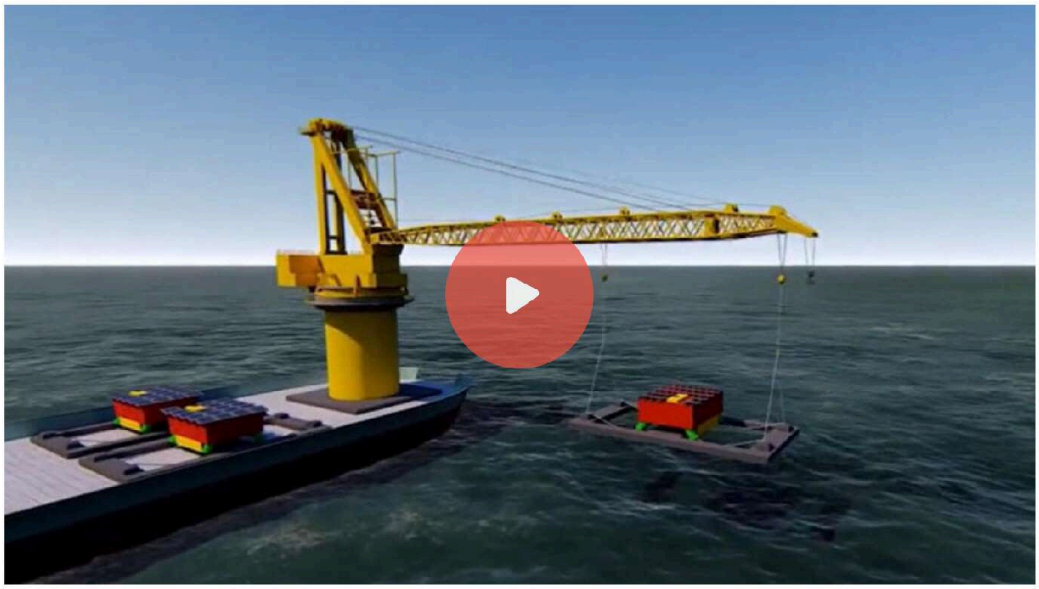
INVEST IN **LAMINAR SCIENTIFIC**

Change Comes in Waves. Breakthrough Wave-Energy Tech for Coastal Communities.



laminarscientific.com Iowa City IA

Hardware | Technology | Sustainability | Social Impact | Clean Tech

LEAD INVESTOR

Sunilkumar Gopakumar Director, Hardware Engineering at Micron

I was an acquaintance of Narayan Iyer from our previous workplace, where he had exhibited disruptive innovation and leadership that consistently led his teams to success. Several meetings with Narayan have given me incredible confidence in Laminar's technology and business plan. The technology and methods produced by this team serve to de-risk the environment and tap into an excellent energy resource. Laminar has many ideas but has a clear plan for TRL analysis and introduction to the market and licensing some ideas to those ready to implement. Laminar's Go-to-market strategy is well thought of and achievable, with key players, onboarded uncertainties identified, and clear and achievable plans to tackle uncertainties. Narayan is a vibrant CEO, always learning, very approachable, and able to form worldwide relationships.

Invested $5,000 this round

Highlights

1. Fresh perspectives (Aero Engineers) + industry experts, to allow for relevant innovations ✈️
2. $200K previously raised (F&F round; 75% left). 💰
3. Co-founder previously Founded and Sold an Energy Company (Exit) ✍️
4. Execs agree to $0 salary pre-revenue for 5 years. You're funding R&D and nothing else! 🚫💸
5. US DOE Award of $150K received for simulation effort (TEAMER). More expected in 2022 🔬🔬
6. Low costs in the American Midwest💸 U of Iowa has world class hydrodynamics labs 🌊
7. Tackling multi-directional seas with World leading magnetic motion rectifier designs ⚙️🧲
8. Accepted into Newchip Accelerator 🚀🚀

Our Team

Our Team

Narayan Iyer Founder and CEO

Former Aerospace Systems Engineer at Rockwell Collins for 5 years. Worked as a Product Owner, Systems Lead, Test Lead on NASA X59 / Airbus projects. B.S. from Purdue University for Aeronautical and Astronautical Engineering and Private Pilot.

