

# INNOVATION & TECHNOLOGY CONFERENCE 2023

### Innovation Through Advanced Manufacturing Research & Technologies



#### **INNOVATION & TECHNOLOGY**

CONFERENCE 2023 Innovation Through Advanced Manufacturing Research & Technologies

# SIMTech Overview & Initiatives to Support Local Enterprises





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Singapore Institute of Manufacturing Technology SIMTech



SIMTech Overview & Initiatives to Support Local Enterprises

John Yong Deputy Executive Director (Industry) A\*STAR SIMTech







A world-class innovation partner in advanced manufacturing technologies, systems and capabilities



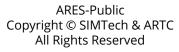








- 1. **Uplift SMEs' Global Competitiveness** through Advanced Manufacturing Technology Innovation, Upskilling and R&D Capabilities
- 2. Enhance the **Manufacturing Value Chain** through Strategic Local Supplier Capability Development
  - 3. Drive **Advanced Manufacturing Research Excellence** in Advanced Manufacturing Processes, Autonomous Manufacturing, Net Zero Manufacturing and Resilient Value Chain





CREATING GROWTH, ENHANCING LIVES



### 2 Shopfronts to Serve a Wide Range of Industries across Value Chain

#### **SIMTech Mission**

- Uplift SMEs' global competitiveness
- Enhance manufacturing value chain

**Companies** 

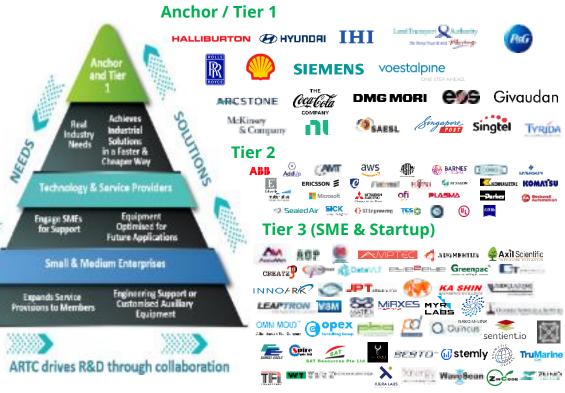
 Drive Advanced Mfg research excellence in 4 S&A themes



Trade Associations

#### **ARTC Mission**

- Catalyse co-innovation & co-deployment through world class industry consortium
- Bridge research and applications
- Translation of A\*STAR Research



#### Focus Sectors:

Transport & Engineering, Modern & Consumer Services, Energy & Infrastructure

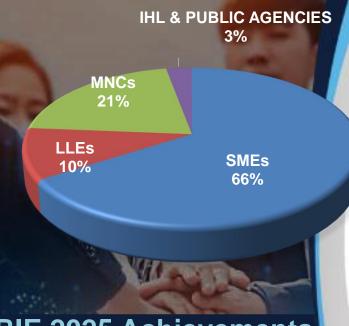


#### Focus Sectors:

Precision Engineering, MedTech, Logistics, Food Manufacturing, General Manufacturing

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### SIMTech INDUSTRY PARTNERSHIP



- **RIE 2025 Achievements**
- 426 Companies served
- 586 Projects completed
- **95 Licenses** signed with companies
- 7 Joint Labs with Local Enterprises





### SIMTech's Innovation Factory & Centres

Mission: To support local manufacturing enterprises in their Innovation, Productization, Digitalisation and Sustainability Journey

**Vision:** To be the one stop technology shop front for the local manufacturing enterprises





#### **Product Innovation** Since 2020,

- supported 60 SMEs & Start-Up
- completed **67 design** projects
- 8 product launches
- help SME and start-up to increase their sales by up to 90%





Enhancing Manufacturing Productivity



### **Automation Innovation**

Since 2013, the centre

- completed 4099 TAP projects
- helped >1000 SMEs to improved their productivity by >20%

#### PE COI Precision Engineering Centre Of Innovation Sustaining and Advancing PE Industry

Manufacturing

Innovation

Since 2007, the centre

completed **1,879** 

840 consultancies

reached out to >15,000

**Industry participants** 

projects





Towards Net Zero Manufacutaring

#### Sustainability Innovation

Since 2009, the centre launched 3 major initiatives

- **Green Compass**
- **Energy Efficiency Monitoring & Analytics** System
- Life Cycle Assessment



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# Innovation Factory

### @SIMTech

Operated by	a	Singapore Institute of Manufacturing Technology SimTech	Supp
Operated by	a	Technology	Supp

orted by Enterprise Sindapore



Innovation Factory @ Level 1M

Design Lab



Material Lab

Electronic Lab Build Lab Move Lab

**Objectives** 

- To plug the current gaps in **SMEs looking to** develop their own products
- To help SMEs scale up to pilot production

### **Target Group**

- SMEs aspiring to be **Product Owners**
- 2<sup>nd</sup> generation SME owners

### Value Capture

- Enable local **SMEs to move up the value chain**
- Expand business opportunities with R&D ecosystem partners

### **Achievements**

- Onboarded and supported **67 companies**
- Helped 7 local enterprises launched their **own products** -> generating economic impact

Day 1 (AM) Session



### **IF** support companies to launch product



Accurate feedback on temperature and humidity





JM Vistec 3D Projection Scanner

To enhance Al, 3D confocal intelligence in the manufacturing



Content of the second s

**Edible Innovations** 

Superfoods baked into cutlery-

shaped, making being healthier

and reducing plastic waste

crunch cutlery Crunch Cutlery GINLEE GIN LEE 3D Pleating Device

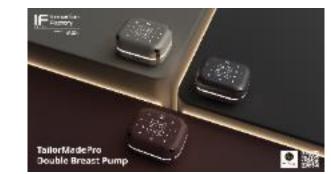
> A pleating device to reduce material usage and improve productivity

Day 1 (AM) Session



### INNOVATION LABS

Smallest hospital-grade double breast pump with calming the mood and regulate breaths



LIM TAN METOR

Electric motorcycle battery swapping station that is powered from renewable energy sources (solar-powered)



**SJAHTech** 

Ceramic-alloy waist wearable provides relief from inflammation, aches and improve blood circulation





## **PE COI** build up local competencies on Advance Manufacturing Processes





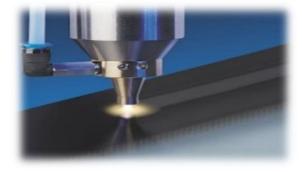
3D Additive Manufacturing

Parts with complex design and geometries



#### Functional & Structural Material Manufacturing

Hybrid metal composite components with high strength-to-weight ratio and enhanced thermal performance

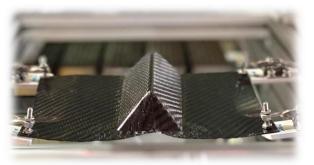


Surface Engineering Advanced surface treatment and sustainable coatings



#### Laser aided Additive Manufacturing & welding

Large format high temperature alloy components



#### Polymer & Composite Manufacturing

Lightweight structural thermoplastic and hybrid composites

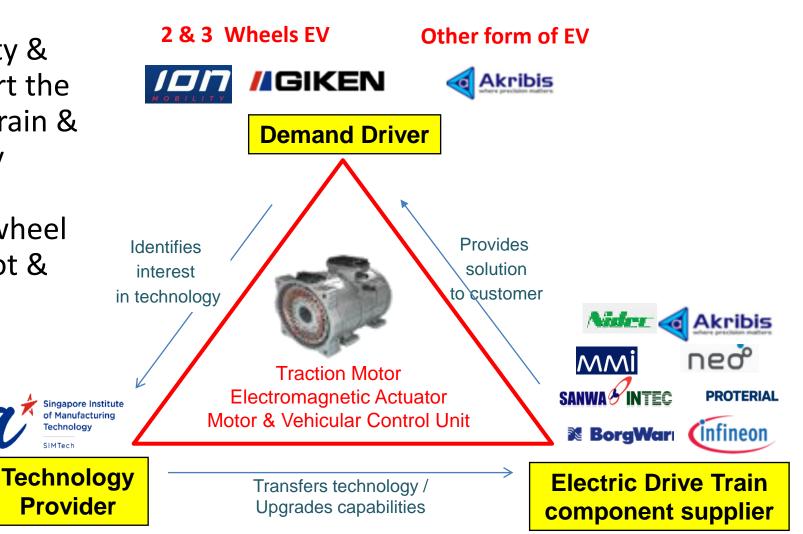
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## **MPTC** build up local competencies in electric motors to support EVs, AGV, Robotics and Drone applications

- Develop local capability & supply chain to support the grow of electric drivetrain & electrification industry
- Application for 2 & 3 wheel EVs, AGV, Mobile Robot & Drone





Day 2 (AM)

Session



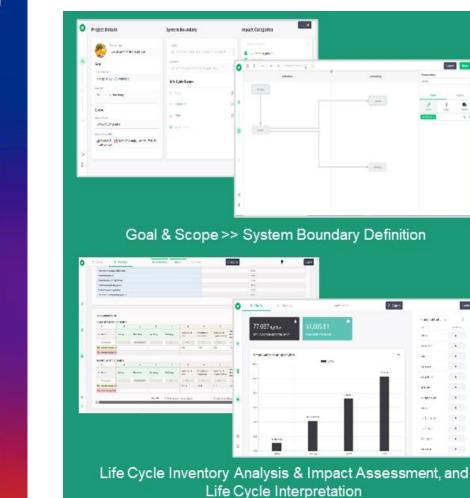
## **SMC** build life cycle assessment & costing tools

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SIMTech developed a life cycle assessment and costing tool and dashboard that allow businesses track their energy consumption and carbon footprint.



### **Key Benefits:**

to **monitor** the energy consumption, water utilisation and carbon emission in one dashboard

Day 2 (PM) Session

Life Cycle ssessmen

Platform

- to **compute** the carbon footprint and other environmental impacts across supply chain
- to provide decision support for carbon pricing
- to compute & monitor ROI of Sustainability Initiatives



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CREATING GROWTH, ENHANCING LIVES

## **MoU Signing between A\*STAR SIMTech & SPETA**

- Co-organize on supplier development activities, tapping on SIMTech's network of MNCs and SMEs.
- Promote various aspects of **sustainability** to different segments of the manufacturing audience.
- Co-organize a series of technology scan events for the SME manufacturing audience.



SPETA – SIMTech workshop on Innovation

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SPETA Members visit to Innovation Factory



## **Thank You**



Singapore Institute of Manufacturing



#### **INNOVATION & TECHNOLOGY**

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## **Product Innovation**

### Mr Rayner Ng Acting Director Innovation Factory, SIMTech

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Operated by Singapore Institute of Manufacturing Technology Sintrech Supported by



## Introducing Product Innovation and the IDEA Model

**Rayner Ng** 

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### OFFERS

### FACILITIES

**Build Lab** 

Leverage best-in-class 3D

printers and the Design Lab,

spend time with simulation technology to reduce trial and error tests and find build

configurations that succeed.

#### Material Lab

Explore materials, sustainable concepts, auxetic and kinetic designs, 3D sensing, displays, AR / VR and mixed media solutions. Delve in a web of knowledge in materials and the ability to realize potential in innovative ways.

#### Electronic Lab Embark on exciting innovation on analog, digital, power electronics and embedded systems; with advanced manufacturing across supply chains and during product

and system design phases.

Mechanical Lab

All necessary tools to explore differentiating capabilities in electromechanical, robotics and automation.

#### **Design Lab**

Combined with flexible outsourcing business models and project managementexperience we provide excellent design services, consultancy, and engineeringsupport to our customers

#### MEMBERSHIP BENEFITS

 Recognition Consultation Access to Innovation Factory Use of Design Tools and **•**Training and Design Equipment Workshop •Exclusive Membership Access Card AND MUCH MORE TO EXDLODE!

Workshop

We provide training and design workshop in the areas of Product Design, Industrial Design and Product Modeling to deliver innovative and higher quality products at lower cost.

institutions in many sectors.

