



Cleantech Forum **Asia** | Singapore

The “Disruption” Innovation
Showcase:
Meet International Innovation
Companies Looking for Capital &
Partners



Cleantech Forum **Asia** | Singapore

“Disruption” Innovation Showcase Moderator



RICHARD YOUNGMAN
CEO, Cleantech Group



Cleantech Forum **Asia** | Singapore

“Disruption” Innovation Showcase



WAYNE BYRNE

Managing Director & Co-Founder, OxyMem

MABR Transforms Wastewater Plants in hours: More Capacity, Less Energy & Less Sludge



Wayne Byrne, CEO wbyrne@oxymem.com +353 879153574

O X Y M E M

About us



- Membrane Manufacturer (MABR - Membrane Aerated Biofilm Reactor)
- 30+ projects delivered at various scales: Industrial & Municipal
- Revenue \$2.5M
- 50 staff, 3 patents, 2 pending
- Target market: Global Wastewater Treatment (\$30B+)
- Focus on Capacity Expansion: e.g. 4000+ plants requiring upgrade in China (next 3yrs)
- Key Corporate shareholders:

أرامكو السعودية
Saudi Aramco



MABR: Looks to Nature to achieve breakthrough efficiency



Conventional treatment uses bubbles
2-3% global electricity production



Nature leverages 37 trillion biological
cells receive oxygen from lungs



Bubble-less MABR leverages gas
transfer membranes to deliver oxygen
directly to biology

MABR Key Benefits



Easy to Install



Less Sludge



Capacity Management



Energy Efficient



Process Resilience



Small Footprint

Sweet Spot: Rapid Plant Expansion with Guaranteed Results



- Product engineered to “**do no harm**”
- Increase **Capacity incrementally**
- **No disruption** of existing treatment process
- No need to drain tanks, modules simply “**dropped in**”
- Installation in **hours** rather than months
- **ZERO footprint** required



10 year guarantee

Performance guarantee





increased
treatment capacity

OXYMEM



OxyMem Looking to Engage Partners & End Users in Asia

- Global Demand for MABR Technology Growing Strongly
- Wastewater capacity challenges a worldwide issue
- Innovative Solutions Needed
- Compelling Benefit Set from OxyMem MABR
- Attractive Commercial Options



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“Disruption” Innovation Showcase



IBRAHEEM KHAN

Co-Founder, President & CEO, Smarter Alloys

smarteralloys

making smart materials smarter

smarteralloys

smarteralloys makes materials
function like machines

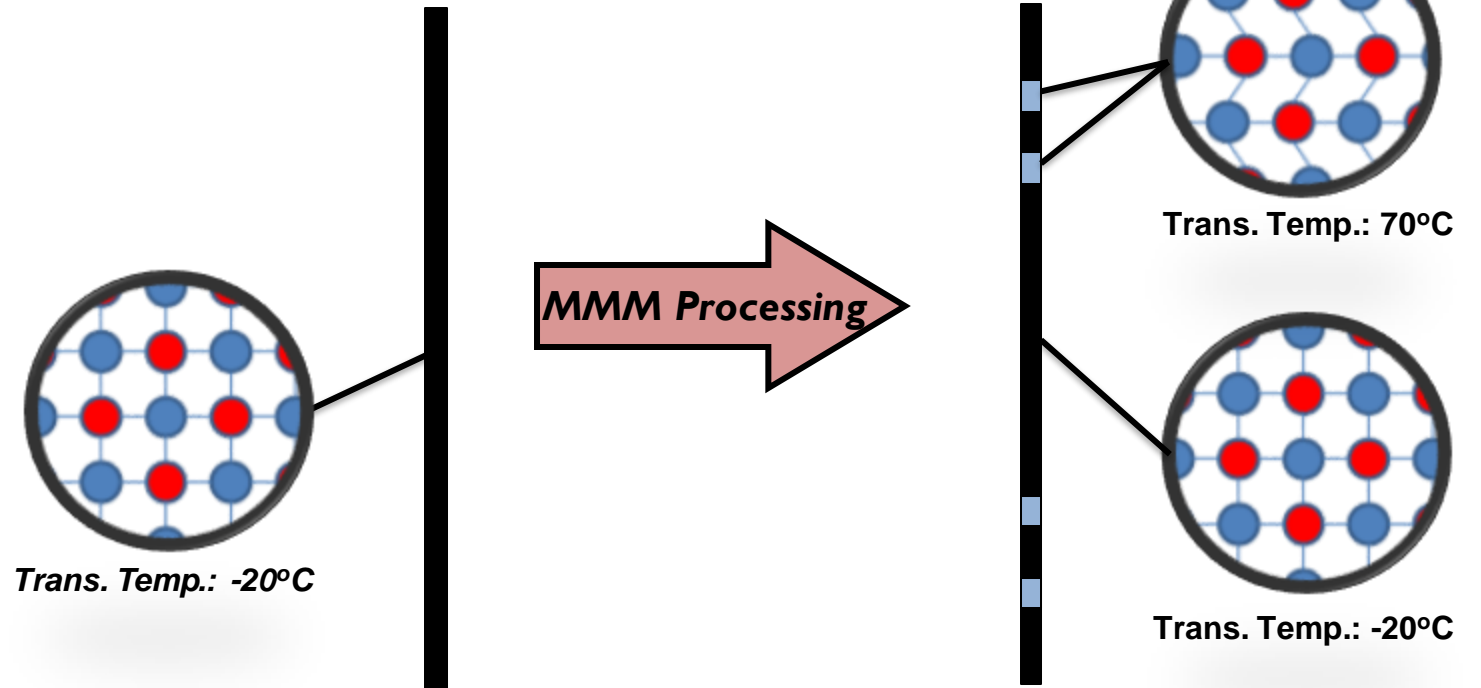
smarteralloys

Technology Breakthrough

Multiple
Memory
Material
Technology

Single Memory/Stress

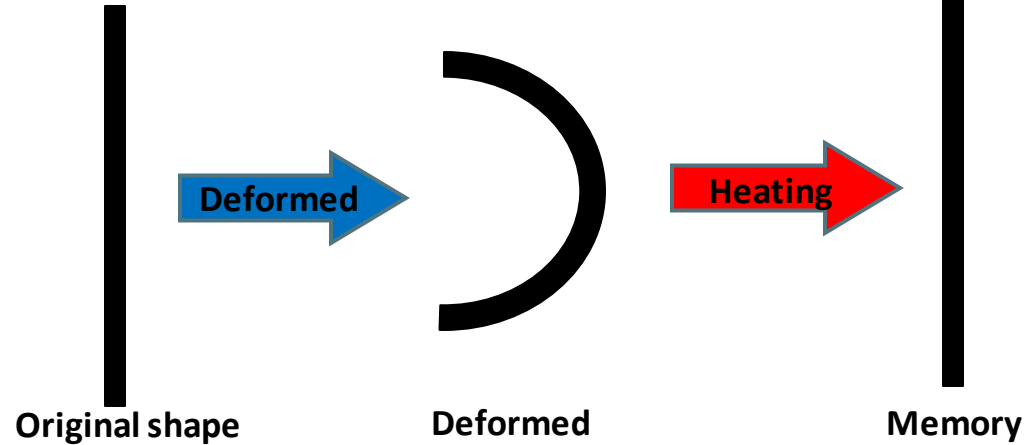
Multiple Memories/Stress



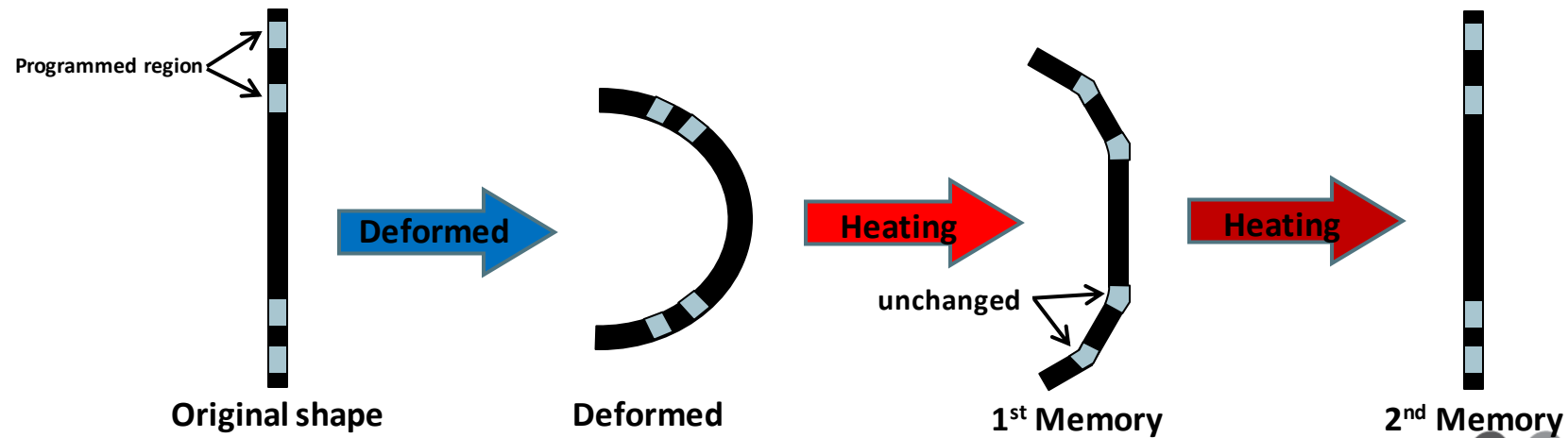
smarteralloys

MMM Technology

Typical Shape Memory Effect



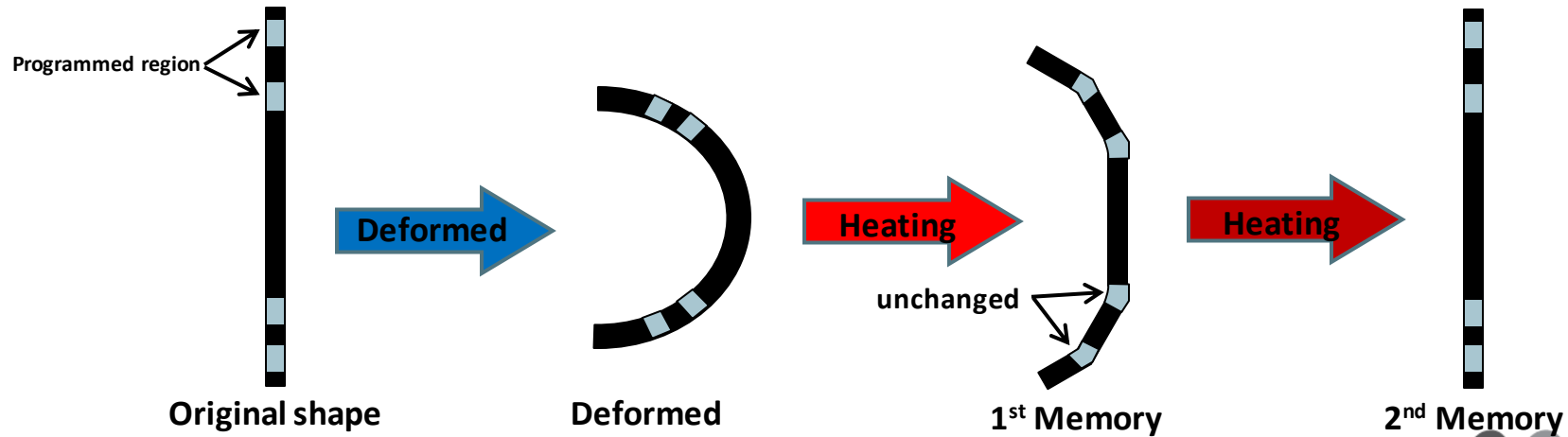
MMM Processed



MMM Technology



MMM Processed

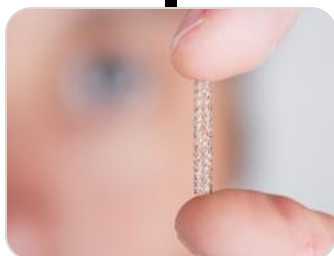


smarteralloys



Dental and Orthodontic

- SmartArch orthodontic wires
- Thermally activated appliances
- Variable stiffness tools



