

**GLOBAL  
CONNECT  
@SBF**

Connecting  
your business to  
global opportunities

AN INITIATIVE OF



SUPPORTED BY

**Enterprise  
Singapore**

CORE PARTNERS



Welcome to SBF Global's

# Navigating India: Riding The Innovation Wave

12 November 2021, Friday | 2.30 – 4.30 pm (SG-time)





## DISCLAIMER

**The information in this webinar is intended to provide general information only and does not contain or convey any legal or other advice.**

**All efforts have been taken to ensure the information provided in this webinar is accurate as of publication date.**

**The organiser and speakers reserve all rights in the material provided.**

**This webinar is being recorded and will be posted on SBF's YouTube Channel.**



## COURTESY POINTS



**By default, you would be muted when you joined the webinar .  
Otherwise, please mute your microphone throughout the session.**



**Have a question? Type your questions into the Question & Answer  
Panel and we will read it out later or contact you after the webinar**



## **Learn** with us

- About markets
- About new customers
- About Free Trade Agreements

**Because knowledge is power.**

## **Land** with us

- Dedicated digital spaces
- Established networks
- Hands-on advice and facilitation

**Scale and grow smartly.**

## **Localise** with us

- Trusted relationships abroad
- Deepen market presence
- Secure long-term sustainability

**Because network is net worth.**

# GLOBALCONNECT@SBF

Connecting your business to global opportunities.



<https://globalconnect.sbf.org.sg/>



## PROGRAMME LINE UP

**2.30 - 2.35 pm**

**Opening remarks by Singapore  
Business Federation**

Mr. Prasoon Mukherjee, Vice-Chairman, South  
Asia Business Group, Singapore Business  
Federation

**2.35 - 2.50 pm**

**Keynote Address**

Ms. Sahana Danasekaran - Associate Vice  
President, Guidance Tamil Nadu

**2.50 - 3.00 pm**

**Ecowrap**

Mr. Angraj Swami, Founder & CEO

**3.00- 3.10 pm**

**Nature Bio Plastic Products**

Ms. Parthiba Bharathi, Founder

**3.10 - 3.20 pm**

**Zodhya Tech**

Mr. Rohith Pallerla , CEO

**3.20 - 3.30 pm**

**Asun Trackers**

Mr. Varun Sachar, Founder & CEO

**3.30 - 3.40 pm**

**Ossus Biorenewables**

Ms. Suruchi Rao, CEO & Founder

**3.40 - 3.50 pm**

**FlyCatcher Technologies**

Mr. Kabir Udeshi, Founder & CTO

**3.50 - 4.00 pm**

**Arishti Cybertech**

Mr. Kanak Kawadiwale, Founder & CEO

**4.00 - 4.10pm**

**Cyberange**

Mr. Rajshekhar Pullabhatla, Co-Founder &  
Director

**4.10 - 4.20pm**

**Payatu**

Mr. Aseem Jakhar , Co-Founder/Director R&D

**4.20 - 4.30 pm**

**Q&A**





Opening Remarks by Singapore Business  
Federation

**Mr Prasoon Mukherjee, Vice-Chairman,  
South Asia Business Group, Singapore  
Business Federation**





Keynote Address

**Ms. Sahana Danasekaran - Associate Vice  
President, Guidance Tamil Nadu**



# Emerging Trends in Cleantech & Cybersecurity Technologies in India



# Cleantech

## Clean Energy

- Renewable Energy Generation
- Energy Efficiency
- Storage Technology
- Smart Energy
- Alternative Fuel
- Solar Power Efficiency

## Transportation

- EV Manufacturing
- EV Charging Infrastructure

## Circular Economy

- e-Waste Management
- Plastic Recycling
- Biowaste Management
- Waste Water Recycling



# Cyber Security

Artificial Intelligence & Machine Learning

Cyber Security Automation

Cyber Security as a Service

Secure Access Service Edge

Cloud based Security



**GLOBAL  
CONNECT  
@SBF**

Connecting  
your business to  
global opportunities

AN INITIATIVE OF



SUPPORTED BY

**Enterprise  
Singapore**



Ecowrap  
**Mr. Angraj Swami, Founder & CEO**

CORE PARTNERS







# ECOWRAP

Mera Desh Zero Waste





# PROBLEM STATEMENT



ECOWRAP

- Lack of waste segregation at the source is main reason for absence of financially viable & technically feasible processes in the treatment of solid waste.
- **HORECA (Hotel, Restaurant & Café)** is most efficient segment to adopt source segregation culture.



# SOLUTION



## Ecowrap Provides-

- A) Free IoT Dustbins
- B) Tech interface
- C) Training for segregation

Incentivise waste generator for segregation at the source

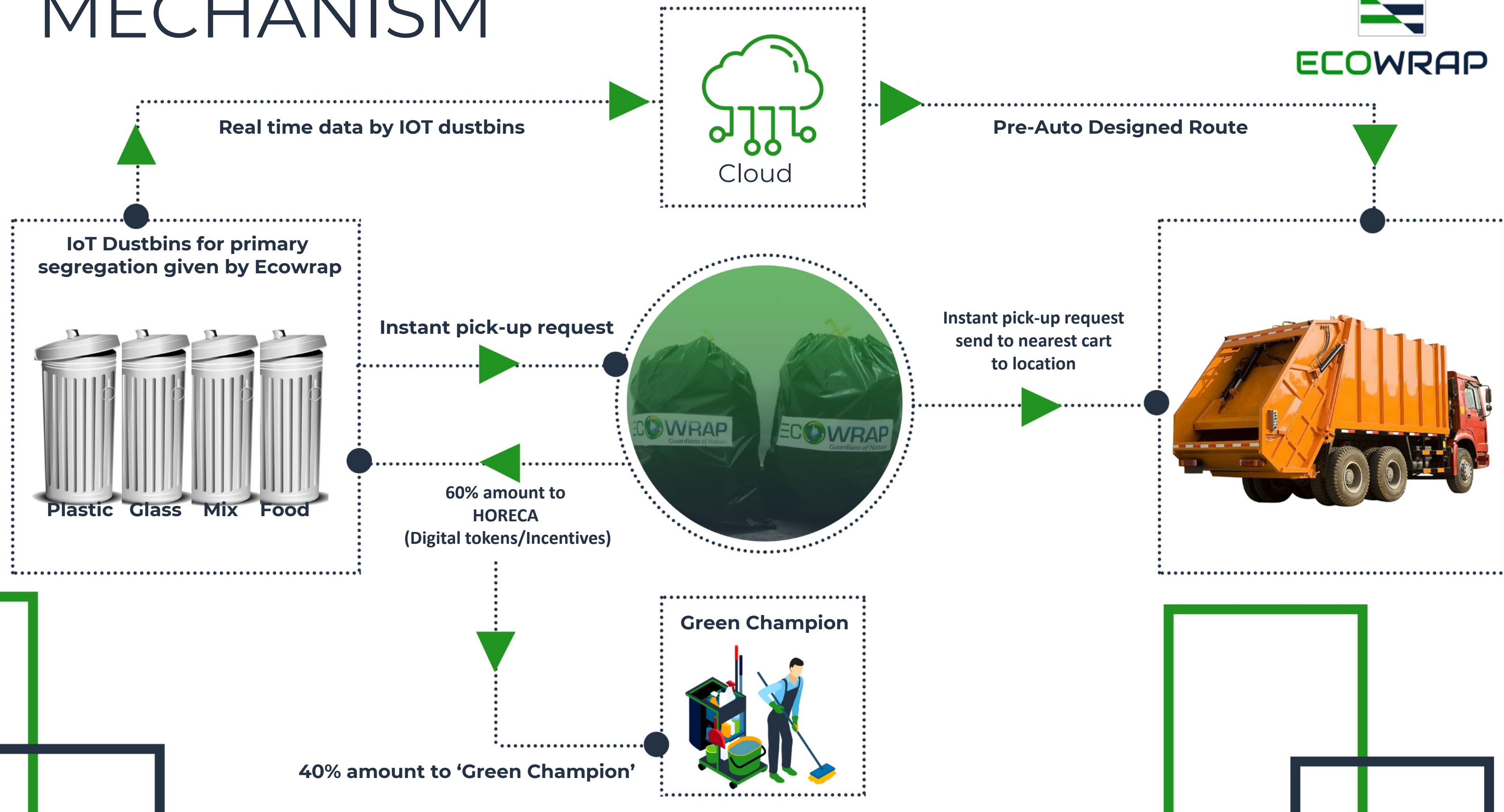
It **PAY** and **COLLECT**  
all type **source segregated** waste

## Ecowrap is –

- A) One stop solution for waste collection, tracking, recycling & up-cycling
- B) Financially viable model by adding extra buffer of Up-cycled & FMCG products