Working with a diverse set of partners gives us an unique perspective when posed with complex problems. With our ever-expanding network of references, we can come up with innovative and ingenious solutions.

### Research & Design

Our teams help companies resolve complex issues using stategic Design Thinking process.

#### Innovation Projects

We work with an assortment of companies, organisations and

#### **Ideation &** Consultancy

We provide best-fit consultancy and advice to our companies. Collaborating with key experts and teams, we will scope projects with companies, with the intent of providing the best solutions.

#### **Equipment &** Tools

We provide a co-working space for companies to embark on a design thinking journey, to tinker and ideate, with equipment and tools for prototyping.

Companies can build product design capabilities, investigate ways to develop better products and compete in this exciting

Creating an Design Tap on:

 Equipment Design MedTech Devices Digital Solutioning Electromechanical

Modules

 Software Programming

#### Engineering

Robotics

Sensors & lot

Simulation

-AI & VR

JOURNEY

Gain access to a pool of technology experts and equipment:

#### Application

 Additive Manufacturing Set up pilot Vision & Inspection production line Advanced Materials

 Model Factory **Digital Solutioning** 

 Product / Module Performance Validation and Assesment

#### Creating design possibilities



# IDEATION

#### Ideation

ecosystem with application of Design Thinking methdologies

> Advanced Product & Engineering Design Prototyping

Open Source Software

·Ready-to-Go Solutions

Innovation Factory

### PROJECTS & PROTOTYPING

#### MECHANICAL, ELECTRONICS AND ELECTRICAL

# Factory

#### **Core Capabilities & Services**

#### **Product Innovation** Creative IDEA process to drive innovation

#### Engineering Design & Development Electronic, Mechanical, Software Design



Design Concepts Industrial designs, CMF, UIUX

Industry Engagements Workshops & Facilities

Prototyping & Product Launches
 3DAM, Materials, Batch Production

Creating design possibilities

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FLEXMECT

#### UI/UX AND SOFTWARE







### The IDEA Model 1.IDEATION

# 2.DESIGN

# **3.ENGINEERING**

### Engineering Journey Program

Access pool of experts from RIs, IHLs, COIs:

- Additive Manufacturing
- AI, Sensors & IoT
- Vision & Inspection
- Advanced Materials
- AR, VR, Simulation
- Robotics & Automation





## **4.APPLICATION**

## Scale-up to Pilot production program

- Assist SMEs to set up Pilot Production line
- Partner with Contract Manufacturers
- Model Factory Digital Solutioning
- Product / Module Performance Validation and Assessment

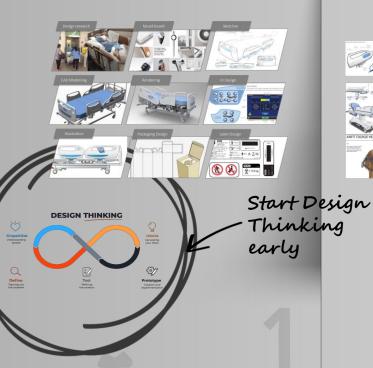






### Ideation Journey Program

- Creating an ecosystem with application of **Design Thinking** methodologies
- Exchange of ideas between demand and supply drivers
- Design workshops



### Design Journey Program

Execute projects with outsourcing and collaboration.

- Product & Engineering design
- New Product Development
- Embedded Systems
- Designers & Consultants

# 

### **Product Launches with Industry Partners** 2021 – 2022

2021



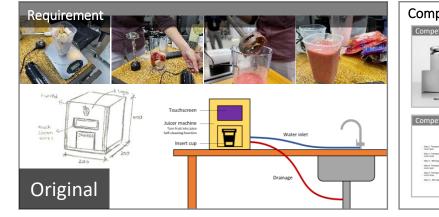
2022



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Factory

### **Smooder – Design of a Self-service Smoothie Machine**







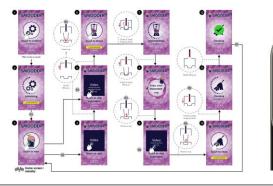




A. Worldly Gray / Piano Blac Premium | Classy | Sleek B. Worldly Gray / Creamy White C. Forged Black / Carmine Red

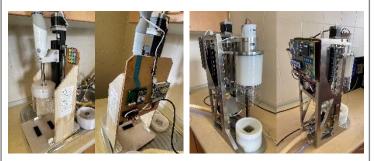
Glam | Royal | Vibrant Lavish | Nature | Authentic

#### **Touchscreen Control**





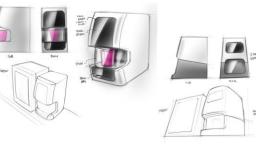
#### **Engineering Design**

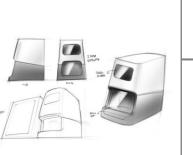


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### **Ideation Sketches**







### **Innovation Factory Layout**

### **Material Lab**

Explore materials, sustainable concepts, auxetic and kinetic designs, 3D sensing, displays, AR / VR and mixed media solutions. Delve in a web of knowledge in materials and the ability to realize potential in innovative ways.

### **Electronic Lab**

Embark on exciting innovation on analog, digital, power electronics and embedded systems; with advanced manufacturing across supply chains and during product and system design phases.

### Mechanical Lab

All necessary tools to explore differentiating capabilities in electromechanical, robotics and automation.



### **Design Lab**

Combined with flexible outsourcing business models and project management experience, we provide excellent design services, consultancy, and engineering support to our customers.

### **Build Lab**

Leverage best-in-class 3D printers and the Design Lab, spend time with simulation technology to reduce trial and error tests and find build configurations that succeed.

### **IFinity Lab**

Offers a premium environment to support members on their business needs

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#### **INNOVATION & TECHNOLOGY**

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## **Keynote for Product Innovation**

Prof Tai Lee Siang Centre Director DesignZ, Head of Pillar, Architecture and Sustainable Design, Programme Director, Design and Artificial Intelligence

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# Design for a

What must we do ?

NET World

Prof Tai Lee Siang 14 July 2023



# Contents

### 1. Why Net Zero?

- 2. What must organisations rethink?
  - Net Zero Processes
  - Net Zero Environment
- 3. Develop a Net Zero Roadmap
  - Net Zero Organisation
  - Net Zero People
  - Net Zero Education
  - Net Zero Campaign



# Why Net Zero?

- Urban Emissions
- More people in cities
- Net Zero Formula
- Is Net Zero possible?





## Urban Emissions

The operations of buildings account for 30% of global final energy consumption and 26% of global energy-related emissions1 (8% being direct emissions in buildings and 18% indirect emissions from the production of electricity and heat used in buildings).





### More people in cities

Today, some 56% of the world's population – 4.4 billion inhabitants – live in cities. This trend is expected to continue, with the urban population more than doubling its current size by 2050, at which point nearly 7 of 10 people will live in cities.





### Net Zero Formula

The net zero formula seeks to balance the amount of GHG produced and removed.

### Reduce Emissions Reduce, reuse and recycling

Problem

Reduce emissions

means increased

cost and reduced

output

X

Remove Emissions Eliminate, avoid and sequest

### Problem

Businesses are unwilling to make the first move to change their model Greater awareness of Net Zero and willingness to advance

### Net Zero

Balance between GHG produced and removed from the atmosphere

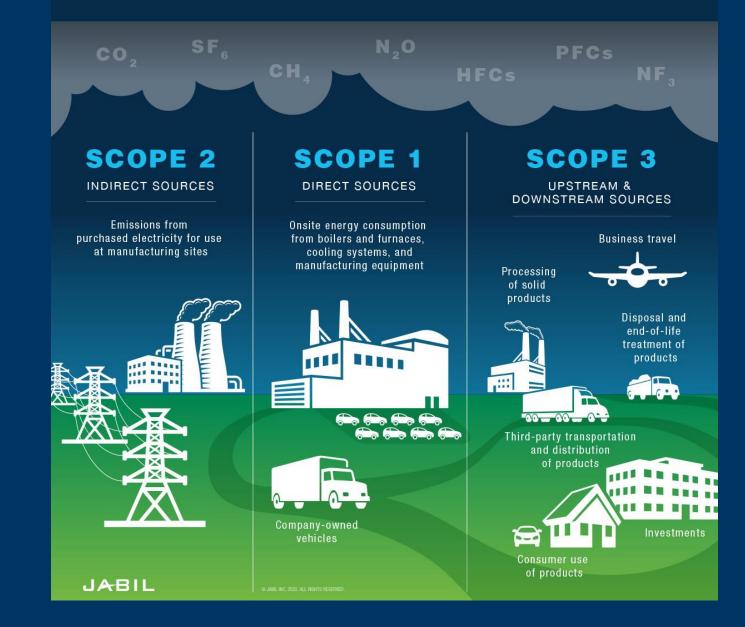
> Lack of knowledge and practical mainstream solutions



## Is Net Zero Possible?

There is an urgent need to understand the impact of interior design industry on the 3 scope of emissions.

Designer & Builder The key contributor lies in the following: Scope 1 - Materials, building process Scope 2 - Operation energy Scope 3 - Supply chain, procurement In general, Scope 1 emissions are generated by a company's processes that use energy, while Scope 2 emissions are created by the energy powering those processes. Those Scope 1 and 2 emissions are counted as part of the Scope 3 emissions of organizations higher up the value chain.





2

# What must organisations rethink?

- Net Zero Processes
- Net Zero Environment





## Net Zero Processes

Develop a circular and comprehensive process of business.

### 1

Examine triple bottomline impact on carbon emissions

### 2.

Plan and design business processes with end in mind

### 3.

Operate and account for:

- Embodied carbon in raw resources
- Energy efficiency
- Waste reduction
- Logistics and transport
- Vendor and procurement

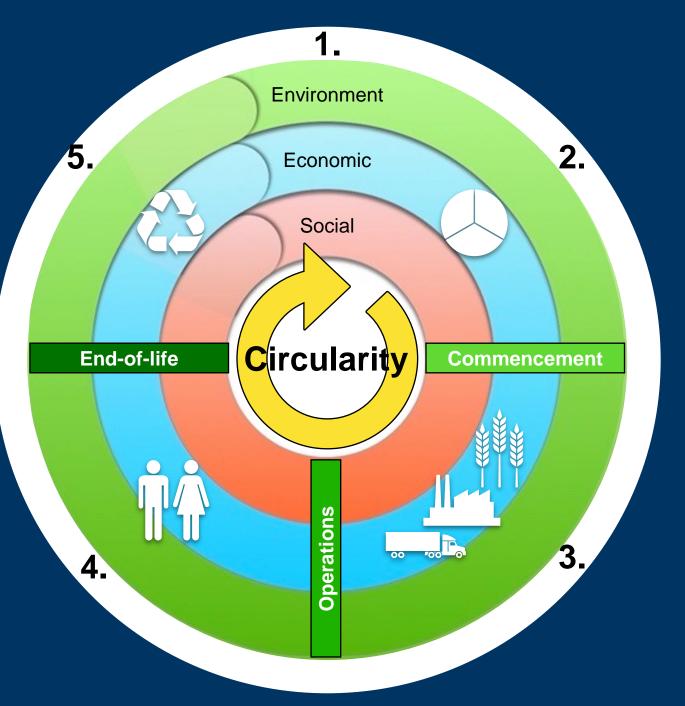
Human behaviour modification

- Culture of Sustainabilty
- Ground-up initiatives
- Continual education
- IOT and smart systems

### 5.

Process to allow for:

- Disassembly
- Recycling
- Reuse
- Upcycling





### **Example: Interface**

A circular business started in the 90s

### 1990s

Started by Ray Anderson in 1973. In 1994, he was asked, "What's your company doing for the environment?"

Ray aspired Interface to be the world's first environmentally sustainable company.