Medical Devices

- Steerable guide wires
- Stents with variable stiffness
- Cardiac devices



Electronics

- Micro-camera autofocus
- Image stabilization
- Haptic sensing
- Adaptive hinges



Aerospace

- Control surface actuation
- Rotary indexing actuation
- Lightweight in-cabin components and systems



Automotive

- Active/Passive temperature control
- Closure latches
- Vehicle lightweighting



Consumer Goods

- Sports equipment
- Thermally activated apparel
- Fire control systems

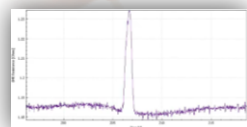


Energy

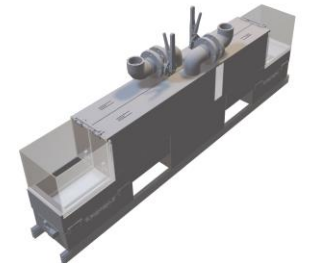
- Energy harvesting devices
- Safety valves (oil/gas)



sma haptics



XtractEnergy



smarteralloys

XtractEnergy

Low grade waste heat engine

Cell Power: 1kW modulated to 10kW

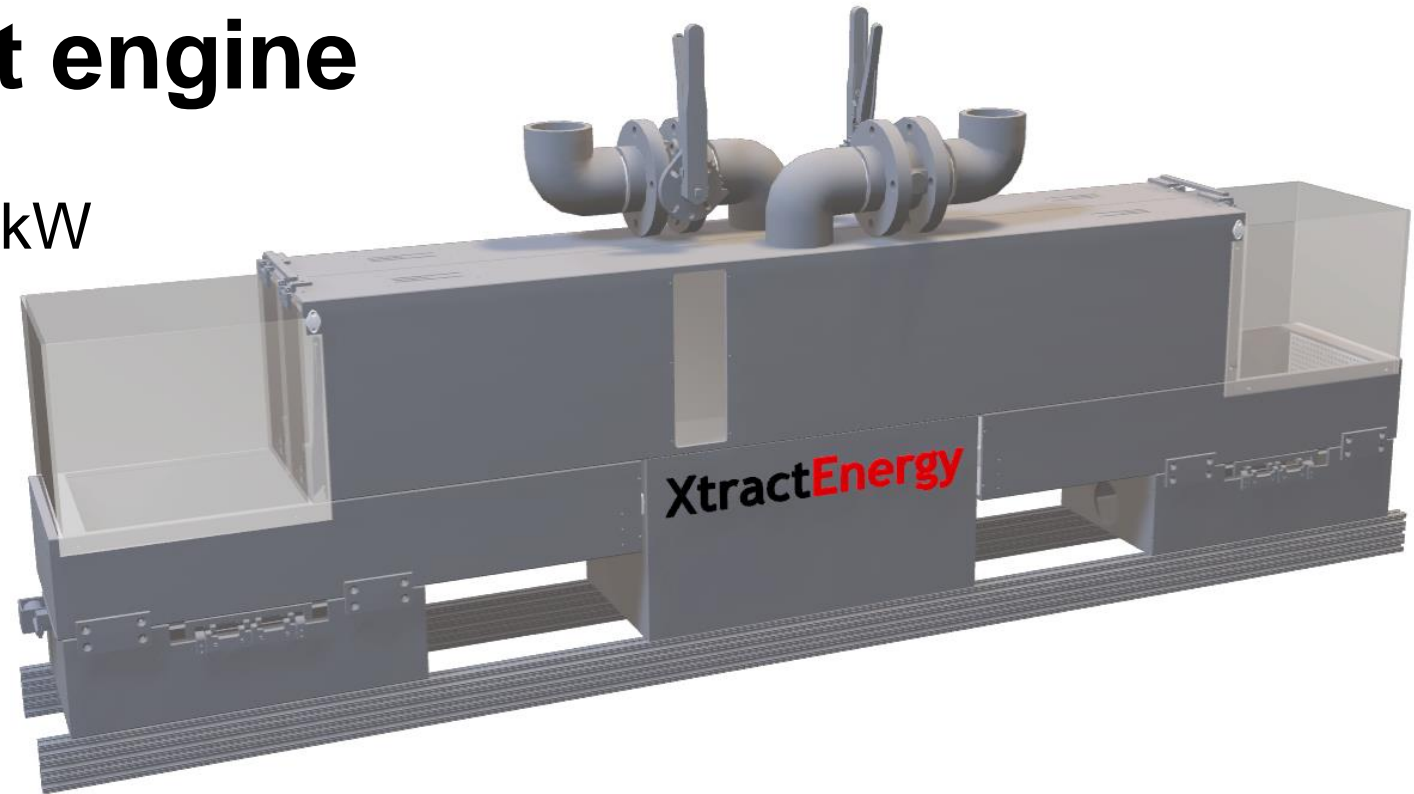
Operating Temp: 60°C-90°C

LCOE: 5.8 c/ kWh

ROI: 12-18 months

Status: Scaled system fabricated

Pilot site: Dec/Jan, Ont. Canada



**Waste heat
accounts up to
60% of energy
loss in power
applications**



XtractEnergy

CO₂ Offset

4.9B $\frac{TCO_2}{Year}$

Opportunity Size

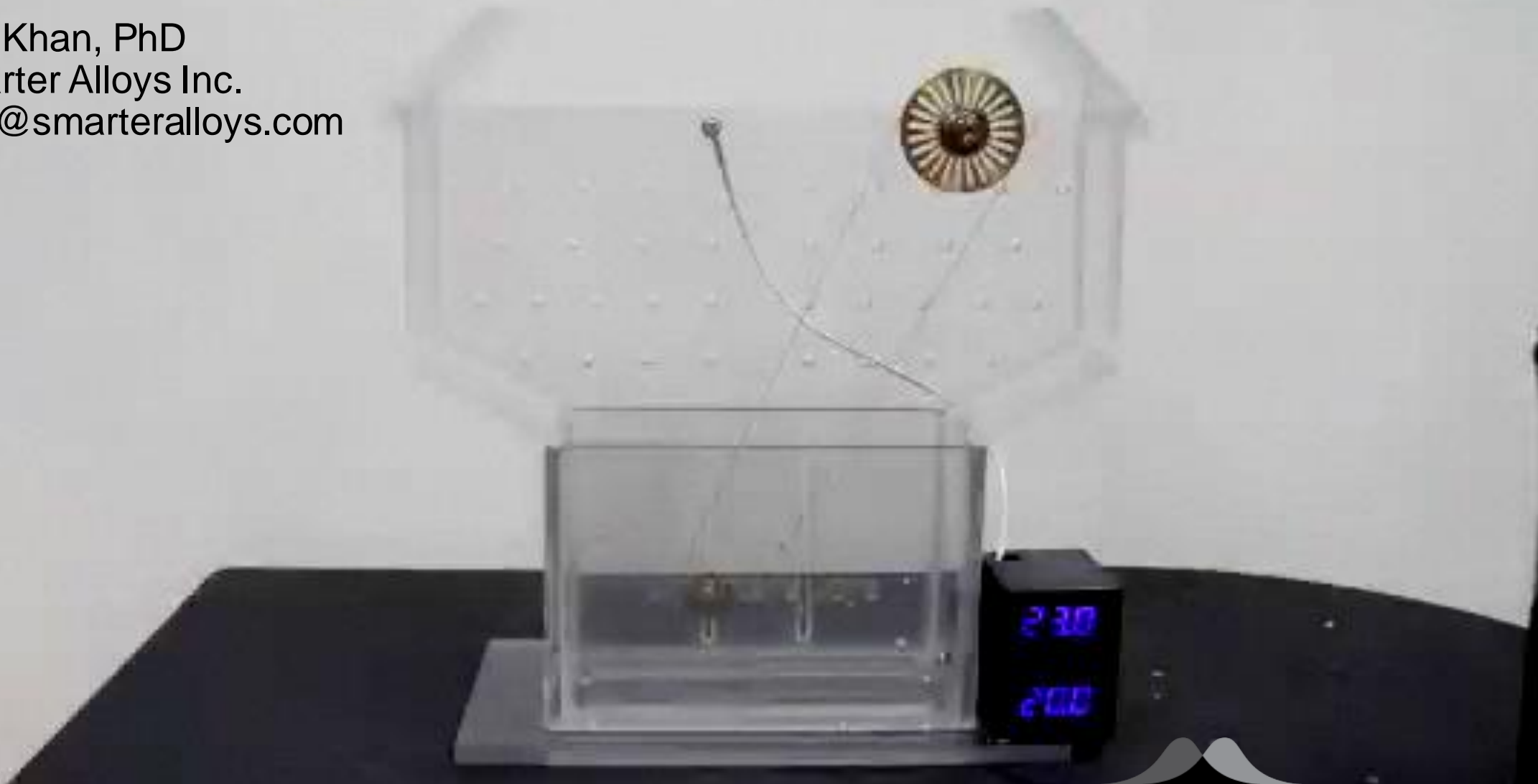
\$1.2T



XtractEnergy

Thank you.