With fresh perspectives (Aero Engineers) combined with Industry veterans, Laminar Scientific is poised to innovate with relevance in the field. With many island communities suffering high energy costs due to unique infrastructure complexities, a nearshore microgrid solution is our Go-To-Market wave energy product.

Brady Kakert Prototype and Test Engineer

ME at the University of Iowa (Tailored Focus in Robotics/Automation and Energy/Environment) Mech Team Lead - Hyperloop at Iowa President - American Wind Energy Association (UI Chapter). Former Undergraduate Research Assistant - University of Iowa

Ranganathan TA CFO and Regional Director - Asia

Former CEO/Founder of an Energy Company - Now Sold (exit). Owned a trading brokerage company, Salt and Commodities. Former Chartered Accountant

Jian Tan PhD Intern

PhD Candidate at Delft University of Technology

Aleksandra Dervisevic European Representative and Systems Advisor

Aleksandra is based in France, and she holds a Masters in Aeronautical and Astronautical Engineering from Purdue University. Formerly a Power & Control Systems Engineer at Collins Aerospace.

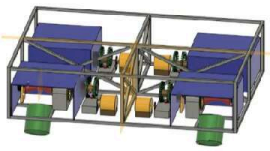
Pulkit Parolia Engineering and Strategic Advisor

Engineering Program Manager at Apple, Commercial Pilot, Purdue SGT Outstanding Senior, Summa Cum Laude (Highest Distinction)

Mina Iyer Marketing Advisor

Sales Executive at Lutron

Pitch Deck



Go to Market Product Sketch. **Patents Pending**.

Laminar Scientific Inc.

A Revolutionary Wave Energy Company

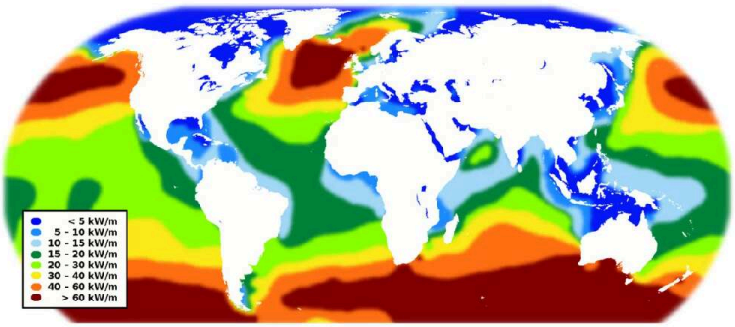
Products:

- Technology Licenses and consultation to Developers
- Setup Nearshore Power Plants
- Wave Energy Device Sales to Operators ★

Total global energy resource: 2 Terrawatts, equivalent to the entire human electricity consumption

"The global wave energy market is expected to grow from USD 4.00 billion in 2019 to USD 21.65 billion by 2027, at a CAGR of 23.5% during the forecast period 2020-2027" (FiorMarkets)

THE MARKET



The Wave Energy Challenge

Barrier to Entry: Why is wave not as common as wind and solar?

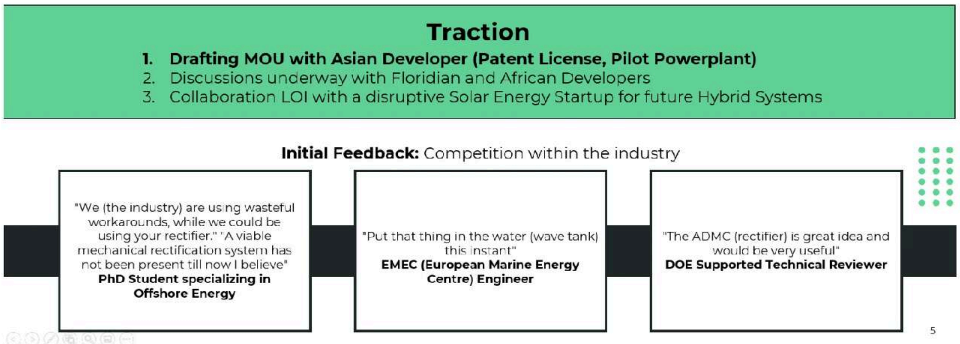
- **Waves are regionally Multidirectional and Chaotic**
- **Biofouling of Underwater systems**
- **Expensive sea maintenance**