SEVEN Fronts Zero waste to landfill Zero fossil fuel energy used Zero process water used Zero green house gas emissions

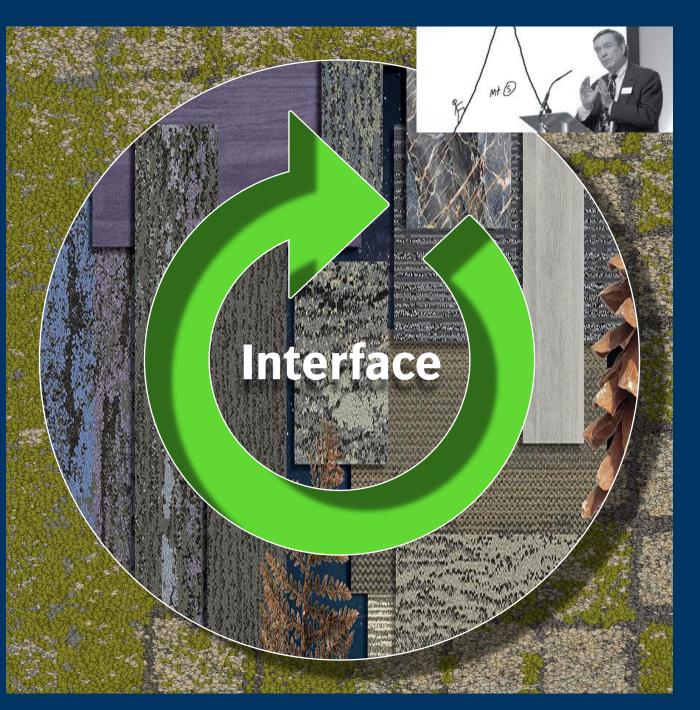
### 2010s

Net-Works®, a program that turns discarded fishing nets into supplemental income for community

CircuitBac<sup>™</sup> Green backing, which effectively stored more carbon in its life cycle than it emitted

### 2000s

First commercial carpet to use recycled nylon 100% recycled content vinyl backing layer Glue free installation system

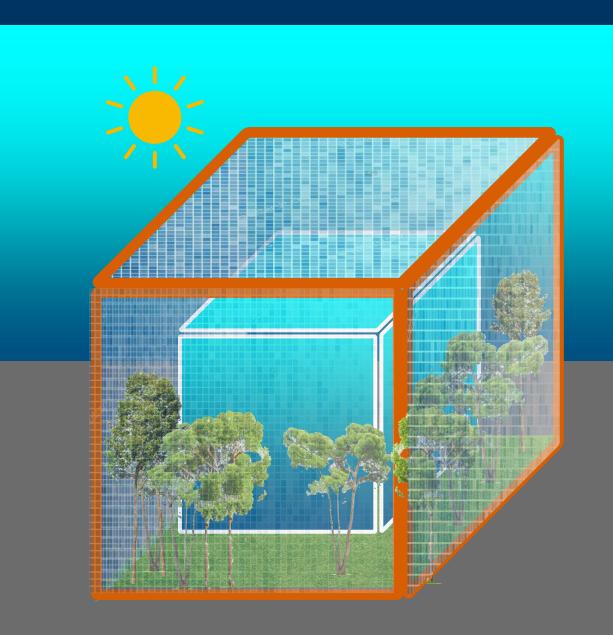


### Net Zero Environment

Develop a net zero environment that is circular. The 6 key strategies are:

- 1.100% solarisation to reduce energy consumption by 10-20%
- 2. Employ zero-carbon materiality
- 3. Reduce air-conditioning load
- 4.100% rainwater harvesting
- 5.100% waste recycling and Onsite waste recovery
- 6. Increase greenery







### Net Zero Environment

### 1. 100% Solarisation

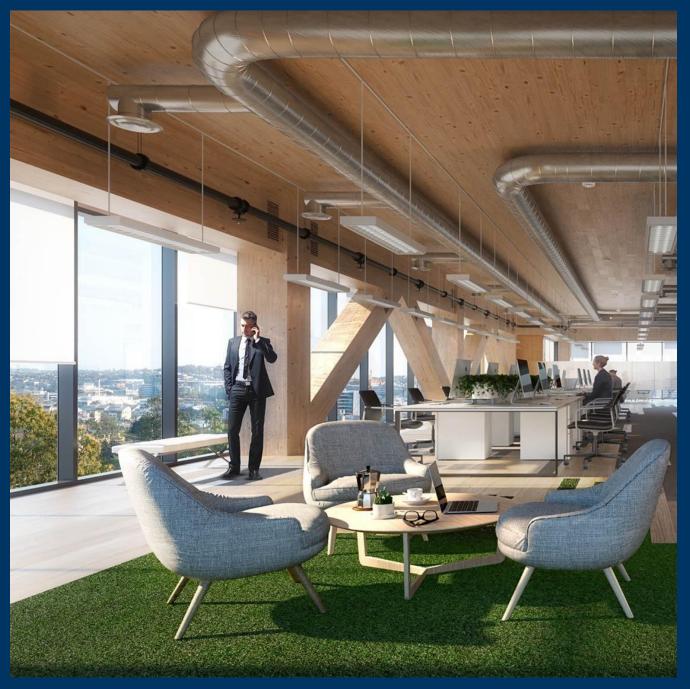
Building Integrated Photovoltaic or BIPV will have visual impact on the look and feel of interior spaces. Picture shows Swisstech Convention Centre. New coloured solar PV facade presents an opportunity to connect facade with interior experience and performance.





### 2. Employ zero carbon materiality

The most significant breakthrough in building materials would be the use of Mass Engineered Timber. This will almost put a demand not hiding the beautiful timber surface. A new naturalism of stylistic expression has already emerged along with sustainable furniture design.





### 3. Reduce Air Conditioning Load

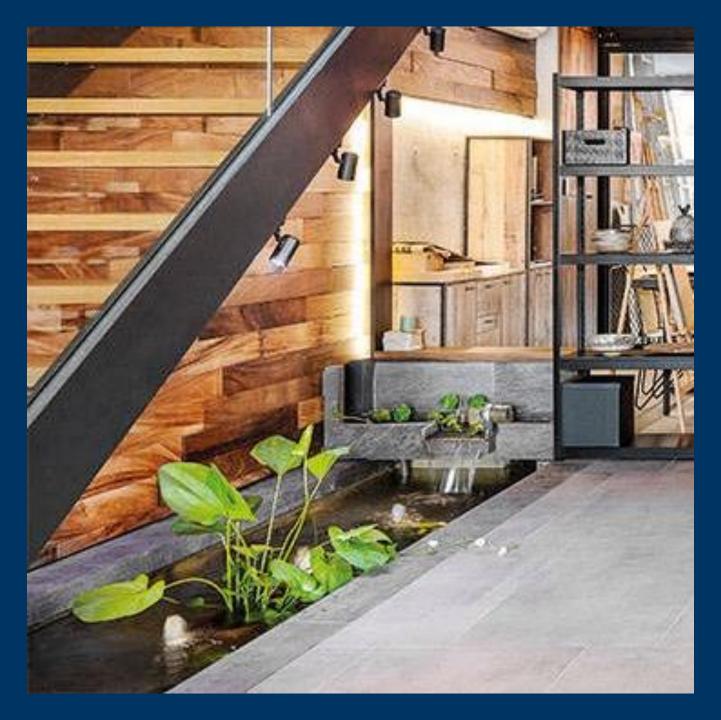
The future of interior is likely to see differentiated air conditioning or stratification of cooling or heating needs. Zones of spaces will be specified differently to match the uses and achieve maximum energy savings.





### 4. 100% rainwater harvesting

Beside a water saving feature, the future of interior could make use of rainwater as a default water feature within interior space to bring relief and sense of serenity for better health and wellbeing.





5. 100% waste recycling and on-site waste recovery

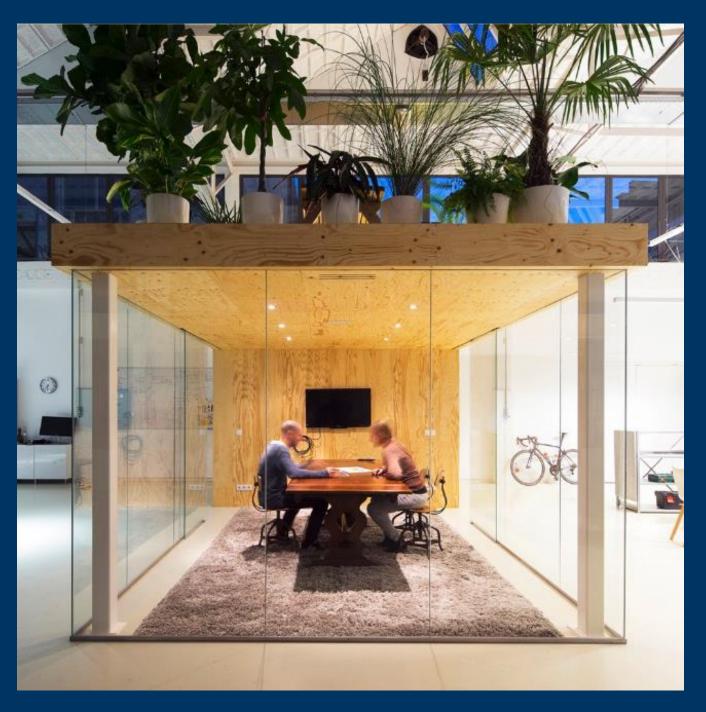
Explore creation of interior products and furnishing made from recycling of waste. Combine recycled waste with advanced manufacturing methods such as 3D printing and digital fabrication.





### 6. Increase greenery

Generally, greenery absorb carbon dioxide and help to reduce green house gases. There is growing evidence to suggest that being in nature has positive effects on people's mental health. Studies have shown that green spaces can lower levels of stress (Wells et al, 2003) and reduce rates of depression and anxiety, reduce cortisol levels (Park et al, 2010) and improve general well-being.





3

# Develop a Net Zero Roadm

- Net Zero Organisation
- Net Zero People
- Net Zero Education
- Net Zero Campaign





#### SINGAPORE UNIVERSITY O TECHNOLOGY AND DESIG

# **Net Zero Organisation**

A net zero plan requires a net zero mindset organisation.

Levels of Sustainability	Sustainability Representation	Description
Level 5	Corporate culture	Total commitment including cultural formation
Level 4	C-suite leader	Concerted effort with corporate commitments
Level 3	Department	Organised effort with clear KPIs and budget
Level 3 Level 2	Department Committee	<b>U</b>

### Net Zero People

For an organisation to be infused with sustainability culture, it needs a sustainable workforce with sustainable mindset. National level work groups must be formed to advance the movement. Green building councils can play a key role.







### **Net Zero Education**

Net zero is a subject that is new and must be taught rapidly to demystify the understanding and increase adoption.

# FROM THOUSANDS OF MERCE TO BILLIONS

Coordinated Action towards 100% Net Zero Carbon Buildings By 2050



### Net Zero Campaign

Unlike other movement, net zero movement does not have the luxury of time and require rapid campaign to raise awareness

#### This building has a secret. It's a climate hero.

- Buildings account for over 30% of global carbon emissions but that can change.
- Net zero buildings are highly efficient and use clean energy. Let's make all buildings net zero by 2050, and win the fight against climate change.



WORLD GREEN BUILDING WEEK 25 SEPT - 1 OCT 2017





# Summary

Most people spend at least 90% of time in indoor spaces. The impact and sustainability of products and spaces cannot be under-estimated. There is a need to rapidly develop both the science and design of green technology.





# Design for a

What must we do ?