Ibraheem Khan, PhD
CEO Smarter Alloys Inc.
Ibraheem@smarteralloys.com



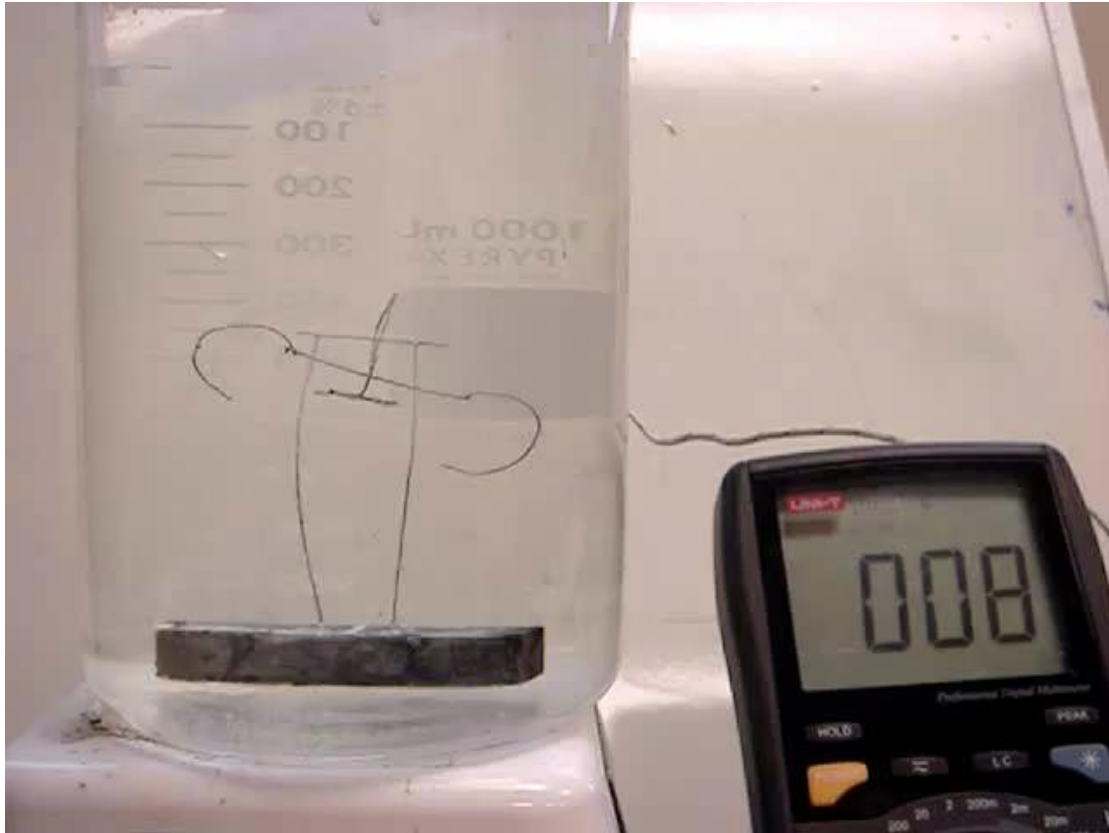
XtractEnergy

Thank you.

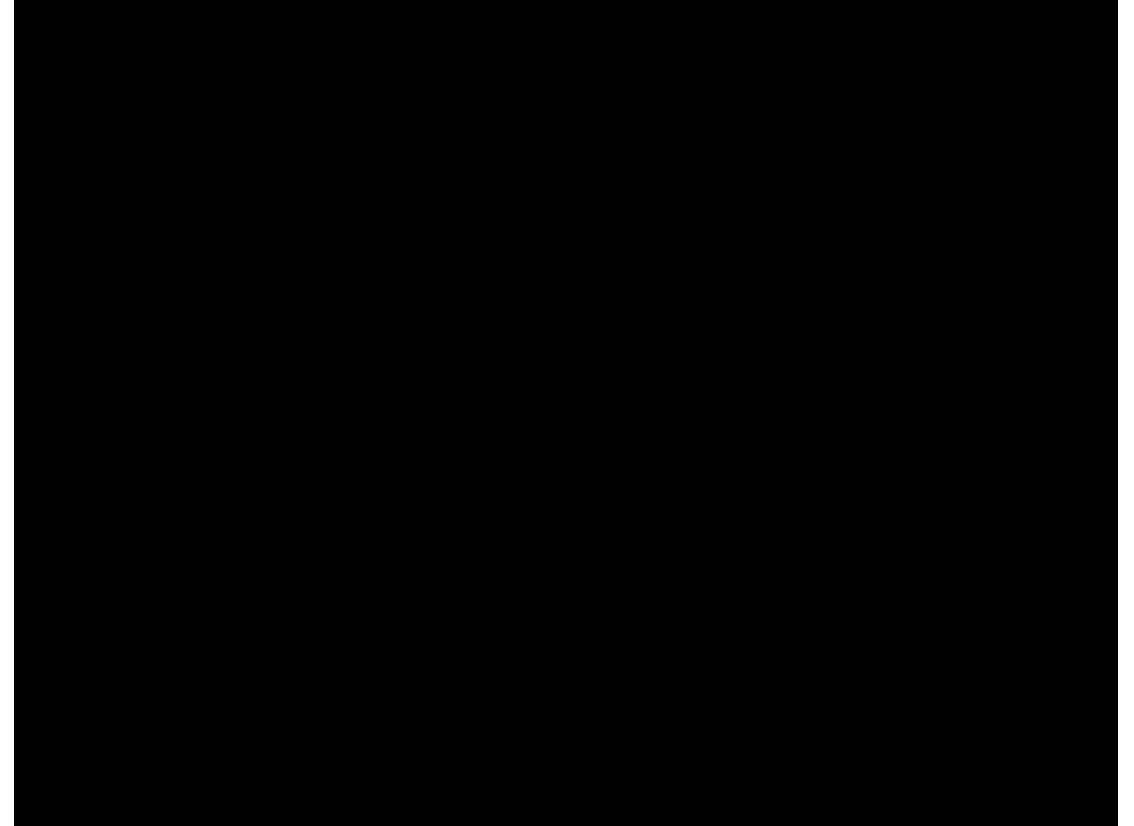
Ibraheem Khan, PhD
CEO Smarter Alloys Inc.
ibraheem@smarteralloys.com

XtractEnergy

smarteralloys

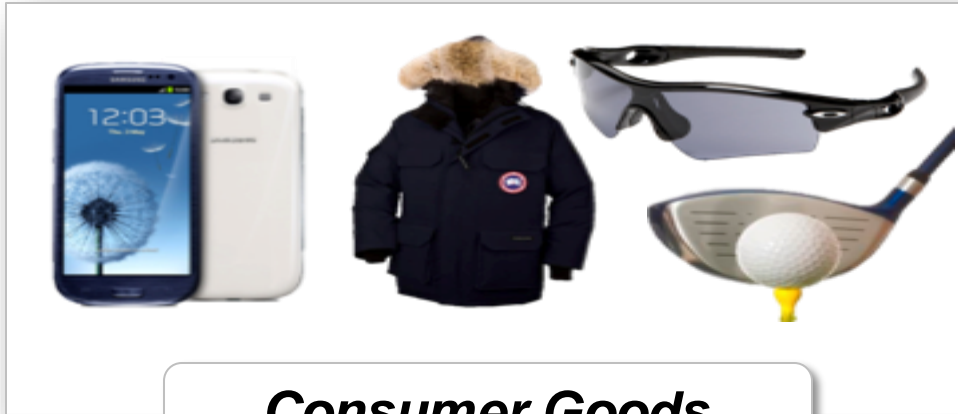


Machine



smarteralloys

Shape Memory Alloys (SMA's)



Consumer Goods



Dentistry



Automotive



Medical Devices



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FRANÇOIS ROBITAILLE
Co-Founder & CFO, XpertSea



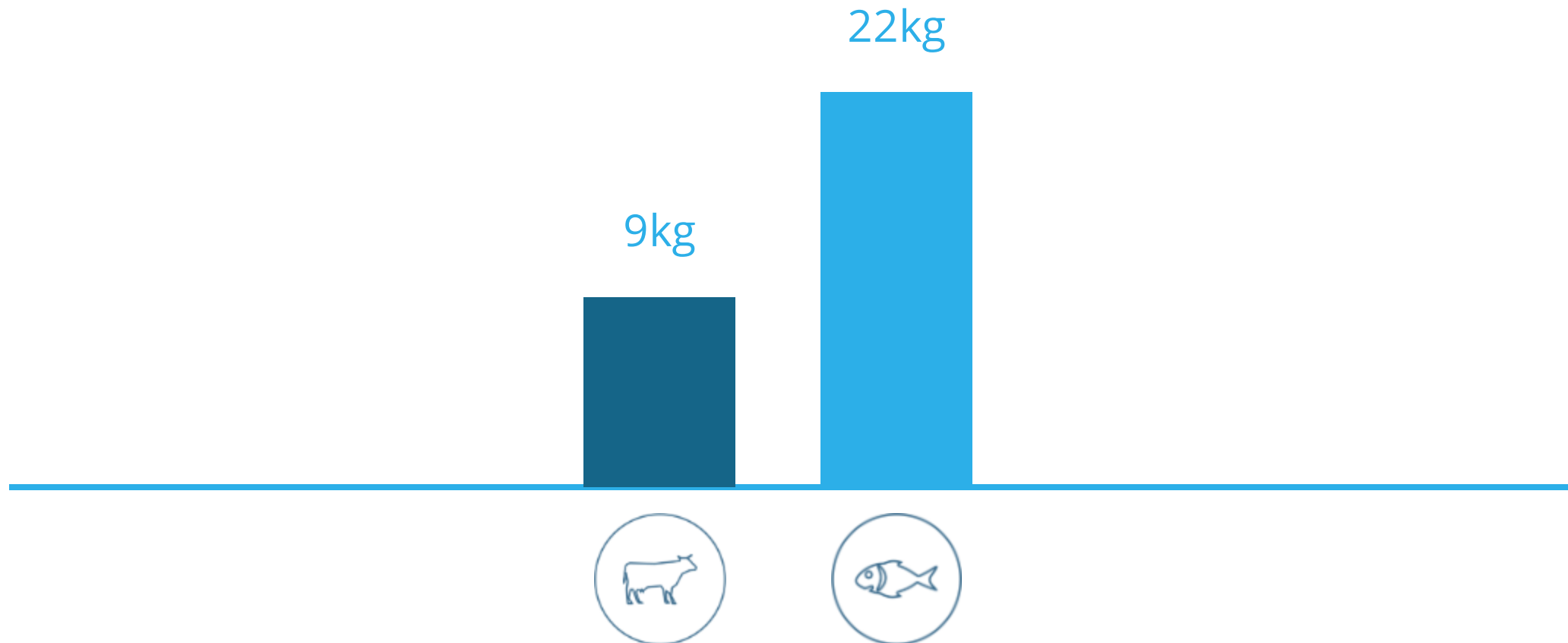
Aquaculture Data to Feed the Planet







WORLD'S CONSUMPTION PER CAPITA PER YEAR TODAY















NỘI DUNG CÔNG VIỆC (Work)

VIỆC NÊN LÀM KHÔNG CHỜ AI NHẮC NHỞ.
VIỆC NÊN TRÁNH KHÔNG CẦN AI NGĂN NGỪA.

26/3: Khai c/nhân chú ý:

+ Vợt trộm thỏ Nam Cá Lân đầu tiên Cấm K'

đi Lượ vật t/ăn cho r/g

A Tâm

29/03: C Nhân chú ý: Khai c/nhân chú ý

- Từ nay các vôi nước phải móc lên.

- Các cây Hecto phải để thưng dây sủa.

