



Cleantech Forum **Europe** | Stockholm

Innovation Company Showcase 3



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Investor Reviewers



**ARUNA
RAMSAMY,**
Principal, OGCI
Climate
Investments



**JERRY
SZUSTAKOWSKI,**
Associate,
Idinvest Partners



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HENRIK BÅGE

Founding Partner, Phoenix Biopower



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EMMA WOXLIN
Co-Founder, Epishine



Cleantech Forum Europe 2019

Commercializing 25+ years research

We will power the indoor
wireless revolution today

And revolutionize solar
power tomorrow

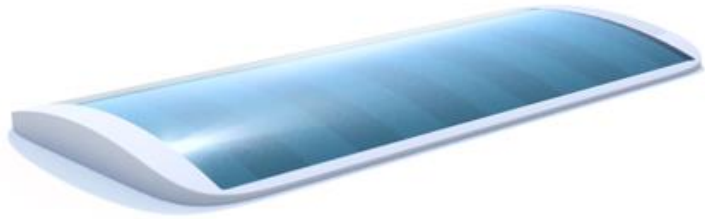




***Step by step enabling the most
scalable, resource-efficient and affordable
solar cell in the world***

Phase 1

Powering Internet of Things



Phase 2

Where traditional solar cells fail



Phase 3

Cheap utility-scale solar



Organic Electronics Emerges Globally

Problem & Solution

Maintenance is expensive



Energy harvesting solutions are awaited

**We power IoT devices with light
- even indoors**

Cut battery replacement costs



Improve user experience

*Become a non-battery
eco role model*

Value Proposition

Eliminate batteries

Eg. Indoor Climate Control

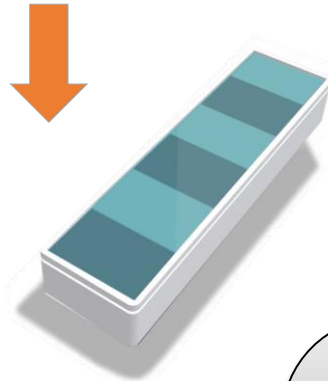
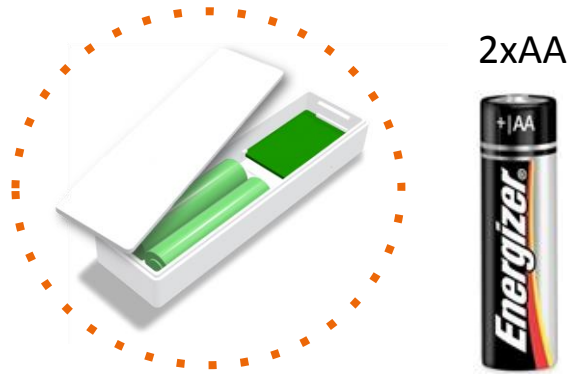


>80%
less OPEX

-99%
climate
impact

Extend battery lifetime

Eg. Magnetsensors



>50%
less OPEX

-67%
climate
impact

Function augmentation

Eg. Cold Storage Sensors



<75%
capacity
In -20°C

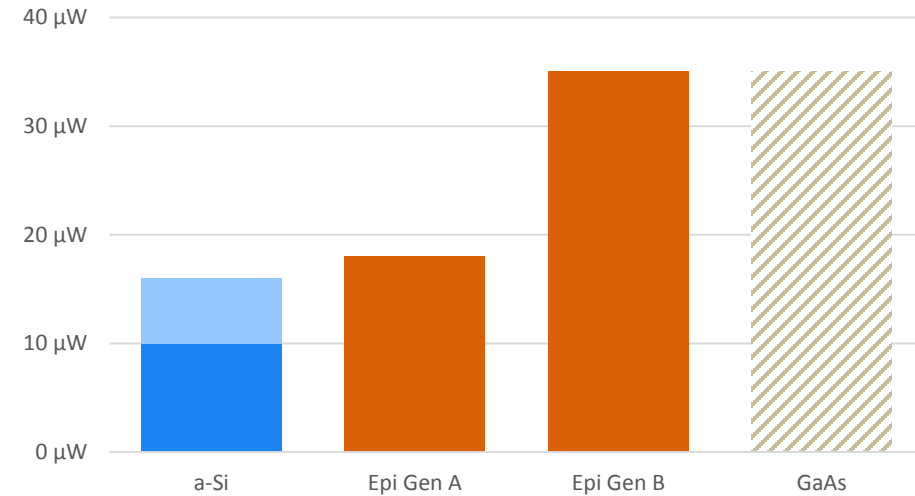
>80%
less OPEX

-99%
climate
impact

Why Epishine?

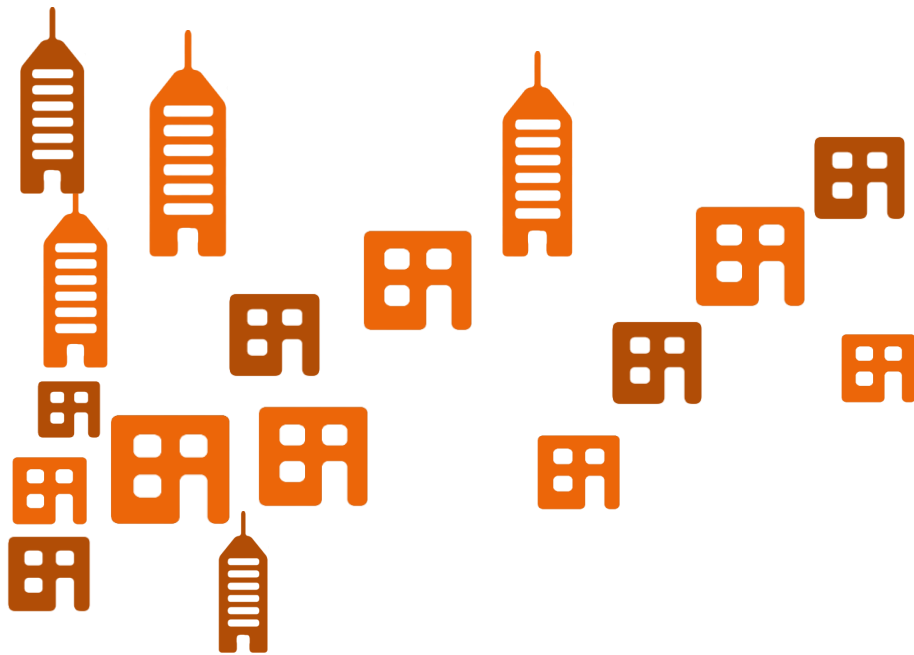


Performance at 500 lux




- ✓ *Better performance than Silicon*
- ✓ *Better price than Gallium Arsenide*
- ✓ *Flexible form factor*
- ✓ *Optimal for Plastic integration*
- ✓ *Non-toxic / Environmentally friendly*

Customers



 *Eliminating batteries*

 *Extending battery lifetime*

Business Model



 Value Chain
Position vs Time:



