:
- Patent strategy: KAir has filed an international Patent Cooperation Treaty (PCT) patent application (PCT/US2014/012730) for the protection of the core intellectual property. To further enrich the patent portfolio and ensure KAir's leading position in this field four additional provisional patents and several new invention disclosures related to the technology advances have been filed, and

will continue to be filed as advances are made. The Ohio State University Technology Commercialization Office has deemed this technology of very high value and fully supports development of a robust intellectual property portfolio to protect the battery. These patents will help to litigate infringers (capital has been allocated in current funding requirements for this).

- First-movers advantages: KAir is among the first-movers in this space, which will afford significant advantages. High barriers to entry in the battery industry will be circumvented by the high demand for a cost effective and energy efficient solution. The superior price performance increases the penetration potential of the potassium air battery into the UPS/ESSS.
- Strategic partners: Strategic partnerships with suppliers (BASF, etc.), technology accelerators (Wildcat Discovery Technologies, who specializes in rapid development of energy related materials), and manufacturers (Emerson Network Power, etc.) are being explored and established. In particular KAir is establishing corporate partner (GE, AEP, Google, Honda, etc.) buy-in from the beginning. This will allow for an increased rate of development due to that partner's established relationships and resources.

Superior pricing performance and being a "first-mover" in the field increases the penetration potential of the KAir potassium air battery.

Regulatory Environment and Restrictions:
KAir is becoming fully aware of the regulatory requirements for stationary battery systems. KAir will comply with national and state regulation codes, be responsible for employees and the community by proactively reducing environmental impact. In the certification/testing process, KAir Battery will pass through various tests under simulated conditions, including electrical tests (e.g. external short circuit test, abnormal charging test, and forced discharge test), mechanical tests (e.g. crush test, impact test, shock test, and vibration test), environmental tests (e.g. heating test, temperature cycling test, and altitude test), and additional specialized tests (fire test, penetration test, drop test, etc.). Besides the battery itself, the safety of the overall electrical storage system and the employees is strictly regulated. KAir will strictly comply with all the related safety codes and the regulatory guidelines related to stationary battery testing, deployment, and management. John Westerman will help KAir navigate the complex regulatory space due to his extensive experience with stationary battery systems.

3. The Team

KAir Battery LLC has a highly capable and committed management team, currently combining talents of electrochemical scientists and business practitioners.

Management Team: John Bair is currently the interim CEO of KAir Battery in charge of the commercialization process. Since 1989, he has co-founded and grown Pinnacle Data Systems, Inc.

into a profitable company with $29.5 million in revenue in 2010, which was recently acquired by Avnet Inc., a *Fortune 500* Company, in 2012. His particular expertise in the areas of engineering, design, operations, strategic planning, and the technology industry can advance the aggressive development KAir Battery LLC desires.

Technical Team: Dr. Yiying Wu will serve as KAir's advisor and is fully committed to the technology development and commercialization. He is the inventor of this technology along with Xiaodi Ren (CTO). Damian Beauchamp (COO) is a PhD chemistry student with a passionate entrepreneurial spirit and got the business aspects of KAir Battery rolling. Mingfu He, Zhongjie Huang and Xuanxuan Bi have solid backgrounds in battery/electrochemistry chemistry. The aforementioned team members have been working cooperatively in the same lab at Ohio State University for the past 2 years.

Financial Manager: Kate Fisher has been with KAir Battery since its inception in October of 2013. She was a financial analyst at JP Morgan Chase for the last six years and is about to graduate with her MBA.

Board of Advisors: KAir's team is also guided by highly experienced advisors in the startup arena and accomplished experts in energy storage industry. KAir has established solid connections with Gary Rawlings, current VP of TechColumbus, to outline KAir's development goals. For further guidance in the energy storage market, KAir has been consulting with Dwight Agan, an expert in energy markets, and John Westerman, a pioneer in implementation of stationary storage system. Their expertise provides industry insight into KAir's product development and business strategies. KAir's efforts to seek funding will be aided by Burr Zimmerman, who is experienced in SBIR/STTR proposal design. KAir also has ongoing communication with SiNode CEO Samir Mayekar. SiNode is a successful battery related start-up which won the 2013 Rice Business Competition and has since raised $10 million in funding. KAir's ongoing relationship with SiNode will assist KAir in both navigating funding options and networking. Curtis Crocker's connections with Wildcat can facilitate KAir's partnership with that technology accelerator. Signet Ventures has offered to syndicate series A financing with its members, which includes a family foundation in excess of $100mm focused solely on clean energy.

Name	**Experience**
Dr. Gary Rawlings	Current VP of commercialization TechColumbus, previous Monsanto director, business development
Richard Focht	Start-up consultant, previous VP of

	TechColumbus
Dwight Agan	Consultant to the energy industry with over 25 years of experience
Samir Mayekar	CEO of SiNode Systems
John Westerman	Extensive experience in stationary storage for micro-grids, including navigation of regulatory procedures. Consulted design and implement one of the first stationary storage system funded by the DOE.

Staffing Plan: Personnel gaps identified are as follows: Expertise in sales and engineering. How gaps can be filled: KAir's relationship with the Fisher School of Business can provide access to seasoned sales professionals. In addition, the Board of Advisors and John Bair have access to the expertise required to fill the sales roles. The Ohio State University Engineering Department has the personnel KAir requires to fill the engineering positions.

4. Impact on EERE Mission

KAir Battery LLC will benefit the Energy Efficiency and Renewable Energy (EERE) in the following area:

- **Solar Energy Technologies Office, Wind Program and Water Power Program:** KAir provides a viable storage solution with round-trip efficiency up to 98%, which enables the efficient storage and utilization of variable renewable energy sources such as solar, wind and hydrokinetic energy. KAir's solution will benefit the mission of *Solar Energy Technologies Office*, *Wind Program* and *Water Power Program* to make renewable energy economically viable to our nation. The Ohio State University has a strong relationship with Iberdrola Renewables which will be leveraged in support of the commercialization effort.
- **Homes and Building Technologies Office:** KAir's stationary storage solution has the round-trip efficiency of 98% with a theoretical energy density as high as 935 Wh/kg, coupled with a lucrative cost as low as $89/kWh. This integration solution promotes the installation of residential level renewable energies, which are among the missions of *Homes and Building Technologies Office.* AEP Energy, the deregulated power supply group of AEP is providing guidance and support around this vertical.
- **Advanced Manufacturing Office:** KAir will also develop an efficient roll-to-roll method to fabricate battery electrodes. The development of this manufacturing technology can create a significant amount of jobs, which are among the missions of *Advanced Manufacturing Office*. The recently established Center for Design Manufacturing Excellence (CDME) within The Ohio State University College of Engineering will assist with this initiative.

- **Government Energy Management Program:** KAir storage solution can provide the efficient and low-cost UPS solution to improving the data center energy efficiency, which are among the missions of *Government Energy Management Program*. Ohio State's Office of Energy and Enviroment will support KAir's ambitions in this initiative.
- **Vehicle Technologies Office:** KAir can also potentially penetrate into electric vehicle market with a low-cost and highly-energy-efficient and energy dense battery solution. This will benefit the mission of *Vehicle Technologies Office* to advance the development of electric vehicles. The Ohio State University has a very strong relationship with Honda North America which will be leveraged in support of the commercialization effort.