+ Phải theo dõi t/nạn vì thời tiết lạnh $30.5^{\circ}C$ $20^{\circ}C$ $10^{\circ}C$

31/03:

Đôi: 4 → 3.5
A: 2kg
B: 1.5kg

Hèo: 10.5 → 8
B₁: 2
B₂: 2
B₃: 2
B₄: 2

Đôi: 7 → 6.5
B₁: 2
B₂: 2
B₃: 2
B₄: 2

ĐM: 26/04
♀ 260-5 = 431cm
♂ 260-7 = 423cm

TÔM CHẾT (Die)

Ngày	H ₁	H ₂	H ₃	H ₄	H ₅
3/03					1 ^{5c}

Nhau (Egg)

BẢNG THỨC ĂN (Feed)

3 ^h 00	7 ^h 00	11 ^h 00	15^h00	19 ^h 00	23 ^h 00
H ₁ M ₁	M ₁	M ₁	M ₁ 13 ^h 30	M ₁	M ₁
1800	1900	2500	400	2500	2500
2300	2300	3100	500	3100	3100

12/5/7 (24/03 → 30/03/2H)

THỨC ĂN DỊ

3 ^h 00 ^(H)	7 ^h 00 ^(H)	11 ^h 00 ^(H)	15 ^h 00 ^(H)	19 ^h 00 ^(H)	23 ^h 00 ^(H)
00(30)			00(0)	00	00
00(40)			00(0)	00	00

Nhờ ghi đầu cuối
Ngày: 30/03/2012 (SEX)

SLTT: 104
SLGV: 64
16 80

* Hiệu (c) lãnh số nhất h/đồng ngày B₁

* Ngày 29/03

B₁: 78 / 107 (5đe' H₁)
50 28 (80 de')

R₄ K₂₂
28 26
30 29
34 28
31 32
28 30
10.1 9.6^m

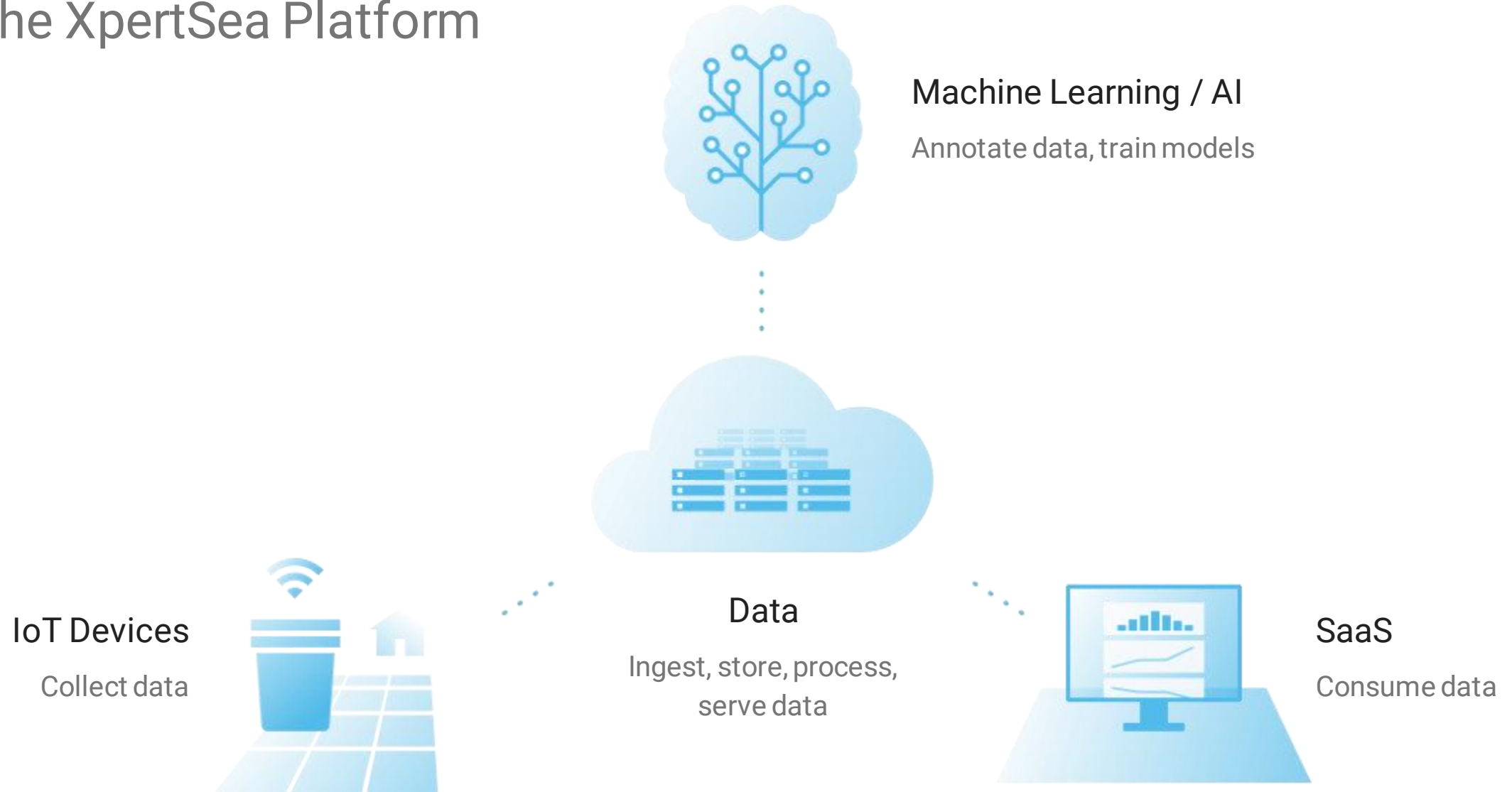
19.7^m (8đ)

B₂: 59 / 75 (3đe' H₁)
50 9 (61 de')

R₂ K₁₁
47
45
40
44
41
14.4^m (6C)

23.6^{v/c}

The XpertSea Platform



#1

Collect accurate field data with
smart equipment

XpertSea created the XperCount to collect animal data

A patented computer vision device for imaging, counting, sizing & monitoring the quality of aquatic organisms



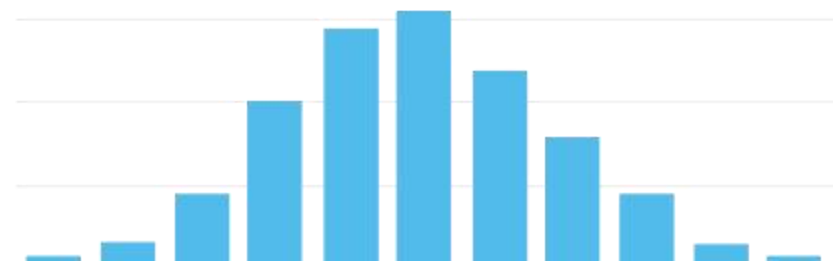
Total count

2,817

Average length

8.19 mm

Size distribution



The XperCount collects production data at all stages



Nauplii counts



Microalgae densities



Artemia hatch rates



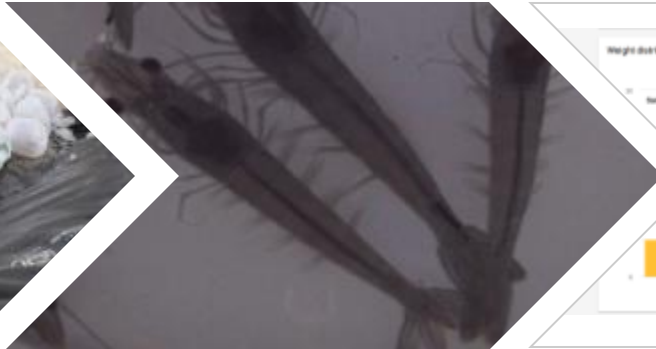
Post-larvae growth/quality



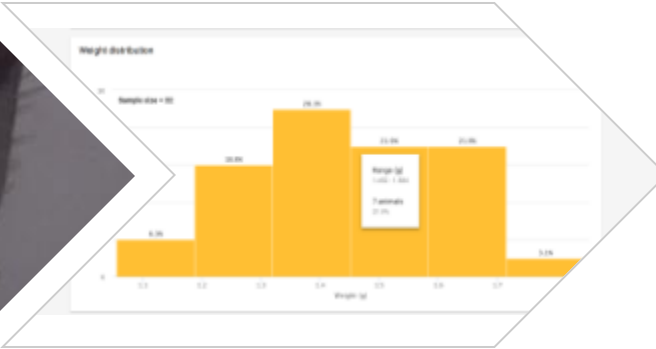
Post-larvae shipments



Farm pond stocking



Shrimp weight in ponds



Harvest quality

AI Accelerated Applications Development



Whiteleg shrimp
nauplii
Litopenaeus vannamei



Whiteleg shrimp
post-larvae
Litopenaeus vannamei



Whiteleg shrimp
adult
Litopenaeus vannamei



Giant tiger prawn
nauplii
Penaeus monodon

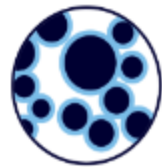


Giant tiger prawn
post-larvae
Penaeus monodon

Shrimp



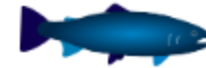
Artemia nauplii
Artemia salina



Microalgae
Multiple species



Rotifers
Brachionus plicatilis



Trout and Tilapia



Seabass and
Seabream

Live feed

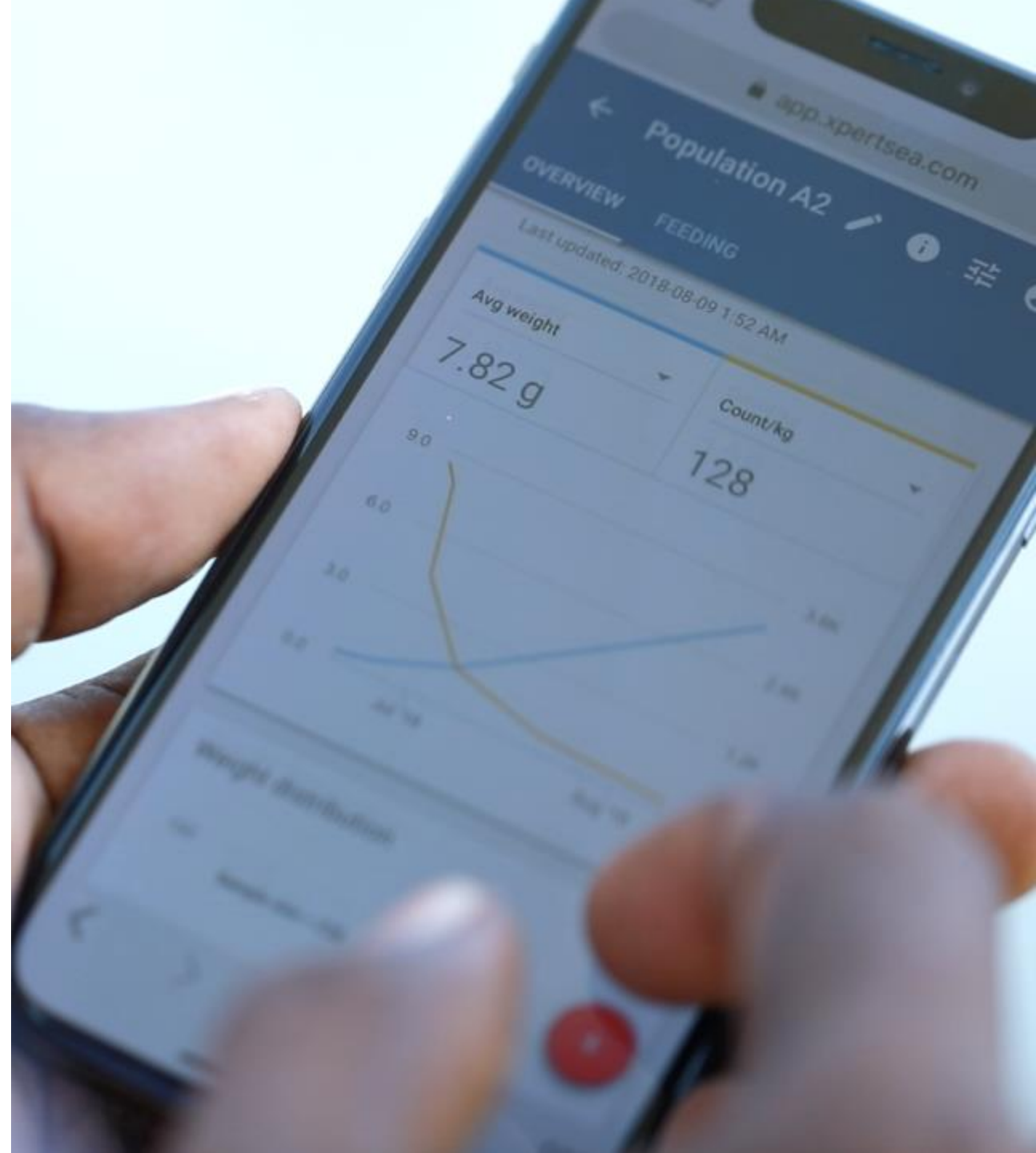
Fish

#2

Use a growth platform for
everyday management

From field to cloud

A complete online platform
for farm data management



Manage shipping and purchase history, stocking densities and track supplier performance with shipment audits