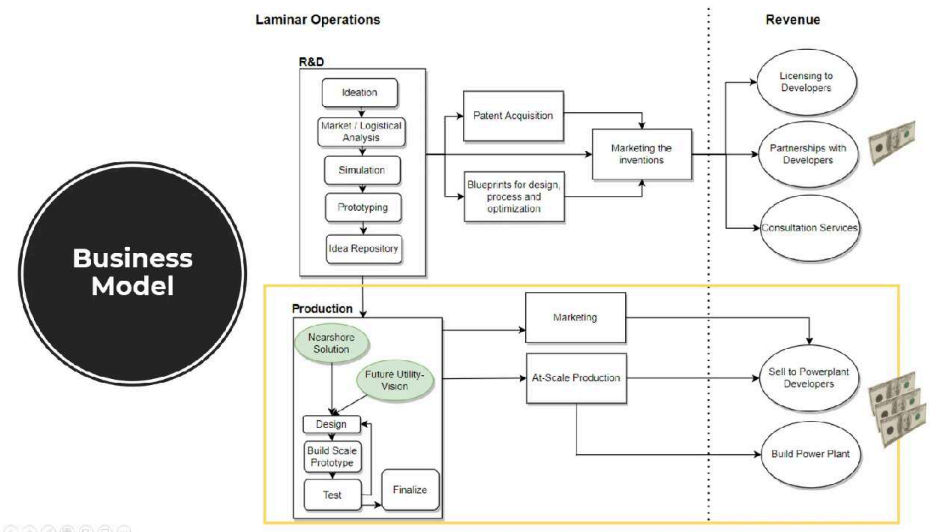
Why Laminar Scientific breaks the Barriers:

- Top American Aerospace Engineers bring a fresh perspective into the field
- Six Worldwide Pending Patents:
- **World leading** motion-rectifiers attain efficiencies never before seen for such a device
  - **Tackles Multi-directionality**
- Our magnetic motion transfer solutions **avoid physical contact** between moving parts
  - **Reduced Maintenance**
- None of our complex systems are below sea level.
  - **Reduced Biofouling, corrosion and Maintenance**

Traction and Feedback

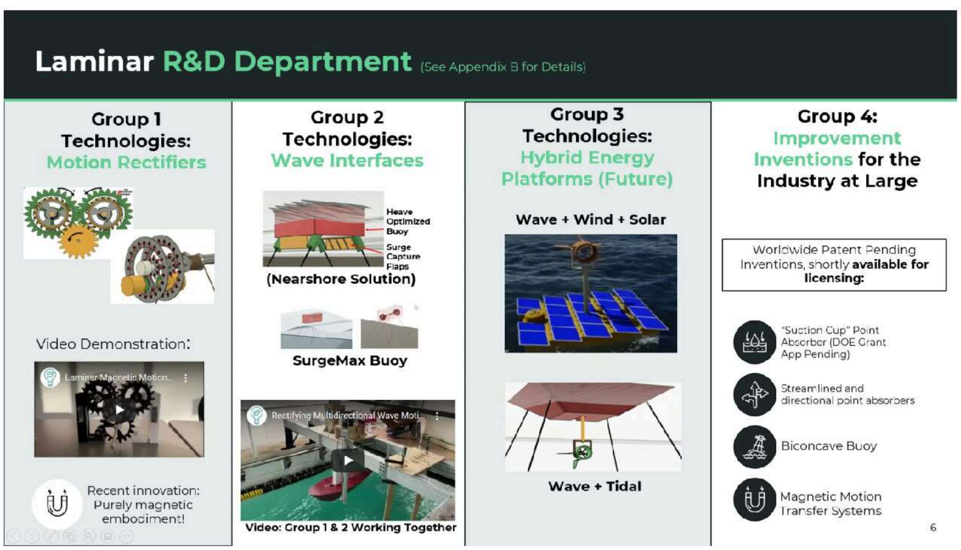
US DOE supported program awarded us **$150,000** for simulation studies. We are confident we will attain **several more** of these this year