NET World

Prof Tai Lee Siang 14 July 2023



### **INNOVATION & TECHNOLOGY**

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# **Product Development Life Cycle**

## **Mr Jean-Luc Fringeli**

Managing Director MDesign Solutions

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# **Design** Solutions

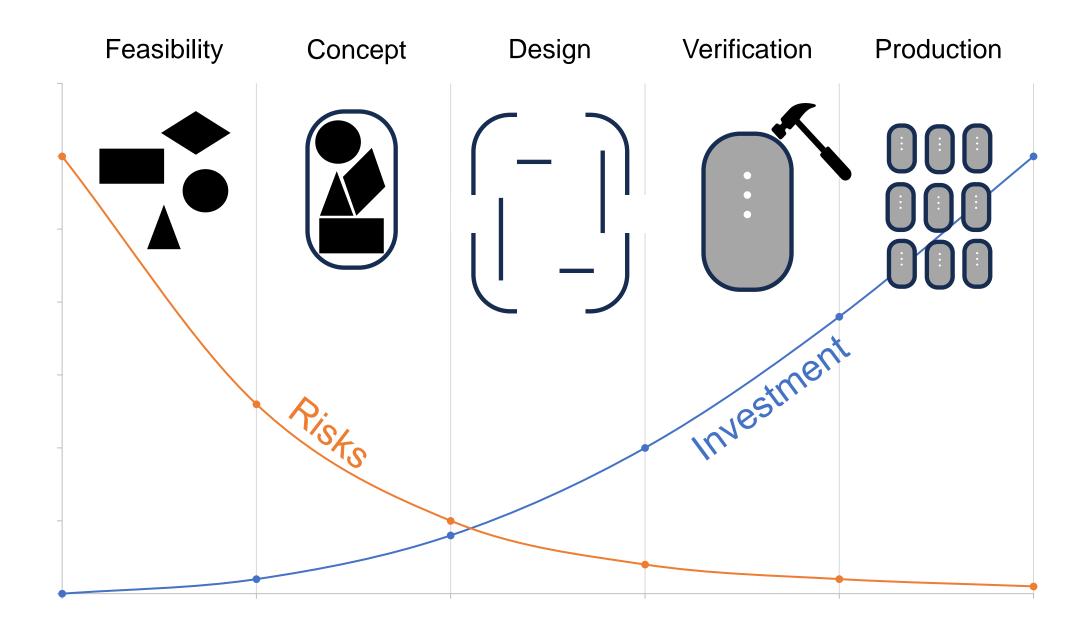


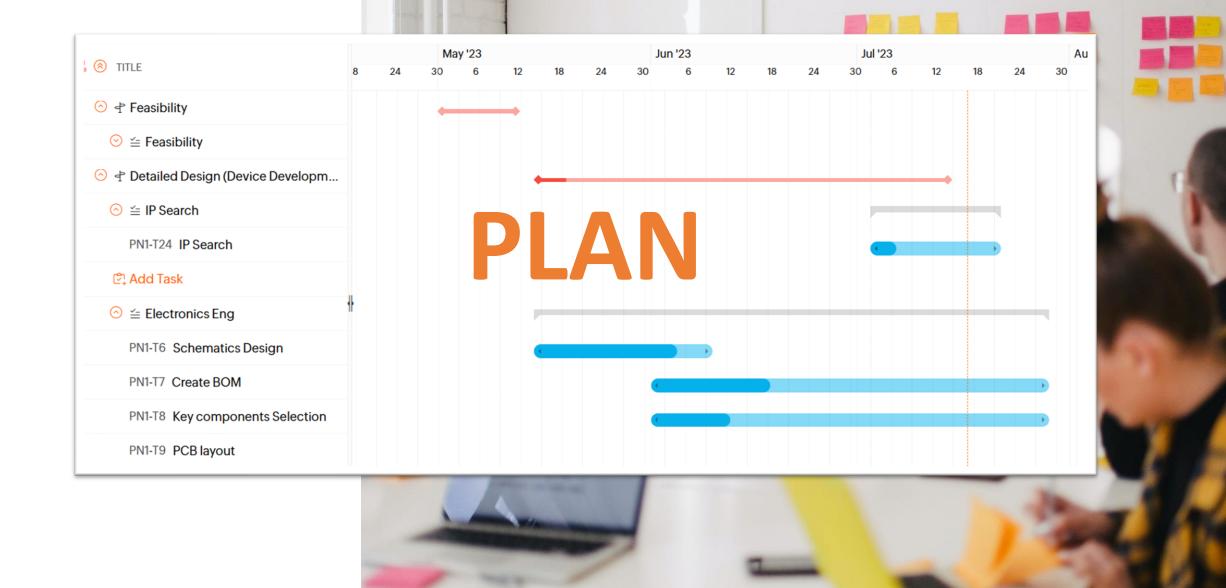
# The Art of<br/>BringingWhat makes<br/>a successfulIdeas to Lifeproject

# Team

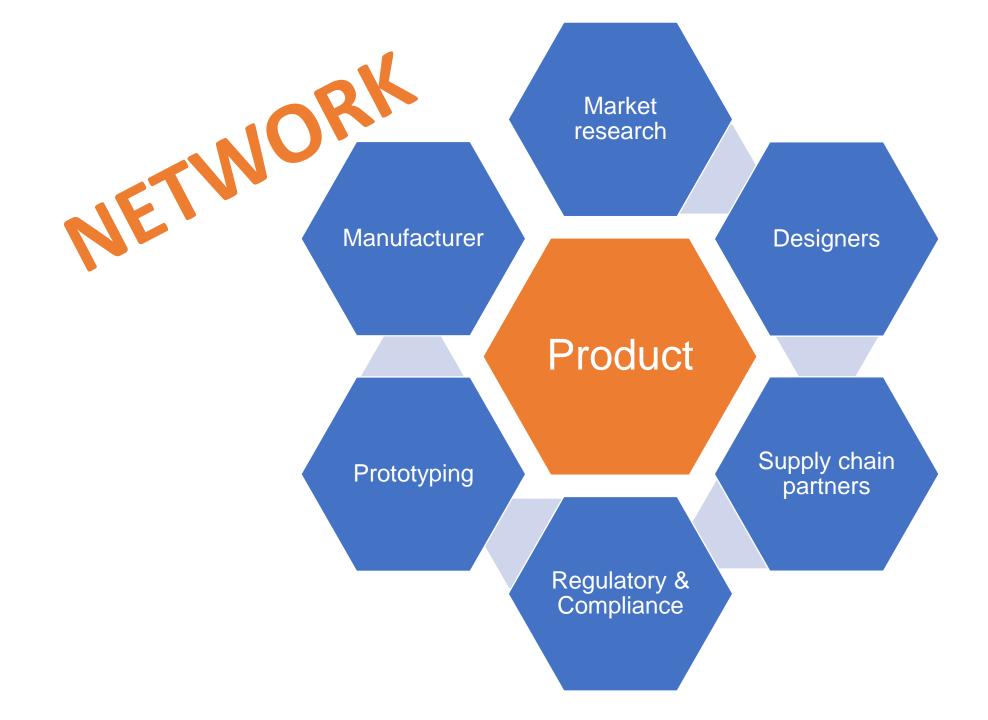
# EcoSystem

**Business** 













# Plan wellto execute wellPartner upto get experts' contributionStrategizeto make it a viable business



# Thank you!

Delivering tangible innovation

### **INNOVATION & TECHNOLOGY**

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# Design and Development of a Solar-Powered Battery Swapping Station

Mr Anders Quek Co-Founder & Chief Operating Officer Quantum Mobility

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### INTELLIVOLT INNOVATION VENTURE



### A FRESH PERSPECTIVE ON EV ENERGY PROVISION

Quantum Volts seeks to bring together the most innovative charge solution from Quantum Volts with the most sophisticated smart lighting solution of Fonda Global Engineering, to deliver a unique, self-sustaining EV charge infrastructure in Singapore and beyond

The development of a proprietary super application that manages bike owner navigation, payment and backend Al-analytics to command and control OCCP-compliant and BMS of battery swap arrays will be seen as a world's first.



#### OUR VISION

The unrelenting pursuit to harness sustainable fuel sources derived from heat, light and wind, leading to the creation of a self-sustainable charging solution that works in any urban landscape for any electric bikes brands of today and beyond.

The mechanics of power provision will ultimately offer charging in the form of physical battery swaps, wired and wireless charging via any existing power infrastructure that varies from a common street light to a sophisticated surveillance structure.



### OUR EXPERTISE

From the adoption of efficient solar farm arrays to the support of solid-state battery manufacturing, IntelliVolts is on track to deliver a next-gen swap 'N' charge lighting solution that is powered by an artificial intelligence retail management suite. Supports both white-label and franchise deployment suited for independent operation across any urban geography. Wind and hydrogen to follow.

### MANAGEMENT TEAM

Quantum Volts is Singapore technology startup company who specializes in promoting a self sustainable charge infrastructure for electric two wheelers through the conceptualization, technical design and manufacturing of modular battery swap array solution and payment system.

It is in the DNA of the company to fully operate her solution around renewable energy sources. with a focus to operate in a carbon neutral footprint from day one.

Fonda Global Engineering is a leader in the facility management space of Singapore, whose wide specialization includes construction, intelligent infrastructure design, smart surveillance and other IoT-centric enablements. Fonda will be Quantum Volt's dedicated installer and maintenance party of Quantum charge infrastructure.



### ESTABLISHED PARTNERSHIPS

QUANTUM VOLTS

Having fulfilled an international criteria for admission and technical contributions, Quantum Volts has successfully obtained the prestigious admission to multiple worldwide consortiums in the field of EV charging and bike manufacturing. giving this venture a unique edge in influencing, leading and synergizing with the biggest known brands in electric bike like Honda, Yamaha and Piaggio, all with the capability to partner with these manufacturers to become the preferred charge operators to rely on in their drive towards sale of their bikes in Asia.

Quantum Volts will seek to leverage the acquired capability to draw additional e-bike manufacturers into Singapore with her universal battery infrastructure, while exploring retail opportunities surrounding future charging infrastructure.

Quantum Volts is pitched as the universal choice to a growing fleet of bike manufacturers who are currently members of the Swappable Batteries Motorcycle Consortium helmed in Belgium.

Quantum Volts is a proud member of the SBMC consortium today.











### **A PROVEN STRATEGY**

Leveraging from the existing street light infrastructure already found around numerous carparks of Singapore, Quantum Volts can launch her hybrid EV charging capability to provide standard Type-2 charging to any electric vehicles today, with a progressive plan to introduce battery swap arrays in the near future. No extensive upgrade is required.

As modular as each street lamp currently is, each upgrade is applied to a singular site without introducing any interferences to existing grid. The added benefits of enhancing each site with an solar-powered integrated battery swap array will further future-proof each investment to cater to upcoming electric 2-wheelers requiring swappable batteries.

### ) CONCEPT OF OPERATION

With a wide selection of existing car parks located near a standard street light, retrofitting each to electrically be active for EV charging is seen as flicking the switch on for every street light during the day.

The concept of EV lamp posts is both proven and popular in many parts of Europe. However, the resolve and capability to do so with a Singapore Brand has far more significant reach to position Singapore as a strong advocate in this industry on a world stage.

### SAFETY MECHANISM

Observing the entire electric load characteristic of a typical street light at 32 Ampere, the standard charge package of our solution will operate well within the operating parameter, with room to grow when nearby solar grid array are leveraged for the modular battery swap array.

All existing electrical failsafe mechanisms that are already in operation to manage the electrical load of each street light will ensure the typical use of the enhanced street light for this application. A soft layer revolving the real-time monitoring of these OCPP-compliant hardware will provide realtime auto command and control of these charge points. The national TR25 standards applies.

### lignment Alignment

Quantum Volts will be the first Singapore brand technology innovator who capitalize on the expertise of the Singapore research agency to develop her commercially viable energy provision charter in accordance to the Singapore Green Plan 2030 managed by the Monetary Authority of Singapore. Armed with the business development capability of the established founder and partner, seek to propel this capability from Singapore into the international arena as Singapore's leadership in the EV industry. The cost effectiveness that will be achieved with this innovative deployment, coupled with streamlined manpower requirement seek to power the nation towards complete carbon superiority, ultimately also fulfilling the key outcome envisioned by other government agencies including LTA and EMA.