Receptions

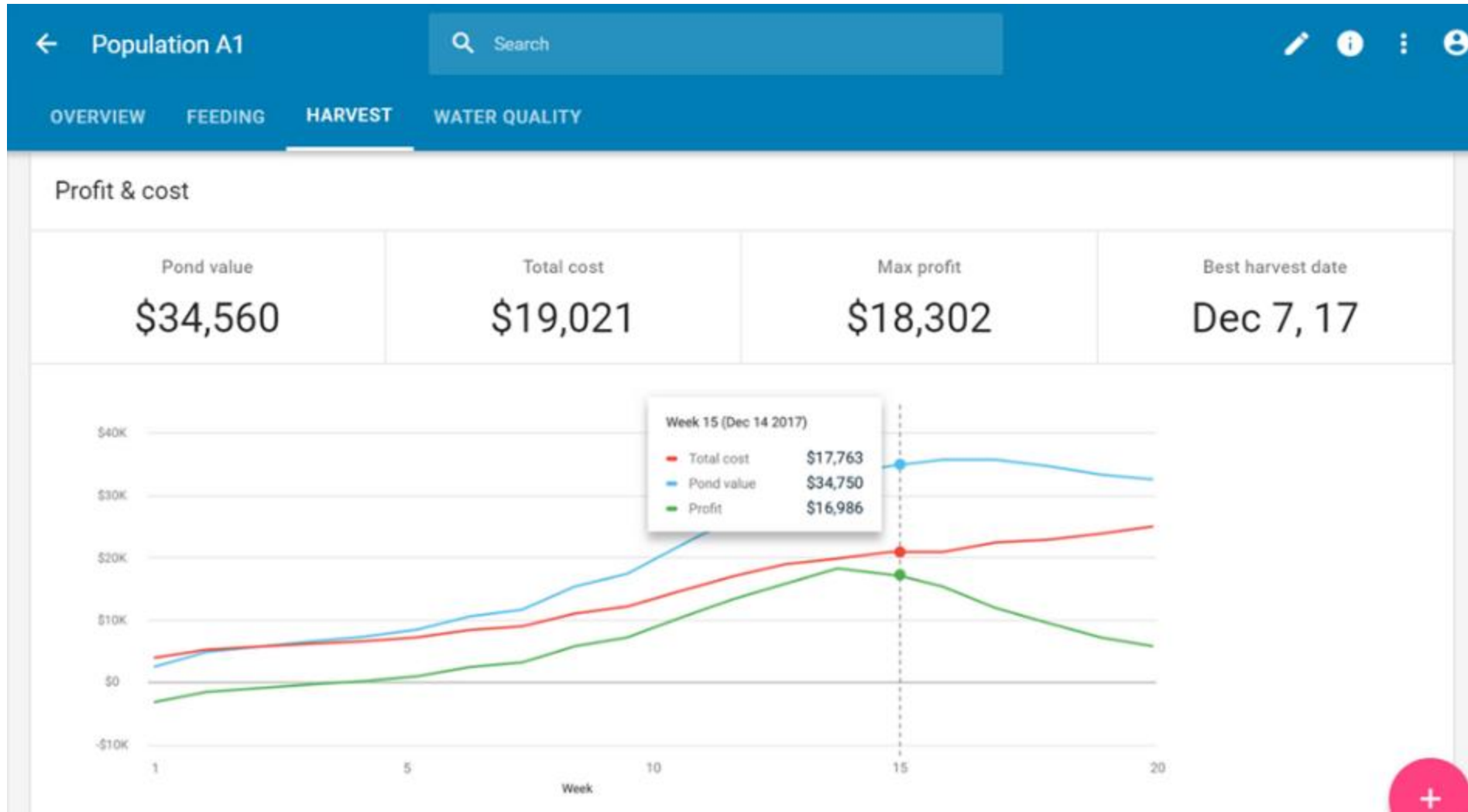


Whiteleg shrimp post-larvae



Date & time	Provider	Amount ordered	Animals received	Order difference	Bags received	Bags sampled
2018-07-29 5:51 ...	Riy	900,000	1,067,474	+18.61%	553	3
2018-07-01 9:42 ...	Rite	1,500,000	2,247,000	+49.8%	500	3
2018-07-01 12:0...	N	1,300,000	1,765,369	+35.8%	721	2
2018-06-24 7:41 ...	R	257,400	254,007	-1.32%	117	2
2018-06-24 7:30 ...	Radhe	255,000	269,175	+5.56%	150	2
2018-06-24 7:21 ...	Rad	327,600	296,751	-9.42%	182	2
2018-06-24 7:10 ...	Radhe	363,600	467,630	+28.61%	202	2
2018-06-22 8:31 ...	Shi	1,800,000	2,426,000	+34.78%	600	3
2018-06-18 1:24	Nik	600,000	841,449	+40.24%	357	3