PV cells



Components



Market Making,
Demo Devices



Building and Home
Automation



Team



Mattias Josephson
**CEO,
Co-Founder**
Serial Entrepreneur

*Project Manager,
Financial Lead*



PhD, Anders Elfwing
**Head of Production,
Co-Founder**

Scaling / Pilot Production



Thomas Österberg
**Head of R&D
Co-Founder**

R&D Lead



Emma Woxlin
**Market Director,
Co-Founder**

Commercial Lead



PhD. Jonas Bergqvist
**CTO,
Co-Founder**

Technical Lead



Lena Jarnryd
International KAM

Sales Lead



Selected Advisors/Board



Prof. Olle Inganäs
**Organic Electronics Expert,
Co-founder**



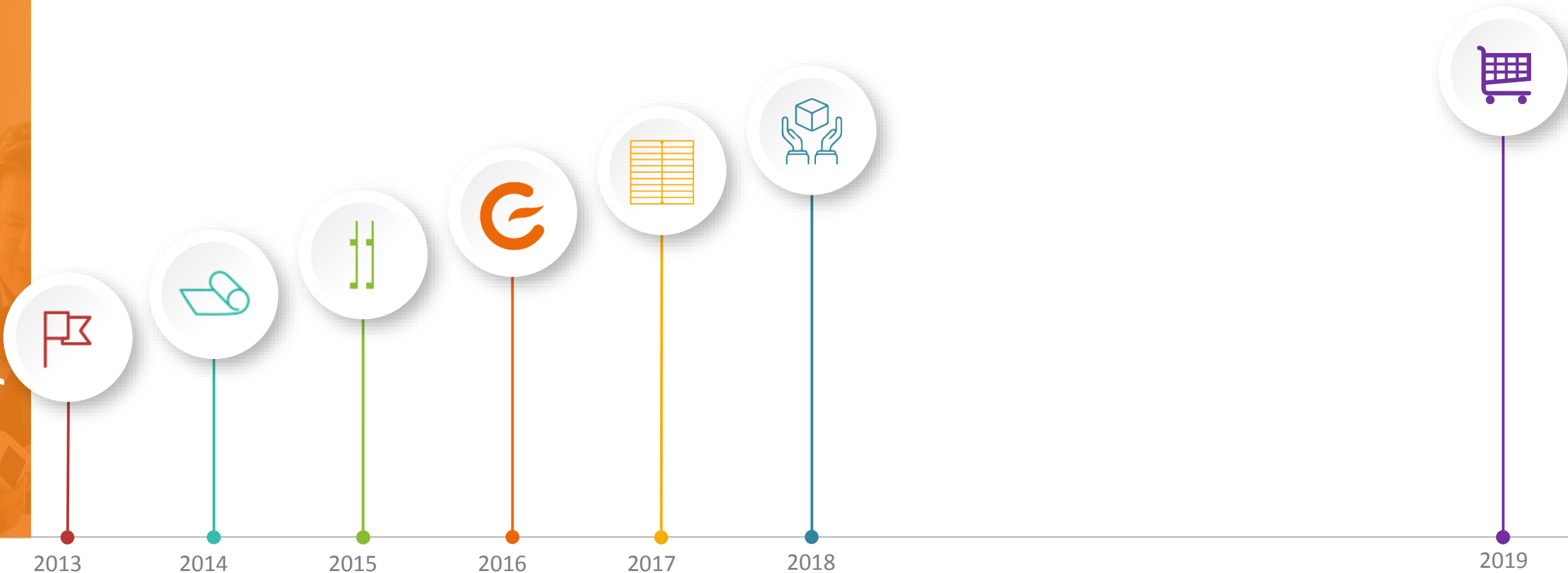
SIEMENS

Ola Johansson
Chairman



ABB
Honeywell
THE POWER OF CONNECTED

Anders Axelsson
International IoT/IIoT Pioneer



Core patent

Epishine is founded

€ 1.5 million grants
€ 1.5 million seed-round
Building industrial production



Printing



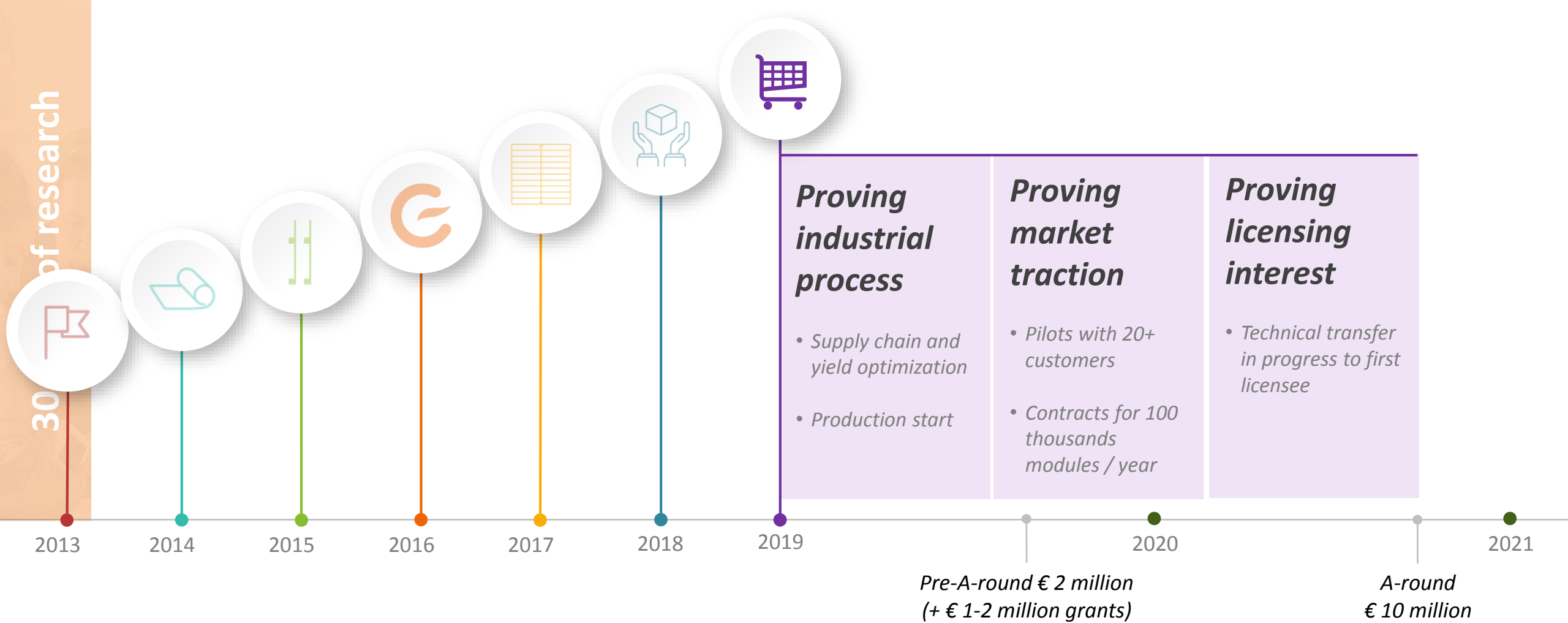
Coating




Conversion



Testing



A hand holding a small green leaf against a warm orange background. The text is centered in white.

The Future is green, sustainable,
and powered with renewable
energy sources



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HEIKE CARL ZATTERSTROM

Chief Communications Officer, Boson Energy

BOSON ENERGY

THE IMBY COMPANY



Clean energy from waste for direct local use



Jan Grimbrandt
CEO & Founder

jgr@bosonenergy.com

Heike Carl Zatterstrom
Chief Communications Officer

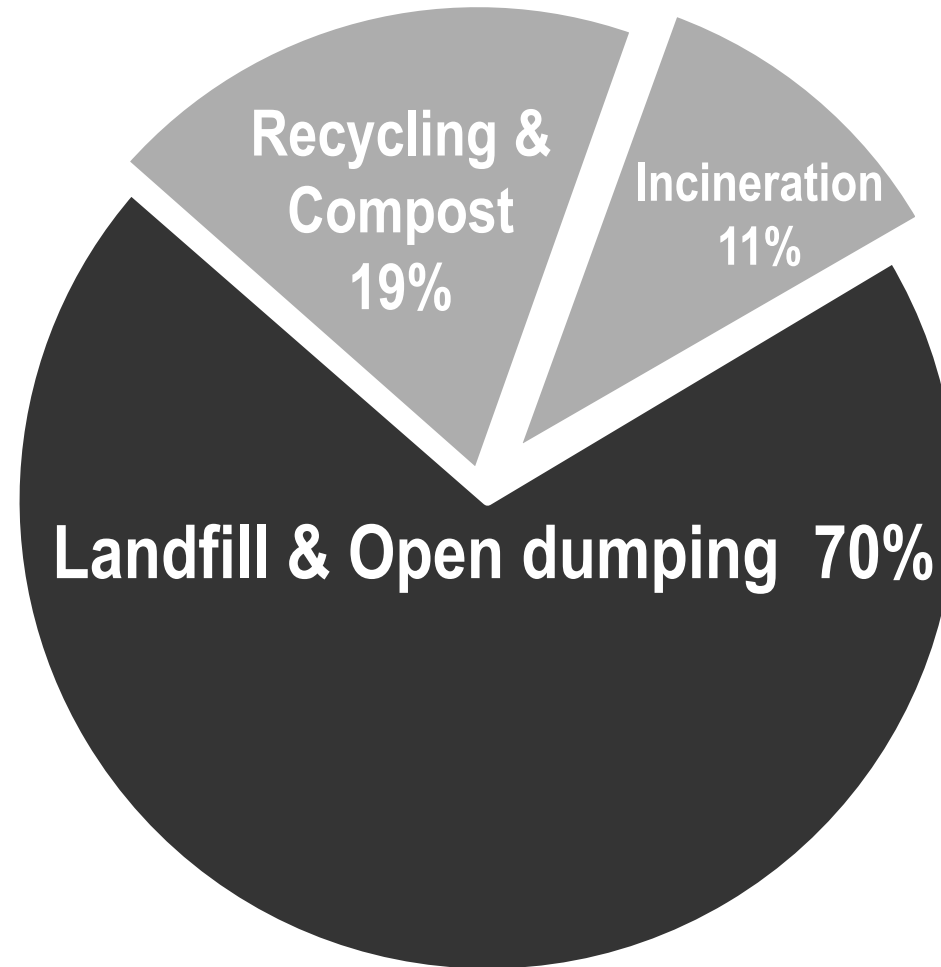
hza@bosonenergy.com



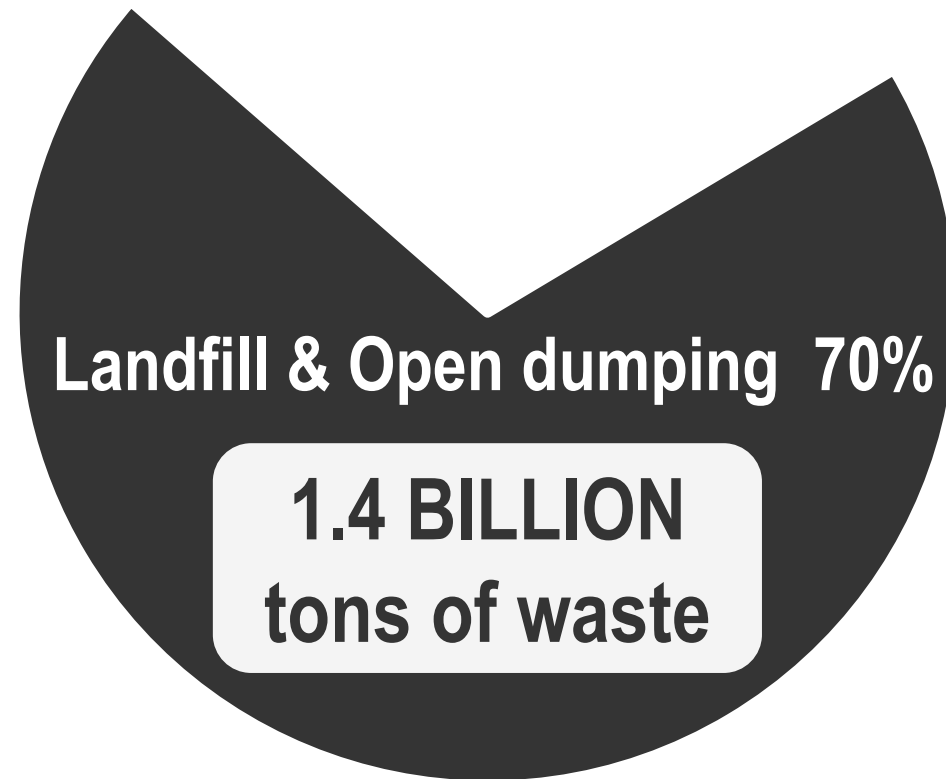
**Waste today is a massive global
polluter and driver of urban stress...**

