

SDP22

Lecture 6

18 October 2021

Check-In 3 week &  
Guest Alumnus



# UMass Amherst Electrical and Computer Engineering Alumni & Friends

 Listed group

17	18 Lecture 6 Check-in 3	19 Check-in 3	20 Check-in 3	21 Check-in 3	22 Check-in 3	23
24	25	26	27	28	29	30
31						

November 2021						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 Lecture 7	2	3	4	5	6
7	8 Lecture 8	9	10	11 Holiday - Veteran's Day	12	13
14	15 Lecture 9	16	17	18	19	20
21	22 Lecture 10	23	24 Thanksgvging Recess	25 Thanksgvging Recess	26 Thanksgvging Recess	27
28	29 MDR	30 MDR	1 MDR	2 MDR	3 MDR	

42 days to MDR

# Check-In 3

18 Oct - 22 Oct

- PDR feedback
- Team member progress reports

# MDR

MDR

29 Nov – 3 Dec

**42 days**

- A convincing demonstration of the critical aspects of the integrated system
- MDR Deliverables achieved

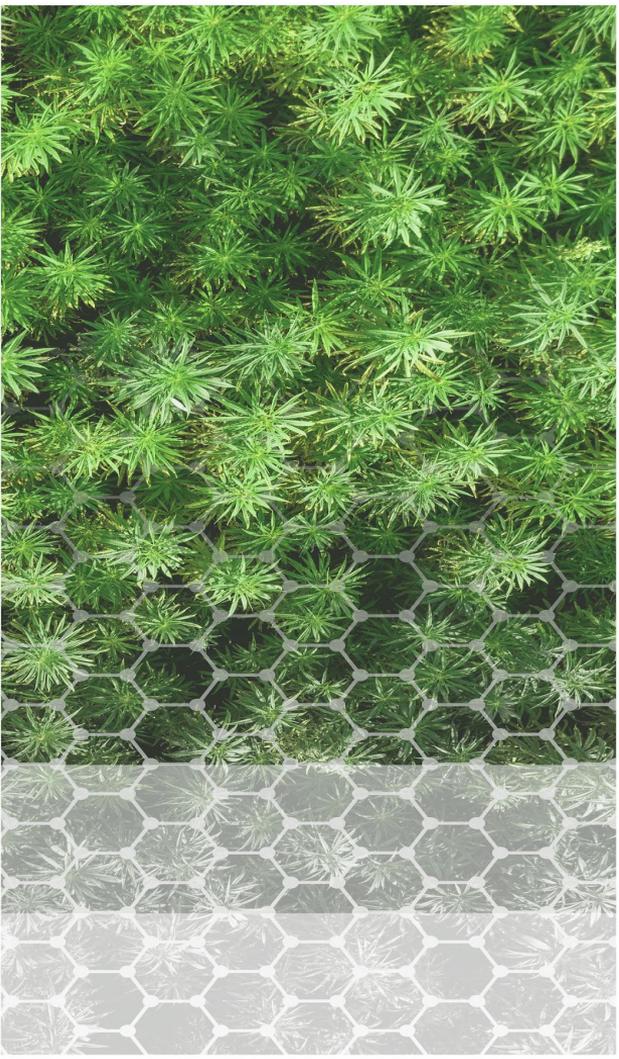
# Guest Alumnus



**Jose LaSalle** · 2nd

Product Management Engineer at Ventacity Systems

Corvallis, Oregon, United States · [Contact info](#)



# HEMPAX

ENERGY SYSTEMS

**Jose LaSalle**  
Founder & CEO



# HEMPAX

## ENERGY SYSTEMS

*Harvest the Power of Green Energy™*

HEMPAX™ is a regenerative technology company that produces patent-pending bio-materials for energy storage solutions.

**Our core purpose** is to provide economic renewable energy storage products that facilitate the world's transition from the fossil fuel economy to a relocalized, resilient, and equitable economy with distributed, decentralized, and democratized energy systems.