Optimize profit by selecting the best harvest date based on our predictions



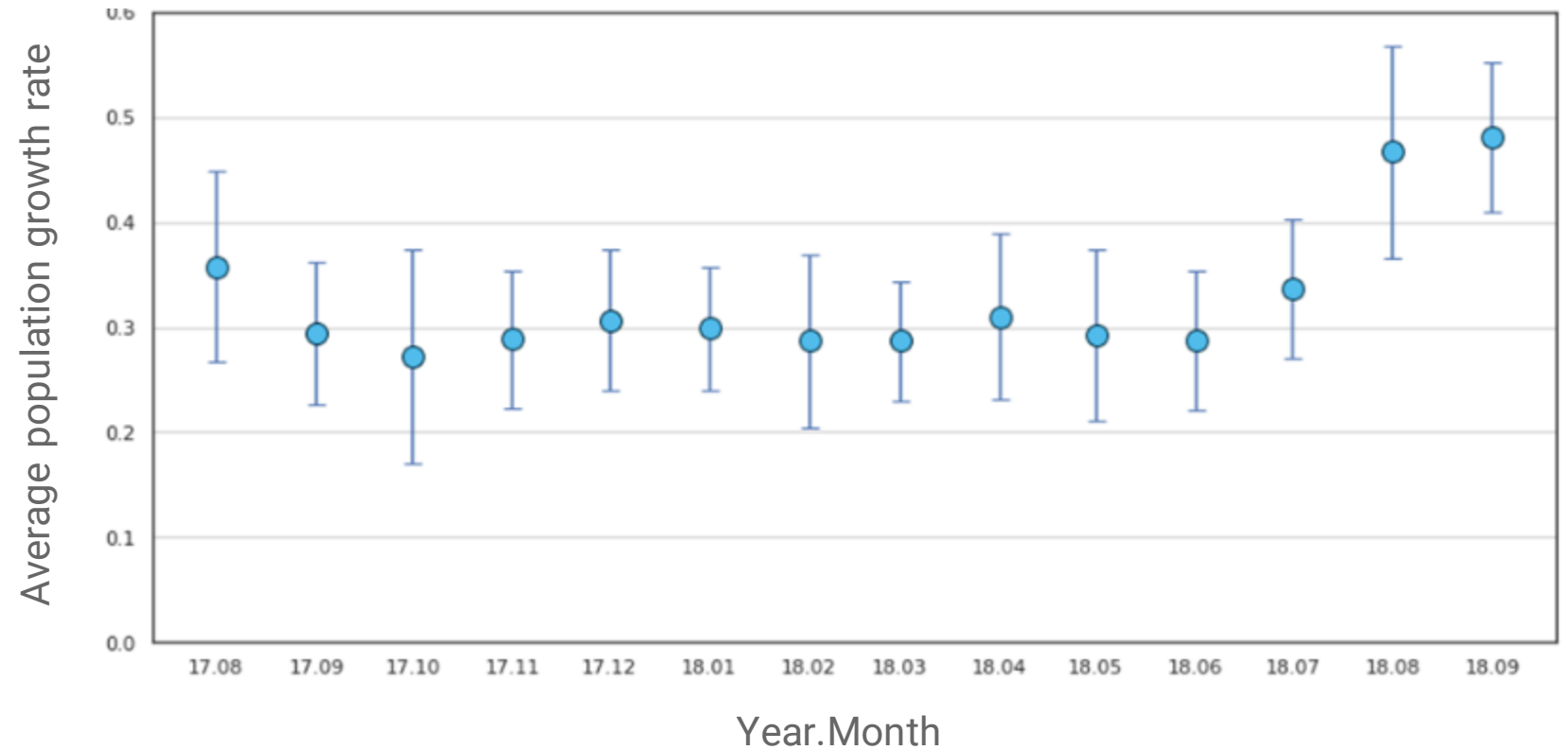
#3

Use big data to improve
efficiency over time

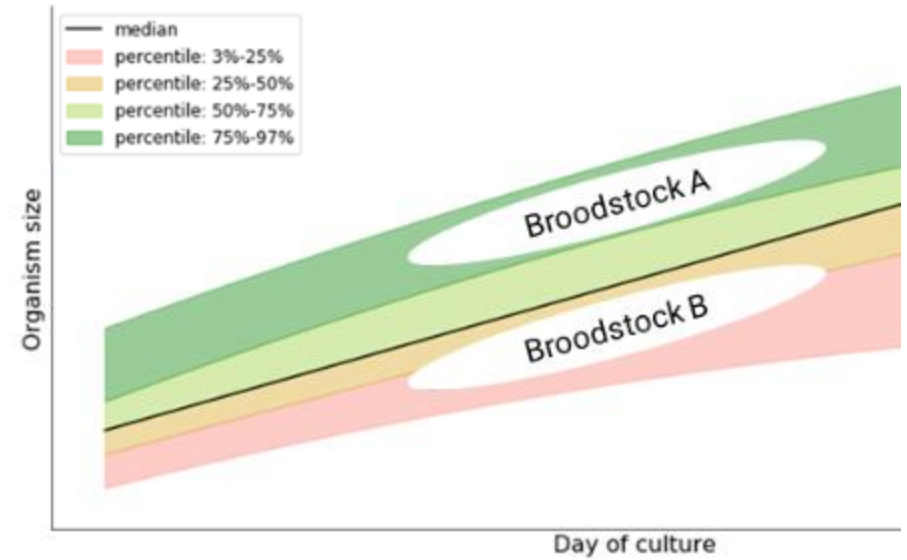
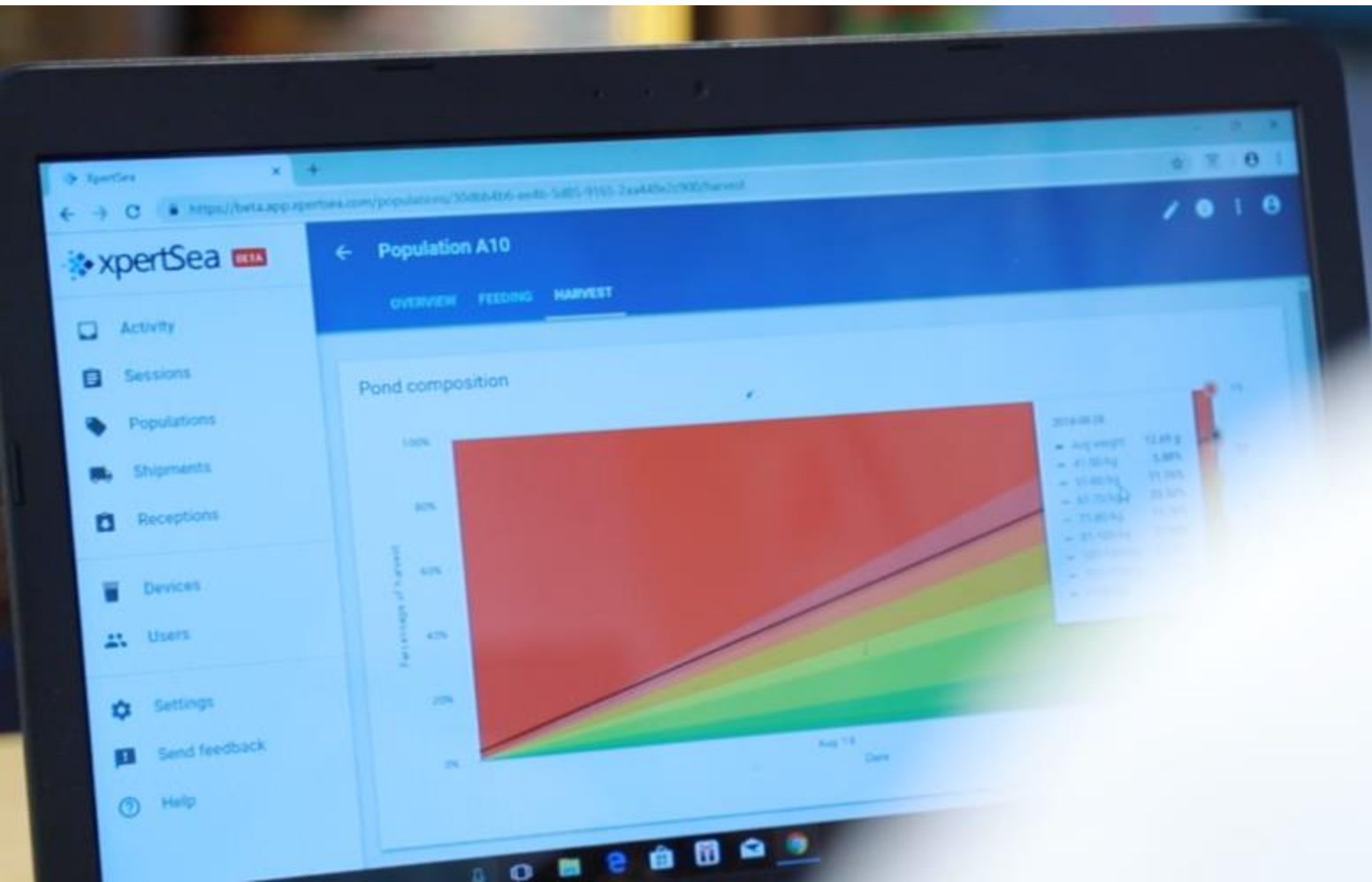


Hatcheries have visibility over their performance

Post-larvae growth rate over time



Benchmarking shrimp post-larvae growth and quality against industry results from over 25,000 production cycles



XpertSea Today

- Based out of Québec City
- Field Staff:
 - Vietnam
 - Indonesia
 - Thailand
 - India
 - Mexico
- Over 50% of Vietnam Shrimp Production
- Product sold in 35+ countries
- Over 150M animals processed monthly
- Series A of 7.5M USD in April 2018
 - Aqua-Spark
 - Obvious Ventures
 - Real Venture



From large multinational agribusinesses..



43B annual revenue



15B shrimp seed/year



World's largest shrimp farm



Shrimp feed tech leader



Asian agri-food leader

... to small independent farmers.





Thank you

François Robitaille

Co-Founder and CFO





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MAX SCHULZE

Advisor, Cloud&Heat

Partner, New Bridge Founders

CLEANTECH FORUM

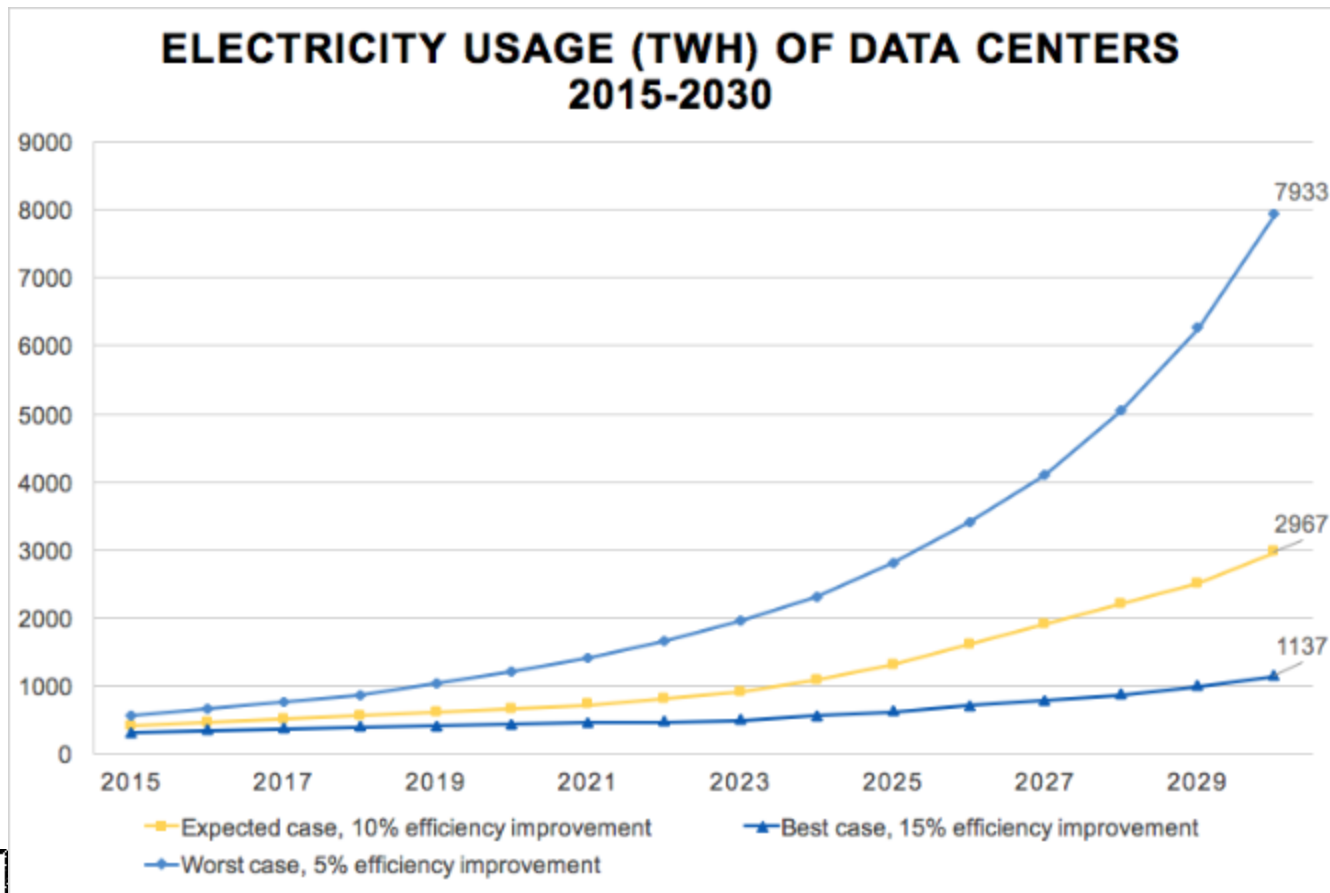
CLOUD
& HEAT



2018/11/14

**OUR GOAL: TO CREATE THE WORLDS MOST
COST-EFFICIENT & SUSTAINABLE DIGITAL
INFRASTRUCTURE.**

NEW TECHNOLOGIES DRIVE INCREDIBLE DEMAND FOR DIGITAL INFRASTRUCTURE



- » Artificial Intelligence
- » Advanced Analytics
- » High-Performance-Computing
- » Blockchain-Mining
- » Internet-of-Things
- » Big Data

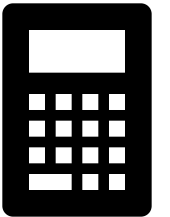
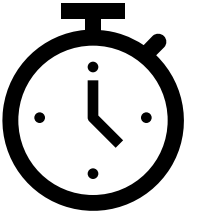
All of these incredible unprecedented amount of computing power.