# MECHANISM





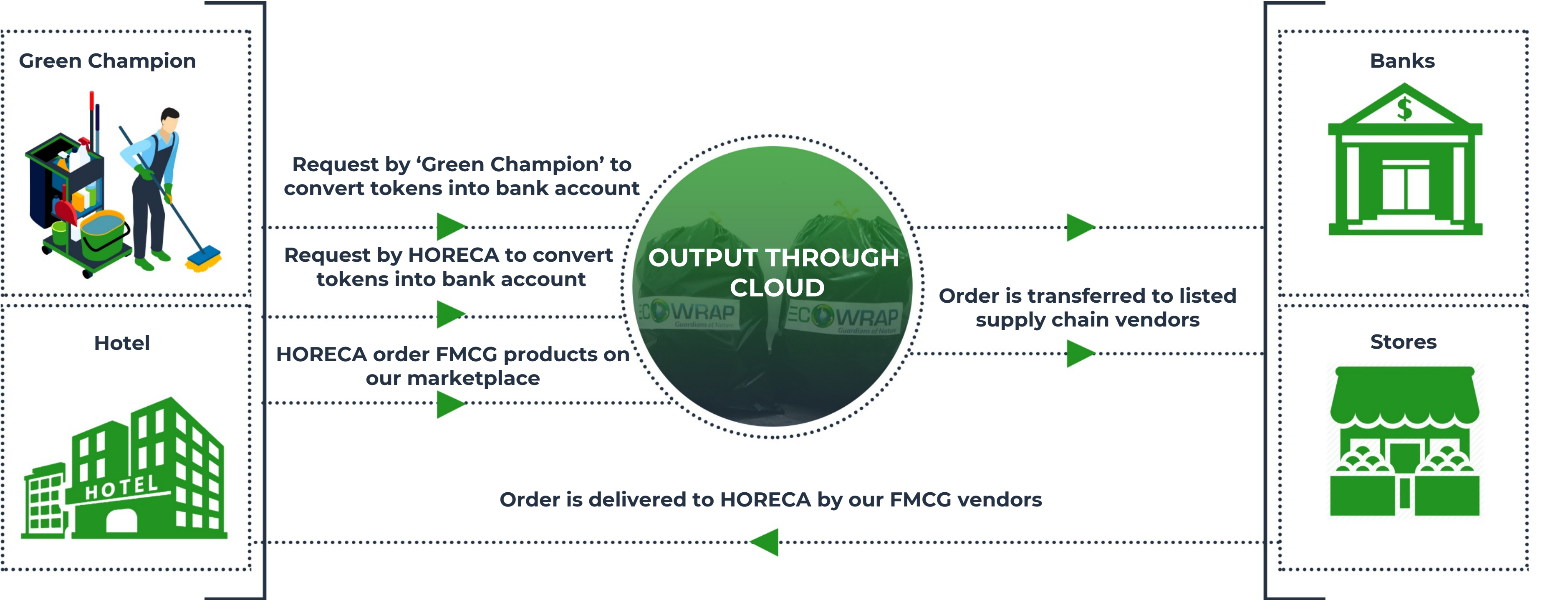
# Use of incentives



USERS HAVING TOKENS  
IN 'ECOWRAP' WALLET

COURSE OF ACTION BY USERS  
TO REDEEM TOKENS

CHANNELS TO REDEEM  
TOKENS





# TREATMENT OF WASTE



Material Recover Facility  
(MRF) of Ecowrap



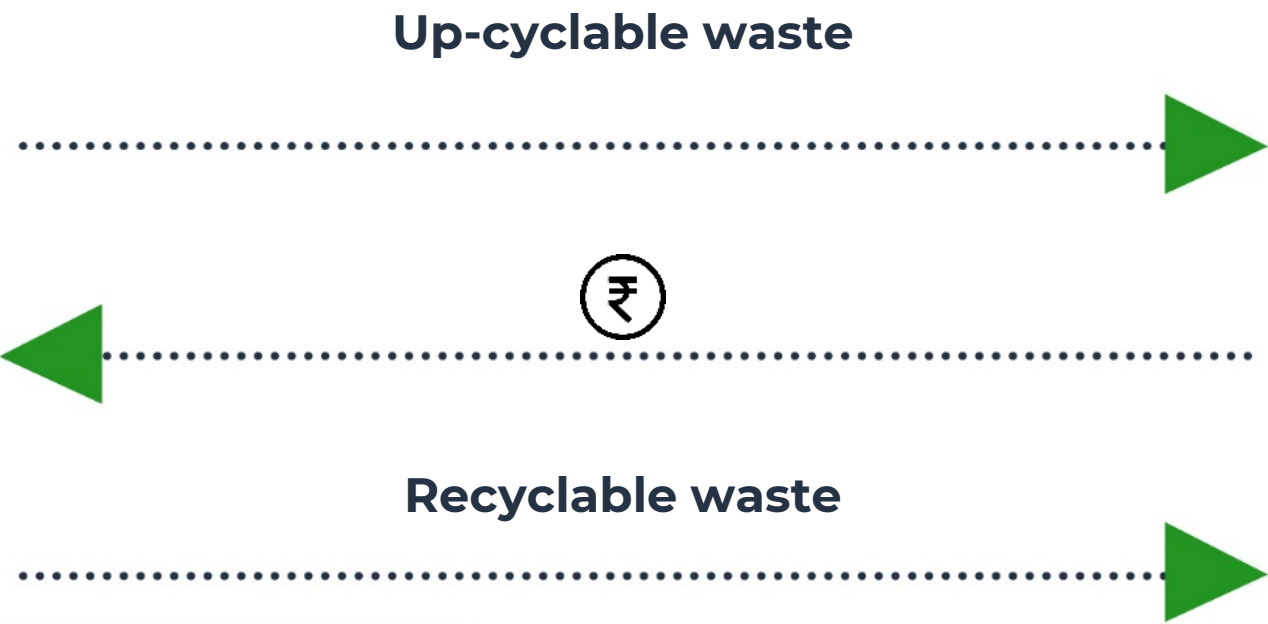
Treatment of waste



Convert waste into  
high value product  
by up-cycling



Recyclable  
waste  
To recyclers





# UP-CYCLED old tyres



ECOWRAP



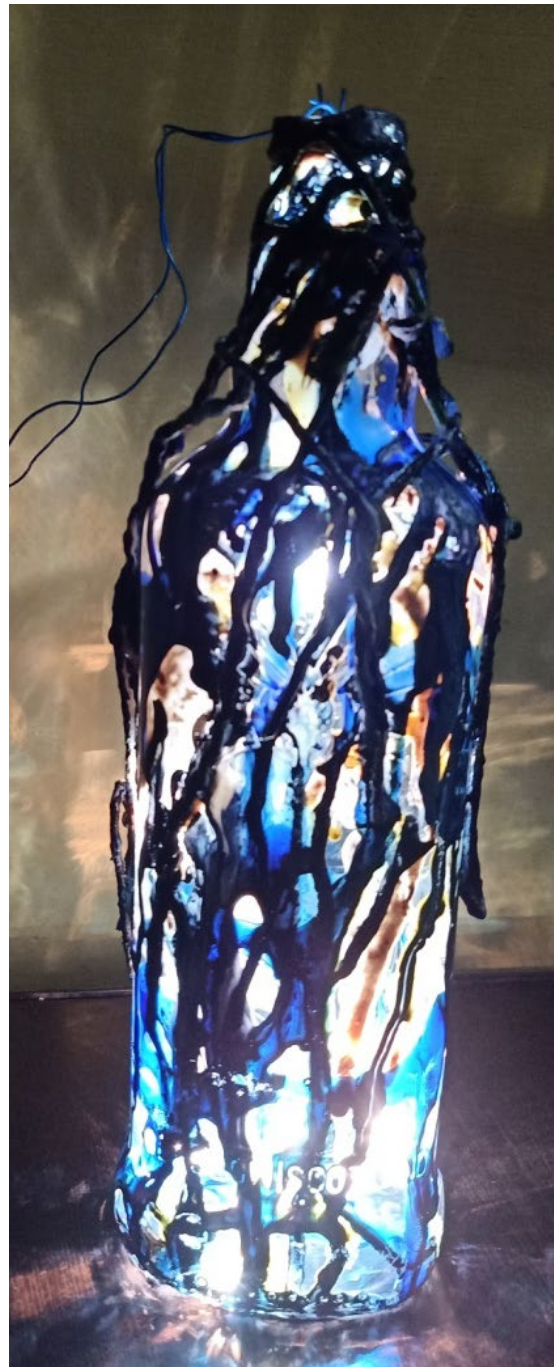


# UP-CYCLED old tyres



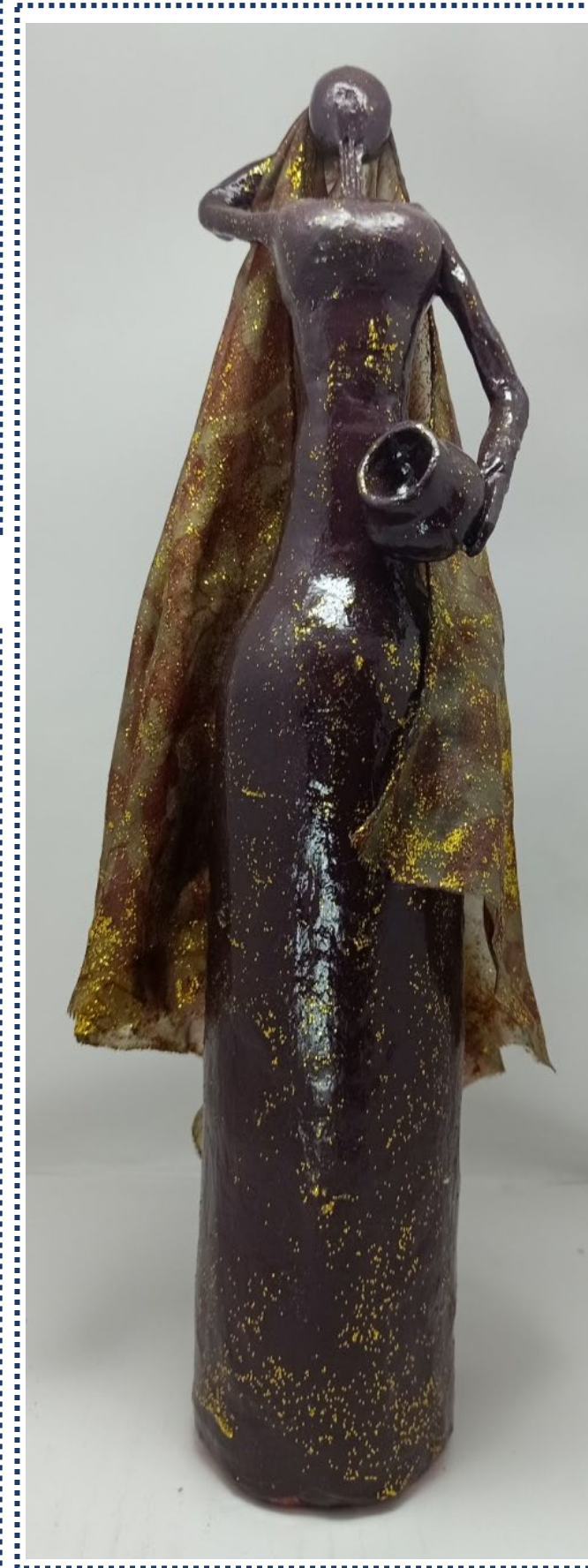
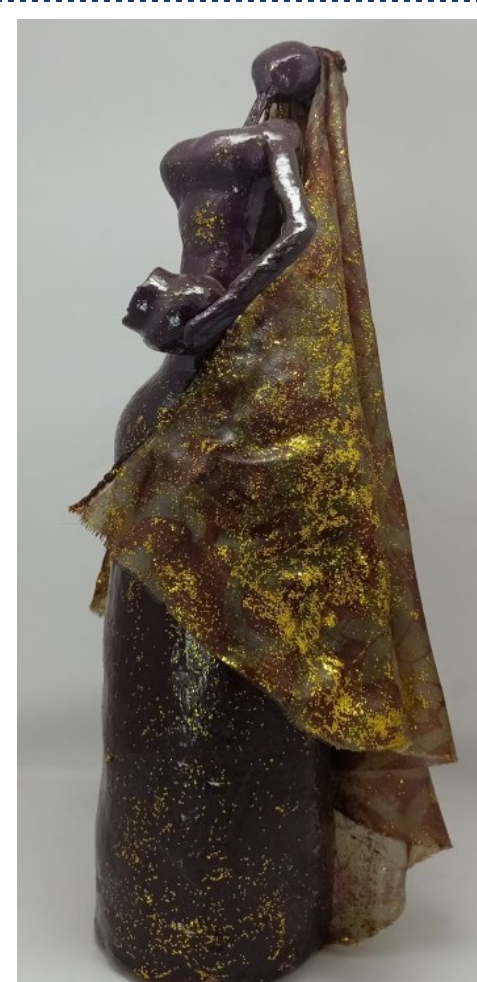
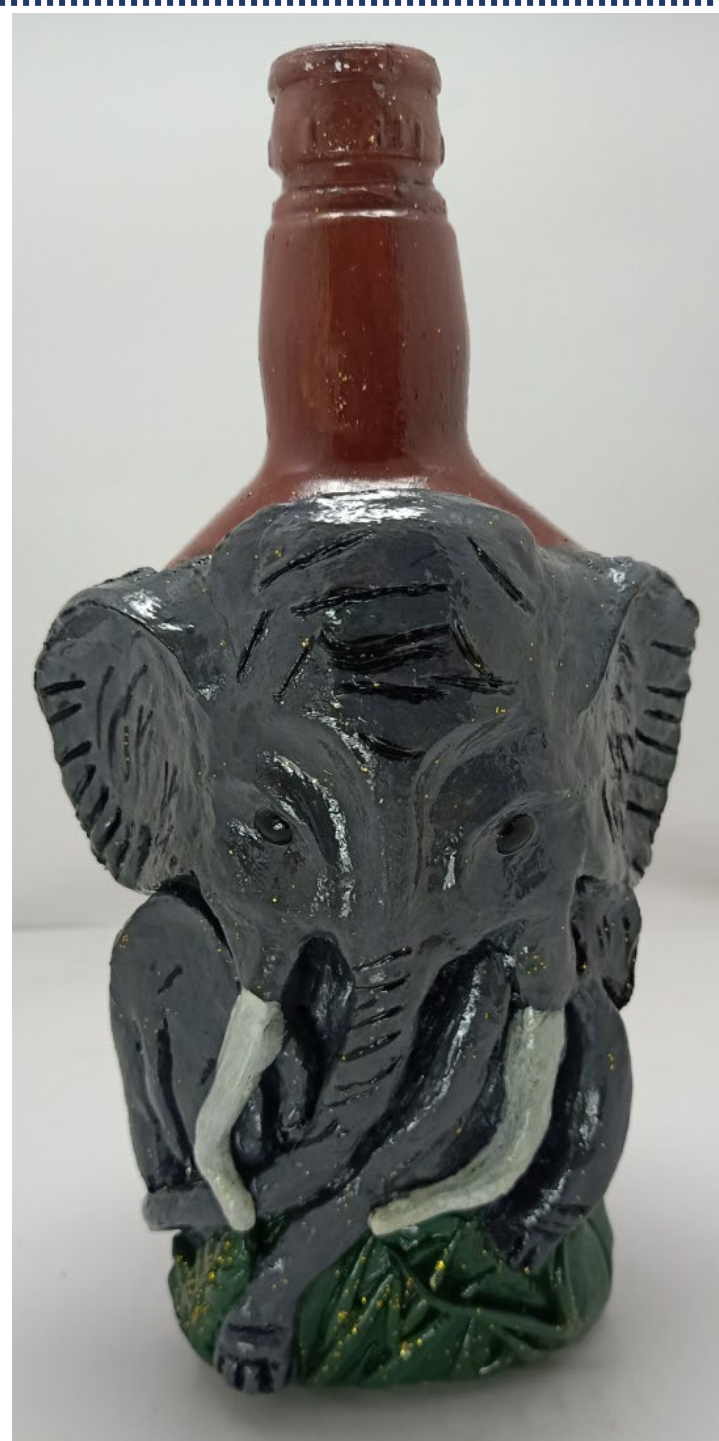


# UP-CYCLED glass bottles



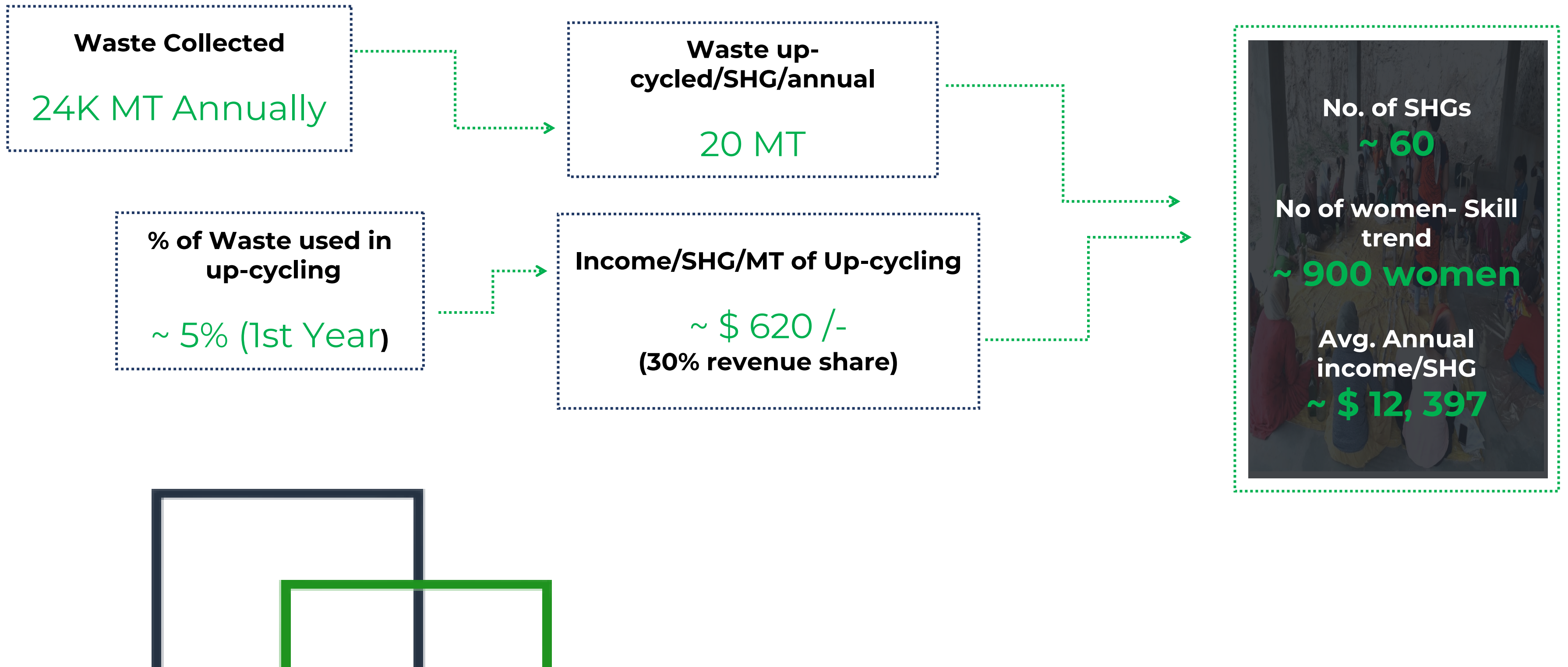


# UP-CYCLED glass bottles



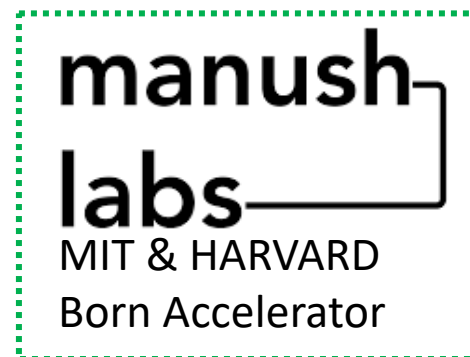


# IMPACT MaTRIX 3<sup>rd</sup> Year





# AWARD & RECOGNISATIONS



United Nation's Youth  
CO:Lab Winner-20



WTFL Switzerland  
Finalist-19 & 21



Tata iprenuer  
Winner-19



IIT Bombay  
Finalist-20





Angraj Swami

Executions

- Graduate in Physics hons. (Delhi University)
- 4 years of Experience in waste Management



Ajay Buri

Product Development

- B.Tech from IIT KGP
- 4 year of exp in product development at topper.com



Chandrakant

Logistics

- Graduate in chemistry (Delhi University)
- 4 years of experience in logistics.