**70% of Municipal Solid
Waste globally is still
landfilled or dumped**

90% in developing markets



**Wasting the energy
equivalent of all solar PV
installed on the planet ¹**

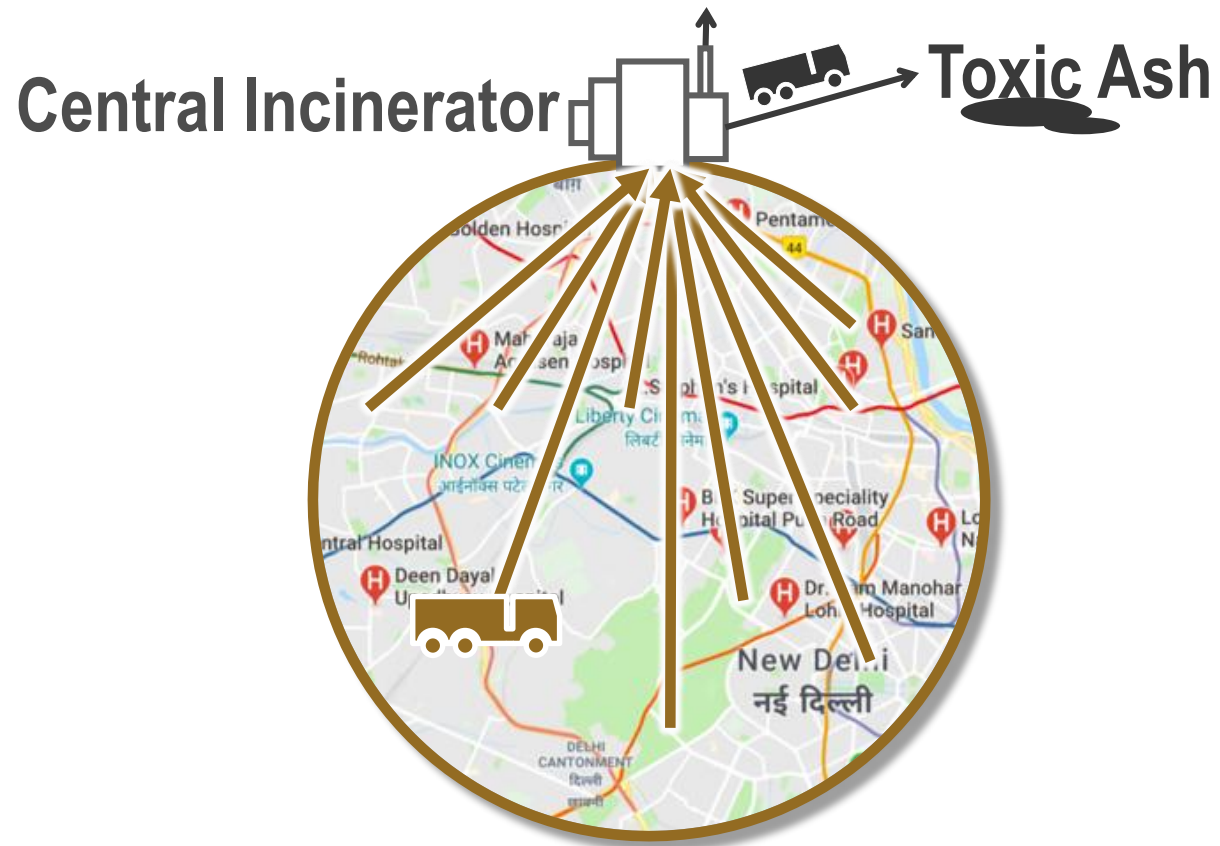


1) Global cumulative PV installations up until 2018 is 580 GW (iea.org).

**We stand for a better-cleaner-cheaper
way forward in waste-to-energy.**

How?

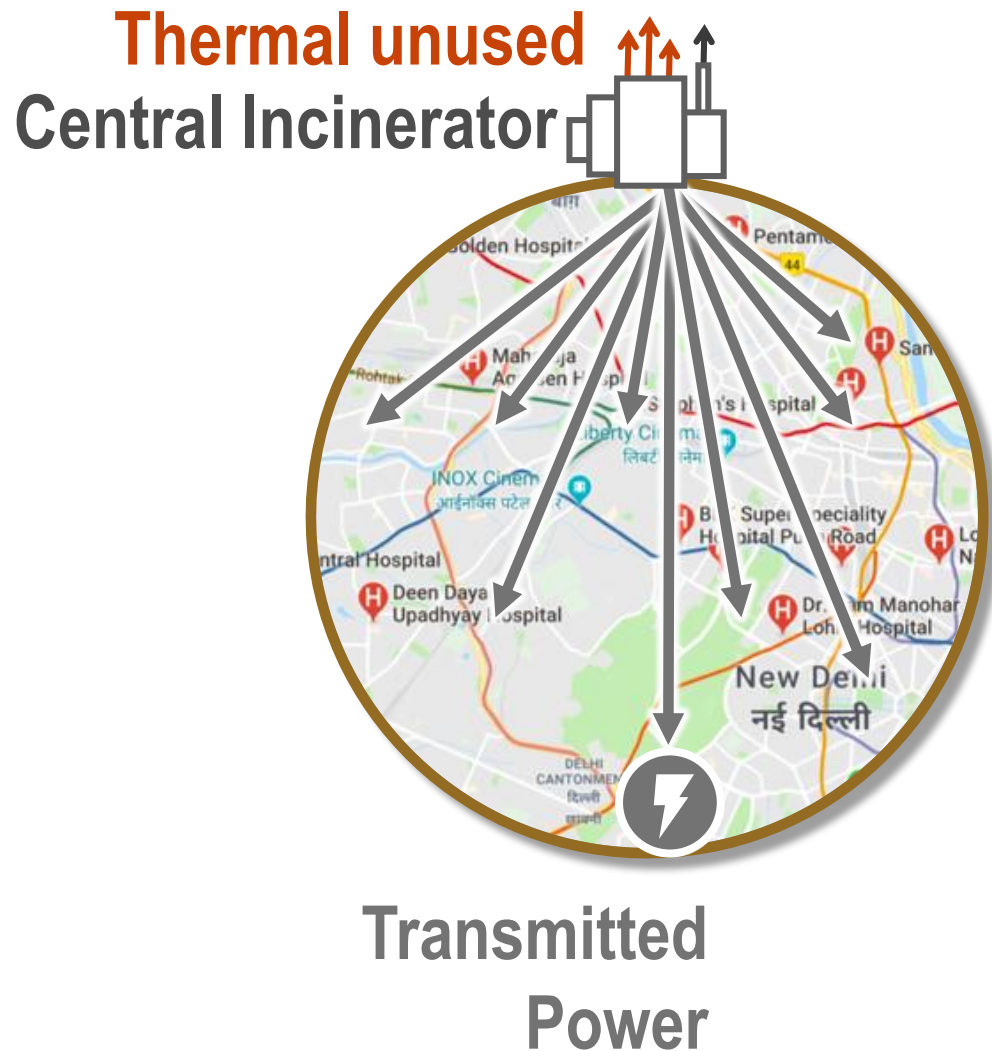
Yesterday's 'last mile' model



Congest and pollute the city with waste transport

20-30% of volume left as toxic ash

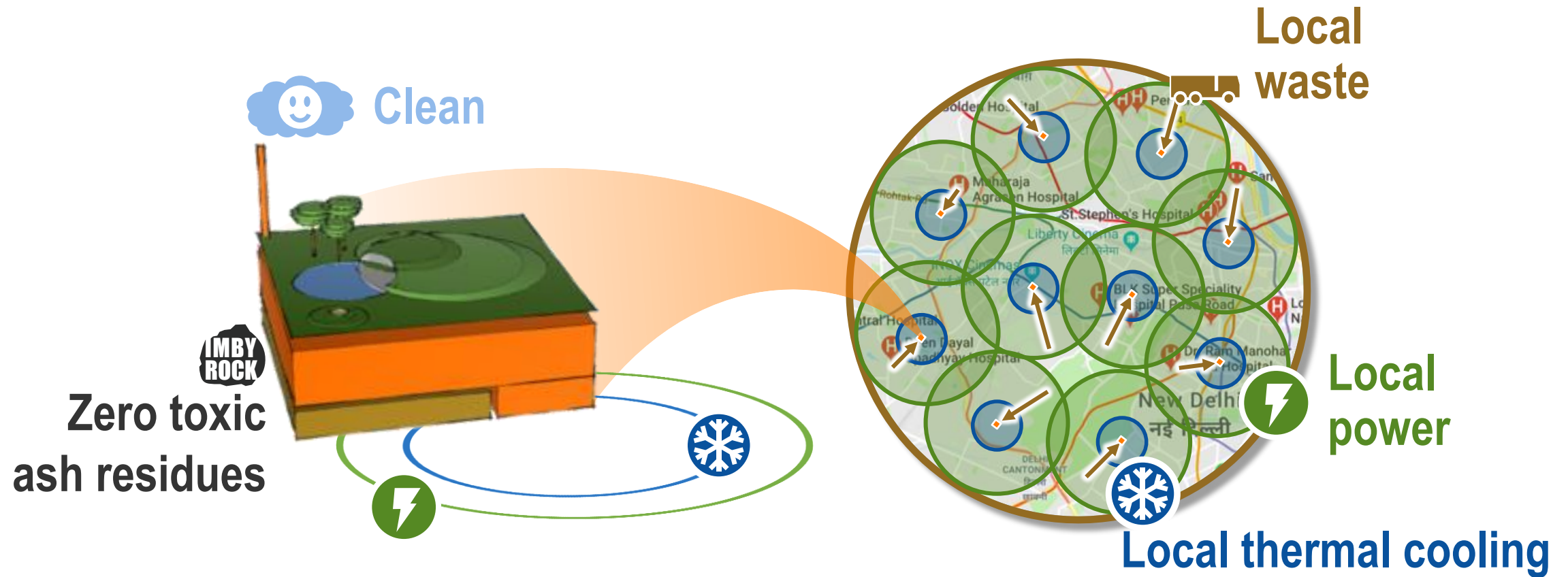
Yesterday's 'last mile' model



Squander the heat

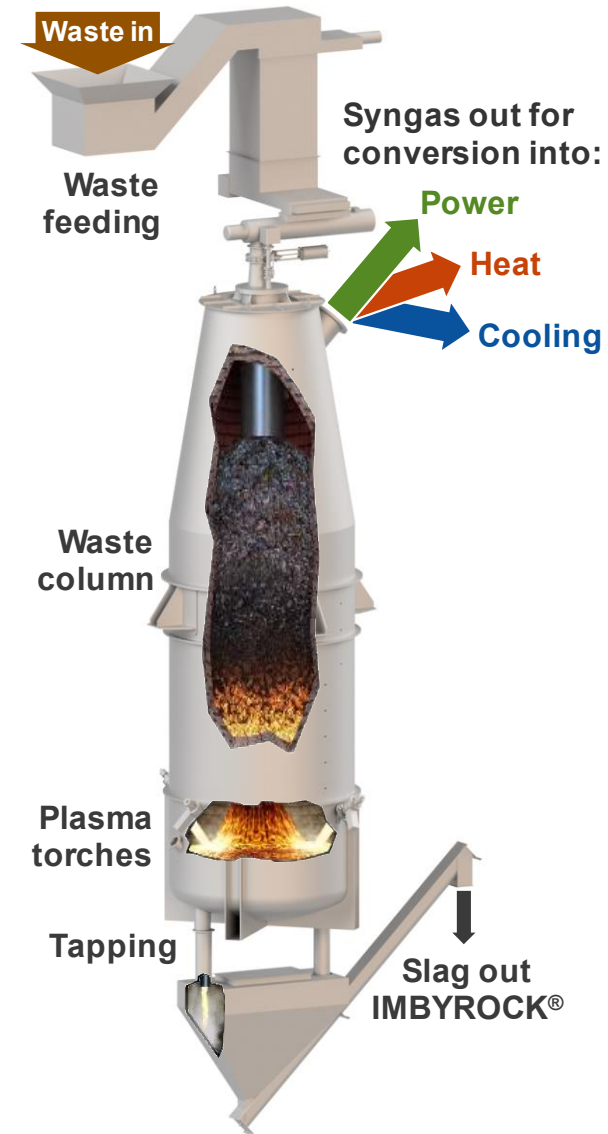
**Transmit power
back for use**

Our 'first mile' thermal model



Technology?