BUT THEY REQUIRE A DIFFERENT KIND OF DIGITAL INFRASTRUCTURE

- » Artificial Intelligence
- » Advanced Analytics
- » High-Performance-Computing
- » Blockchain-Mining
- » Internet-of-Things
- » Big Data



- » **Low latency**
- » **Local & close to where data is generated**
- » **Extremely cost-efficient**



BUILDING DATA CENTERS IN ASIA IS FACED WITH CHALLENGES:



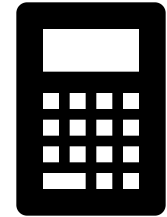
Difficult cooling

Due to climate conditions cooling is a major challenge



Unstable power supply

Creating uptime challenges

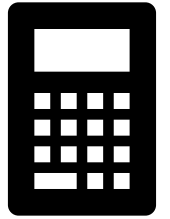


Inefficient

Cooling overhead makes DCs in Asia not competitive

USING OUR LIQUID-COOLING TECHNOLOGY WE CAN SOLVE THE COOLING EFFICIENCY

- » World-record in energy- & cooling-efficiency: only 2.6% overhead
- » Water-cooled with input temperatures up to 50C and output of up to 60C



USING SOFTWARE WE TACKLE THE UNSTABLE POWER SUPPLY CHALLENGE

- » We use state-of-the-art infrastructure software developed by Google, Microsoft & AWS
- » Depending on the setup, we can:
 - Shift loads across locations
 - Predict outages & replicate in multiple locations

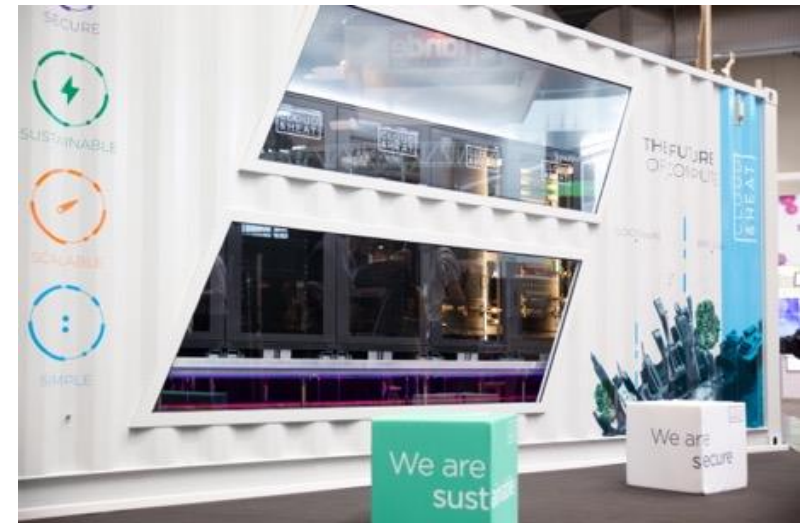


kubernetes



FLEXIBLE DEPLOYMENT USING CONTAINERS & MICRO-DATA-CENTERS

- » Standard ISO Ship-Containers can be used to deploy anywhere
- » Infrastructure can be moved when needed
- » Smallest unit can be integrated into buildings



WE HAVE MANY DEPLOYMENTS ACROSS EUROPE TODAY

22 Buildings across Germany, heating 1000+ homes using our heat-extraction technology.



DREWAG 




**COMMERZ
REAL**

Japan:

Inabata & Co., Ltd.

Company Profile:

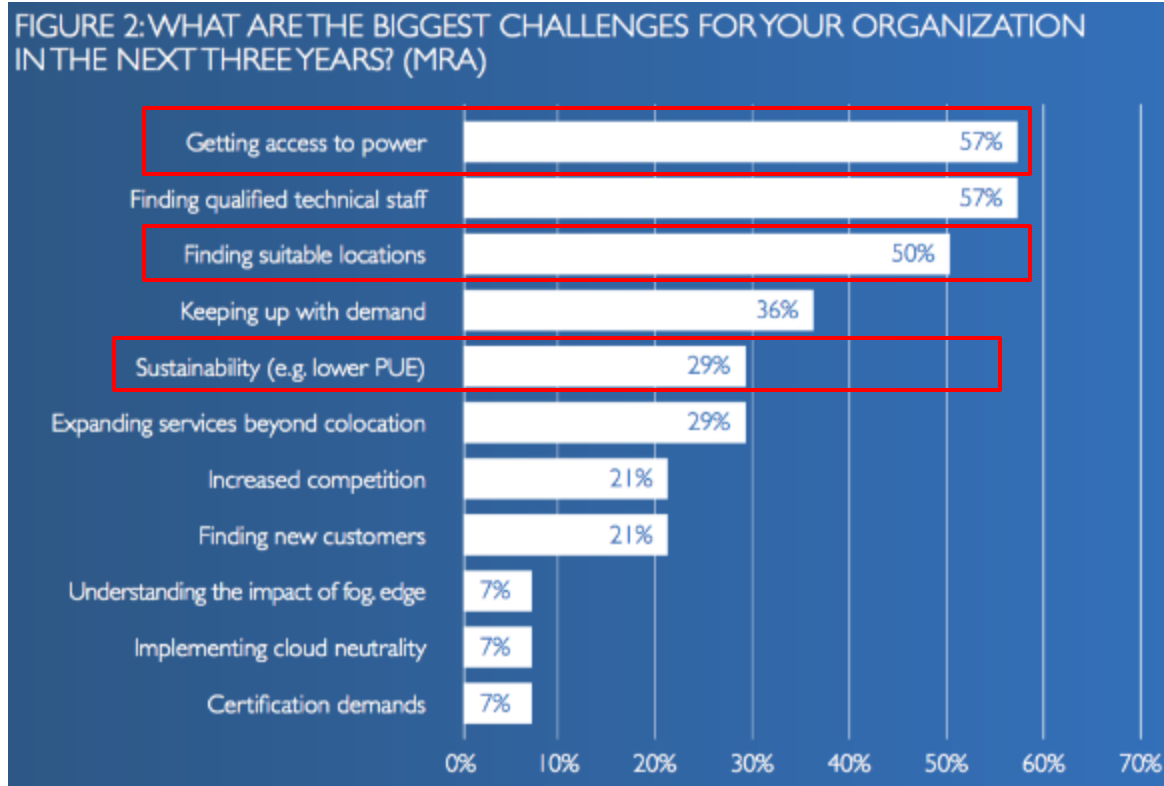
Specialized Japanese trading company with focus on electronic components

Project Dates: 01/2018 - 04/2018



**CLOUD
& HEAT**

CHALLENGES OF INFRASTRUCTURE IS AN OPPORTUNITY FOR UTILITIES



Opportunities for utilities:

- » Power & Locations: Co-locating digital infrastructure with actual power plants
- » Connecting directly to renewable production, due to flexible deployment
- » No energy wasted due to high-efficiency of cooling system

COMPUTING CAPACITY IS A COMMODITY ALREADY, LINKED MAINLY TO POWER

Opex for data centers:

40% is Power

10-20% Site & Grid connection

Commodity markets emerging:



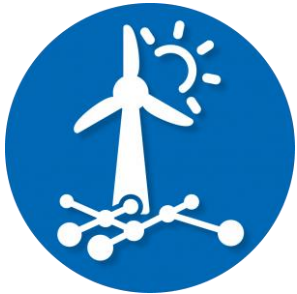
Utilities are entering the market



SUMMARY



We can solve the power, cost & stability challenges of digital infrastructure in Asia, leveling the playing field with regions like the Nordics.

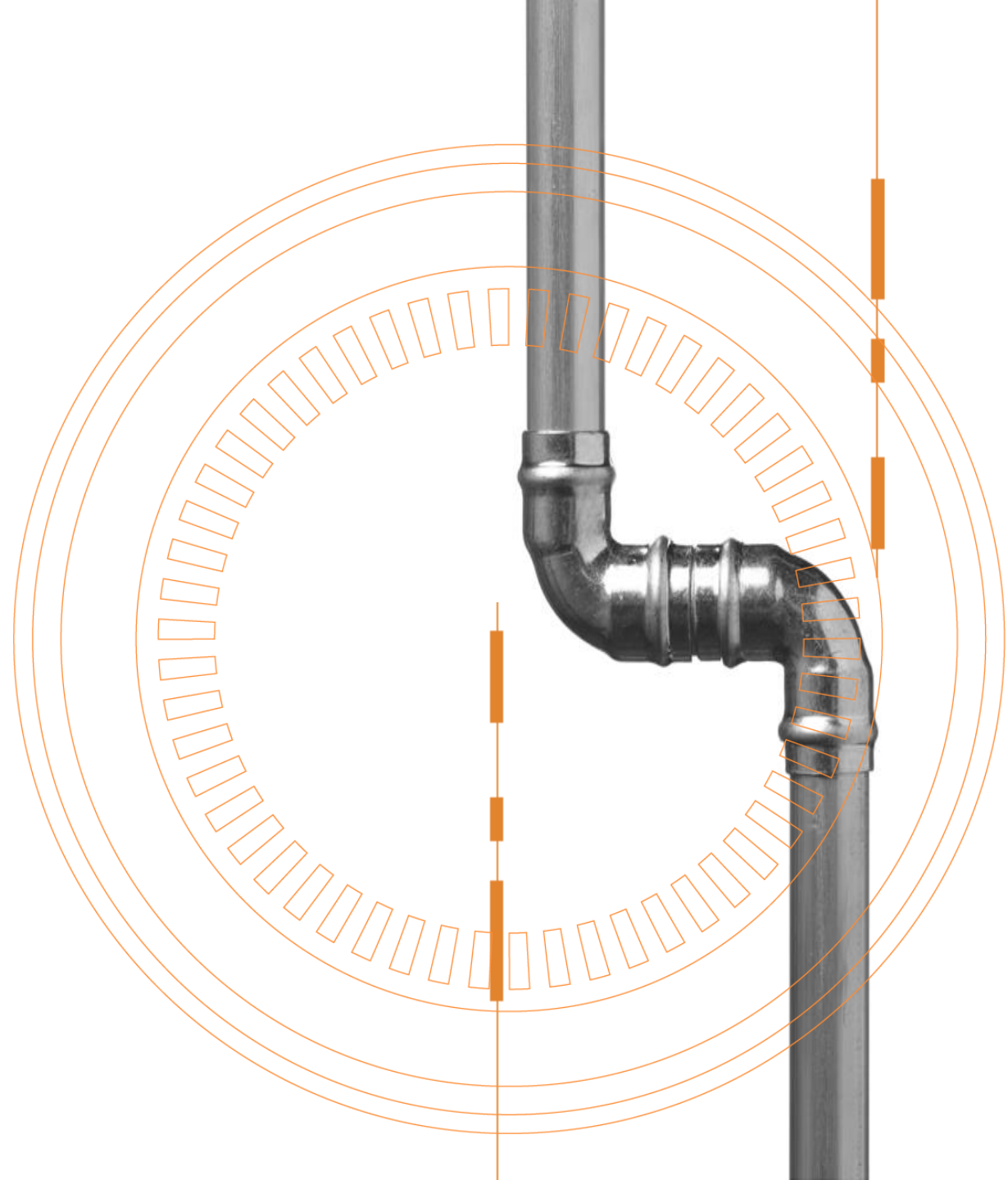


We help utilities expand their offering and verticalize into profitable digital infrastructure sector, same as charging infrastructure.



We are looking for partners, governments & utilities to expand into the APAC region.

THANK YOU!