Manoj Sabu

Waste handling

- Graduate in Computer Science (Raj. University)
- 5 year of experience in Business Development

Seed fund

From

SOCIAL  
alpha↗





ECOWRAP

Reach us  
on



[info@ecowrap.in](mailto:info@ecowrap.in)



9269099901



6th Floor, Bhamashah Techno  
Hub,  
Jaipur (Rajasthan)



**GLOBAL  
CONNECT  
@SBF**

Connecting  
your business to  
global opportunities

AN INITIATIVE OF



SUPPORTED BY

**Enterprise  
Singapore**

CORE PARTNERS



Nature Bio Plastic Products  
**Ms. Parthiba Bharathi, Founder**

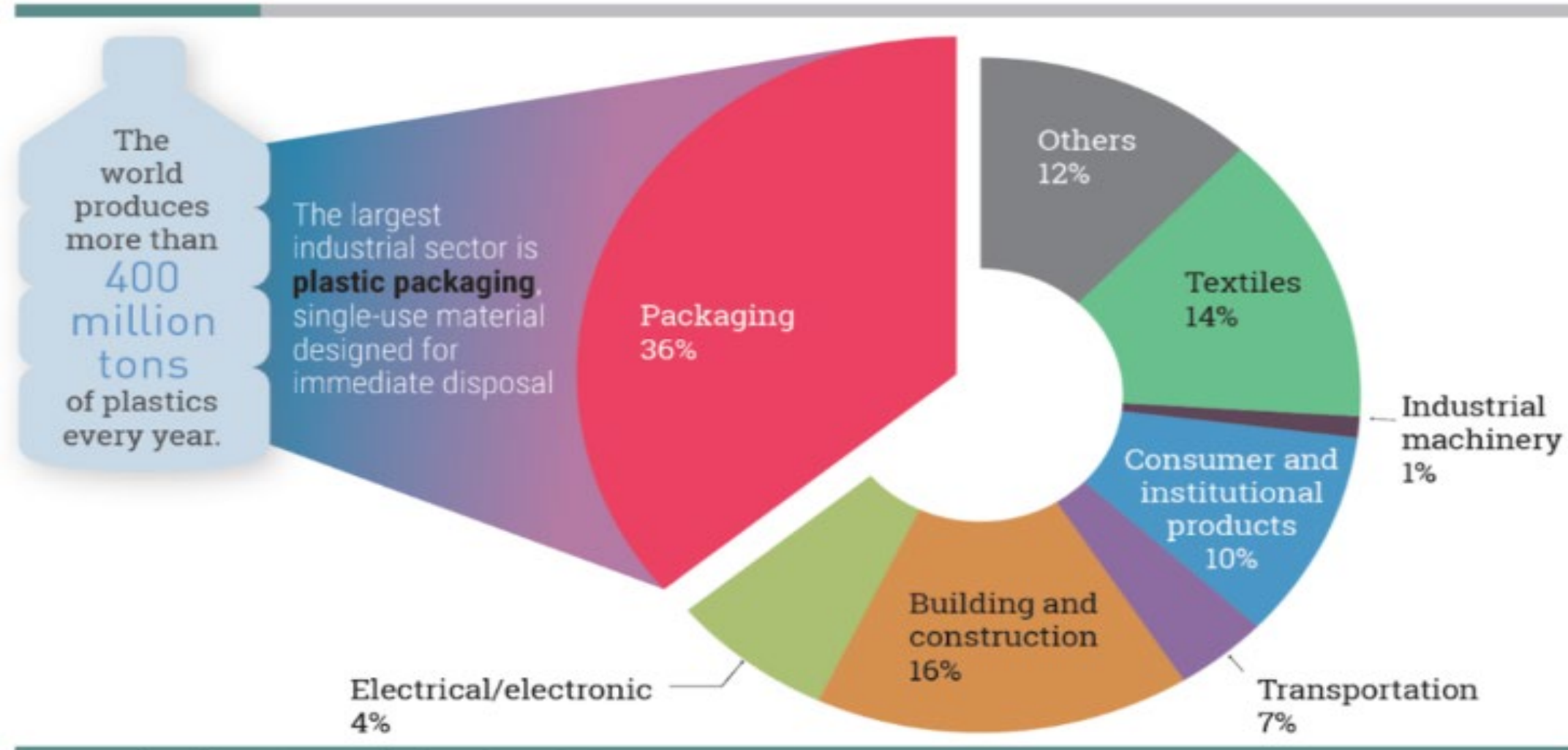




Nature's Bio Plastic  
Greener Future



# Market Scope:

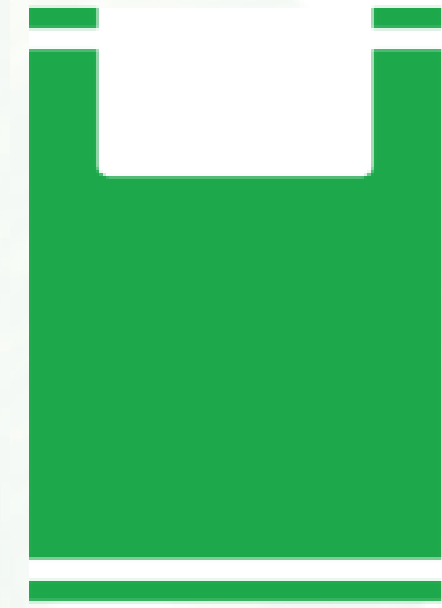
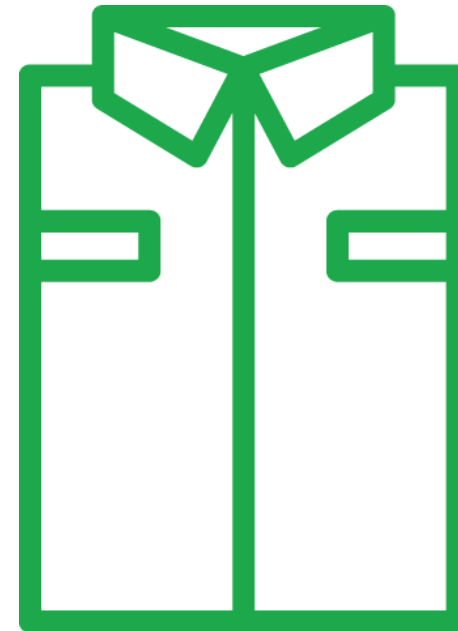
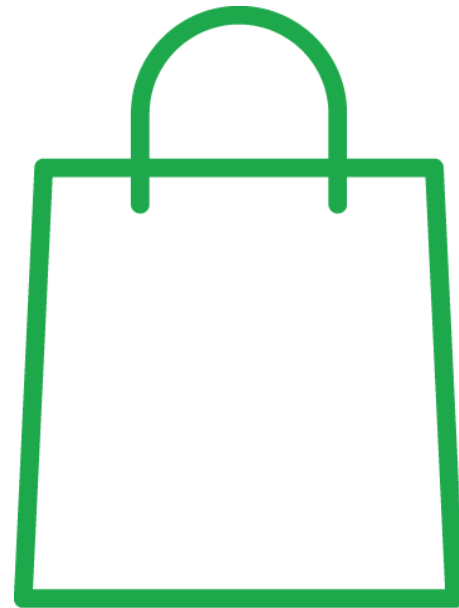


CARRY BAGS  
GARMENT BAGS  
GARBAGE BAGS  
SHOPPING BAGS  
WRAPPING BAGS

- Over USD 3 billion Size of the Indian plastics and polymers industry in 2018.
- In 2018, plastics export from India stood at USD 5 billion
- India stands third in polymer consumption globally after China and US.



# About Us



Nature's Bio Plastic is into Manufacturing and Supplying of biodegradable plastic covers for Packaging, Shopping, Garbage, Textile segments.

These products are 100% biodegradable (environmental friendly), made out of natural materials like corn starch, vegetable oils, natural colors, etc.



# Our Products:



## Biodegradable & Compostable Garment and Apparel Bags

- Engineered to provide high level of packaging performance and protection for garments.
- Ultraviolet Protection.
- Breathable Material ROHS Compliant and do not contain any heavy metals or toxic material.
- Made from renewable resources and therefore enable brands to reduce the carbon footprint of their products.
- Sustainable Biodegradable & Compostable Covers (End of Life).



# Our Products:



## Biodegradable & Compostable Shopping Bags, Carry Bags, Garbage Bags

- We offer an extensive range of carry bags, garbage covers, etc
- Our Products do not contain polyethylene or polypropylene.
- Offer additional benefit of potential final use as biowaste bag.
- Potential reduction of CO2 footprint, GHG emissions and fossil energy consumption.
- Our Products can be used in departmental stores, hotels, restaurants & shopping malls.



# Our Products:

## Biodegradable & Compostable Industrial Packaging



- We Supply Our Biodegradable & Compostable Products to many Industries.
- Our Products are used in Packaging of Auto Parts, Dust Covers and Commercial Applications.
- A Real Environmentally Friendly Packaging Bag For Magazines/Leaflets/Newsletter/Advertising Article Products Which Is Biodegradable And Compostable.
- We offer Perforation films & bags also.



# Composting Process :



1



2

**Fragmentation**



3

**BioDegradation**

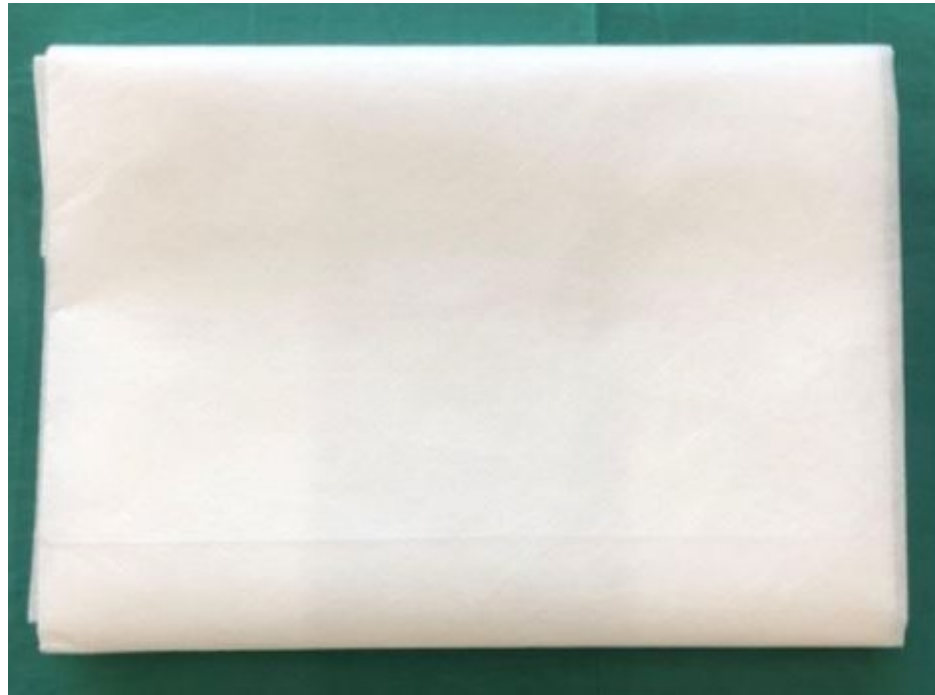


4

ECO  
friendly



# Our Products :



**1** Hospital Bed  
Sheets



**2** Carry Bags



**3** Transparent  
POuches



**4**





# Our Products :



**1 D Cut Bags**



**2 Carry Bags**



**3 Garbage/Trash Bags**



**4 Pouch**



# Extrusion Machine:



CO  
friendly

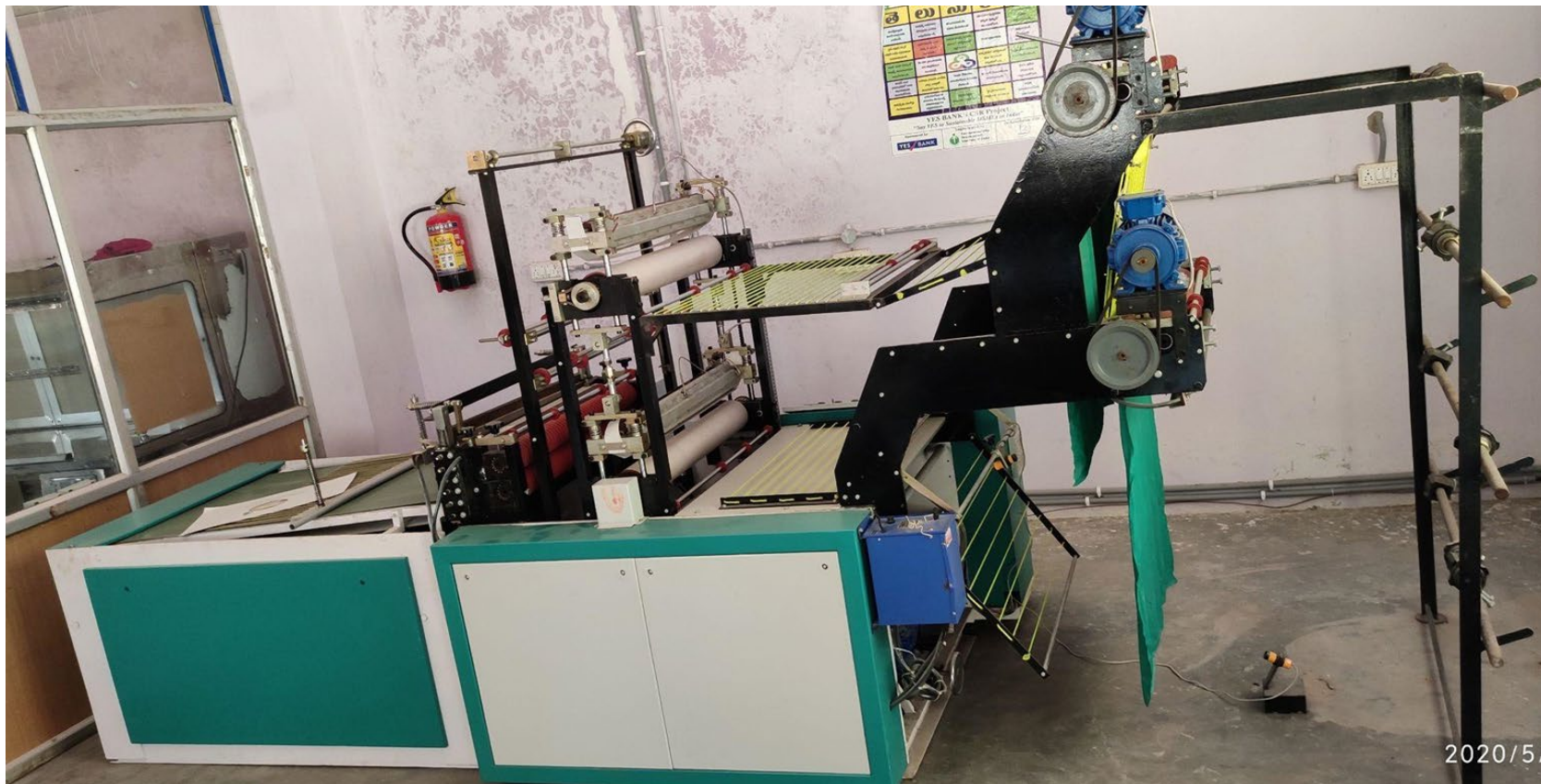


# Our Setup





# Supporting Machinery:





# Certifications:



केन्द्रीय प्रदूषण नियंत्रण बोर्ड  
CENTRAL POLLUTION CONTROL BOARD  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार  
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE GOVT. OF INDIA