- Plasma Assisted Gasification – PAG
- Zero-waste solution in one integrated process
- Mixed waste streams, including hazardous waste





**MIXED
WASTE**

**BOSON
ENERGY**

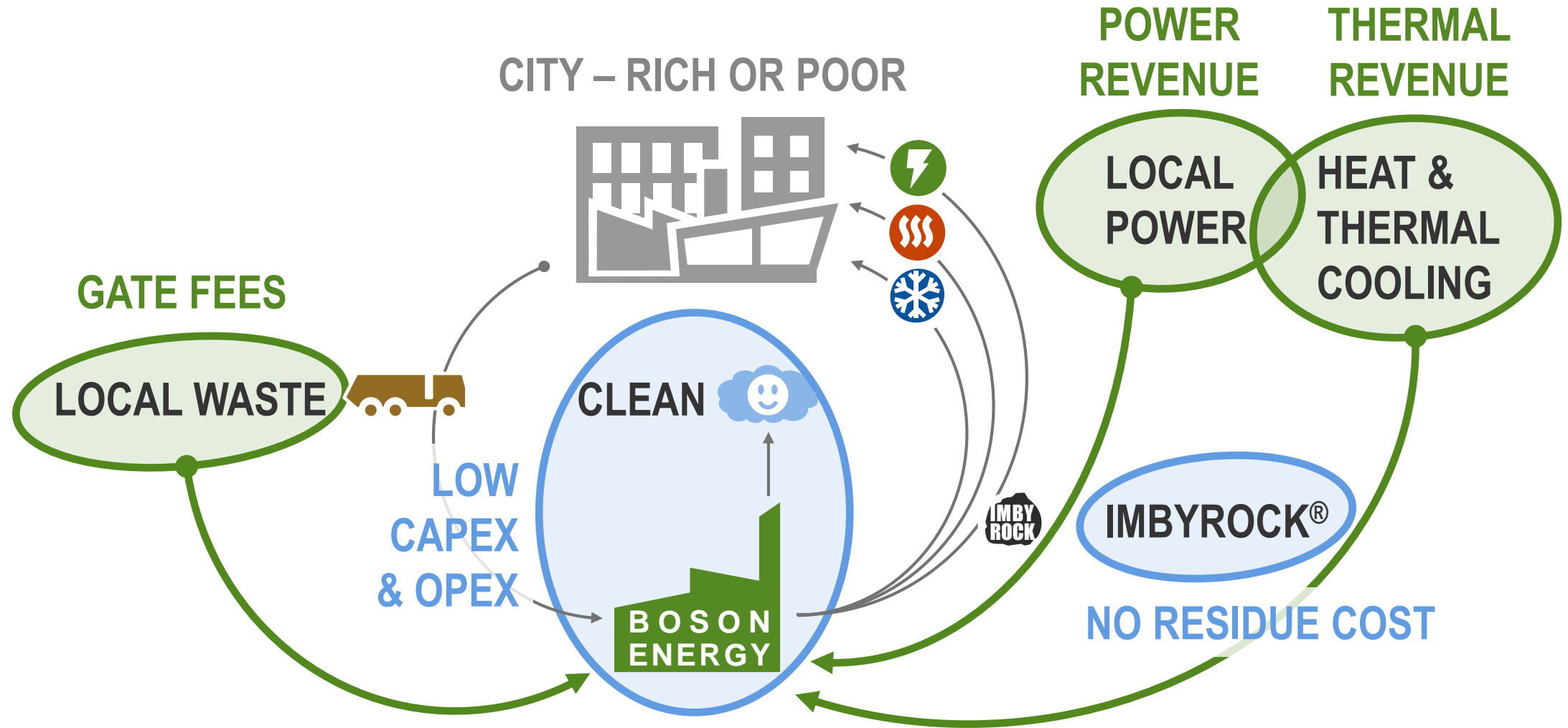
**CLEAN
LOCAL
ENERGY**

+

**IMBY
ROCK®**
CONSTRUCTION MATERIAL

Sounds expensive?

A solid business case



How do we bring this to market?

Solid experience in science, business and execution

- **Founder Jan Grimbrandt**
has two successful exits to
SIEMENS and **NALCO**
Ingenuity for life
- **Dedicated management team with combined experience of 100+ projects in €3m to €200m range**
- **Team of 30 people**



CEO and co-founder Jan Grimbrandt
25+ years in industrial clean-tech hardware – taking disruptive niche technologies to global market leadership



CTO Liran Dor
15+ years in the international waste industry within technology, execution, and commercialisation

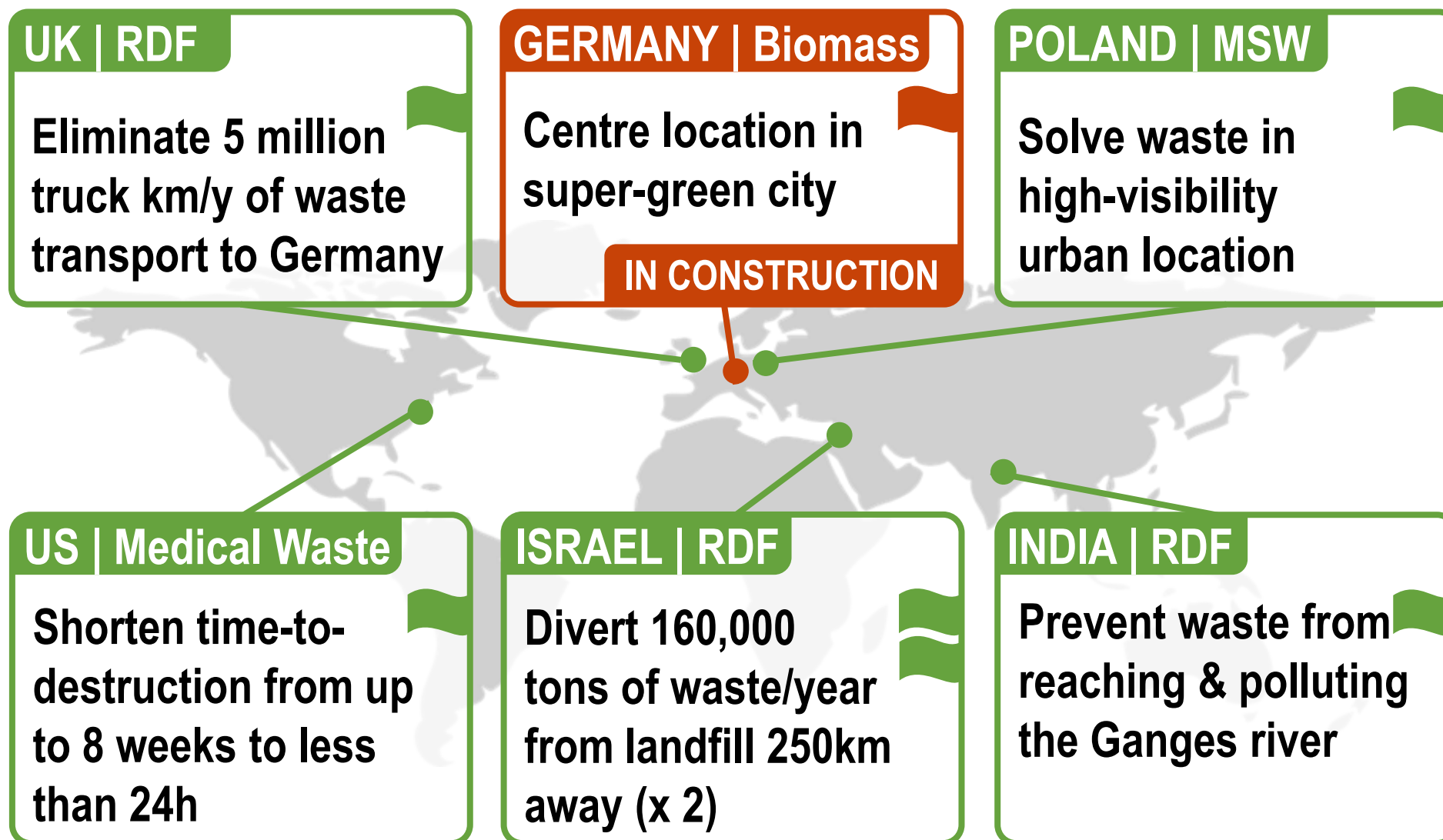


Co-founder Prof Wlodzimierz Blasiak
40+ years of applied thermochemical research and development experience in close cooperation with industry

Executed with solid global and local partners



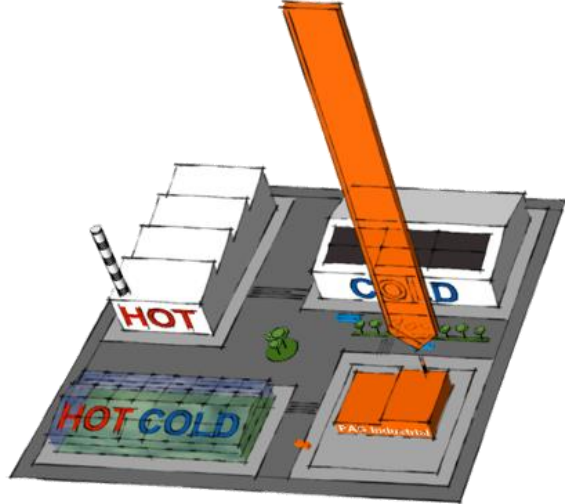
PROJECTS: Flagship projects on six key markets in first wave



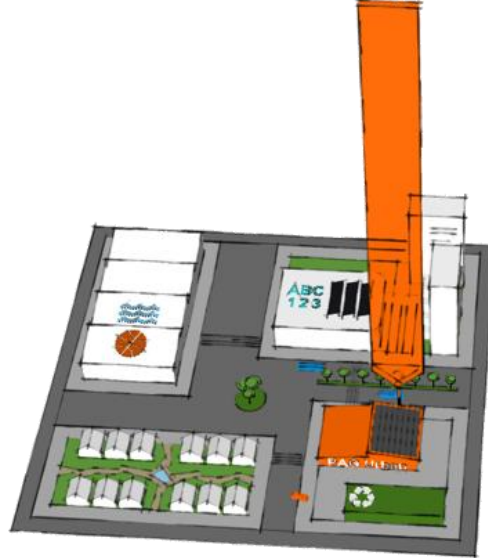
A vision combining high standardization with local flexibility