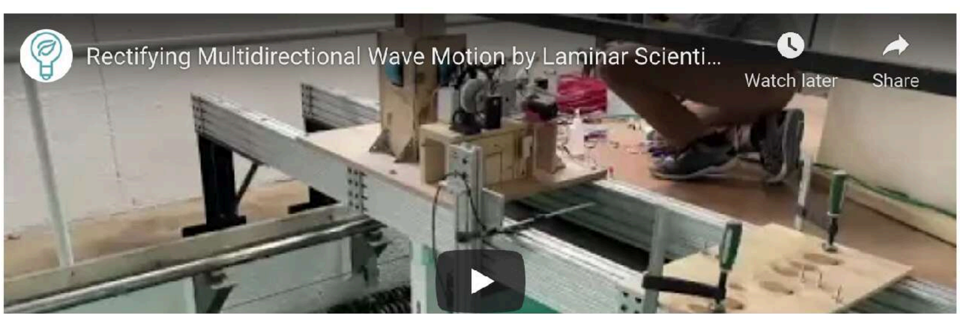




~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**R&D**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Warning: Technical Slide

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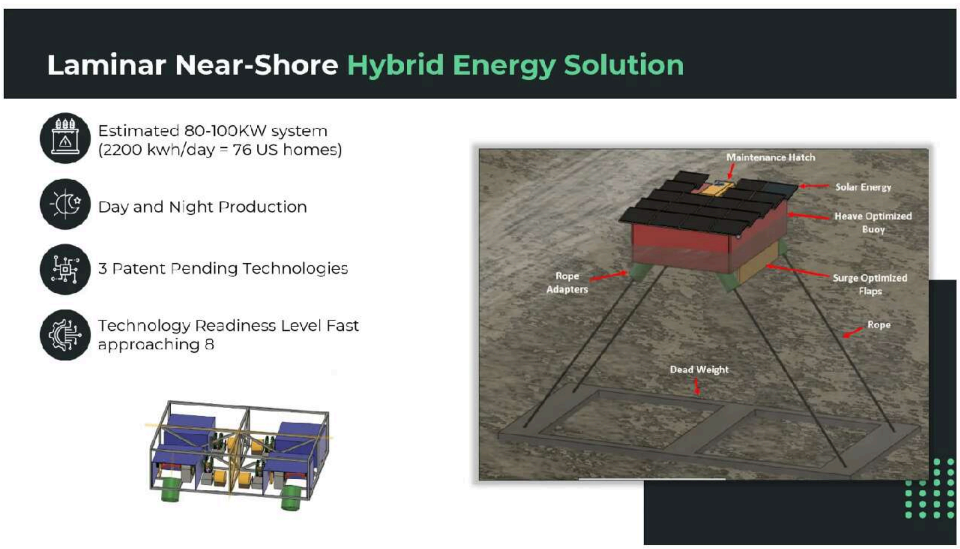
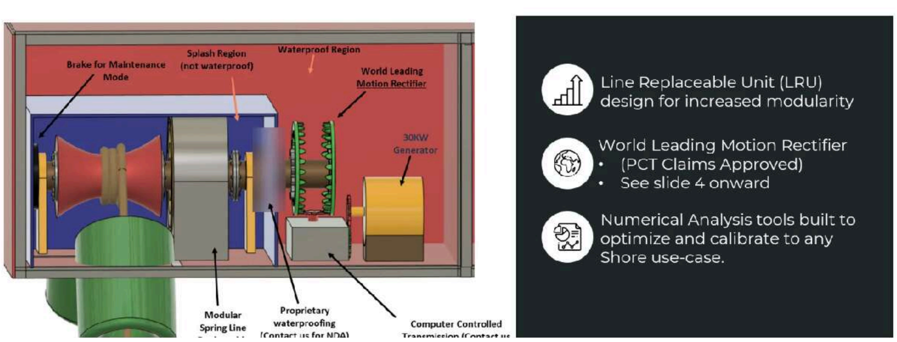
Watch on YouTube