## **PROVISIONAL CERTIFICATE TO MANUFACTURER FOR MARKETING AND SELLING OF COMPOSTABLE CARRY BAGS/PRODUCTS**

Provisional Cert. No.-B-17011/7/PWM(COMP)/2020(NBPPL) Dated.:31/08/2020

To,

M/s. Nature's Bio Plastics Pvt. Ltd.  
C/O A/C, ALEAP v/e Hub,  
ALEAP Industrial Estate,  
Survey No- 342, Pragathi Nagar,  
Kukutpally, Hyderabad-500072

With reference to the application no. Nil, dated 11.11.2019 & subsequent communication, this is to certify that M/s. Nature's Bio Plastics Pvt. Ltd. C/O A/C, ALEAP v/e Hub, ALEAP Industrial Estate, Survey No- 342, Pragathi Nagar, Kukutpally, Hyderabad-500072 is fulfilling the criteria as per revised Standard Operating Procedure (SOP) for issuing certificate as per the provisions '4(h)' & '11(c)' of Plastic Waste Management Rules, 2018, for marketing and selling of compostable carry bags/products such as in Indian Market as 'MANUFACTURER'.

Central Pollution Control Board, hereby, grant the permission to M/s. Nature's Bio Plastics Pvt. Ltd. C/O A/C, ALEAP v/e Hub, ALEAP Industrial Estate, Survey No- 342, Pragathi Nagar, Kukutpally, Hyderabad-500072 as 'MANUFACTURER' for Marketing and Selling of compostable carrybags/products in Indian Market.

**THE PROVISIONAL CERTIFICATE SHALL BE VALID FOR THE PERIOD OF SIX  
(6) MONTHS FROM THE DATE OF ISSUE OF THE LETTER**

### **GENERAL CONDITIONS**

- The Certified 'MANUFACTURER' M/s. Nature's Bio Plastics Pvt. Ltd., shall comply with the provisions of '4(h)' & '11(c)' of the PWM Rules, 2018, notified under the Environmental (Protection) Act, 1986.
- The certified Manufacturer M/s. Nature's Bio Plastics Pvt. Ltd., shall comply with conditions for compliance as per any Guidelines issued from time to time by the Ministry of Environment, Forest & Climate Change or Central Pollution Control Board.

*Divya*

Contd....2

'परिवेश भवन' पूर्वी अर्जुन नगर, दिल्ली-110032  
Parivesh Bhawan, East Arjun Nagar, Delhi-110032  
दूरभाष/Tel : 43102030, 22305792, वेबसाइट/Website : www.cpcb.nic.in

-2-

- If the certified Manufacturer M/s. Nature's Bio Plastics Pvt. Ltd., is found non-complying with the provisions of the PWM Rules, 2018, the Certificate shall stand cancelled.
- Each carrybag made from compostable material or plastic shall bear a label "COMPOSTABLE" IS/ISO:17088 titled as Specifications for "Compostable Plastic" in English & regional language. Each carrybag shall also have printed M/s. Nature's Bio Plastics Pvt. Ltd., code: NBPPL and Certificate Number of "MANUFACTURER".
- The Manufacturer M/s. Nature's Bio Plastics Pvt. Ltd., shall provide quarterly report giving details of raw material procurement and product sale to CPCB.
- This certificate is issued with the condition that the manufacturer shall manufacture/sell the compostable carrybags/products only after they obtain a valid Registration for manufacturing of Compostable carrybags/products from concerned SPCB/PCC. This Registration should be submitted to CPCB upon its receipt from concerned SPCB/PCC.
- This certificate is issued with the condition that the manufacturer shall submit a fresh interim test report of the sample within Six (6) months from the date of issue of Provisional Certificate as per Indian Standard IS/ISO:17088 (as amended time to time) and complete test report of the sample, including seed germination and heavy metal analysis test (after 180 days) as per Indian Standard IS/ISO:17088 (as amended time to time) from CIPET or any other CPCB recognized Government laboratory having adequate testing facilities for issuing Final Certificate, failing which, the Provisional Certificate shall stand cancelled.

**AUTHORIZED SIGNATORY**  
(with designation and seal)

*Divya*  
Divya Sinha  
केन्द्रीय प्रदूषण नियंत्रण बोर्ड  
Central Pollution Control Board  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार  
Min. Env. Forest & Climate Change, Govt. of India  
पारिवेश भवन, पूर्वी अर्जुन नगर  
Parivesh Bhawan, East Arjun Nagar  
दिल्ली/Delhi-110032



# Test Report:

## सिपेट: इंस्टिट्यूट ऑफ प्लास्टिक्स टेक्नॉलाजी (आई पी टी) कोची

रसायन एवं पेट्रोसायन विभाग,  
रसायन एवं उर्वरक मंत्रालय, भारत सरकार  
जेएनएम कैम्पस, एलूर, उद्योगमंडल पी. ओ.  
कोची, केरल - 683 501.  
फोन: 0484-2547741, 2547742  
ई-मेल: kochi@cipet.gov.in, cipetkochi@gmail.com  
वेबसाइट: www.cipet.gov.in  
मुख्यालय: गिण्डी, चेन्नै - 600 032



## CIPET: INSTITUTE OF PLASTICS TECHNOLOGY (IPT) KOCHI

Department of Chemicals & Petrochemicals,  
Ministry of Chemicals & Fertilizers, Govt. of India  
JNM Campus, Eloor, Udyogamandal P. O.  
Kochi, Kerala - 683 501.

Ph: 0484-2547741, 2547742  
email: kochi@cipet.gov.in, cipetkochi@gmail.com  
Web: www.cipet.gov.in

Head Office: CIPET, Guindy, Chennai - 600 032

सिपेट:आई पी टी-कोची /परीक्षण/२०१९-२०

CIPET:IPT-Kochi /Testing/2019-20/021

दिनांक : २४.०३.२०२०

Date: 24.03.2020

सेवा में / To

M/s. Nature's Bio Plastic Pvt. Ltd.,  
C/O AIC ALEP We Hub,  
ALEAP Industrial Estate  
Survey No. 342, Pragathi Nagar  
Kukatpally, Hyderabad-500072

प्रिय महोदय / Dear Sir,

विषय : नमूनों की परीक्षण - संदर्भ में।

Sub.: Testing of samples – Reg.

Ref.: Your letter dt.06.11.2019

हम इसके साथ परीक्षण के लिए प्रस्तुत नमूने से संबंधित टेस्ट रिपोर्ट क्रमांक 19611 दिनांकित 24.03.2020 संलग्न कर रहे हैं।

We are enclosing herewith Test Report No. 19611 dt. 24.03.2020 pertaining to the samples submitted for testing.

कृपया संलग्न कस्टमर फीडबैक फॉर्म भरकर वापस भेजने का कष्ट करें।

Please find enclosed herewith the feedback form. Kindly fill and send it back to us.

धन्यवाद तथा सबसे अच्छी सेवा देने का आश्वासन के साथ,

Thanking you and assuring you our best services,

सादर, / yours sincerely,

  
प्रमुख निदेशक और प्रमुख  
Principal Director & Head

संलग्न यथोक्त / Encl. as above.

सिपेट: इंस्टिट्यूट ऑफ प्लास्टिक्स टेक्नॉलाजी (आई पी टी) - कोची

रसायन एवं पेट्रोसायन विभाग  
रसायन एवं उर्वरक मंत्रालय, भारत सरकार  
जेएनएम कैम्पस एलूर  
उद्योगमंडल पी.ओ.  
कोची, केरल - 683 501  
फोन : 0484-2546740  
ई-मेल: kochi@cipet.gov.in, cipetkochi@gmail.com  
वेबसाइट : www.cipet.gov.in  
मुख्यालय : गिण्डी, चेन्नै : 600 032



प्लास्टिक्स परीक्षण केंद्र  
PLASTICS TESTING CENTRE  
परीक्षण रिपोर्ट  
TEST REPORT



CIPET: INSTITUTE OF PLASTICS TECHNOLOGY (IPT)-KOCHI

Department of Chemicals & Petrochemicals  
Ministry of Chemicals & Fertilizers, Govt. of India  
JNM Campus, Eloor  
Udyogamandal P.O., Kochi, Kerala-683 501  
Ph: 0484-2546740

E-mail:kochi@cipet.gov.in, cipetkochi@gmail.com  
Web : www.cipet.gov.in

Head Office : CIPET, Guindy, Chennai-600 032

क.सं. / Sl.No. 7112

Test Report No : 19611

Date: 24.03.2020

Issued to: M/s. Nature's Bio Plastic Pvt. Ltd.,  
C/O AIC ALEP We Hub,  
ALEAP Industrial Estate  
Survey No. 342, Pragathi Nagar  
Kukatpally, Hyderabad-500072

Ref: Letter dt. 06.11.2019

## INTERIM REPORT

## BIODEGRADABILITY TEST AS PER IS/ISO 17088

Date of Initiation : 21.11.2019

Date of Completion: 20.03.2020

1. Sample Detail : Compostable Film ( as declared by the party )
2. Material Identification by FTIR : Blend of Polylactic Acid(PLA) and PolybutyleneAdipate Co-Terephthalate (PBAT)

### 3. Observations:

(1) Conditions of reaction Mixture

Origin of Compost	: Livestock excrement, municipal and vegetable waste
Reaction Temperature	: 58°C (±2°C)
Dry Solid (%)	: 52.02 %
Volatile content (%)	: 35.76%
CO <sub>2</sub> evolved during first 10 days	
in blank vessels	: 60.87 mg/g of volatile solids of compost
Test Duration (Days)	: 119 Days
Reference material	: Cellulose
Volume of reaction Vessel	: 3000ml



१९.००.१४



Test Report No :19611  
Date: 24.03.2020

## 6. Disintegration- After 12 Weeks



## Comments

Percentage of disintegration of submitted sample is determined based on the sieve analysis and visual examination. After 12 weeks the sample is passed through 2.0 mm sieve and total mass retained is determine as 9.1%.

Further, the submitted sample is not distinguishable in the organic compost. The above observation indicates that the submitted sample demonstrates satisfactory disintegration.

## Note

The submitted sample is exposed under controlled compost condition as per ISO 14855-1 and at the end of 119 days, the cumulative biodegradation is estimated as 90.74% with the reference to the degradation of the cellulose. The test is being continued as per IS/ISO 17088 to evaluate seed germination and heavy metal analysis. The final report will be issued after completion of the above test.

## REMARKS

NB: i) The results stated above related only to the items tested.

ii) This Test Certificate shall not be reproduced except in full without the written approval.

iii) Details of test subcontracted – Nil

  
Manager (Technical)  
Authorized Signatory

१९.००.१४

केन्द्र : अहमदाबाद, अमृतसर, औरंगाबाद, अमरतला, बही, बालासोर, बेंगलुरु, भोपाल, भुवनेश्वर, चंद्रपुर, चेन्नै, देहरादून, गुवाहटी, ग्वालियर, हैदराबाद  
हाजीपुर, हल्द्वी, इम्फाल, जयपुर, कोची, लखनऊ, मद्रास, मुरखल, मैसूर, रायपुर, रांची, वलसाड एवं विजयवाड़ा  
Centres : Ahmedabad, Amritsar, Aurangabad, Agarthala, Baddi, Balasore, Bengaluru, Bhopal, Bhubaneswar, Chandrapur, Chennai, Dehradun, Guwahati, Gwalior, Hyderabad  
Hajipur, Haldia, Imphal, Jaipur, Kochi, Lucknow, Madurai, Murthal, Mysuru, Raipur, Ranchi, Valsad & Vijayawada





Nature's Bio Plastic  
Greener Future

The choices that we make today will define our collective future.

The choices may not be easy. But through awareness, technology, and a genuine global partnership, I am sure we can make the right choices.

Let us all join together to beat plastic pollution and make this planet a better place to live.

**"We are committed to eliminate all single-use plastic by 2022"**

**PM. Narendra Modi**





# Thank You

Contact:

Pratibha Bharathi - 9700861653

Praveen Kumar - 9000802375



**GLOBAL  
CONNECT  
@SBF**

Connecting  
your business to  
global opportunities

AN INITIATIVE OF



SUPPORTED BY

**Enterprise  
Singapore**

CORE PARTNERS



Zodhya Tech  
**Mr. Rohith Pallerla , CEO**





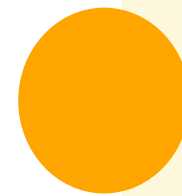
# ZODHYA

**Making spaces energy-efficient**



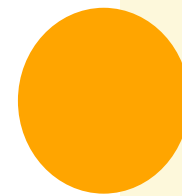
# Major Concerns

02



In 2020, CO<sub>2</sub> emissions due to Electricity usage stand at 33100 MtCO<sub>2</sub> globally.