Super Urban (under ground)

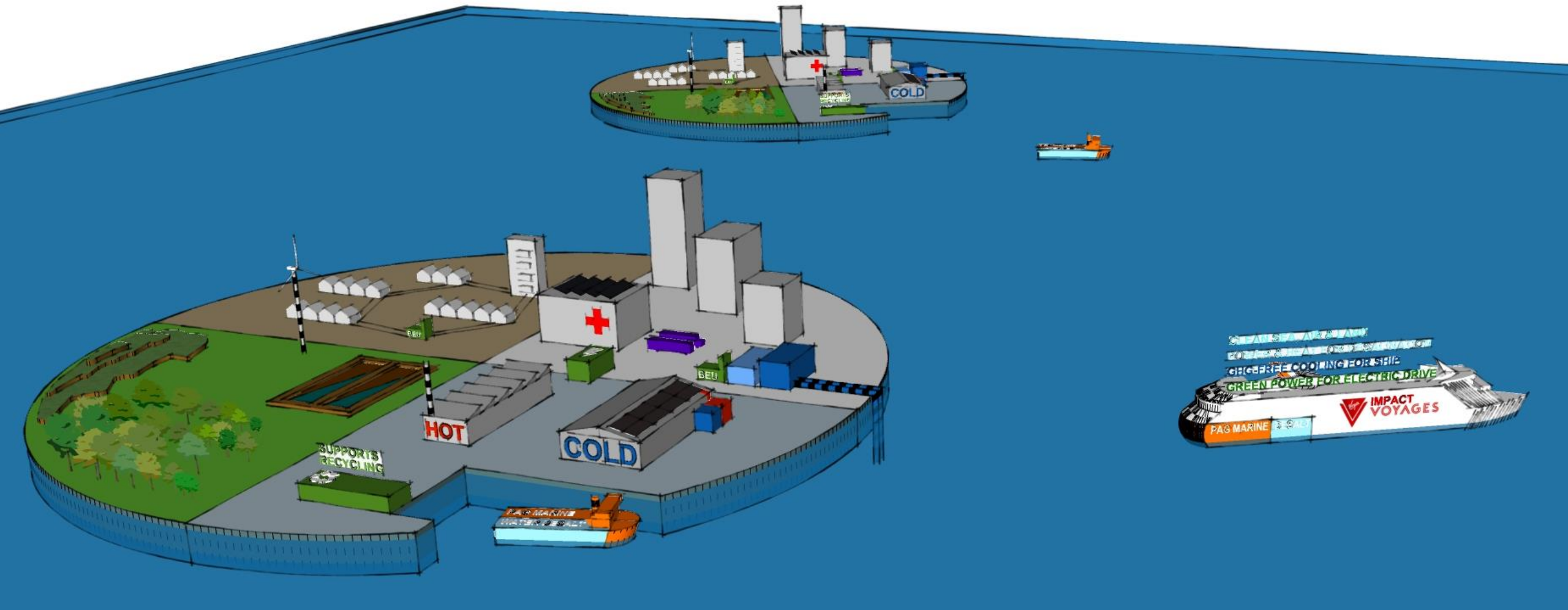
Industrial



Urban



Longer term: Taking care of waste anywhere



To conclude.



- Better-cleaner-cheaper means high potential for profitable impact
- Plan to reach 1000+ plants contracted by 2030
- We are currently raising up to €15m
- IPO planned 2-3 years from now



1000 BOSON ENERGY PLANTS BY 2030
– LOCAL WASTE FROM 200 MILLION PEOPLE
TURNED INTO CLEAN POWER AND COOLING



Join us!

Linkedin & Twitter: @BosonEnergy
www.bosonenergy.com





Innovation Company Showcase 3



INGRID NORDMARK

Chairman of the Board, APR Technologies AB

Better
Electric vehicles
with
Space technology



Pitch Presentation – Cleantech 2019-05-23

Ingrid Nordmark

Chairman of the Board APR Technologies



Imagine if.....



.....we can charge electric vehicles in 10-15 minutes

Control temperature – from space to earth



Telecom Satelites



Small satelites



Electrical vehicels

Unmatched thermal management performance



- APR Technologies has developed a multipurpose thermal management platform for satellites, batteries, and other electronics
- Patented dielectric liquid cooling system carrying several "no-moving-parts" –solutions with long lifetime, low power consumption, minimum noise and vibration levels
- The aim of APR is to become a major provider of Thermal Management solutions worldwide

AIRBUS





APR Technologies AB



- Self financed entrepreneur company
- 13 high qualified employees
- Multiple patents
- Customer like NASA, Airbus and ESA
- Numerous awards in entrepreneurship



Peter Nilsson, APR Technologies
Science/Technology CEO of the Year - Sweden



**Morgondagens
Samhällsbyggande
Entreprenörer 2018**

Stiftelsen ÅForsk och
Swedish Incubators &
Science Parks

<https://aforsk.com/>

Estimated turnover per market

Space

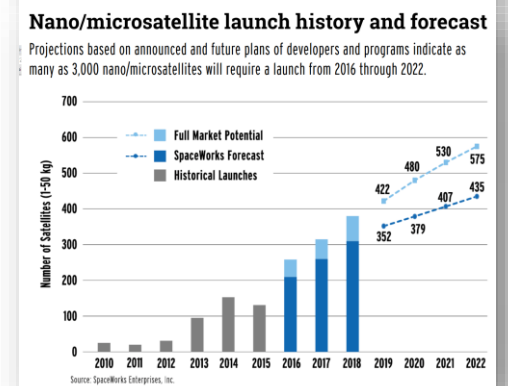
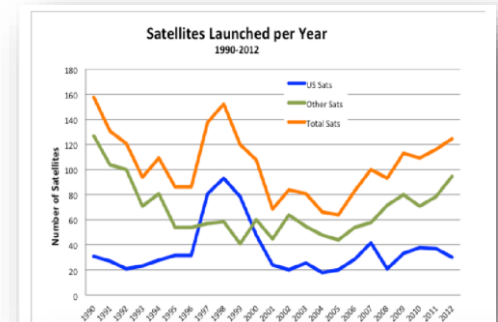
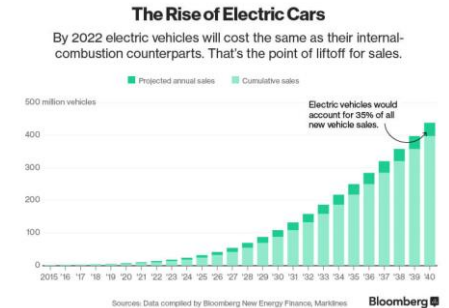
- 20 M€/year, in 5 years
- 50 M€/year, in 10 years (25% market share)

Based on customer estimates (Airbus)

Electrical Vehicles

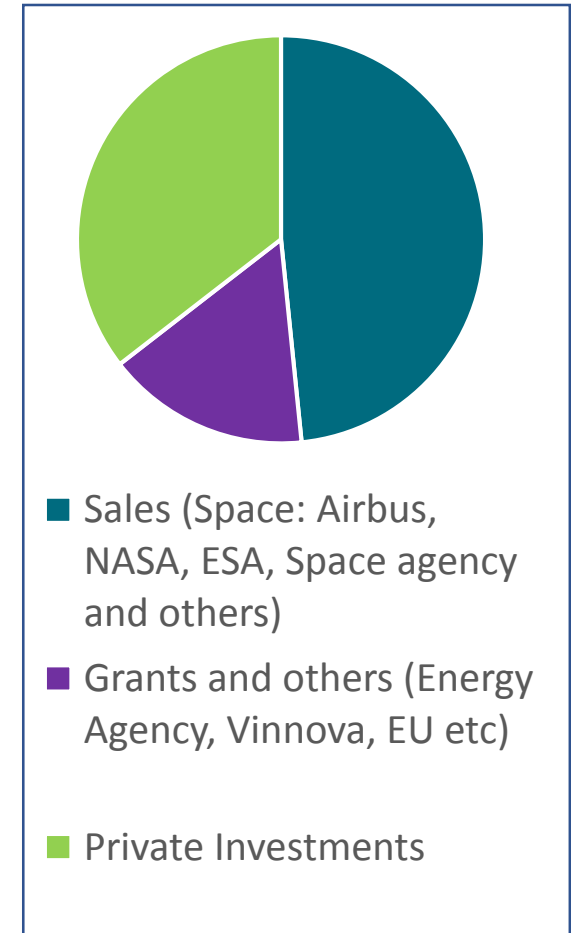
- 50 M€/year, in 5 years
- 2 B€/year, in 10-15 years (1% market share)

Based on estimates from Wood Mackenzie



2019 – private placement of ~20 MSEK

- Platform – 30%
 - Common production capacity improvements and Quality Assurance
- Space – 25%
 - US + global market entry, Large Satellites
 - Adaptation to “new space” Small Satellites, globally
- Electrical Vehicles – 45%
 - Adaptation to Electrical Vehicles
 - Pre-sales to industry
 - Commercialization, supply chain, organization etc.