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**Go-To-Market**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~


Go-to-Market Product
(Production Dept)
Starting Small: Nearshore Wave and Solar Solution
Market: Capital restricted, coastal communities, special use (military, port)


Laminar Near-Shore Hybrid Energy Solution
Estimated 80-100KW system (2200 kwh/day = 76 US homes)
Day and Night Production
3 Patent Pending Technologies
Technology Readiness Level Fast approaching 8
Maintenance Hatch
Solar Energy
Heave Optimized Buoy
Rope Adapters
Surge Optimized Flaps
Rope
Dead Weight


Brake for Maintenance Mode
Splash Region (not waterproof)
Waterproof Region
World Leading Motion Rectifier
30KW Generator
Modular Spring Line
Proprietary waterproofing
Computer Controlled
Line Replaceable Unit (LRU) design for increased modularity
World Leading Motion Rectifier
(PCT Claims Approved)
See slide 4 onward
Numerical Analysis tools built to optimize and calibrate to any Shore use-case.
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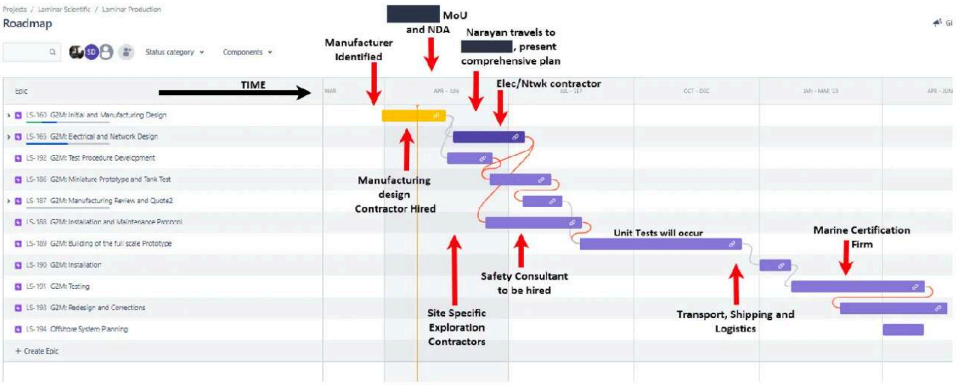
Go-to-Market Manufacturing and Testing Roadmap:



Forward looking projections cannot be guaranteed

Cost/Energy Forecast for Go-to-market product

Technology	Power (24/7 Avg)	Upfront Cost (At-Scale Production)	Operation Costs (10y)	Maintenance Costs (10yr)
MegaBuoy	96 KW (constant!)	$40,000	$15,000/unit Installation $15,000/unit (At scale - 10 units)	$10,000
Wave Power (Rectifier +Gen+PTO)		$90,000		$50,000
Solar	6 KW	$14,000		$2,000
Totals	102KW	Total Cost = $236,000		

Non-utility Nearshore Product

You **save** 445m^2 of solar land! Equates to $62000 in land cost (G2market location) Avoid deforestation = carbon tax savings. Savings in Complex Storage Technology.

102KW Returns about **$89,352** per year

Upfront cost based on non-scale manufacturing. Expect NREs in Magnetic Rectifier cost, and potentially reduced maintenance.