EEA



An advanced state like California suffered rolling blackouts, caused by Climate Change & Poor Planning.

LA Times



50% Emissions can be reduced with Efficiency in Energy.

BEE



## WHY NOW?

- The world is increasingly aware of Climate Change & looking out for sustainable solutions.
- Technology development in the areas of AI & Cloud computing assisting the innovation of new solutions.
- Increasing Energy Bills (has been doubled over the past 10 yrs) & high Carbon footprint needs to be addressed.





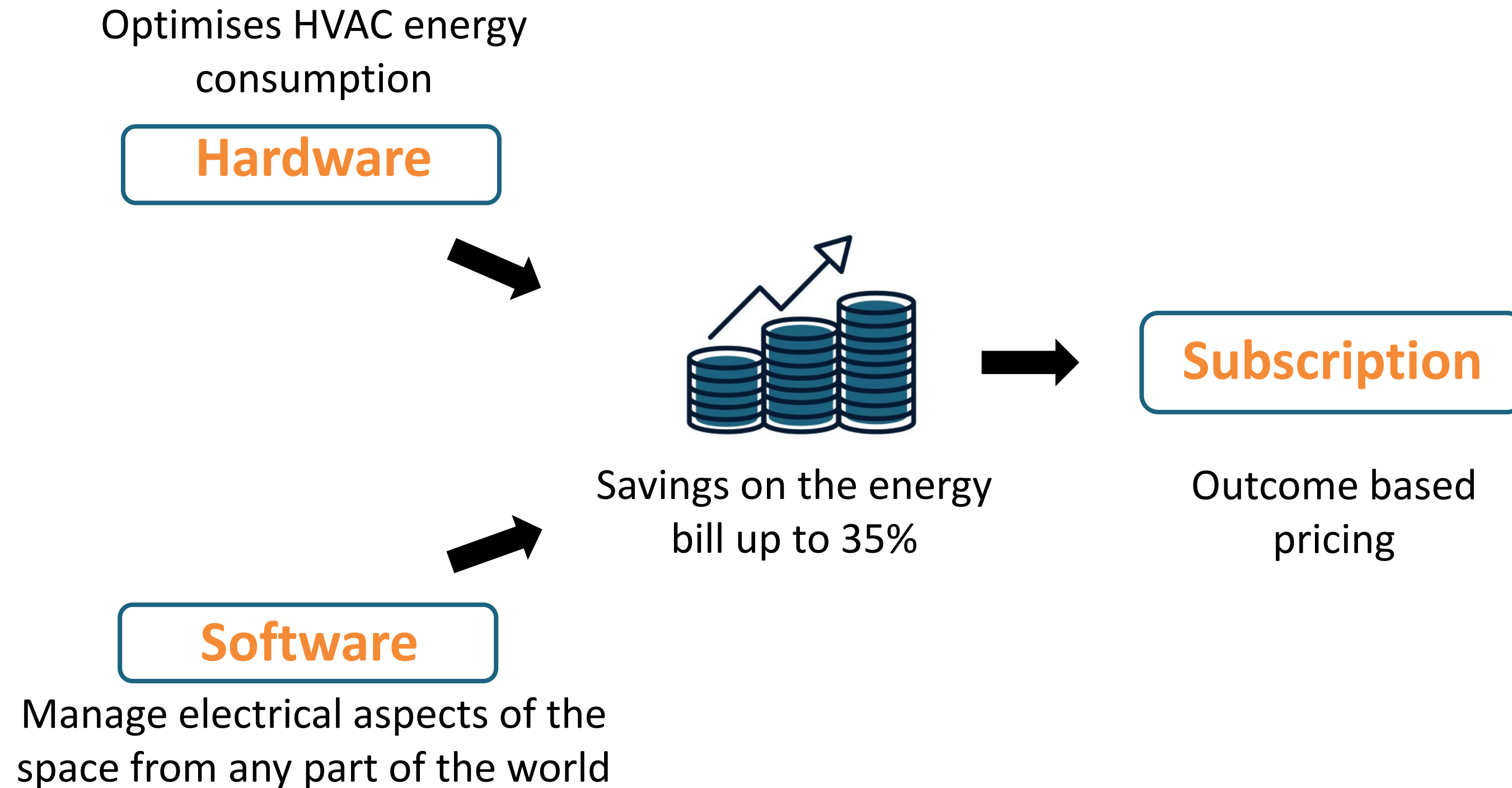
*“According to E&Y,  
Measures like sanitization have  
increased the operating  
expenditure along with the  
ongoing expenses like Rents, Air-  
conditioning and staff salaries.*

***“Energy bills consuming  
up to 30% of  
Operational expenses”***

- 70% of the energy bill is through HVAC/ Air-conditioning
- Has to operate min. 10-12hrs/day irrespective of occupancy
- Managing CHAIN of spaces is a Burden in the Absence of CONSISTENT optimization systems
- Upfront investment in a pandemic world isn't feasible





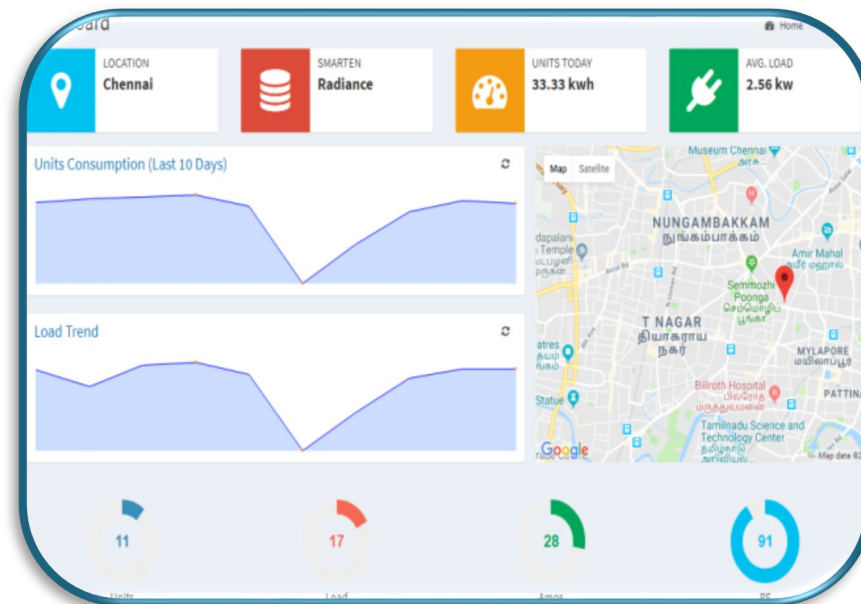






## HARDWARE

- **AI-based algorithm:** Based on least energy consuming path
- Externally attached to HVAC
- **Avg. saving of 20% (15-35%)**



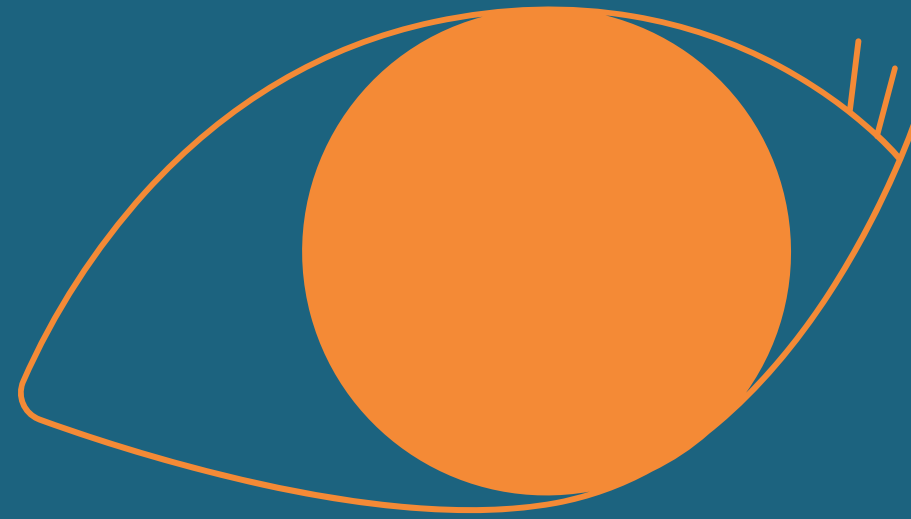
## CLOUD-BASED PORTAL

### Real-time ML

- Detect faults & repairs
- Identify inefficiencies
- Monthly reports







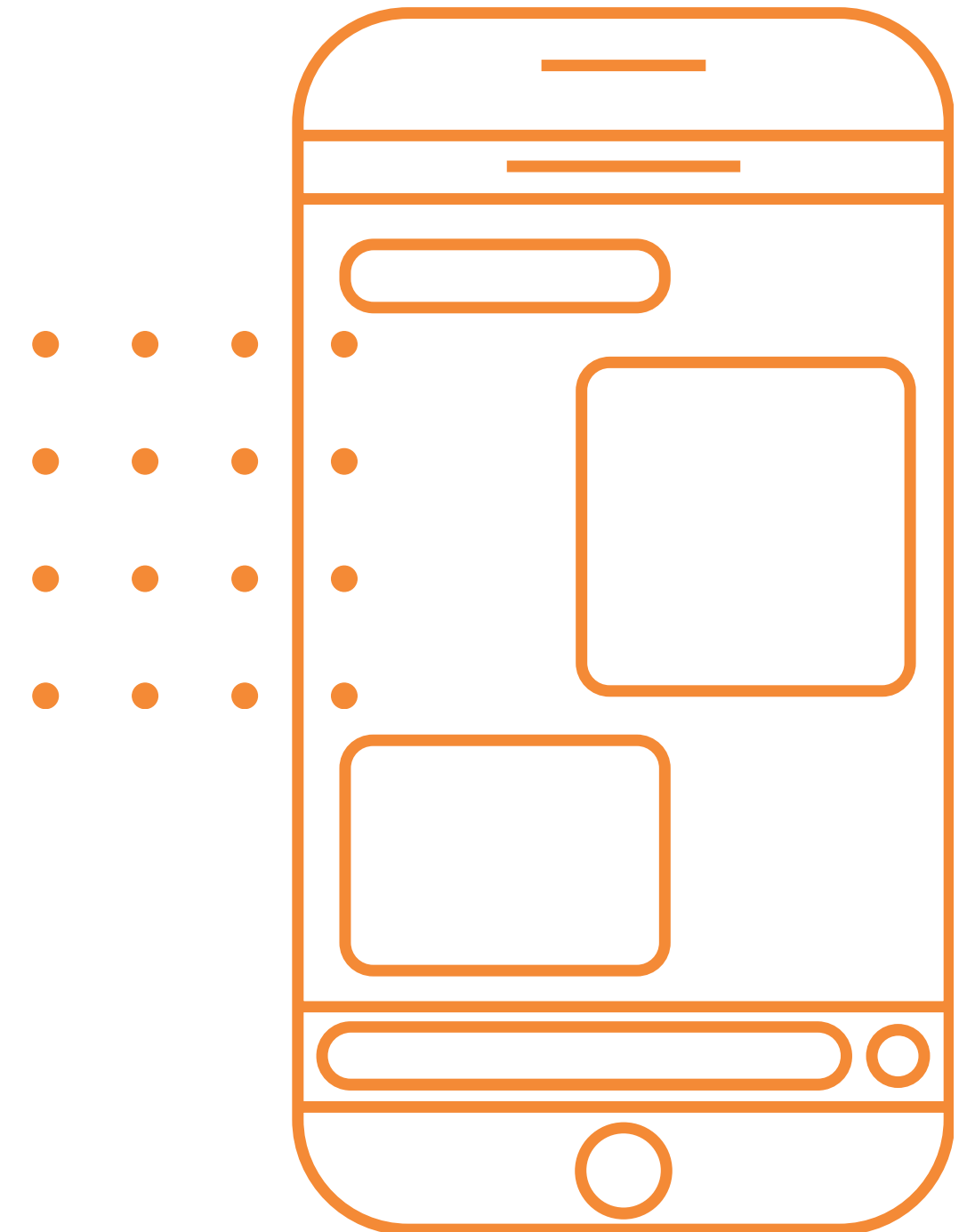
HERE'S A WAY ZODHYA CAN  
CONTRIBUTE



# USER-LOW CARBON INTERFACE

Helping large-scale users meet their net-zero emissions target by:

- Letting the C&I know where their buildings stand w.r.t Carbon footprint
- Connecting microgrids/ renewables (low carbon resources) to large-scale C&I to reduce demand on the grid at certain times of the day
- Improving the energy-efficiency for consumer, which will reduce the impact of abrupt demand