**HEMPAX** | **TEAM**  
ENERGY SYSTEMS | PARTNERS



**Jose LaSalle** | CEO



**Joe Hastry** | COO-CFO



**Alex Nichols**  
VP Engineering



**Diane Danielson**  
Business Advisor



**Dr. Brian Jing**  
Technology Advisor



**Nicolai Alexandrowski**  
Business Advisor



**Dr. Arnab Majee**  
Technology Advisor



**UW Seattle**  
Clean Energy Testbed



**UMass Amherst**  
IALS Core Facility



**Nordic Waves Group**



**TEAM**

**Jose LaSalle** | Co-Founder & CEO  
Electrical Engineer • Product Development

**Joe Hastry** | Co-Founder & COO-CFO  
CPA • MSA Tax Manager- PwC

**Alex Nichols** | Co-Founder & VP Engineering  
Electrical, Computer Engineer • Entrepreneur

**Diane Danielson** | Business Advisor  
COO • CMO • Attorney • Forbes 40 over 40

**Brian Jing, PhD** | Technology Advisor  
PhD Materials Engineering UIUC

**Nicolai Alexandrowski** | Business Advisor  
Entrepreneur • Circular Supply Chain

**Arnab Majee, PhD** | Technology Advisor  
Post-Doc Fellow • Sandia National Lab

**Walt Tracinski** | Technology Advisor  
Fmr. NASA Battery Engineer

**Chris Johnson, PhD** | Technology Advisor  
Fmr. Boeing Battery Electrochemist

**AFFILIATIONS**

**UW Seattle** | Micro-Grid Simulation Testing

**UMass Amherst** | R&D and Pilot Manufacturing

**Nordic Waves Group** | Circular Economy

**Winona's Hemp & LIFT Economy** | Supplier & Advisor

**GenoVerde** | Collaborator, Hemp Tester & Supplier



# HEMPAX Addressable Market

Wind Turbine  
Pitch Control



Solar Smoothing



Utility  
Distribution



Short-Term  
Power Supply



- **Facilitate** Renewables Adoption
- **Extend** Battery Life by 2x
- **Improve** Grid Reliability

Power Quality &  
Frequency Response



EV Transport & Charging

Energy Buffer  
& Peak Shaving



# HEMPAX Energy Storage Solution

Applications: Utility Distribution / Solar / Wind / Commercial / Industrial

HEMPAX-5Wh  
UC Cell

SOLAR PLANT  
with HEMPAX UC + LIB

WIND FARM  
with HEMPAX UC + LIB

COMMERCIAL / INDUSTRIAL  
with HEMPAX UC + LIB



**HEMPAX UC Modules** help utilities provide their customers with ancillary services that maximize reliability, save rate-payer electricity costs, extend LIB life by 2x, and embody social and environmental justice.



# HEMPAX Energy Storage Solution

Applications: Utility Distribution / EV Charging / Transport

HEMPAX-5Wh  
UC Cell

SOLAR PLANT  
with HEMPAX UC + LIB

WIND FARM  
with HEMPAX UC + LIB

EV CHARGING STATION  
with HEMPAX UC



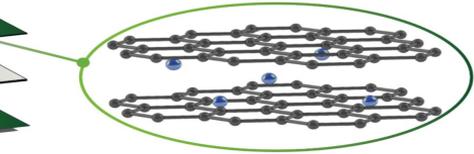
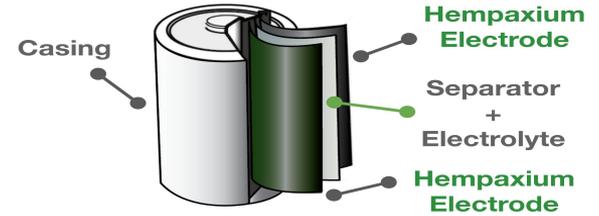
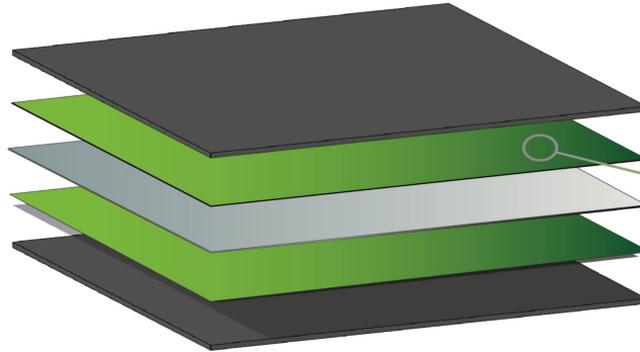
**HEMPAX UC Modules** help EV charging station installers provide their customers with maximum charging power by utilizing ancillary services that maximize power quality, grid stability, and embodies social and environmental justice.



# HEMPAX Ultracapacitor

Physical Construction and Conceptual Operation

Current Collector  
Hempaxium™  
Separator + Electrolyte  
Hempaxium™  
Current Collector



Charge **accumulation** in embedded carbon structures

## Performance & Safety

- Cutting edge energy density
- Industry standard power density
- Non-flammable materials

## Cost & Longevity

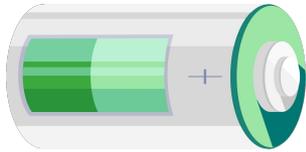
- Long product lifespan
- Competitive market cost
- Relocalized manufacturing

## Regenerative & Circular

- Carbon-sequestering biomass
- Circular product life cycle
- Local economic development



## Market, Competitors, & Validators



**\$7B**

Ultracapacitor Market by 2027

[Source: Gordon Schenk, CEO UCAP]



**\$47.4B**

Microgrid Market by 2025

[Source: BoxPower]



**UK installs 5 MW ultracapacitor**



**HEMPAX** contributes to the well-being of the Earth and humanity with bio-based energy storage technology for the growing green energy economy.



**Provide** grid energy storage for 100% renewable energy



**Revitalize** inclusive regenerative agriculture and materials economies



**Embody** a circular energy-agricultural economy



**Create** fair-wage jobs in diverse local communities



**Reaffirm** respectful intergenerational relationship to land and life



**Facilitate** cleaner electrification of transportation



**Thank you for your time**

**HEMPAX**  
ENERGY SYSTEMS



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**Joe Hastry | COO/CFO**  
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**Alex Nichols | VP Eng.**  
*alex@hempaxenergy.com*



# Appendix



## Latest Prototype