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~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**Business**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~


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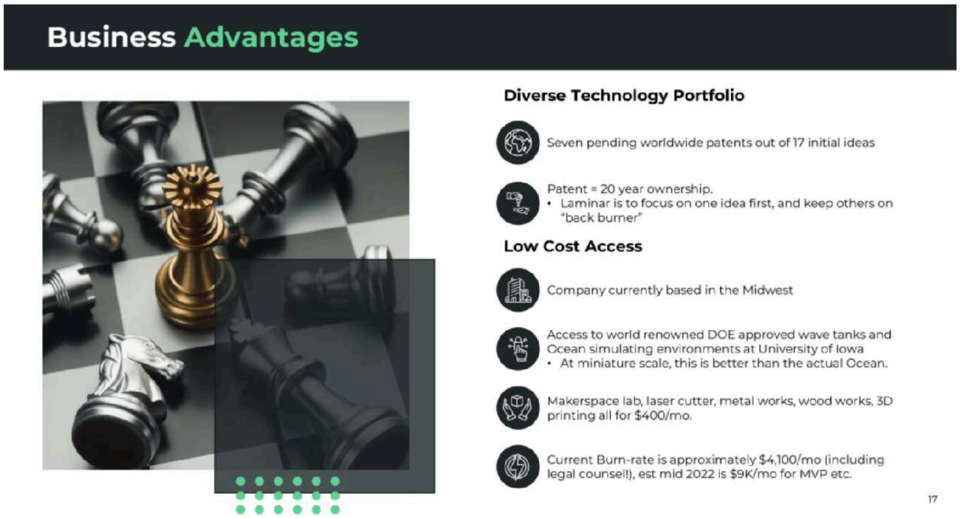

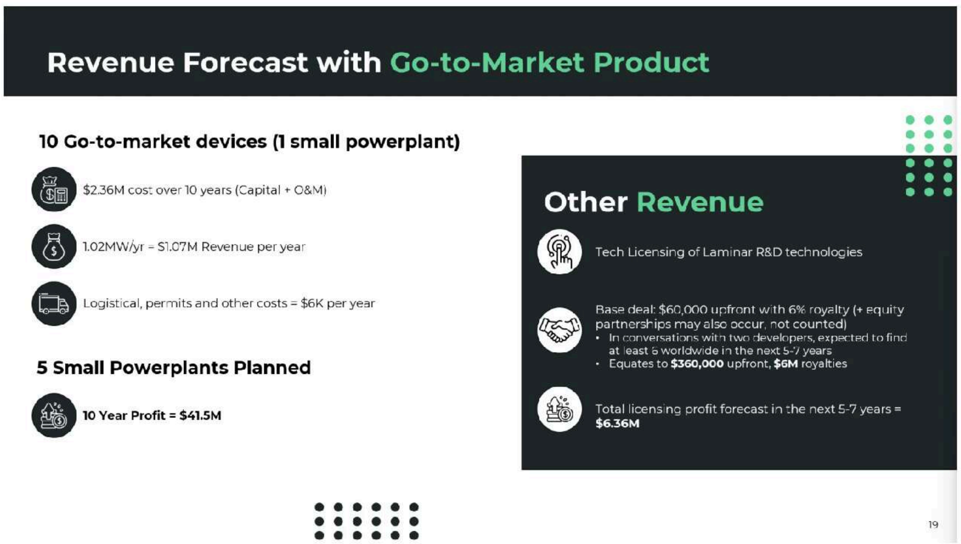

Forward looking projections cannot be guaranteed.