\*Peak demand can be reduced by 5%, adding flexibility to the grid



# HOW ARE WE DIFFERENT ?

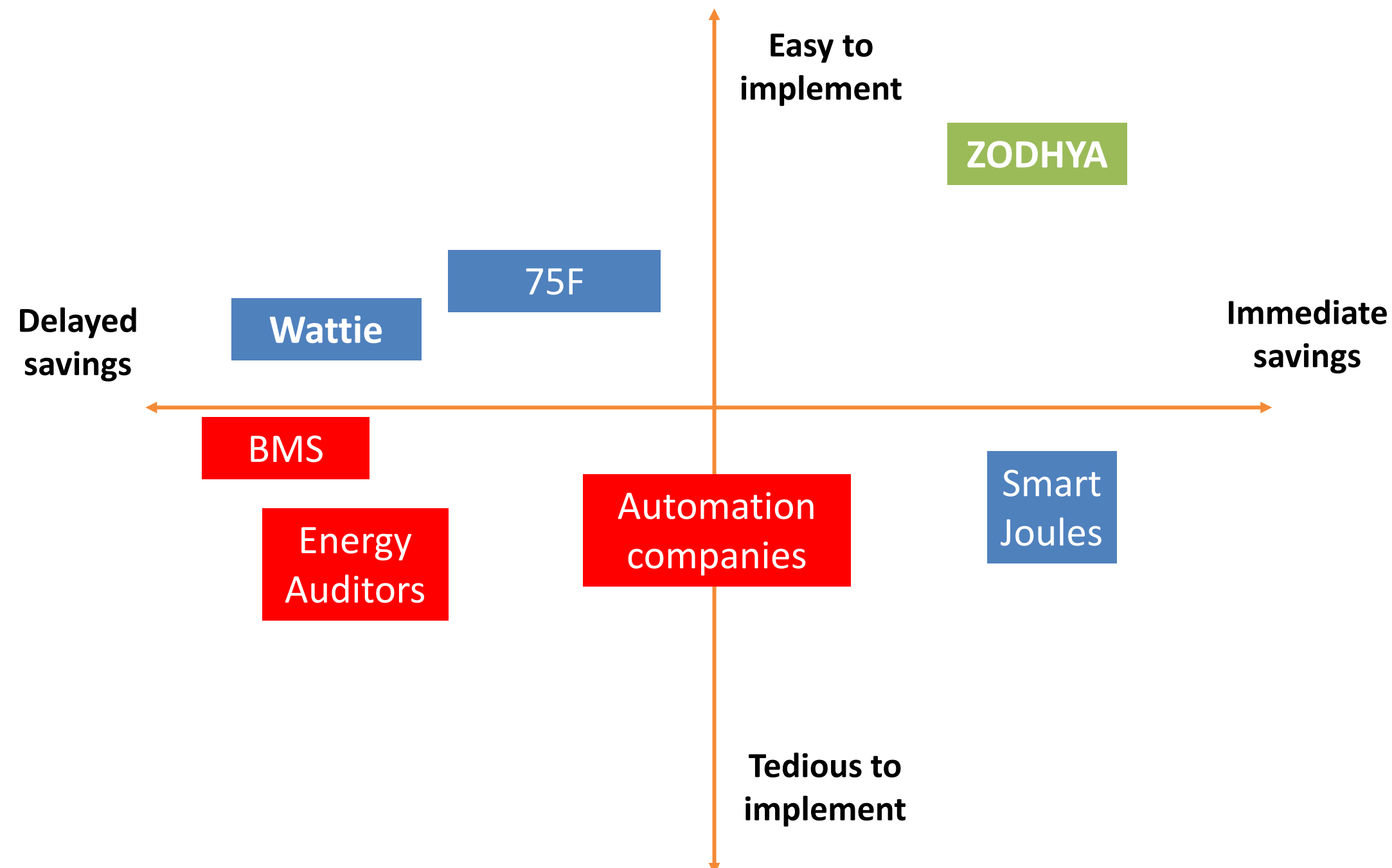
## USP

- The savings are incurred during USAGE, unlike IoT or analytics which involve Post-Manual methods to save

## Advantages/ Barriers

- Algorithm tough to replicate
- Versatile nature of the product. Applicable to various spaces

09





## Subscription based on retained savings

Customer pays a **% of the savings\*** on bills every month

\*Flexible based on client requirements and features required







THE  
EXECUTIVE  
CENTRE

Operating in India. Extending to EU, South-east Asia, Aus





“

## CLIENT TESTIMONIALS

12

We wanted something where we could reduce on our energy consumption. You guys stepped in and said you reduce by 20%.

*Earlier our bills were about 1 lac per month, now it's hovering around 80k. That's a great contribution.*

”

*Siddharth, Radiance Facility manager*

“

I was in Bangalore on a meet recently when there was a power shutdown in our office. Just by looking at my desktop web portal, I was able to contact our electrician and fix it beforehand. This is an efficiency I never thought was possible.

”

*Alaarswamy, TVS project head*





**GLOBAL  
CONNECT  
@SBF**

Connecting  
your business to  
global opportunities

AN INITIATIVE OF



SUPPORTED BY

**Enterprise  
Singapore**

CORE PARTNERS



Asun Trackers  
**Mr. Varun Sachar, Founder & CEO**





T R A C K E R S

Product Presentation

*Imagination is more important than knowledge.  
Knowledge is limited. Imagination encircles the world.  
- Albert Einstein*



# GROWTH OF SOLAR PV



Past decade has witnessed an exponential increase in the growth of Solar PV all over the world.

A big factor in this increased adoption has been the constant improvement in technology as well as reduction in price of solar panels.

This growth has also resulted in tremendously improved LCoE of solar energy. Today it is at par with or even lower than that of Thermal energy.

These developments along with global concerns about emission cutbacks have catapulted Solar PV to a viable alternative, attracting attention of large investors.





# EFFICIENCY IMPERATIVES

Along with this increase in growth and resulting competition there also has been a steady and dramatic fall in tariffs for solar energy.

This has resulted in cost optimisations with focus on both the BoS and Panel costs. However they have reached a plateau.

The only way forward is a closer look at operational efficiencies.

**CUF remains the single largest factor in the competitive play for developers.**

**For example:**

**A 3% drop in CUF can result in over 7 % per cent fall in equity returns\***

**A consistent increase in yield is the only way to achieve higher CUFs and improved IRRs**

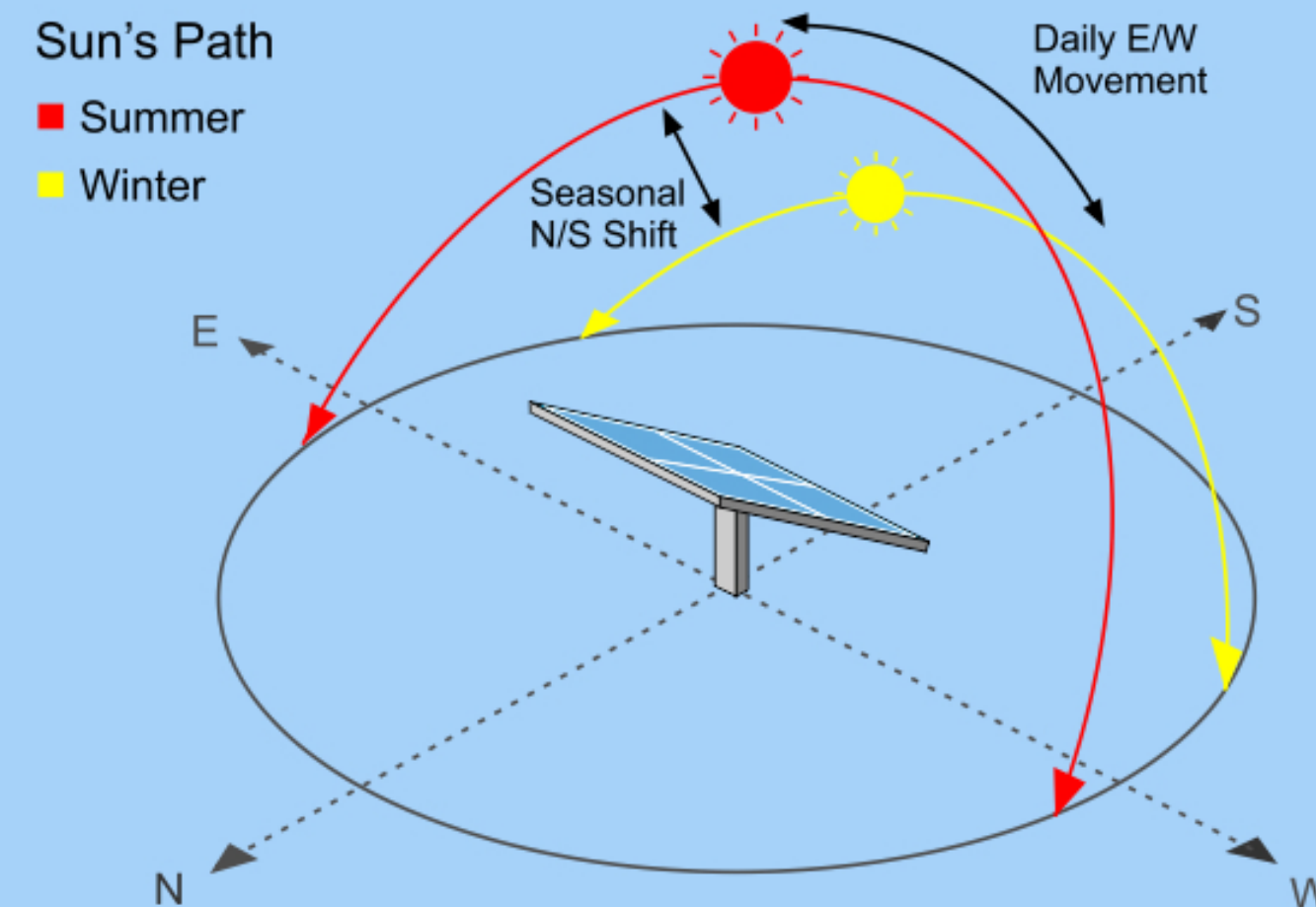




# HOW TO MAXIMISE YIELD

Now the sun as we all know, moves east to west during the day. This east west path also shifts along north south during the year. It is higher during summers and lower during winters.

The amount of electricity generated off a solar PV module is maximum when the angle of solar incidence on the module is perpendicular or at normal.



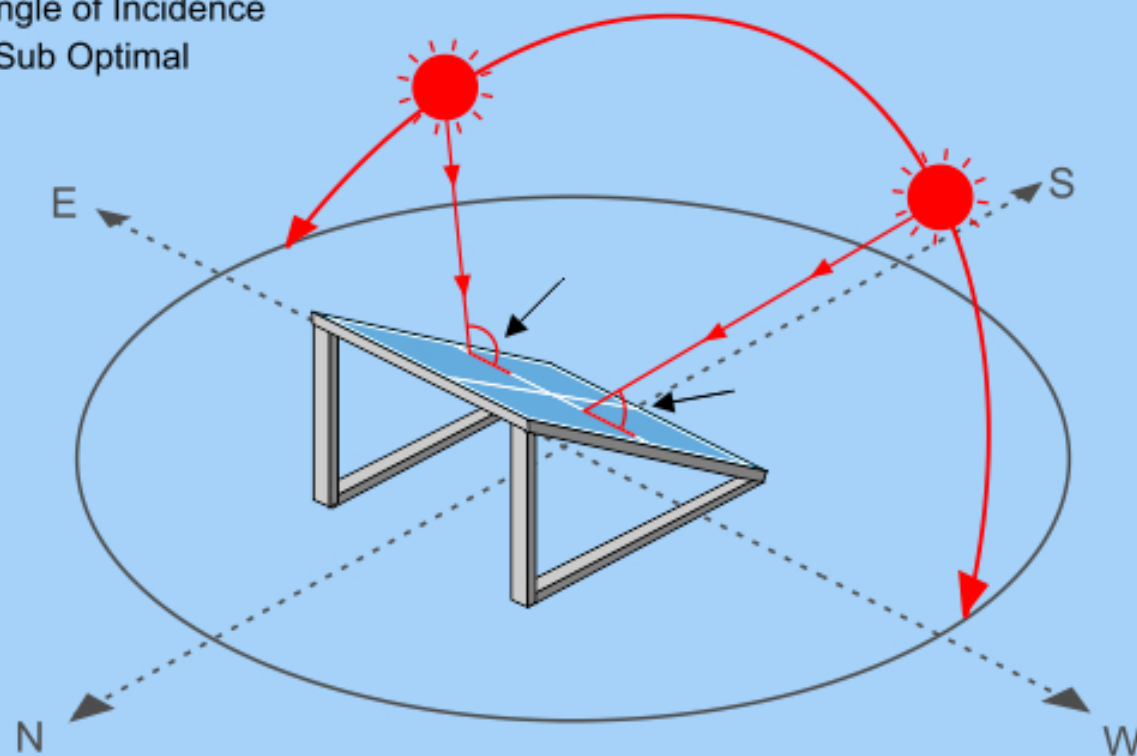


# PREVALENT OPTIONS

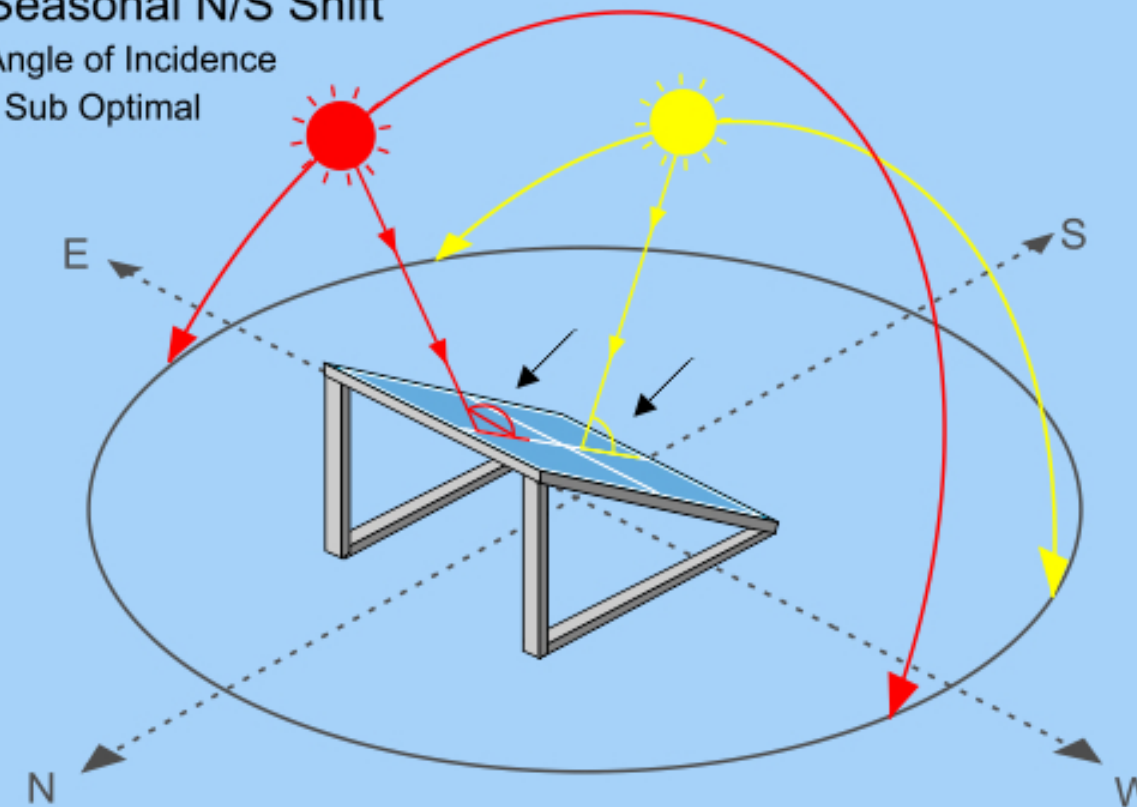
## Fixed Tilt

Modules are fixed at an angle determined as per location, so as to receive the aggregated near normal incidence.