CLOUD
& HEAT



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BRETT WILCOX

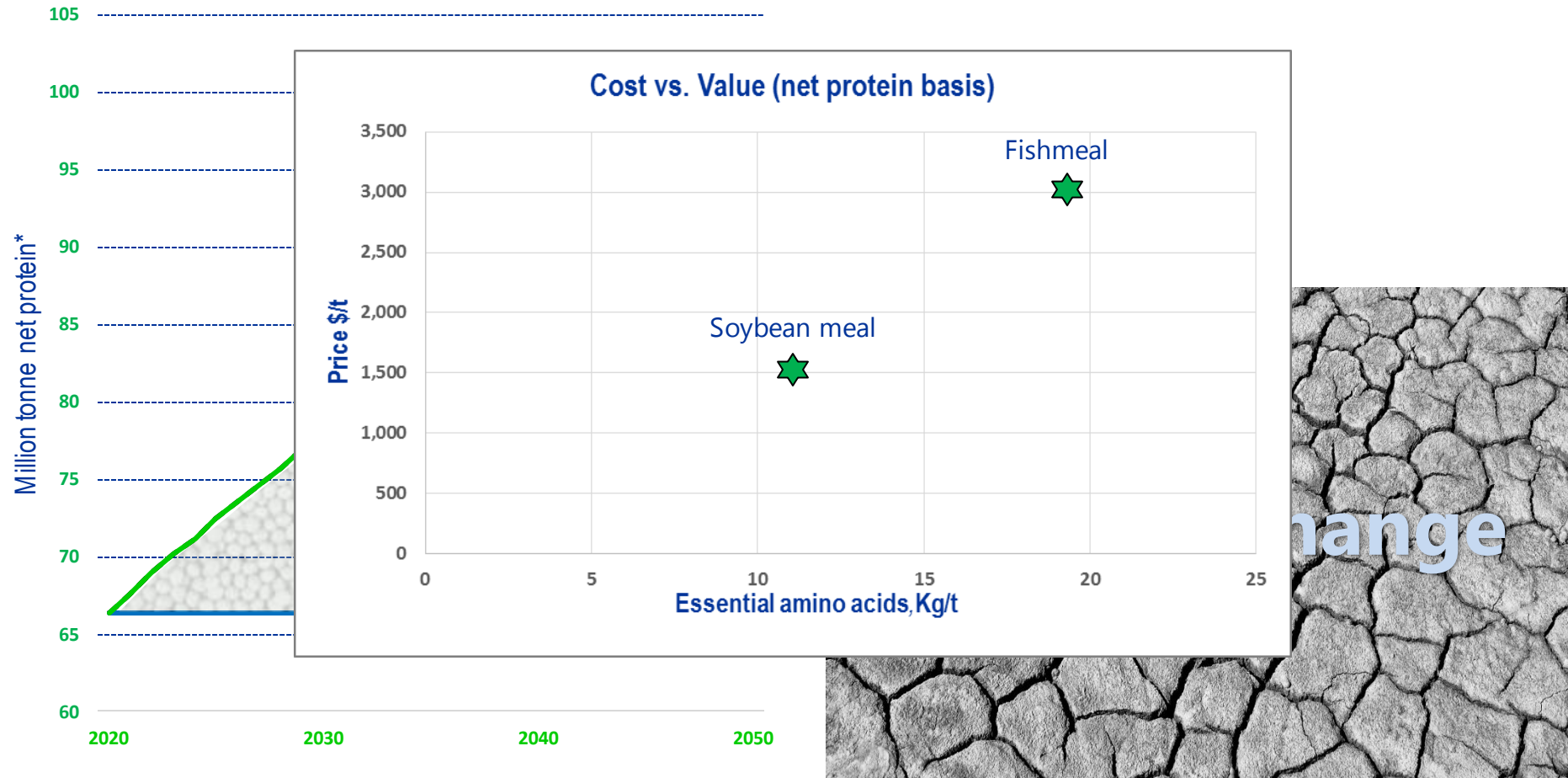
CEO, Cvictus



**Low Cost, Low Carbon, Large Scale
Protein Substitute for Fishmeal &
Soybean Meal in Animal Feed**

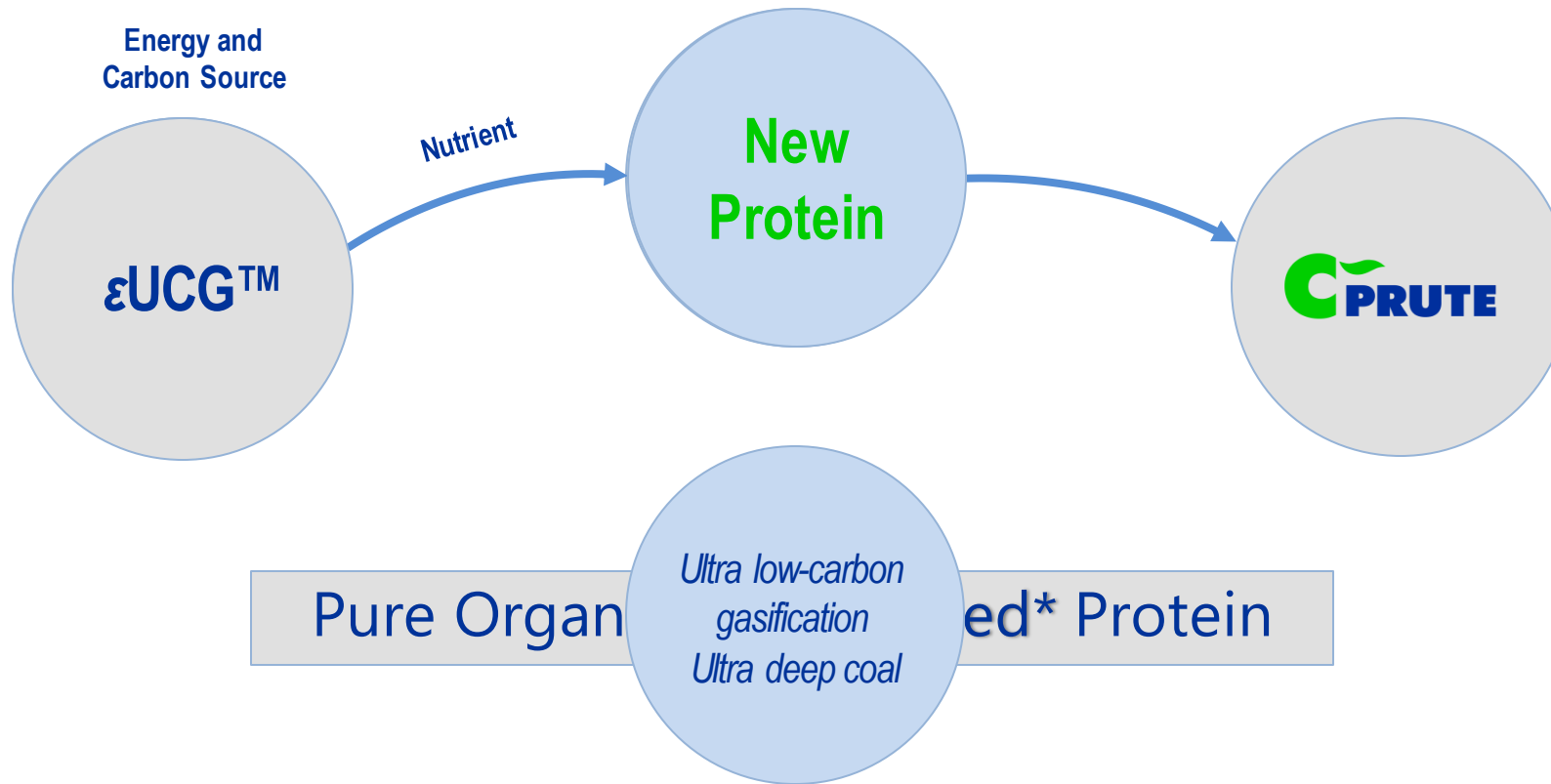
PROBLEM Supply world demand for more & better food

Animal feed protein demand will grow by 50%



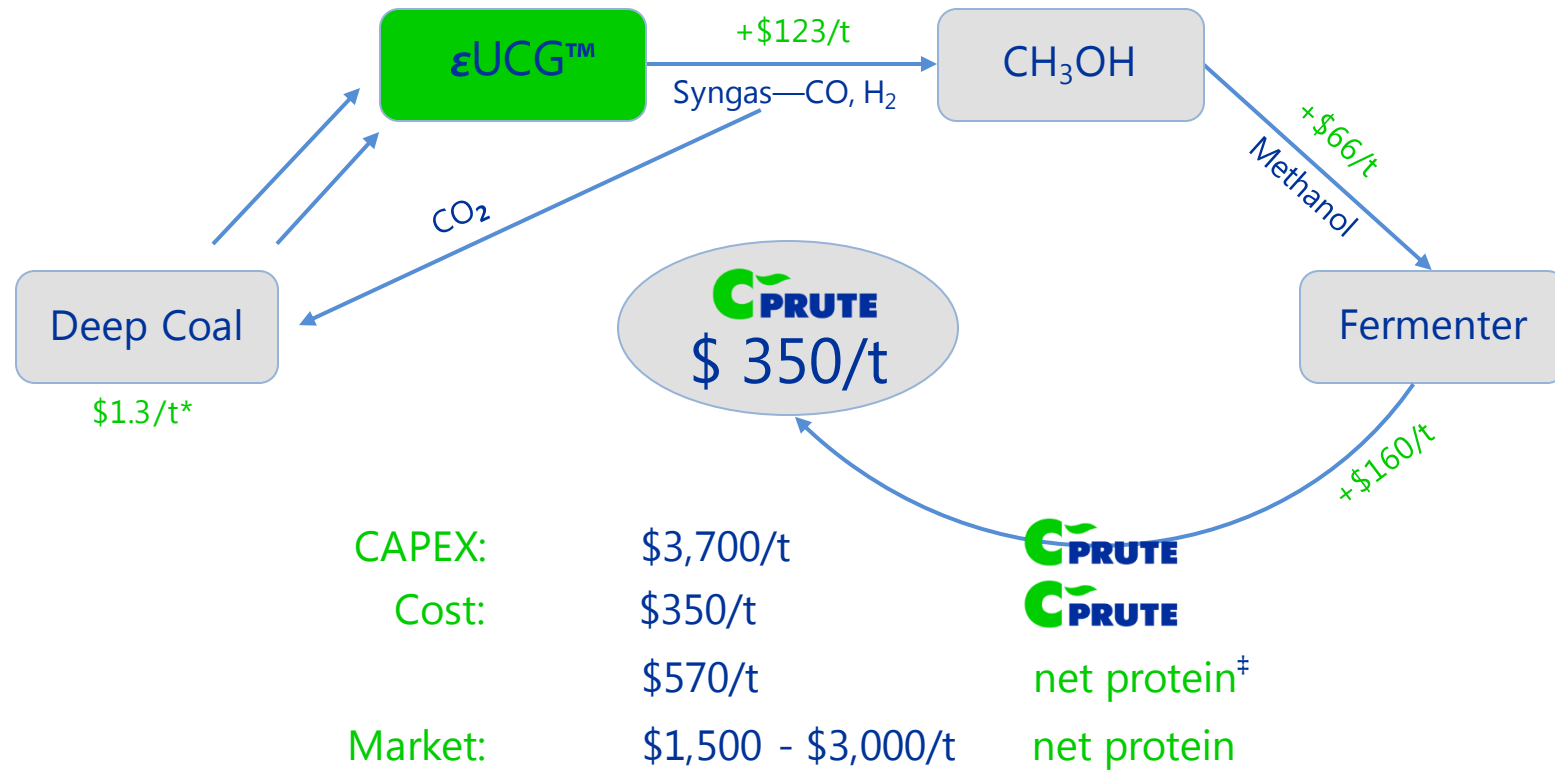
*Net protein – amount of feed protein convertible into animal body protein

Solution A New Way to Make Animal Feed Protein



*Further development is required to make C-PRUTE suitable for a human consumption

Process Low cost, low carbon, large scale, high margin



*All costs are per 1 metric tonne of **C-PRUTE**

[‡] **Net protein** – amount of feed protein convertible into animal body protein

IMPACT Compelling environmental & economic benefits



Pure Organic Animal Feed Protein

- ✓ **Low Cost:** 20% the cost of fishmeal and 40% the cost of soybean meal
- ✓ Helps feed the world, **replenish oceans** and **reverse deforestation**
- ✓ **Reduces CO₂ Emissions**