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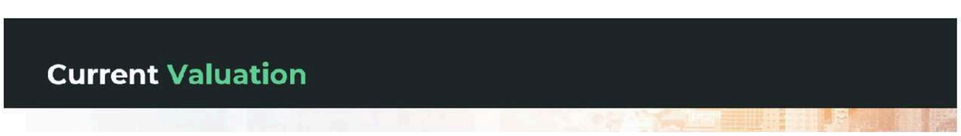
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Est Valuation cap of other similar firms that are raising funds:

$20M
Oscilla Power

$60M
Marine Power Systems

See our competitive advantages (Appendix C)

Our raise:

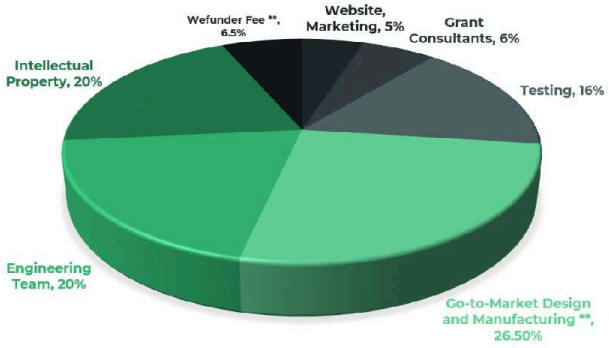
Current Ask: **$250K**

Laminar Scientific Valuation Cap: $6M
- Nearshore Go-to-Market product: $4M
- Other patents: $2M
- After risk and uncertainty adjustments

Active capital Effective valuation:
Contact: founder@laminarscientific.com

Estimated Use of Investments

Wefunder Est Total: $250K



** Opportunities for Cost Reduction:
- $150K Developer contribution to Co2Market Pilot Testing (Drafting MoU, Slide 5)
- For Individual Wefunder Investors > $25K, there are no fees for Laminar

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Investor ROI Estimation

5-7 year outlook, all values in $Millions

Category	Consideration Item	Modest Achievements	Target Achievements
Revenue Sources	Basic Licenses	5	10
	Small G2M Powerplants	5	10
	Advanced Licenses (Hybrid Energy)	1	3
Cash Flow	Revenue	24.0	50.2
	Costs	16.2	27.3
	Taxes	1.65	4.80
	Grant cost offsets	10%	30%
	Free Cash Flow	7.8	26.2
ROI Estimation in 5-7 years	Valuation (Nominal P/FCF ratio of 4)	31.3	105.0
	Early Investor ROI (multiplication factor)	**7.0**	**23.3**
	Investor ROI (multiplication factor)	**4.5**	**15.0**

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Forward looking projections cannot be guaranteed

Contact Us

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Cell: +1 3129092629

Email: founder@laminarscientific.com

LinkedIn: https://www.linkedin.com/in/entrepreNarNar/

Important Legal Disclaimers

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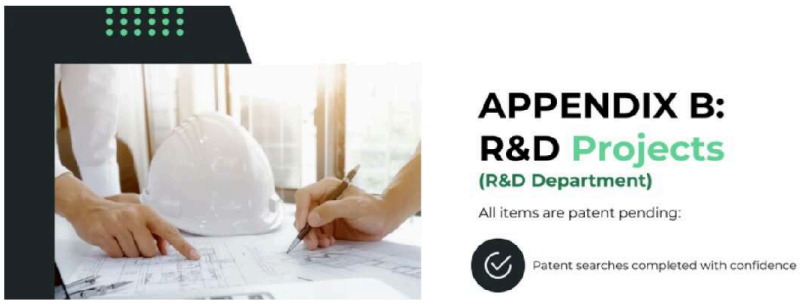
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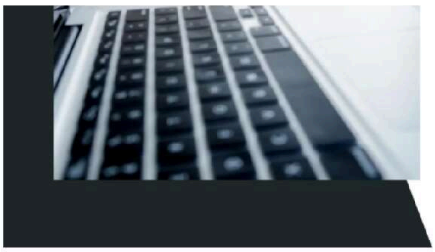

Dozens, sometimes hundreds, of alternative embodiments covered in our patent applications

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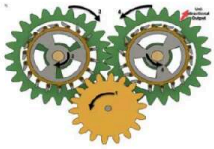
Appendix B: Motion Rectifiers



Special Gearboxes that convert multidirectional motion to **unidirectional motion**, more suitable for standard generators (more scalable)

Newest embodiment: purely magnetic, no physical contact, no friction, less maintenance!