Daily E/W Movement  
Angle of Incidence  
- Sub Optimal



Seasonal N/S Shift  
Angle of Incidence  
- Sub Optimal





# PREVALENT OPTIONS

## Single Axis Tracking

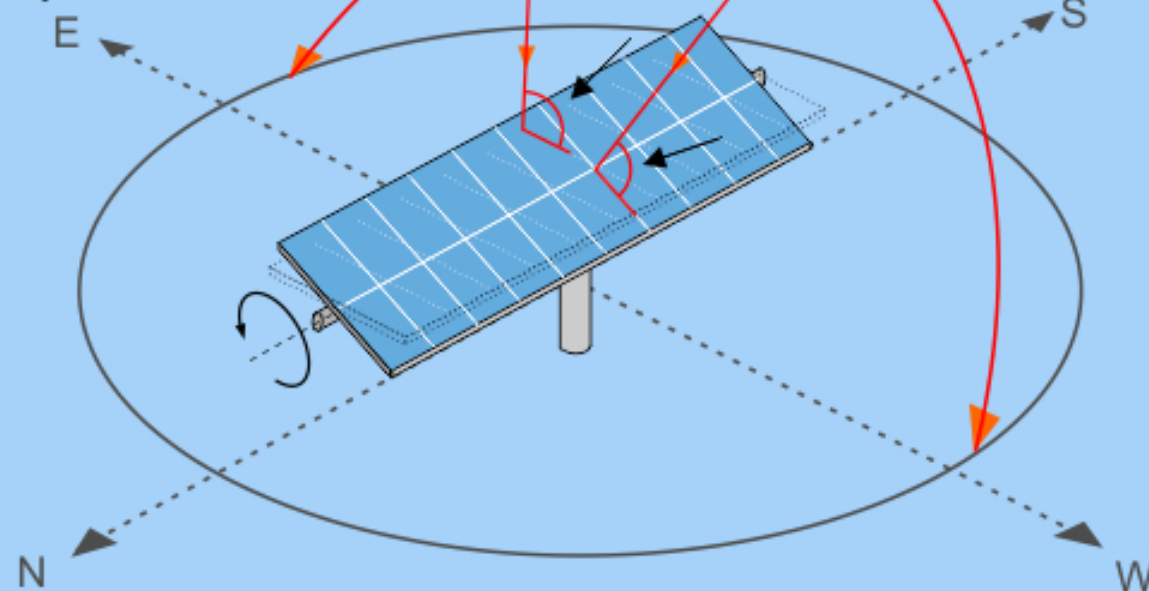
Modules mounted on a torque tube along the north south axis parallel to the ground. The modules move east to west along this axis.

The yield improves during summers when the path of the sun is high, but falls in winters with configuration unable to tilt in NS direction.

### Daily E/W Movement

Angle of Incidence

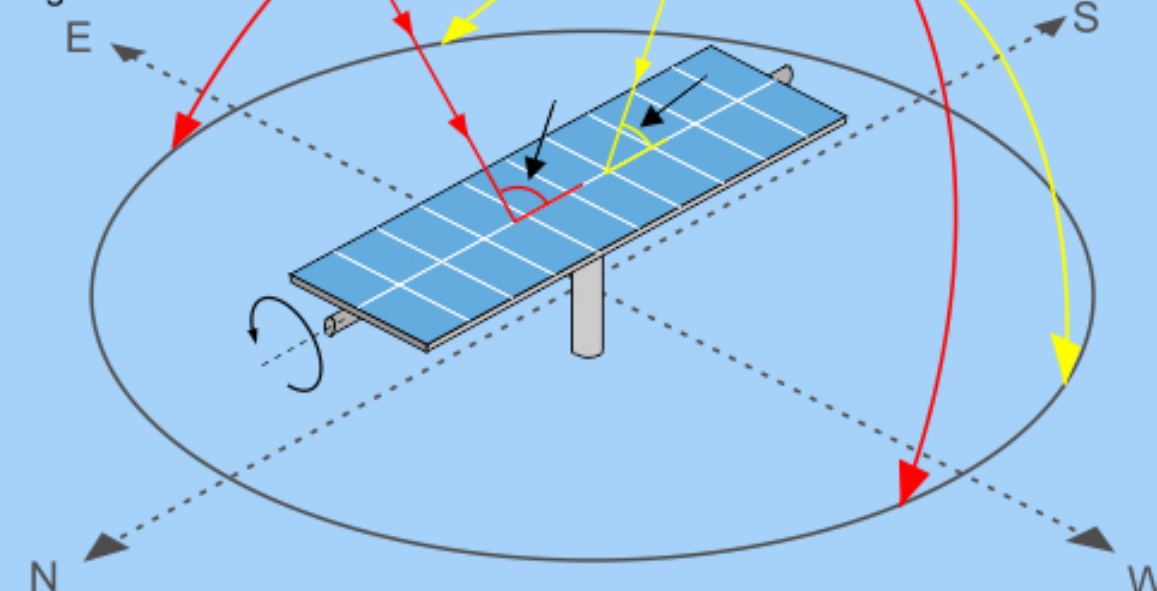
- Optimal with high sun path during summers with daily EW rotation



### Seasonal N/S Shift

Angle of Incidence

- Sub-Optimal with low sun path during winters





# PREVALENT OPTIONS

## Dual Axis Tracking

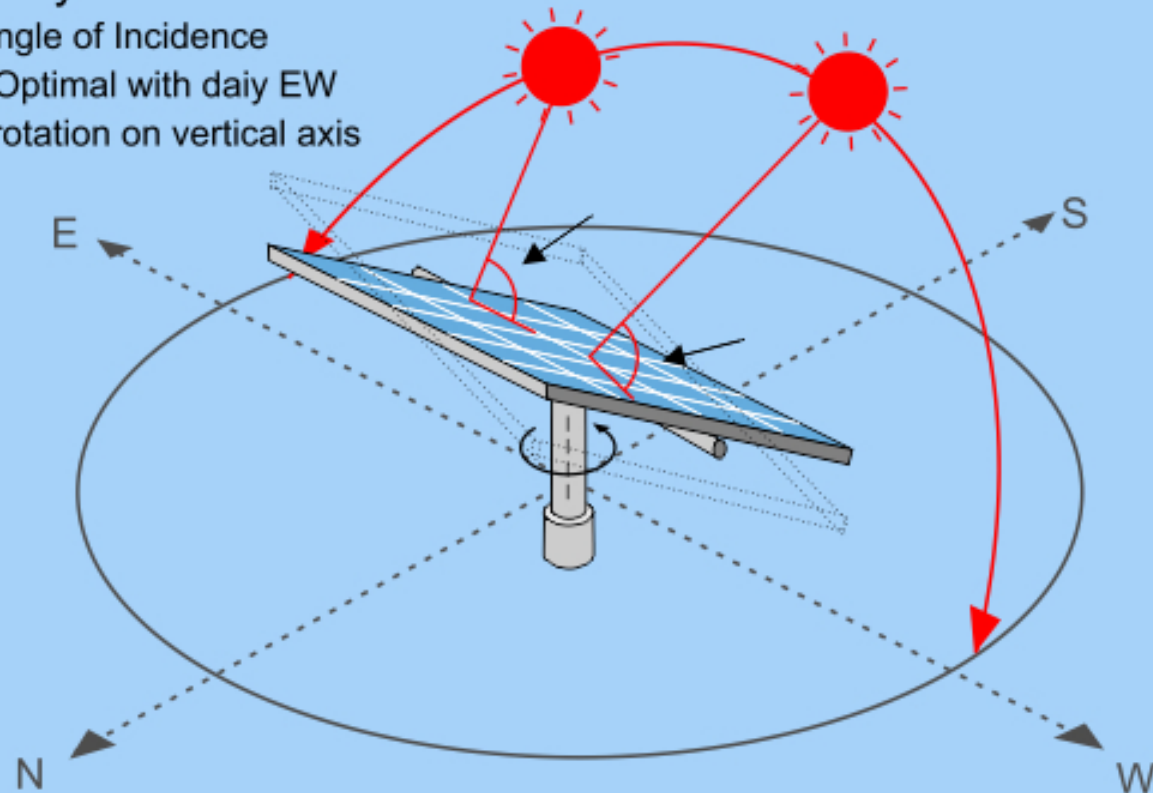
Where the modules move east to west during the day, but also keep tilting north to south according to season. This is the optimal yield scenario.

However heavy structure and complex mechanism raise capital costs significantly rendering it unsuitable for most projects.

### Daily E/W Movement

Angle of Incidence

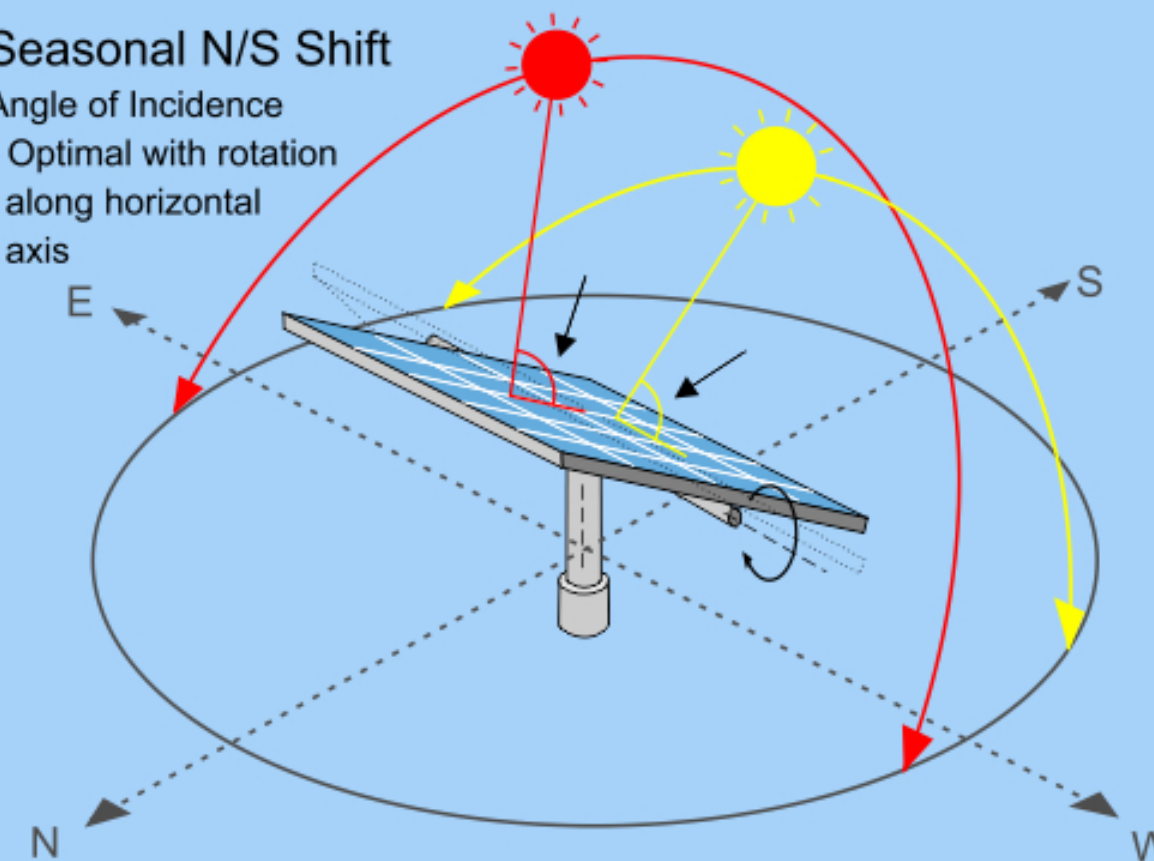
- Optimal with daily EW rotation on vertical axis



### Seasonal N/S Shift

Angle of Incidence

- Optimal with rotation along horizontal axis





**Presenting ...**  
**Dual Axis Performance at Single Axis Cost**





# ASUN 2 AXIS TRACKER

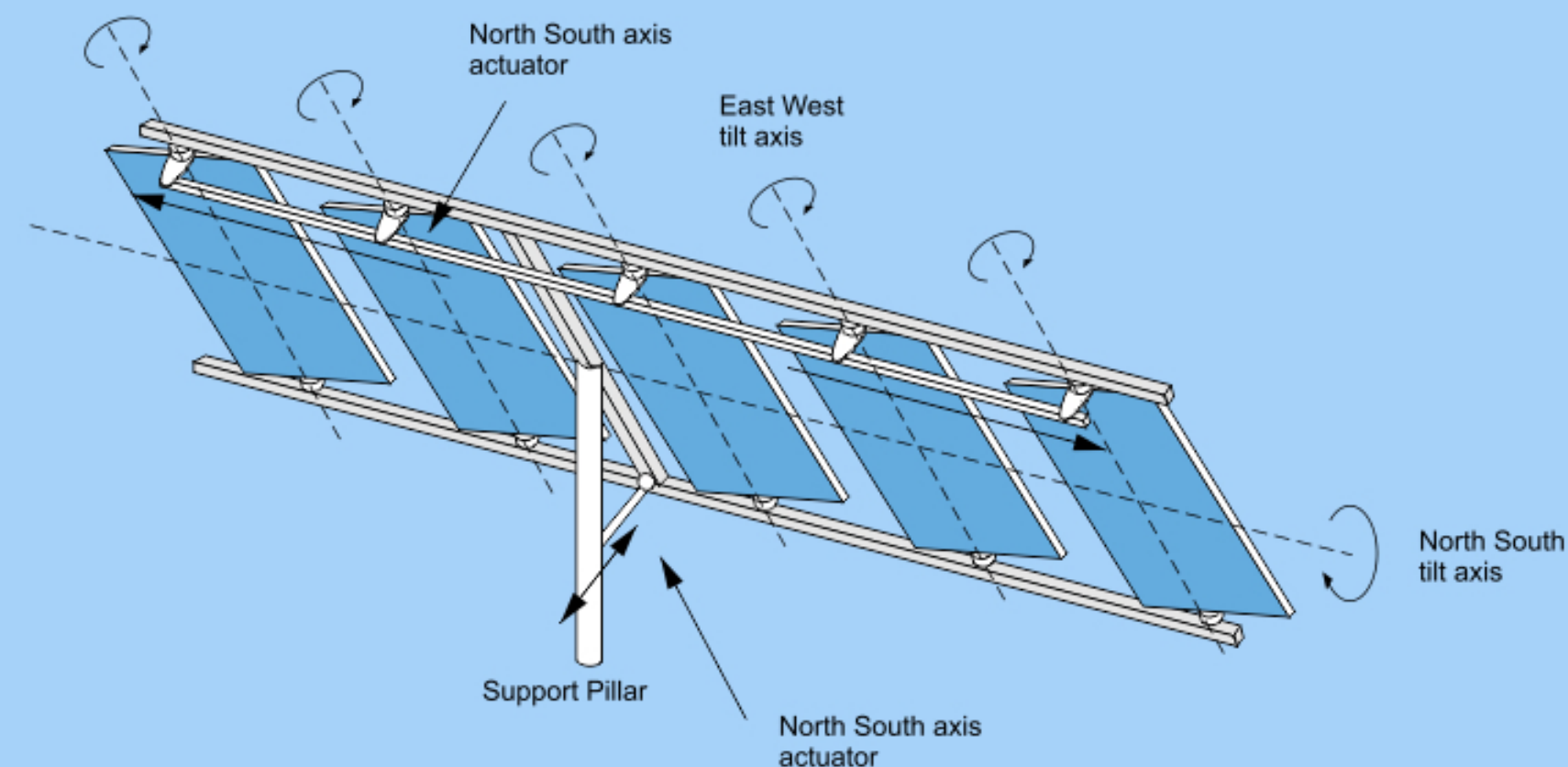


## Dual Axis Performance at Single Axis cost!

Designed in collaboration with IIT Delhi, the Asun 2 Axis Tracker overcomes the inherent disadvantages of the Single Axis design