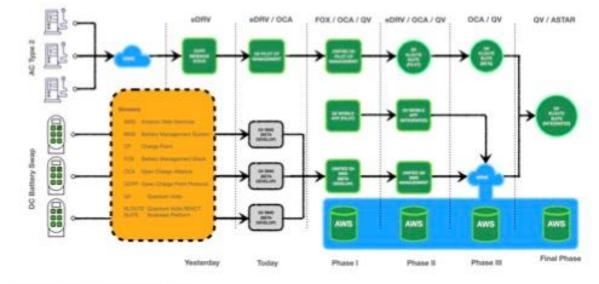




Equipped with over two decades of operational capability to maintain street lamps, Fonda Global Engineering possesses the complete understanding and technical clarity and expertise to ensure the smooth, reliable operation of these 400 lamp posts and beyond.



### KLOUT SUITE DEVELOPMENT MILESTONES



#### **DEVELOPING QV ADVANTAGES**

~

Hamessing solar, wind and biomass as the sustainable, longer-term sources of energy to drive EV charging requirements. QV is poised to deliver a truly sustainable EV ecosystem while protecting the environment.

Involvement and steering role in world battery swap consortium, QV will operate as the neutral platform for open communication, and normalization of proprietary battery solution from all major manufacturers in the world. The rise in energy dependency, supply instability will give rise to the much needed new economy of energy provision via an intelligent, open bidding algorithm that allows transparent competition and consumer benefits that arises from globalized effort in EV promotions.

Favourable business appeal to all business owners who wants to own a segment, a geographic location or state based on emerging EV energy supply business. QV business development model accommodates hardware as a service in various lucrative franchise models.



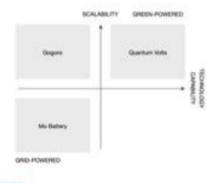
### ABOUT QUANTUM VOLTS CEO



Lawrence Oei is the third-generation business owner of CEH Group and an avid catalyst driver for his family business empire for the last 25 years, having delivered a lean set of fundamental business skills and ideation DNA across multiple geographies and culture for his family.

Among a series of successful startups he is proud to be associated with, he has consistently put the Singapore brand in the forefront of each endeavour, including global delivery of innovative solutions among a dozen of global projects in both government agencies and multinational entities like Razer, Campari and Apple.Today, he is in deep focus to return his multiple disciplines skillset the the community, in spearheading innovative startups and playing the role as a corporate counsel and Chief Executive to Quantum Volts, having his eye set on fulfilling the national agenda of creating the Singapore brand in sustainable EV provision and infrastructure vacuum to an international market.

### COMPETITIVE ASSESSMENT







 $\checkmark$ 

YAMAHA HONDA KIM FEE

### **INNOVATION & TECHNOLOGY**

CONFERENCE 2023 Innovation Through Advanced Manufacturing Research & Technologies

# Design of a Self-Service Juice Blender Machine Prototype

**Mr Henry Tan** Founder Smooder

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# Singapore's first Nespresso-like Smoothie machine





# Smooder Background

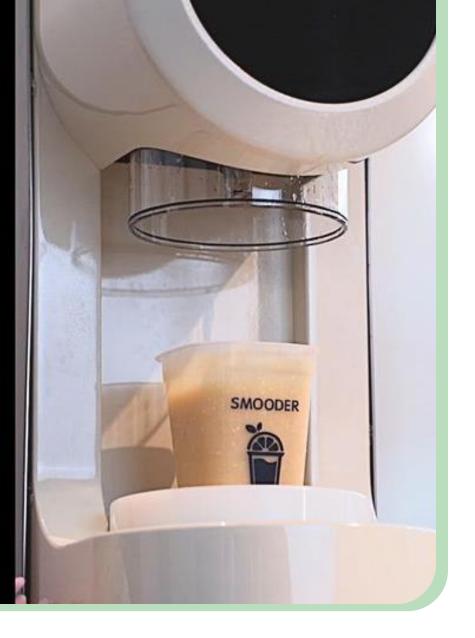
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As Singapore employees spend long hours at work, many of us want a work environment that is <u>fun, healthy, and productive</u>. A wonderful method to achieve that is through offering free snacks and beverages in the office pantry (a magical area where ideas and connections flow).

However, we noticed that many of the beverages offered in pantries are filled with <u>artificial sugar</u>. Prolonged consumption of unhealthy sodas could lead to <u>serious health issues</u> like obesity, type 2 diabetes, high cholesterol, heart diseases, and other chronic illnesses.







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# We are here to show you that one small change can generate a big result!

Presenting to you, <u>Smooder</u>, Singapore's first Nespresso-like smoothie maker (in collaboration with A\*Star Technology). Paired with the fully compatible Smooder cups that are filled with <u>natural fruits and vegetables (no added</u> <u>sugar</u>), empowering healthy habits has never been easier.





Meet **Smooder:** Singapore's first countertop Smoothie Maker. Creating a happier, healthier, and more productive workspace through smoothies





# Smooder Machine

Proprietary machine developed in collaboration with A\*Star, Singapore.

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SMOODER<sup>2</sup>iznis Presentation

Plug and play installation

Simple user interface, with blend-incup technology

With its self-cleaning technology, you won't have to waste time cleaning

Fast and convenient! Making smoothies only take 60 seconds!



# What makes **Smooder** so special?

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Our proprietary machine offers a blend-in-cup technology and selfcleaning functionality. By popping the fully compatible <u>Smooder</u> cup filled with flash frozen and ultra-fresh fruits and vegetables, all you need is a <u>touch on the screen</u>, you will have a fresh smoothie on demand in a minute.

Employees and workers are getting more <u>health-conscious</u> in today's world and desires a <u>fun and more engaging workplace</u>.



Welcome your staff back to office and make your workplace shine with Smooder!

×



Smooder
Offerings

Product/Service Feature	Benefit to the Client
Blend-in-cup + Self-cleaning technology	Employee gets smoothie on demand with a touch of the screen, no additional cleaning of the blender required
Fuss-free subscription plan	Smooder will provide the Smooder machine (FOC) + freezer (FOC) + regular replenishment of fruit cups base on subscribed plan + regular maintenance of machine.
Plug and play installation	Site visit + installation FOC
Healthy and nutritious drink with no added sugar	Happy, engaged, productive employees = <u>PRICELESS</u>
IQF fruits	Individual quick-frozen fruits and vegetables in each cup to lock in nutrients and taste at their prime season
Client Dashboard	Consumption of smoothie by employee data sharing -> can be used to correlate to medical claim, engagement survey result, attrition rate etc





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## All you need is **Smooder**

Smooder empowers healthy habits. As employees, when we get busy and carried away with work, we tend to grab the most convenient snack or drink which is often unhealthy. This ends with us. Smooder's smoothies are <u>healthy</u>, <u>nutritious and have</u> <u>no added sugar</u>. Now you can hustle and be <u>healthy</u> -- all at once!



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## Pricing Information

Employer full payment plan.

Basic Ideal for a small company/startup

From <sup>\$</sup> 1,900 / month

\$3.80 per cup.

Healthy habits can be **affordable** too.

✓ Smooder machine + counter freezer

✓ 500 Smooder cups

X

- ✓ Delivery and installation
- ✓ Maintenance and cleaning

Choose Plan

Standard Perfect for a medium-size enterprise

From <sup>\$</sup> 2,700 / month

\$3.60 per cup

Now you can **hustle and be healthy** at the same time.

✓ Smooder machine + counter freezer

✓ 750 Smooder cups

- Delivery and installation
- ✓ Maintenance and cleaning

Choose Plan

Premium The best for large companies

From <sup>\$</sup> 3,400 / month

\$3.40 per cup.

Make your office the **best place to work in** Singapore.

- ✓ Smooder machine + counter freezer
- ✓ 1,000 Smooder cups
- ✓ Delivery and installation
- ✓ Maintenance and cleaning

Choose Plan



#### • • • • •

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## Pricing Information

Employer-employee co-payment plan.

Basic Ideal for a small company/startup

From <sup>\$</sup> 950 / month

Employee pays \$2.10 per cup; employer pays \$1.90 per cup.

Healthy habits can be **affordable** too.

- ✓ Smooder machine + counter freezer
- ✓ 500 Smooder cups
- ✓ Delivery and installation
- ✓ Maintenance and cleaning

Choose Plan  $\rightarrow$ 

Standard Perfect for a medium-size enterprise

From <sup>\$</sup> 1,350 / month

Employee pays \$2.00 per cup; employer pays \$1.80 per cup.

Now you can **hustle and be healthy** at the same time.

✓ Smooder machine + counter freezer

✓ 750 Smooder cups

- ✓ Delivery and installation
- ✓ Maintenance and cleaning

Choose Plan

Premium The best for large companies

From <sup>\$</sup> 1,700 / month

Employee pays \$1.90 per cup; employer pays \$1.70 per cup.

Make your office the best place to work in Singapore.

- ✓ Smooder machine + counter freezer
- ✓ 1000 Smooder cups
- ✓ Delivery and installation
- ✓ Maintenance and cleaning

Choose Plan





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## **Companies that love us**



















## **Smooder** is a spark that works

In order to retain talent by creating an <u>engaging and enjoyable workplace</u> culture, employers are taking steps to improve the office environment and pantry offerings. While snacks and coffee do spark happiness, they become less appealing to the growing number of employees and workers who are becoming more and more <u>healthconscious</u>. Smooder is here to empower healthy habits by bringing you a smoothie on demand in less than 2mins, right here in your office pantry.

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## Get In Touch

11 Kee Seng Street, #01-13,Onze @ Tanjong Pagar, S089218

8022 6932

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henry@smooder.com

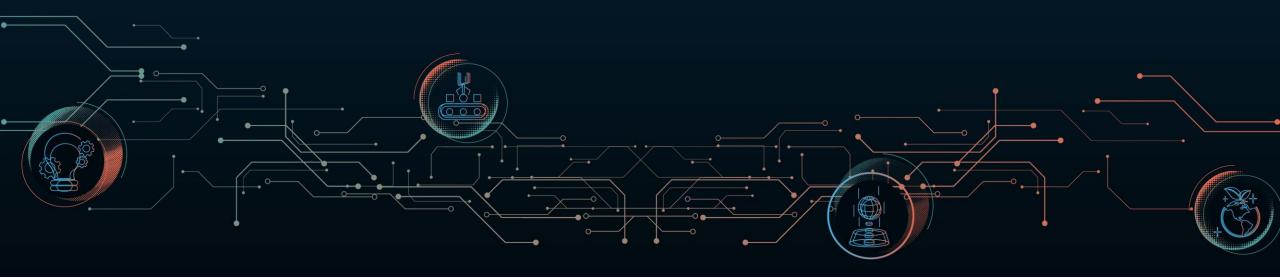
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#### **INNOVATION & TECHNOLOGY**

CONFERENCE 2023 Innovation Through Advanced Manufacturing Research & Technologies

## Papilio: Product Development & Launch

**Mr Tan Chong Hui** CEO JAH Tech





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## **ABOUT US**

JAH Tech was established in 2019 in Singapore to spearhead global technology commercialization, licensing, and partnership formation for our group's Deep Tech research labs. In the past 20 years, the work by these labs covered a diverse spectrum of technology research.

JAH Tech holds and manages the commercial rights to a broad portfolio of cutting-edge technologies and works actively with partners globally to empower these technologies towards a positive, lasting impact in everyday life and the environment.

# COMPANY STRUCTURE

JAH Tech has built an eco-system of companies to offer and push forward its spectrum of technologies & proprietary process to engage with partners globally in industrial, manufacturing, beauty & wellness and sustainability industries.

In 2020 & 2022, the following wholly-owned subsidiaries were incorporated to focus on specific technology in their respective related industry:

## **Solution Solution Solution Technology.** Wellness. Life.

© JAH TECH PTE LTD. 2023



www.naturidgelab.com

Brea

**Skin Relief** 

JAH Life's key focus is to promote health and wellness through our proprietary technologies.