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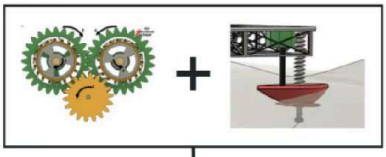
Appendix B: Motion Rectifiers (continued)

We completed one major with a partially magnetic rectifier:

- Efficiency of **75.6%** in rectifying and smoothening motion
- Most competitors feed alternating, bidirectional motion to a generator (est **37%** efficient)

Fully integrated point absorber system built and tested

Click **Video** to Play.
Notice successful unidirectional gear rotation (rectification)



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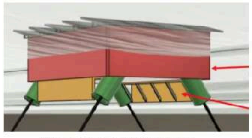
Appendix B: Group 2 Technologies: Wave Interfaces

Means by which we interface with the ocean waves.



Heave Optimized Buoy

Surge Capture Flaps

(Nearshore Solution)

SurgeMax Buoy

NDA Needed

Condition Adapting Buoys
(offshore solution, utility scale vision)

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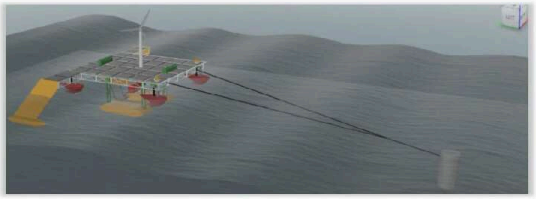
Appendix B: Group 3 Technologies: Hybrid Energy Platforms (Future)

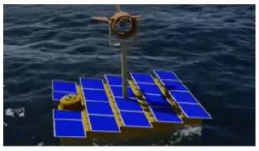
Nature does not supply per human demand and waves often vary seasonally, therefore hybrid energy systems levelized energy output by facilitating backup energy systems

This group of technologies combines innovations from Group 1 and 2 into a hybrid, multi-energy-capture system.



Floating hybrid structure (future utility scale vision)

Wave + Wind + Solar



Wave + Tidal
(utility scale vision)

Appendix B: Group 4: Improvement Inventions for the Industry at Large

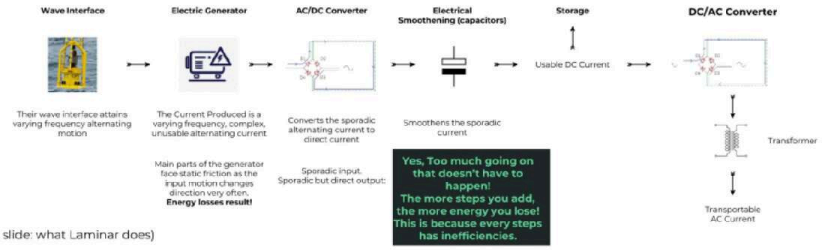
Worldwide Patent Pending Inventions, shortly **available for licensing:**

- Point absorber with suction cup effect (DOE Grant Application filed)
- Streamlined and directional point absorbers
- Biconcave Buoy
- Magnetic Motion Transfer Systems

Appendix C: Comprehensive Competition Analysis

1. Most wave companies abandoned motion rectification as a "pipe dream", **But we've revolutionized the mechanism.**
2. One prior mechanical system: This Mechanism only turns Clockwise, no matter what. (Jump to 4:17)
3. Without Motion Rectifiers, most companies have too many steps in wave energy capture, leading to loss of efficiency

OTHER WAVE COMPANIES compensate for the lack of rectified motion using many electrical steps:



(Next slide: what Laminar does)

Appendix C (continued)

SHORT AND SIMPLE.

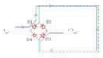
What Laminar Scientific does:

Alternating to direct motion converter is designed with a flywheel effect (Smoothening)

Ratification + Smoothening of motion

The generator is much more efficient without input constantly changing direction and intensity

Usable DC Current



Transformer

Transportable AC Current