Faster charging

Longer range

Longer lifetime

Improved safety

Easier recycling



Better
Electric vehicles
with
Space technology



Pitch Presentation – Cleantech 2019-05-23

Ingrid Nordmark

Ingrid@Nordmark-leadership.se

Chairman of the Board APR Technologies



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ATHAN FOX

Chief Technology & Innovation Officer,
Aurelius Environmental

out of the furnace and into the leaching pot

Dr Athan Fox, Technology Director



EU Cleantech Forum
Stockholm, 23 May 2019

Aurelius Environmental
Cambridge, United Kingdom

World without Waste

- Our mission
 - Catalyse a global revolution in recycling
 - Create a world without waste
 - Abolish the act of landfilling



Circular Economy

- Operating since 2015
 - Profitable in year 1 (£100,000 GBP)
 - 2019-2020 forecast: more than £10M GBP
 - Flagship tech licensed from Cambridge University



Horizon 2020
European Union funding
for Research & Innovation

We work with
Innovate UK

The People



Lead-Acid Batteries

most successfully recycled commodity product

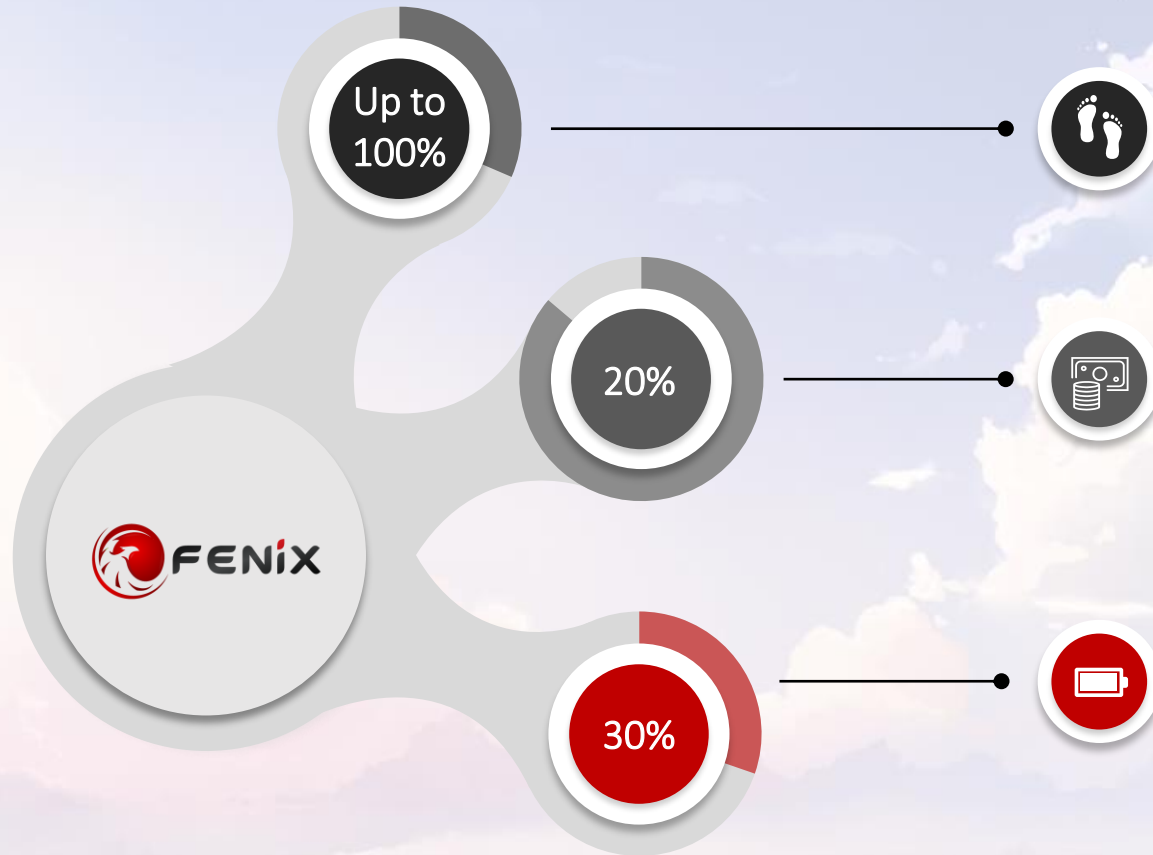
LAB market: \$84 billion USD by 2025
>40 million tonnes of lead in circulation



Our process uses water  instead of fire 



Lead-Acid Batteries



The Environment

- Carbon footprint reduced by 80-89%.
- Slag reduction by more than 90%.
- Waste produced: 0.0%. Sulphur dioxide: 0.0%.

The Supply Chain

- PbO produced **directly** from waste
- Saves \$500,000 USD per 10,000 tonnes of material

Battery Performance

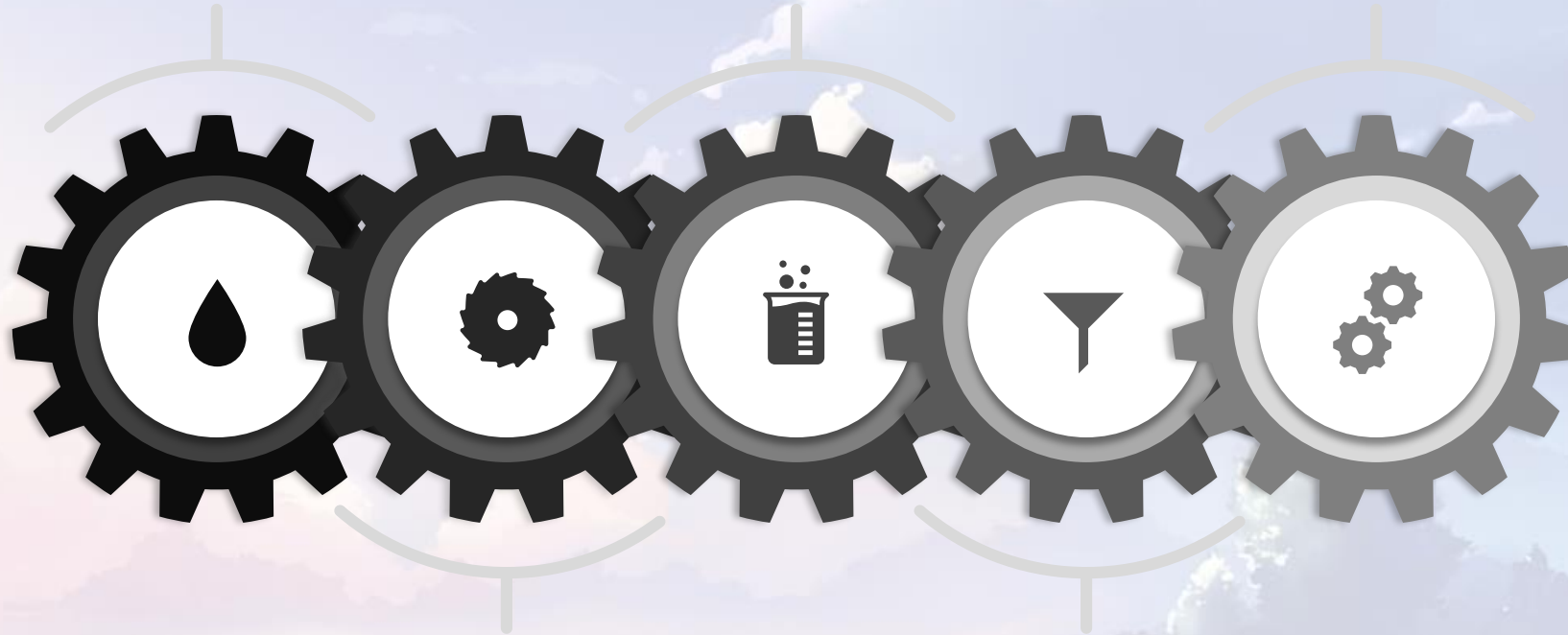
- Energy density increased by a factor of ~30%

The Process

STEP 1: Drain Battery
Remove waste acid.
Produce EcoAcid.

STEP 3: Leaching
React paste with **citric acid**.

STEP 5: Calcination
Produce new paste.



STEP 2: Crush and Separate
Remove plastic, metal, paste.

STEP 4: Filtration
Remove lead citrate.

The Key Reagent: citric acid

- Reagent for the process produced from waste (i.e. waste treating waste to make products)
- Cellulose from landfill extracted as a fibre and converted to citric acid



A world without waste?



Thank you for your attention

Athan Fox, CTO
a.fox@cantab.net





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DAVID AINSWORTH
CEO, Kite Power Systems

The year is 2050

- Wind and solar meeting 75% of world wide electricity market
- World population increased from 7bn to 10bn
- Deployed wind generation has increased from 600GW to 5,000GW

But

- Demands for material for electric motors, generators, batteries, invertors, solar power has driven global mining operations leading to environmental challenges
- Raw material costs have soared
- The hunt is on for electrical generation solutions with lower raw material resource demand

KPS – The Vision



KPS – Kite Power Systems Ltd

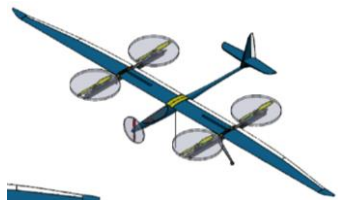
- KPS
 - Kite Power Systems
 - Team of 20
 - Glasgow, UK
 - Engaged in AWE since 2011
- Current shareholders include



KPS Strategy

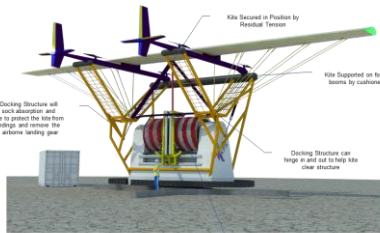
Project Forward

Scale Back



2019

Proof of concept



2020

500kW Demonstration



2022

500kW Minimum Viable Product



2023

500kW Product & Scaling



2030+

15MW Floating Product



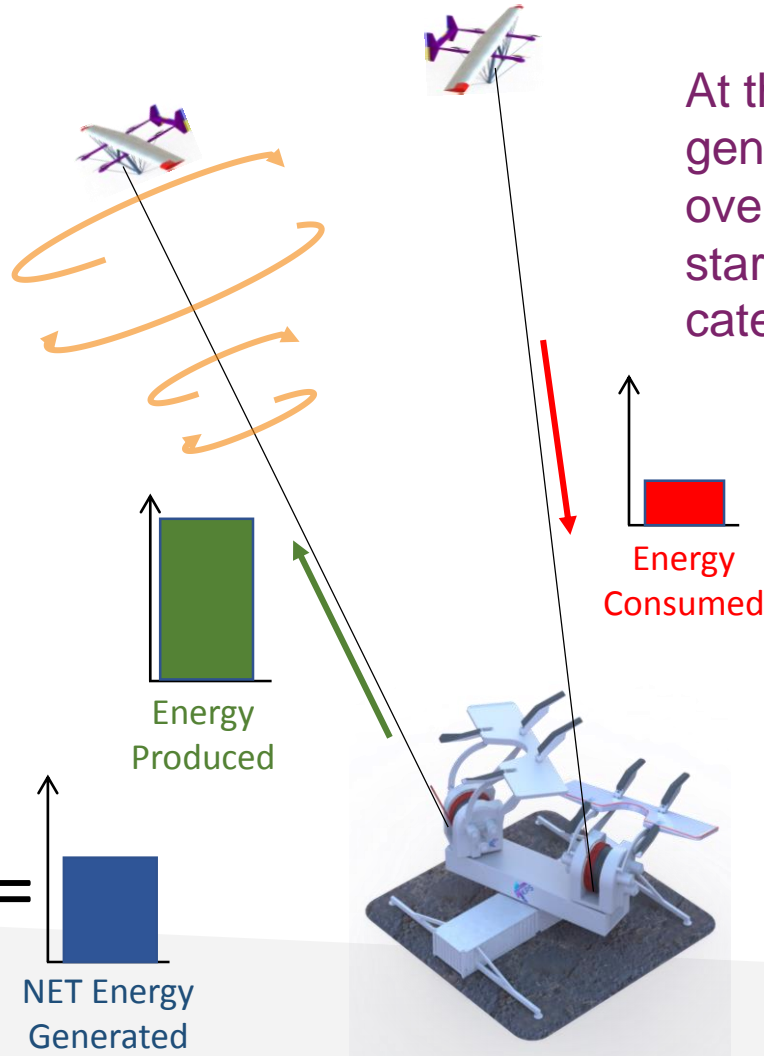
First revenue from energy sales or unit sales