The increasing focus by consumers preferencing for an "all-natural" in beauty, skincare, and health products, has encouraged us to create an innovative platform tengage and work with beauty, health, and wellness partners to incorporate our proprietary technologies into the manufacturing of their products.

Aligned to our company's mission, we seek to work with our partners in the global marketplace to develop quality wellness in life by bridging the best of nature and technology.

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### Technology Overview

# Unitatem **PRIMIS**<sup>™</sup>

Through our labs' leading-edge research & development, we have produced a Ceramic-Alloy using our proprietary nanotechnology process, which emits a unique field – Unitatem PRIMIS<sup>™</sup>. This field is naturally occurring wave frequency in the spectrum of Far-Infrared and Terahertz.

The Unitatem PRIMIS<sup>™</sup> has been validated by an independent third party who tested it in a Scratch Wound Assay separately as an Energized Media and Static Field and has shown to increase wound closure, promote wound healing and anti-inflammation property.

The Ceramic-Alloy is a durable material that can be integrated into the design of health wellness wearables. It provides relief from inflammation, aches & pains as well as improved blood circulation all while boosting strength & flexibility.

The nano-pores on the surface of the Ceramic-Alloy provide benefits such as exfoliation and skin renewal when integrated into skin beauty applicators.



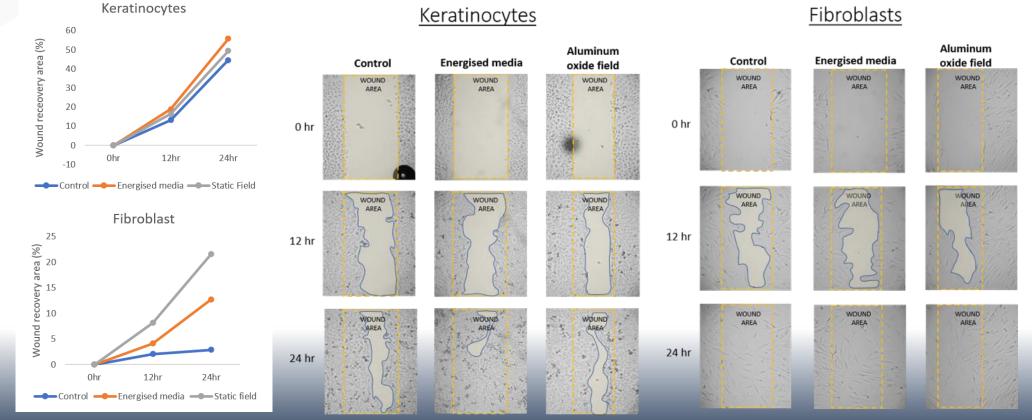
## Aluminium Oxide Device

Wound Healing

- Scratch Wound Model
- 3D Coculture Wound Healing Model

#### Wound Healing Scratch Wound Assay

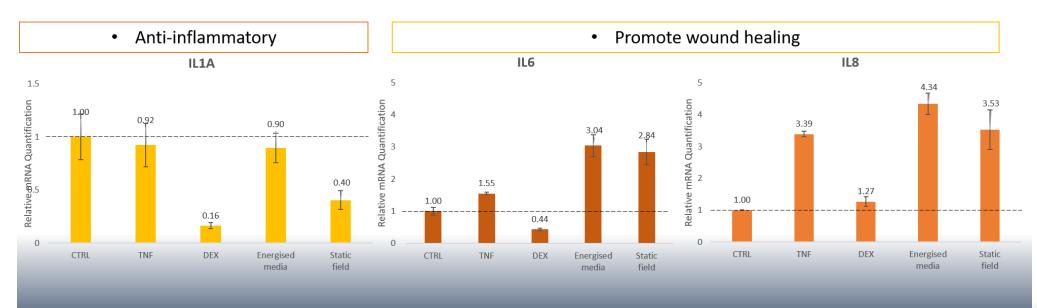




Energised Media and Static Field (alumnium oxide field, AO) increased the wound closure as shown in a scratch wound model.



#### Wound Healing 3D Coculture Wound Healing Model



Energised Media and Static Field (AO) had shown to promote wound healing and anti-inflammation.

Experience the power of the PAPILIO in sparking a transformative "Butterfly Effect" for recovery



TECH. WELLNESS. LIFE.



#### The Journey

In 2021, JAH Life collaborated with Innovation Factory @ SIMTech\* on the development of the PAPILIO Waist & Back Therapeutic Belt. Innovation Factory @ SIMTech supported the conceptualization and industrial design of the product. JAH Life integrated its proprietary nanotechnology, the Unitatem PRIMIS<sup>™</sup>, with the aim of providing back support and muscle recovery for users.

\*Innovation Factory @ SIMTech is a partnership between the Agency for Science, Technology and Research (A\*STAR) and Enterprise Singapore.

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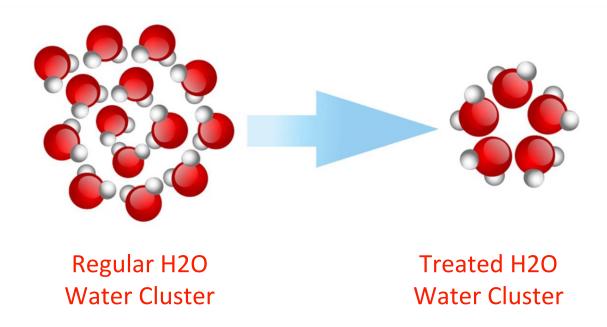








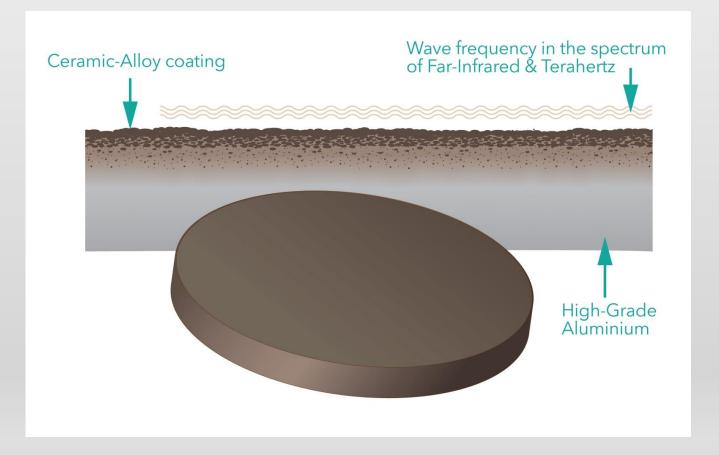
### **Effects of Ceramic-Alloy on Water**



In a NMR (Nuclear Magnetic Resonance) test conducted by a third-party lab, it was evident that a reduced hydrogen bond in water treated with the ceramic-alloy, showed a reduced in size of the H2O cluster.

This results in a better penetration of water to cell membranes.

# A cross-section diagram of JAH Life's proprietary technology treatment on the coaster.



A naturally occurring wave frequency in the spectrum of Far-Infrared and Terahertz is emitted through the layer of nanopores on the Ceramic-Alloy coating.

This wave frequency has been shown to affect water cluster for better absorption.

## **CURA** NATURE'S AID ON A DISC



#### Nature's Aid On A Disc

Enjoy drinking water at another level – a disc that treats your water, making it smoother and lighter.

Introducing CURA from JAH Life, a ceramic-alloy disc made with our proprietary tech that helps rearrange the molecular structure of water to enable easy water absorption into body cells, better discharge of wastes and toxins, and boosting the body's immune system.

The CURA is a compact and convenient piece of beverage accessory that fits the cup or bottle of your choice. Water never tasted any smoother and lighter like how it used to be.

# O JAHCUIUR

A BETTER HARVEST. A BETTER TOMORROW.

## **ABOUT US**

JAH Cultura believes in cultivating for a sustainable future through innovation. Through smart farming with Unitatem CULTURA<sup>™</sup>, its proprietary technology developed for the agricultural industry, JAH Cultura aims to increase harvests to combat the anticipated increase in global food demand.

As part of the JAH Tech group, JAH Cultura's technology allows for the customization of its products to any farming requirement without altering existing farm infrastructure.

In line with JAH Cultura's goal of sustainable farming, its proprietary technology does not require additional energy sources, and its products will be continually recycled and reused to minimize waste.



www.jahcultura.com

Our technology allows us to customize to any farming requirement without altering existing farm infrastructure.

Unitatem CULTURA <sup>™</sup> by JAH Cultura is a unique field generated by our proprietary Ceramic-Alloy developed over 20 years of deep tech research. This field has been shown to provide enhancement properties to yield of stem cells, plants growth, and enhance growth.

Unitatem CULTURA<sup>™</sup> requires no additional energy sources because the field emitted through the layer of nanopores on the Ceramic-Alloy coating is a naturally occurring wave frequency in the spectrum of Far-Infrared and Terahertz. This wave frequency has been shown to reduce water molecule cluster for better absorption, supports soil quality and affects seeds to improve plant growth.



Cult





www.jahcultura.com



\* Treated Germination-Normal Growth \*\*Normal Germination-Treated Growth

# RESEARCH & DISCOVERY

In 2021, JAH Cultura engaged a third-party research institute to test and verify previously observed effects of Unitatem CULTURA™ in agriculture. Feasibility study of the effects of JAH Cultura's treated water on the growth of vegetables were conducted at Republic Polytechnic's Agriculture Technology laboratory. An increase of 21.42% in yield was observed for treated Bok Choy seeds, and Bok Choy plants grown with treated water showed an increased yield of 18.5% under laboratory conditions.

Taste and visual assessment were also conducted, and results were on par with the control plants.

#### Agriculture Application Stages of Unitatem CULTURA<sup>™</sup>

**Seed Enhancement** Pre-germination treatment of seeds to enhance growth potential.

**Germination** Supports and enhances germination process.

Water Treatment Enhancement of water used for the growing of produce.

**Growth Stage** Providing our field in the presence of the produce as it is grown, either in the soil or water.



#### Aquaculture Application Stages of Unitatem CULTURA™

**Improve Fish & Shrimp Fry Survivability** Increase the overall rate of the number of fry growing to maturity.

**Water Treatment** Enhancement of water use for the growth of aquaculture produce.

#### **Growth Stage** Providing our field in the presence of fish/shrimp to enhance their absorption of feed and nutrients.

**Feed Enhancement** Enhance absorption of feed for better results.

**Microalgae** Ongoing research on microalgae.

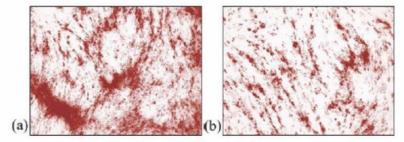




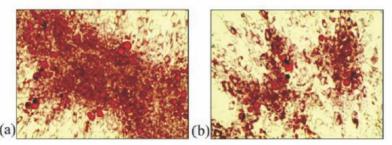


## <u>ENHANCED</u> <u>& IMPROVED GROWTH</u>

3<sup>rd</sup> party test on Stem Cell culture showed a 50% improvement in cell growth when Unitatem CULTURA<sup>™</sup> was present. This test result showed possible improvement in the growth of plants and animals in farming conditions.



Adipocytes after treatment with differentiation media for 21 days, stained with Oil Red O solution (4x magnification) (a) Coated Test; (b) Control Test



Adipocytes after treatment with differentiation media for 21 days, stained with Oil Red O solution (20x magnification) (a) Coated Test; (b) Control Test

Increased Adipocyte Differentiation from MSC. Proceeding to Chondrocyte Differentiation (In Progress)

## SAHCUITURa in partnership with Nature's International Commodity

## Our collaboration with Farmer Nick have seen results in growth and yield.

The innovation of our technology has allowed us to create a smart farming channel for farmers to produce vegetables with greater yields and faster growth speeds.

Since December 2021, we have started a series of pilot vegetable farming incorporating Unitatem CULTURA<sup>™</sup> at Farmer Nick's rooftop farm.