>250MW of 500kW System Sales (>500 units) generating >\$0.5Bn sales revenue from systems, O&M and Spares

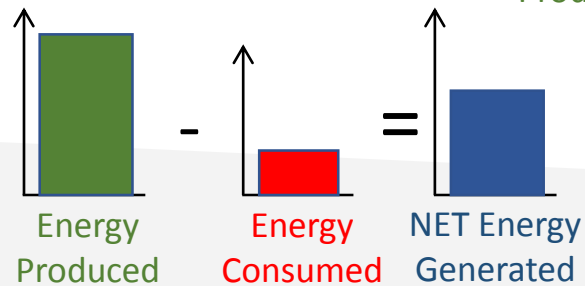
www.kps.energy

Airborne Wind Energy – How it Works

Flies away from base station,
lift creates tension in tether
turning the winch drum



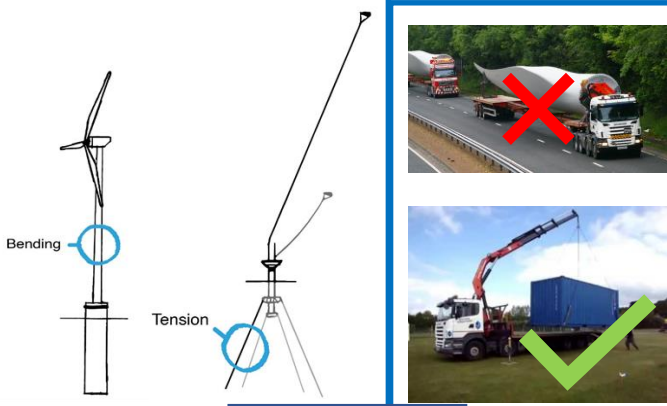
At the end of the power
generation stroke, kite pitches
over and glides back to the
start of the cycle with tether
catenary winched in



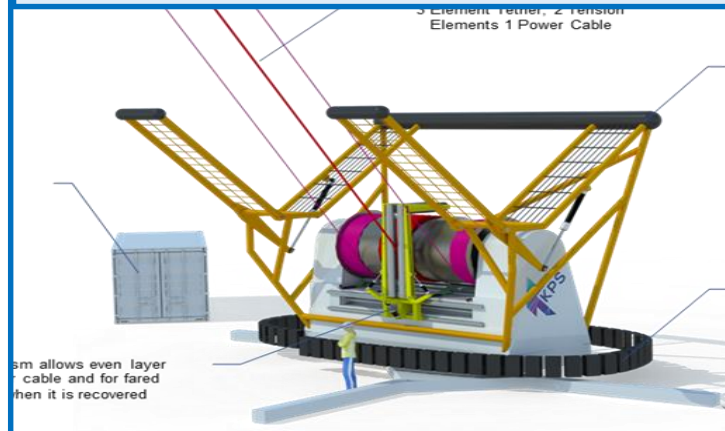
LCOE - Levelised Cost Of Electricity

$$\text{LCOE} = \frac{\text{Total Capital Cost} + \text{Total Project Lifetime Operating Cost}}{\text{Total Lifetime Revenue from Energy Generation}}$$