## SAHCUITIA in partnership with Nature's International Commodity



Growth @ Week 3 with seeds treated over a 5-6 days period before planting

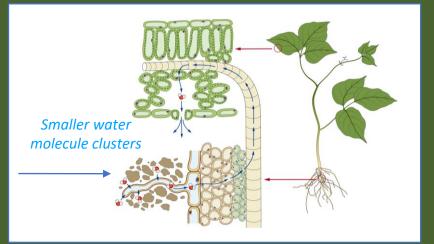


Growth @ Week 3 with untreated seeds farmed with 3-weeks germination process

"From my observation, there was an obvious yield and growth speed in plants with seeds treated using JAH Cultura's technology."

> Kevin Chua Farm Manager @ FarmerNick

A water system was setup at Farmer Nick and without any alteration to the existing farm irrigation system. It was simply "plug and play" into the farm's irrigation piping. No power consumption, chemical free and environmentally sustainable.



CulturaPlus links treat water by rearranging molecular structure of water for better absorption in plants.



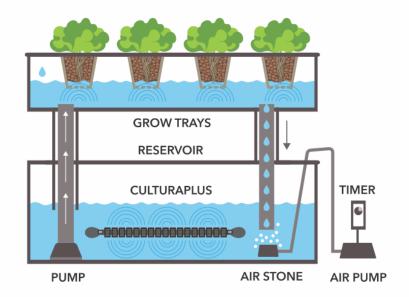


Growth @ Week 4 without treated water





Growth @ Week 4 with water treated by Unitatem CULTURA™



GH Hydroponics incorporated the JAH Cultura's Ceramic-Alloy links into their 4-tier vertical NFT Rack System to test out on the growth rate of the plants.

The Ceramic-Alloy links were placed in the reservoir tank of a 4-tier vertical NFT Rack System. Installation was non-disruptive to the existing system structure and simply "plug & play". Plants that grew with the treated water grew better and were ready to be harvested a week earlier than those without treated water.

Our technology requires no power consumption and is environmentally sustainable. Low maintenance and works efficiently with home hydroponics system farming.

## **JAHCultura** in partnership with **Ebizu Aquaculture**

"We quarantined injured fish in water treated by JAH Cultura's Ceramic-Alloy and observed a faster recovery rate for the fish."



12/10/2022 (Day 1)





15/10/2022 (Day 4)

17/10/2022 (Day 6)

28/10/2022 (Day 17)

The effect of JAH Cultura's technology was observed to produce results in Fish Health Management. The Ceramic-Alloy placed in the fish-rearing water filter system showed a positive healing effect on the quarantined fish within a few days.



Ebizu is a local aquaculture farm whose goal is to cultivate a variety of 100% organic, non-genetically modified, hormone and antibiotic free fish. Ebizu's farming methods are environmentally friendly and sustainable to meet the growing demands of an expanding population.

JAH Cultura's proprietary technology, Unitatem CULTURA was introduced to Ebizu Aquaculture in 2022, where it was used to treat water and fish pellets.

# Solution in partnership with Ebizu Aquaculture



Fish pellets treated in the Ceramic-Alloy containers showed that the fish had an increase in appetite and displayed a more active and lively behaviour during feeding than those fed with untreated fish pellets. However, a more extended time is required for more observations before drawing a conclusion on the growth rate.

Nevertheless, the current positive results from the testing done at Ebizu Aquaculture has encouraged further experiment to identify the optimal application process in fish farming operations. "CulturaPlus aids in enhancing fish feed promoting healthy fish behaviour and activity."



# CULTURA Product Design by Innovation Factory @ SIMTech





### WATER SPRAY BOTTLE FOR FARMING

Innovation Factory

A Product Innovation Project – Design Of A Sustainable Water Spray Can For Farming

A\*STAR SIMTech Innovation Factory is dedicated to support Singapore's SMEs from the ideation stage to the design and engineering stage, allowing them to become product owners to venture into higher value markets.

In our course of designing products that includes the JAH Cultura Ceramic-Alloy, we partnered with Innovation Factory to help transform our ideas and bring them to fruition. In this ongoing project, the team at Innovation Factory is working to improve the industrial design of the current JAH Cultura Spray Bottle. The improvement area will focus on product aesthetics and user experience.



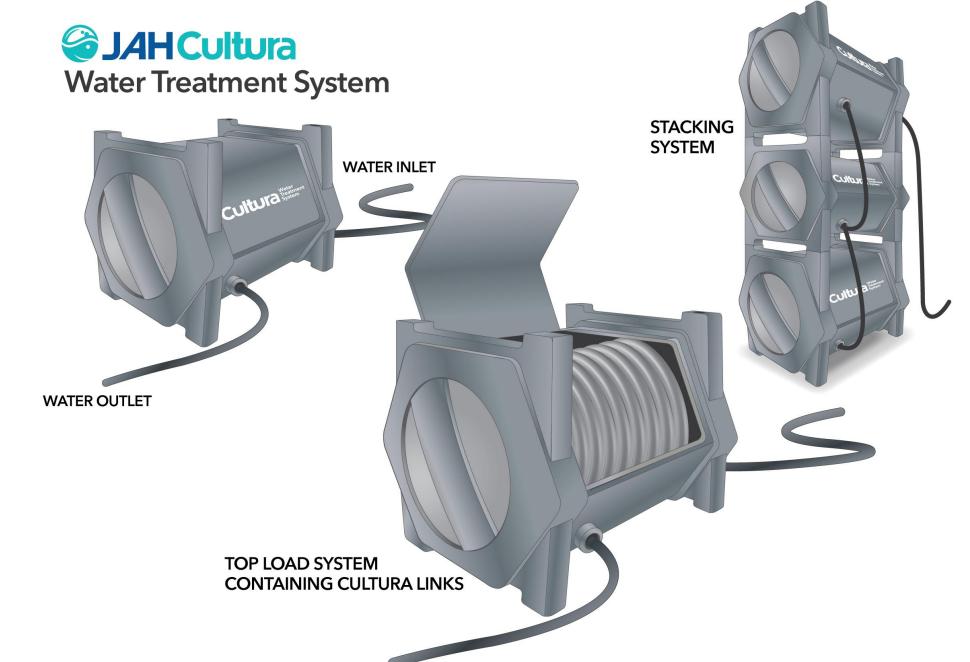




WATER SPRAY BOTTLE FOR FARMING ARC DESIGNED HAND REST FOR COMFORT OF YOUR PURLICUE SYMBOLISES JAH - TECH'S CORPORATE IDENTITY A THICKER, FROSTED FINISH ENHANCES DURABILITY AND PREVENTS VISIBLE BEND MARKS EMBEDDED WITH JAH CULTURA'S CERAMIC-ALLOY SILICON GRIP WITH VISIBLE BASE FOR **C**olturaplus WATER LEVEL CHECK



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# MEDIA COVERAGE

# THE BUSINESS TIMES

Thursday Jul 20, 2023



# Deep tech creates good vibes for plants and people

JAH Tech's ceramic alloy emits an electromagnetic field that improves agricultural yields, BY ZENITH WONG

FROM helping plants grow better soothing backaches, the cerami alloy technology developed by JAH Tech has a wide range of uses - and the Singapore-based company is trying to bring all these to market. Deep tech research may often result in failure, noted chief exec utive officer Tan Chong Hui 'There's always the risk of certain things not working out." 'But where IAH Tech comes in is. to identify those that already have

some positive impact, and we are able to create some commercial value out of it." One recent foray is to Indonesia where JAH Tech aims to introduce

its agriculture solution, Unitatem Cultura JAH Tech's ceramic alloy emits electromagnetic waves. In the Unitatem Cultura treatment, pieces of

the alloy are placed into water. The electromagnetic field causes water molecules to be spread further apart, facilitating nutrient optake by crops and boosting soil health, which in turn improves crop vields, said Tan. This May, JAH Tech's agritech

arm JAH Cultura visited Jakarta to present their solution to farming industry players and Indonesia's ministries for agriculture and aquaculture.

Agritech is one of two focus areas for commercialisation, along with wellness applications under another unit, JAH Life.

#### How it all began

For over two decades, technopreneur Barton Lee has been investing mainland China that engage in **Helping farmers** deep tech research, covering a wide spectrum of technology. used the alloy ~ introduced him to for using our technology, we'll death. Lee. the tech through Barton, I suggest time.

he said. tablished in 2019- the year that the and is set to be deployed in farms alloy was deemed ready to be used in Indonesia for vegetables, fish in skincare, thus providing the im- and prawns. petus for this move The company handles commer- the initial set-up, but the bulk of and JAH Life.



JAH Tech CED Tan Chong Hui says deep tech research may often result in failure, but where the company comes in is to identify those that already have some positive impact, to create commercial value out of it, in-citro, vita minut, any at

cialisation, licensing and partner- the fees are under a monthly or The latter was set up in 2020, to mareri basis, which is JAH Tech's ship for the technologies devely subscription, akin to paying apply the group's technology to preferred model. oped at the labs. Besides its own for utilities. This way, farmers can health and wellness products. labs, JAH Tech collaborates within access the technology without One such product is Sanitatem aries. JAH Gaia uses the ceramic al-stitutes of higher learning in ilong high upfront costs. The group de-Alpha, a solution of water, carbon loy in an "emissions control tech-Kong, China, Singapore and Indo cided to do this as farmers' operate and sodium enhanced with the ce nology' that can be fitted into car in laboratories in Hong Kong and nesia for testing and development. on very, very thin margins", said ramic alloy. Said to have anti-age engines. This alters fuel molecules Tart. The solution can be used in dient is used in skincare products ciently, improving engine perfor-In Indonesia, JAH Cultura's busi- aquaculture, too. Singapore farm under JAH Life's NaturidgeLAB mance and reducing harmful emis-This research resulted in the deness model is to work with the first. Ebizu found that grouper fish beand. velopment of their ceramic alloy. few farmers that approach them healed from skin problems faster Another solution is Unitatem Around 2016, one of Tan's friends- for each type of crop, said Tan. in water treated with Unitatem Cul-Primis, where the ceramic alloy is different surface treatment techness. who was testing a trial product that "Will offer them a special discount tura, leading to a lower rate of fish modified for use in wearable prod-nology, that makes aluminium ucts. The waves are said to im-strong enough to replace traditionwaive certain fees to allow them to In the next few months. LUHCulprove blood circulation, relieve in- al steel moulds used in factories. "After finding out more about use our technology for a period of tura will launch in Cambodia, Maflammation and promote wound laysia and China. For its first largehealing. ed to him that we should start a "So the farm gives us data, and scale deployment, it is in talks with The most recent example, to 40 per cent per manufacturing company in Singapore for commer we use the data to show the rest of a commercial farm in Hainan, Chi launched on Jul 20, is the Papillo cycle, improving efficiency and cialisation of the products," said Indonesia or the rest of the world," na. Beyond vegetables and fish, the waist and back therapeutic belt, revenue, Before the pandemic, this company is exploring applications Containing pieces of the ceramic technology was used in a factory in like deep tech, it's not somethin After three years of planning Unitatem Cultura has been test of the technology for livestock alloy, the belt is said to promote China to produce plastic toy build-like 'Bay and sell, next week you and groundwork, JAH Tech was es ed by a bok choy farm in Singapore, such as pigs, sheep and chickens. blood circulation, and relieve ing blocks. strain and inflammation in the low-Beyond food er back and hins. JAH Tech's current revenue Unitatem Primis is also provid Till now, JAH Tech has been funded

"We are building up not just the reputation, but also the credentials of our tech, and from there we hope to get into profitability within the next one to two years."