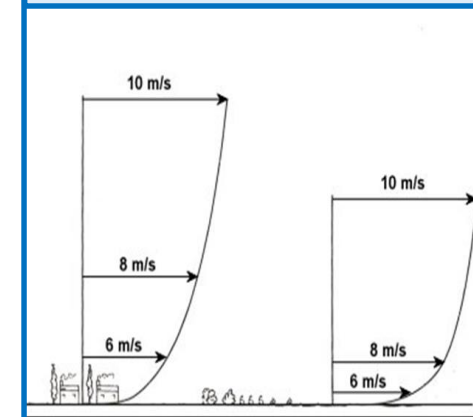
Lower Capital Cost



Lower Maintenance Cost



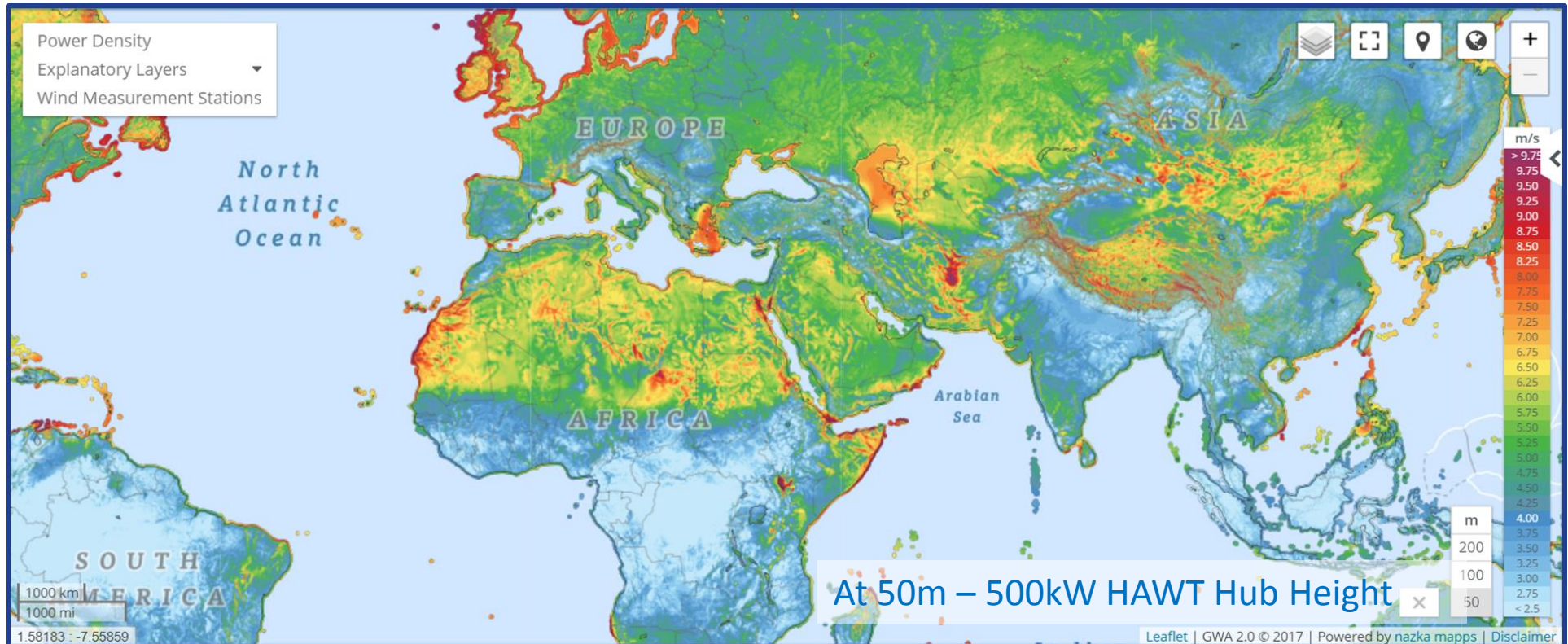
Higher Yield



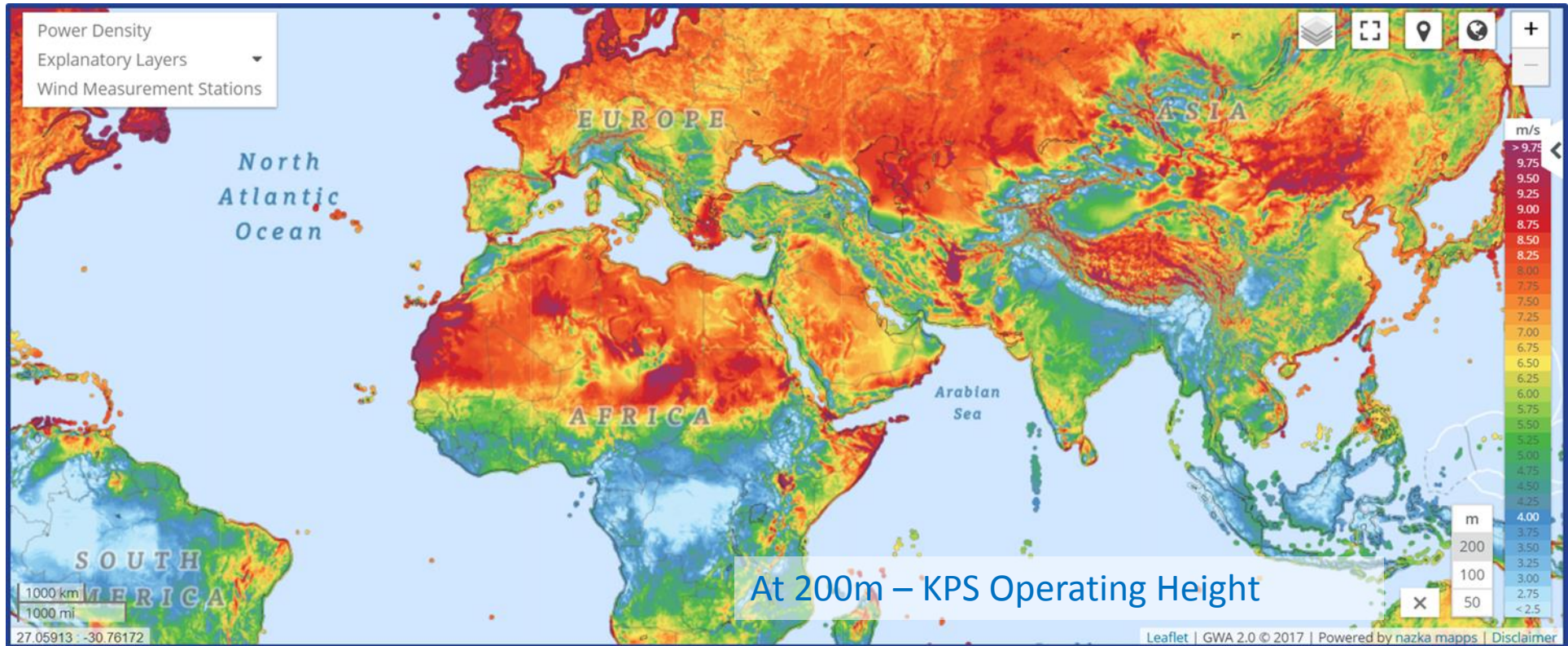
Reduced
CO₂/MW



Global Wind Resource - HAWT

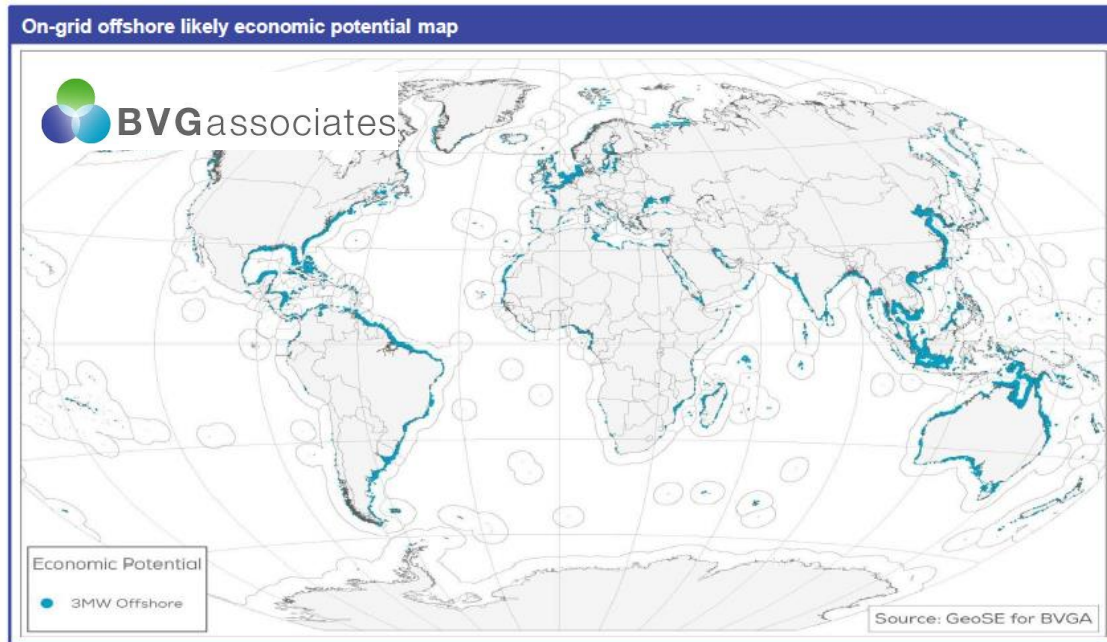


Global Wind Resource - KPS

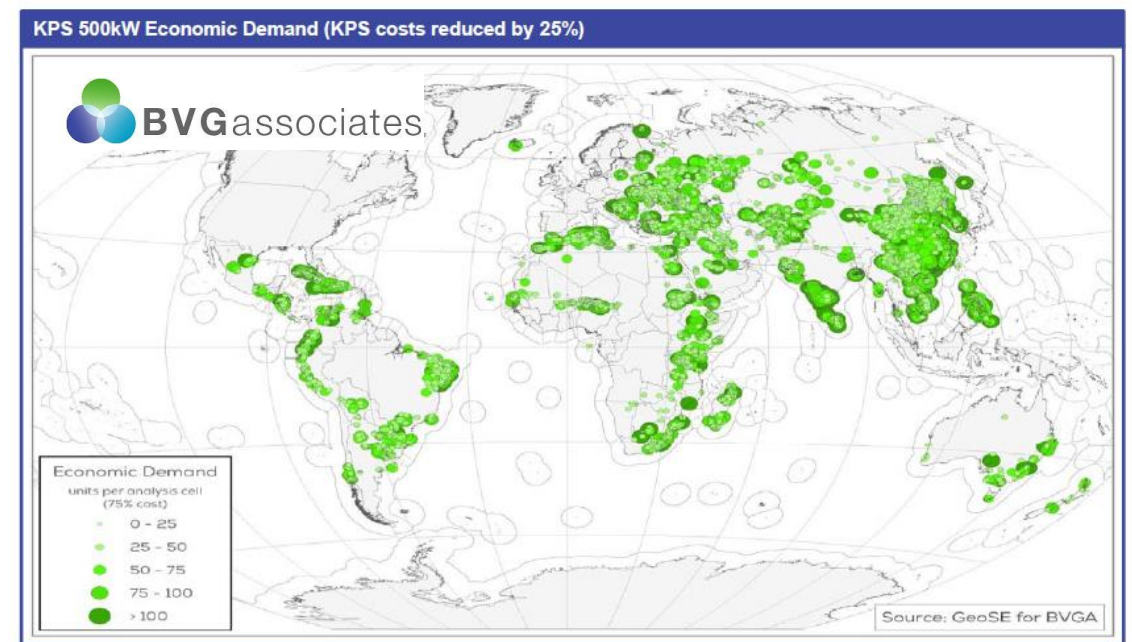


KPS Market Assessment

Offshore Market Potential

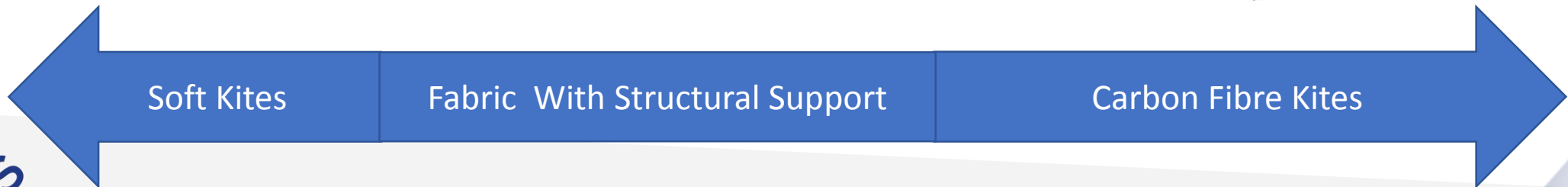


Onshore Market Potential



KPS total potential >>5,000 GW 2050 deployment (GWEC)
1% of GWEC predicted market Growth 2020-2030 >\$40Bn

Competitors



KPS Differentiators

Technical

- **Two Kites per base station**
 - Increased yield
 - Lower CAPEX/MW
 - Lower LCOE
- **Hybrid Wing**
 - Air Beam Wing/Pressure Stabilised Structure
 - >25% Mass reduction compared with carbon fibre
 - Deflates for transportation
 - Scalable to match HAWT
 - More durable than carbon fibre
- **System of systems approach**
- **Approach to tether management** for optimum life



Business/Commercial

- **Approach to commercialisation**
- **Shareholder mix**
- **Team**
 - Track record
 - Team experience



KPS Team



Dr Andrew Tyler
Non Exec Chair

- CEO Algeco Group
- President IMareEST
- Previous
 - CEO at Northrop Grumman Europe
 - CEO at Marine Current Turbines
 - COO at MoD



Dr Sian George
Non Exec Director

- Independent Chair and NED
- Wave & Tidal (Aquamarine, Orbital, Ocean Energy Europe)
- Energy policy (EU)



Dr Nik Rotering
Non Exec Director

- Appointed by E.ON

**KPS
Board**



David Ainsworth
Chief Executive Office

- Marine Current Turbines
- Bowman Power
- Aerospace (gas turbines, hydraulics)



Paul Jones
Chief Financial Officer

- Marine Current Turbines
- Nuclear power
- Chemical industry M&A

**KPS
Management
Team**



David Stewart
Director of Technology

- Airships
- F1 cars
- Aerodynamics



Barbara Jackson
Director of Projects

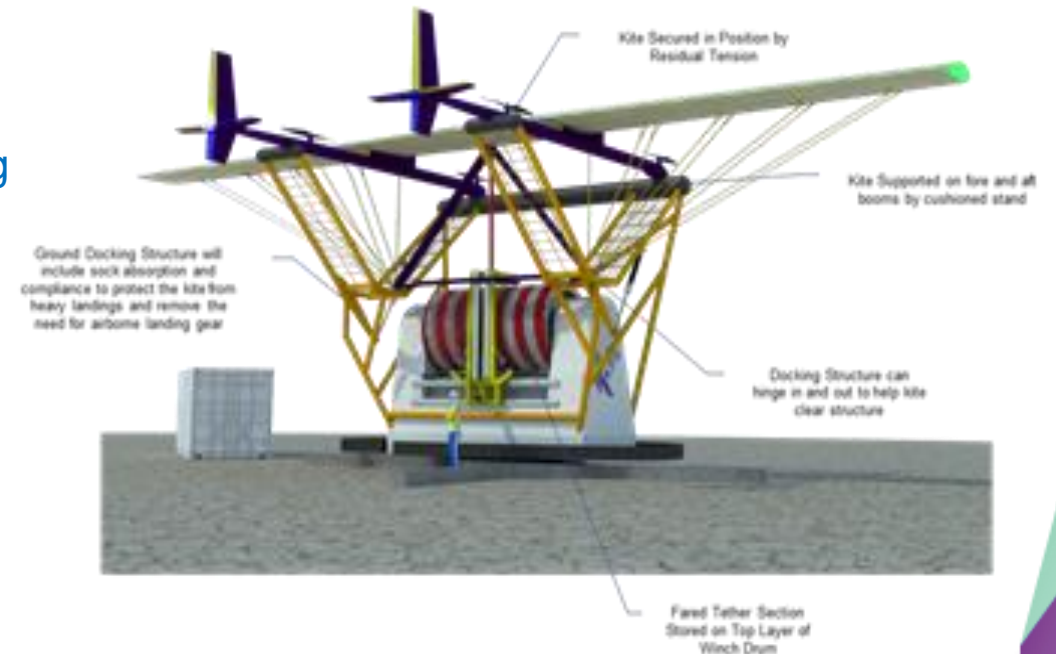
- Power station construction
- Project Management
- Business Development



Next Investment Round

Additional £2.6M equity closing in October 2019

- Application of funds:
 - Delivering technology inflection in 2020/2021 by demonstrating new wing concept at significant scale
 - Development of supply chain
 - First revenue - Progress 500kW array demonstration project for deployment in 2022 – working with developers with access to sites
 - Progress first 500kW commercial sales in 2024



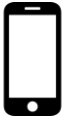
Contacts



David Ainsworth - CEO



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GREENBACKERS
Investment Capital

Robert Hokin - CEO



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