Tan Chong Hui, CEO of JAH Tech

this year. 'We are building up not just the reputation, but also the redentials of our tech, and from there we hope to get into profitability within the next one to two years," said Tan JAH Tech's subsidiaries are open for investment and looking for the right partners, he said. "The ideal case is always licensing. If we are able to find good partners that recognise and value the technolo gy, we are able to establish a licen ing model, things will move a lo

The right partner should have "more to offer than tust funds", he added. For instance, an agricultu ral seed provider aiming to develon premium seeds could license JAH Tech has two other subsidi-JAH Cultura's technology to do so The main challenge is a 'chick en and egg' one, said Tan: "One of the main things for any research firm or deep tech firm is to show

ing properties, this active ingre- such that the fuel hums more effi- enough data to convince commencial companies to start a collabora tion." But to get that data, they must find companies to trial their JAH Materials specialises in a technology and prove its effective-

"That is always one of our oneo ing challenges: how to achieve commercial results, while provid-These treated aluminium ine certain aspects to satisfy scient moulds reduce cooling time by up tific question People need to understand the nature of deep tech as a long term

> investment, he said 'For things make your money back'. We're talk ing about 24 years of funding an research, it takes a lot of belief and commitment.

#### Farmers pay a certain sum for streams come from JAH Cultura ed to other manufacturers on an by Lee, but the company will start OEM ioriginal equipment manufac- its first round of seed funding later zenith@sph.com.sg

sines.

**Going further** 

**FHE STRAITS TIMES** 

SINGAPORE

Innovative ceramic alloy helps S'pore farm to improve yield and taste of its fish



Mr Lim Kim Chwee, Co-founder of Ebizu Fish Farm, storing fish feed in a box made from JAH Tech's ceramic material. ST PHOTO: RXAN CHIONO

### Lucas Tan

UPDATED FEB 6, 2023, 6-56 AM SGT -

f y ...

SINGAPORE - A local aquaculture farm has started deploying an innovative type of ceramic alloy to improve its yield without requiring more electricity to operate.

Ebizu, which grows local favourites such as grouper and threadfin, is using the material, which can emit electromagnetic waves, to improve the quality of water and fish feed, as well as heal injured fish.

The ceramic, called Unitatem Cultura, was invented by local agri-tech start-up JAH Cultura.





CAPITAL CONNECTION

THU, SEP 1 2022 • 2:06 AM EDT

HARE f 🖬 in 🖾

# This agritech firm is working towards meeting Singapore's food security goals

Tan Chong Hui, CEO of JAH Tech, explains how the technology at his agritech firm works to help Singapore achieve its aim of providing 30% of its nutritional needs locally by 2030. FOLIO

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LIFESTYLE, TECH

### A Tour Of the Nature's International Commodity Farm With JAH Cultura's Tan Chong Hui

By Bryan Goh August 19, 2022





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新闻新加坡生态环保永续

有限的土地,无限的科技

2022年09月20日 星期二 🛛 0 259608

### 💊 f 💟 👂 🕒 🗲 分享

新加坡国土面积狭小,而人口众多,是一个人口高度密集的国家。如今的新加坡有着亚洲四小龙的称 呼,工业经济发展用地多,而农业可耕地资源却十分有限。疫情冲击供应链、气候变化威胁粮食安全 等,更凸显了农产品的供应韧性和农业可持续发展的重要性。

今年4月8日,据新加坡食品局(SFA)统计显示,新加坡90%以上的食物需要从其他国家进口,另 10%由本地生产,且只有1%的土地用于农业,因此解决新加坡口粮的关键途径就是依赖于进口。正如 本地所提出的,饭碗要装自己的粮,新加坡也有意识的要扩大本土粮食的供给比例,如何确保稳定的粮 食供应成为新加坡面临的一项重要议题。

当局计划在2030年满足本国30%营养需求量的农业生产, 达成"30·30愿景"。为了实现这一目标,新 加坡多家农场正在利用科技提高粮食产量,通过增加本地鱼、蛋和蔬菜等常用食品的产量以解决粮食安 全问题。

提升农作物产量有很多种方式,如何运用科技提高生产率? 《时代财智》记者正是带着这样的疑问,走 访了本地一家利用陶瓷合金材料提升农作物产量从而达到可持续发展目标的技术公司——JAH Cultura。

JAH Cultura经过20多年的深度技术研发出特有的陶瓷合金已通过欧盟 REACH 化学物质安全认证,该 材料不需要额外的能源就能自然产生太赫兹波频率。

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Hive life

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BUSINESS NEWS, ENTREPRENEURIAI INSIGHTS & LIFESTYLE GUIDES

LIFESTYLE GUIDES

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# JAH Cultura's Deep Tech Solution Yields A Sustainable Food Future

Jiahua Tan · 2022-08-23 14:06

New deep-tech startup JAH Cultura wants to cultivate a sustainable future by revolutionising agriculture. Using its proprietary technology, it has created a series of ceramic-alloy products to significantly boost harvests for farmers and hobbyists.



### **BUSINESS INSIGHTS**

# Singaporean DeepTech Startup JAH **Cultura Innovates in Food Sustainability**

BY SUKHVEER KAUR SINGAPORE JUN 27TH 2022 2 MINS

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BUSINESS & TECH, BUSINESS NEWS, ECO & WELLNESS, NEWS

### fy≌in



JAH Cultura, a new DeepTech startup based in Singapore, takes a step forward to revolutionise the agriculture ecosystem with its proprietary sustainable AgriTech solution that boosts harvests for farmlands.

Delivering an innovative sustainable AgriTech solution, JAH Cultura, a DeepTech startup founded in Singapore, is working to cultivate food sustainability and boost food security across the region. Increased <u>climate instability</u> has posed a constant threat to agricultural and aquaculture yields, and JAH Cultura's newly developed solution is revolutionising the agricultural landscape. By incorporating its proprietary ceramic-alloy technology, Unitatem CULTURA TM, growth is improved, resulting in a surge of harvest produced for farmers.

"Our intent with JAH Cultura was to look for agricultural solutions that were environmentally and socially conscious."



Tan Chong Hui and Nicholas Goh

### JAH CULTURA

JAH Cultura believes in cultivating to for a sustainable future through ( innovation. Through smart farming ( with Unitatem CULTURA<sup>™</sup>, its with Unitatem CULTURA<sup>™</sup>, its with Unitatem CULTURA<sup>™</sup>, its with the agricultural industry, JAH ( for the agricultural industry, JAH ( Cultura aims to increase harvests ( to combat the anticipated increase in global food demand. "I was ( originally a software engineer by to training and spent over 20 years in to the software in the soft

the IT industry," reveals CEO and Co-Founder Tan Chong Hui. "JAH Cultura was first set up, together with my co-founder Barton Lee, to provide solutions for the agricultural sector. Given that food security is a growing problem, with Singapore being especially affected by this issue, we felt that this was one of the more pressing issues we wanted to address finst."

# Innovative Breakthroughs

"Our biggest breakthrough to date would be Unitatem CULTURATM. It is the natural EM field emitted by our proprietary ceramic-alloy material to decluster the water molecules that will go into the plants. This way, water molecules become easier for plants to absorb, spurring the rate of growth and the health of crops. Integrating Unitatem CULTURA<sup>TM</sup> into existing farming infrastructure is a cost-efficient and fuss-free affair. The technology can be customized to suit all farming requirements without altering existing farm infrastructure. It also doesn't require setting up additional energy sources as the field emitted from the ceramic-alloy field is a naturally occurring wave frequency."



#### At the Heart of the Matter

"Practical applications for our Unitatem CULTURA<sup>INI</sup> are varied, but with the worsening climate crisis and the rising food insecurity due to poor crop yield, we decided to first delve into the agricultural sector with this technology. Our intent with JAH Cultura was to look for agricultural solutions that were environmentally and socially conscious. This led us to develop

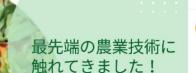


INNOVATION JOURNEYS

several products and processes to integrate this technology into farming processes. This includes creating ceramic-alloy capsules in which seeds can be treated, an irrigation process to treat water used to grow crops, and pegs that can be inserted into the soil that produce is grown in."

#### Reaching Out to the Next Generation

"We are scheduling visits to primary schools to educate children about agri-tech and the benefits in can bring to the urban farming community. We are targeting to start these visits from this month onwards. As part of the school visits, we will take them through the science behind accelerating plant and animal growth to increase food production and why this is important for us, our food sources, and the Earth." [2]



Future of **4** agriculture

JAH Cultura主催のイベントが行われ、 今後家庭菜園や様々な分野で活躍すると期待される技術を学び、 不思議体験をしてきました! part?.

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Startup JAH Cultura Innovates in Food Sustainability

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シンガポールのアグリテック

スタートアップ、「JAH Cultura 」 のメディアミートアップへ伺いまし

JAH Culturaのコースターの上に ウイスキーやお醤油を置くと、

化学反応が生み出す未知の可能性に ワクワクしたイベントでした 🎔

写真2枚目は、JAH Culturaスティック

の側にだけ芽が出ているシーンア

旨味が増えていたり、

3日経っただけです! そして3枚目は、2週間後 🥬 立派に成長しました 🔿

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\*English Below

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OCTOBER 19, 2022

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hivelifemagazine A new #DeepTech startup based in #Singapore @jahcultura takes a step forward to revolutionise the agriculture ecosystem with its proprietary sustainable #AgriTech solution that boosts harvests for farmlands. 🍞

Increased #climateinstability has posed a constant threat to agricultural and #aquaculture yields, and @jahcultura 's newly developed solution is revolutionising the #agricultural landscape.

Learn more about the sustainable solution on www.hivelife.com

Cahcultura

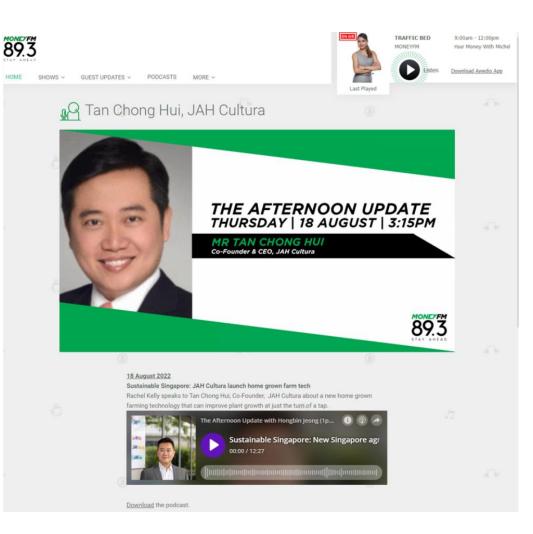
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# **JAH Cultura Tech Event** Jakarta – 15 May 2023

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Facebook

Updated: May 31, 2023

### **JAH Cultura Hadirkan** Teknologi Baru untuk Mendukung Pertanian **Berkelanjutan**

By Maialah Trubus | May 23, 2023 244



Suasana acara Cultivating A Sustainable Future with JAH Cultura di Hotel Santika Premium Hayam Wuruk, Jakarta. (Dok. Trubus)

# **Pos Sore**

## Aktual Ekonomi

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IAH Cultura Hasilkan Produk pertanian Berkelanjutan

by Tety Polmasari (2) 15/05/2023 (2) 0 (2) 62





**Dukung Pertanian** Berkelanjutan, JAH Cultura Kenalkan Teknologi Unitatem Cultura

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Para narasumber pada workshop dengan tema Cultivating a Sustainable Future with JAH Culture

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Perkenalkan Teknologi Unitatem Cultura Demi Pertanian Berkelanjutan

Redaksi JagatBisnis.com 15 Mei 2023 - 22:36



Berita Terbaru Event Inovasi dan Teknologi

# JAH Cultura Hadirkan Teknologi Pengolahan Air untuk Pertanian dan Perikanan

May 23, 2023

Pertanianku — Kehadiran teknologi untuk mengoptimalkan produksi pertanian sangat diperlukan pada masa ini. Berangkat dari permasalahan tersebut, perusahaan DeepTech asal Singapura, JAH Cultura memperkenalkan teknologi pengolahan air bernama Unitatem. Teknologi ini tidak memerlukan sumber energi dan bisa didaur ulang untuk meminimalisir limbah





Inspired by



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