It also addresses the key investor/developer concerns that prevent adoption of trackers

By moving away from a 360<sup>0</sup> rotational design of a dual axis it opts for an economical and optimized 2 axis movement





# VALIDATED DESIGN & CONCEPT



Ongoing Data capture in real time from three types of installations at the same location in Roorkee, Uttarakhand.

Fixed Tilt vs Single Axis vs the 2 Axis innovation.

**Fixed Tilt Installation**

**Horizontal Mount  
Single Axis Tracker**

**Pilot project  
Asun 2 Axis Tracker**

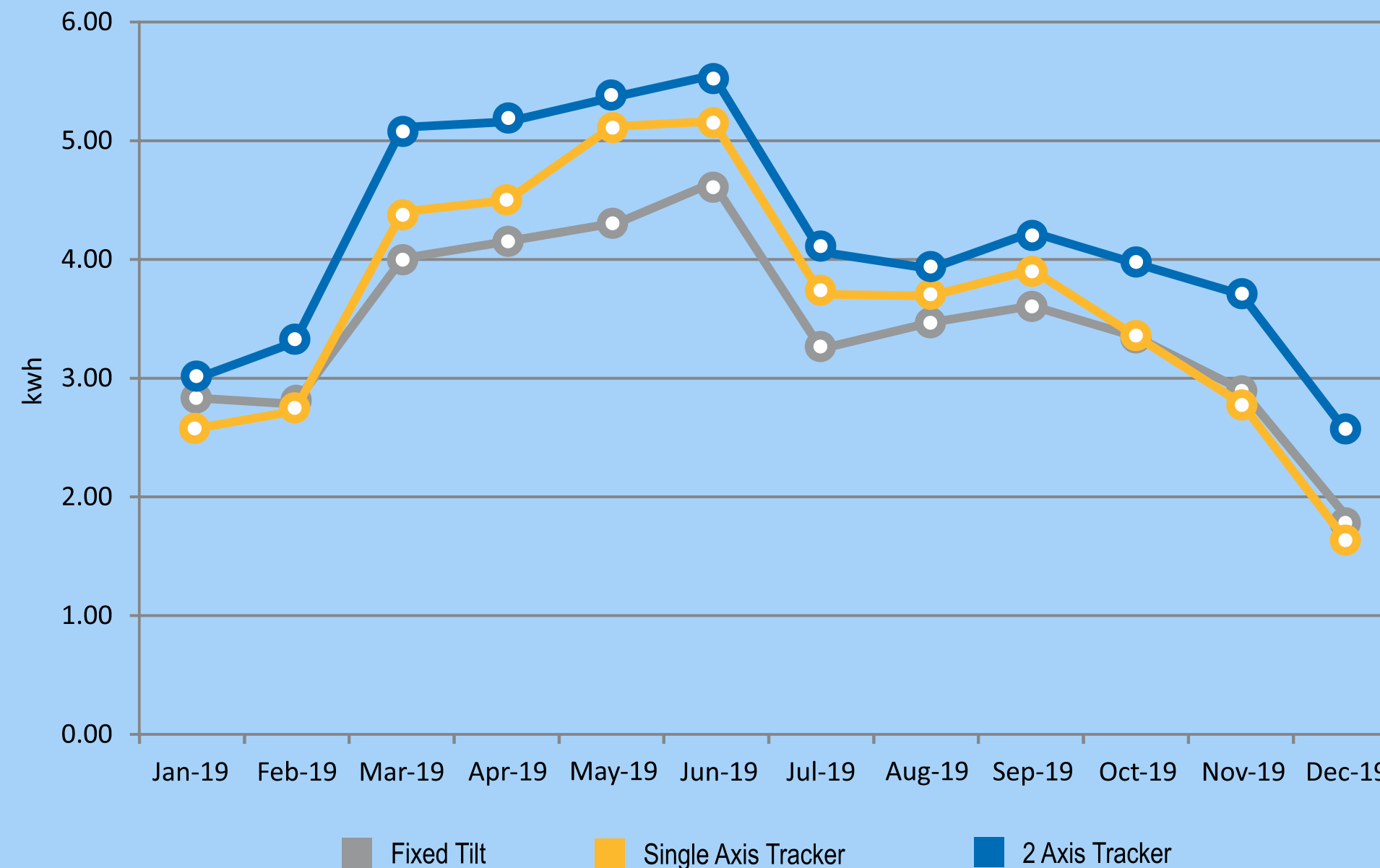




# VALIDATED DESIGN & CONCEPT



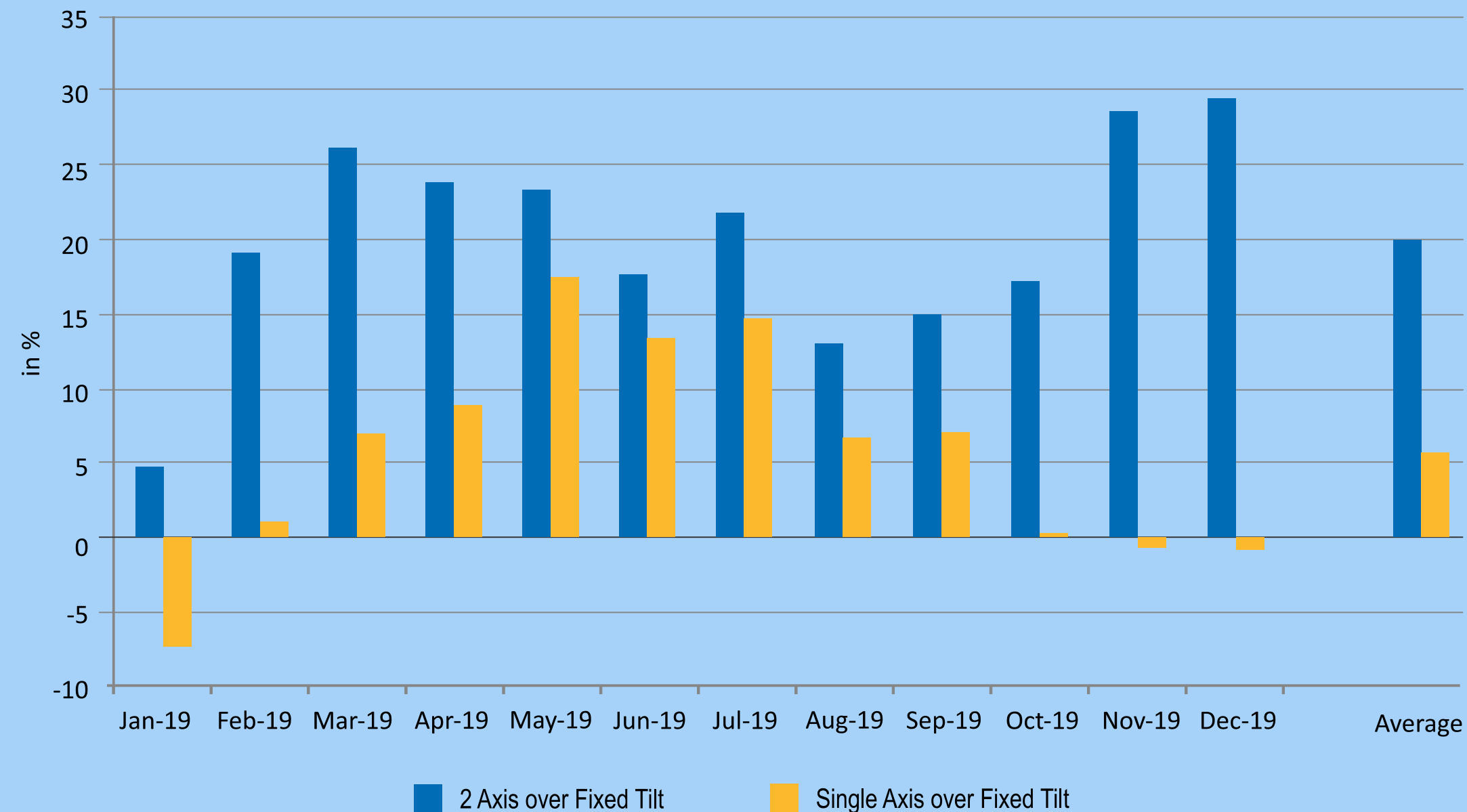
First year incident free operation points to an overall increase in yield of 20% over Fixed tilt and 13.5% over single axis.





# VALIDATED DESIGN & CONCEPT

Potential to significantly improve the IRR of any solar PV project in general and every project considering single axis tracking in particular.

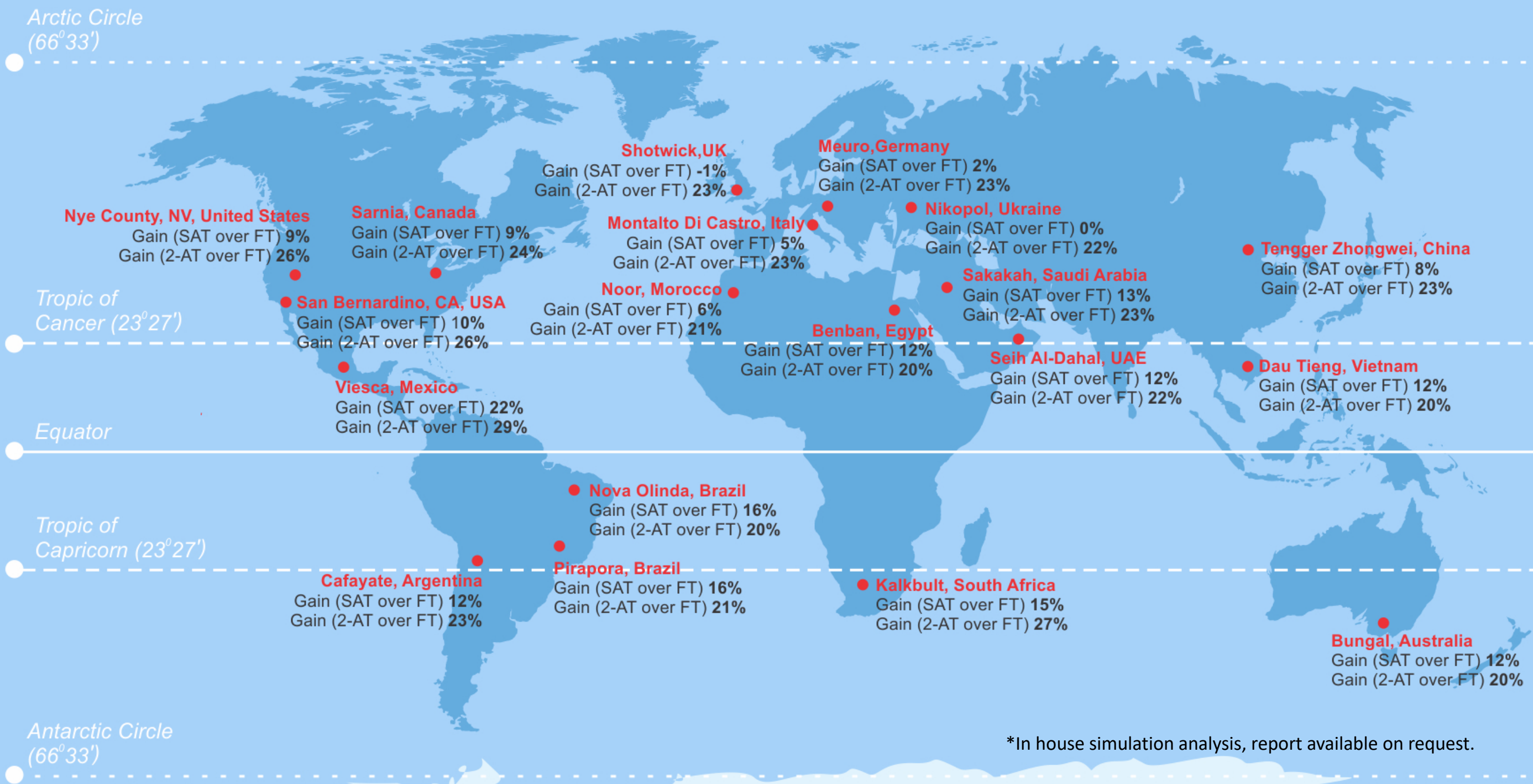




# CONSISTENTLY HIGH YIELD



A gain of 20% or more over fixed tilt, across locations between Arctic and Antarctic circles\*



\*In house simulation analysis, report available on request.

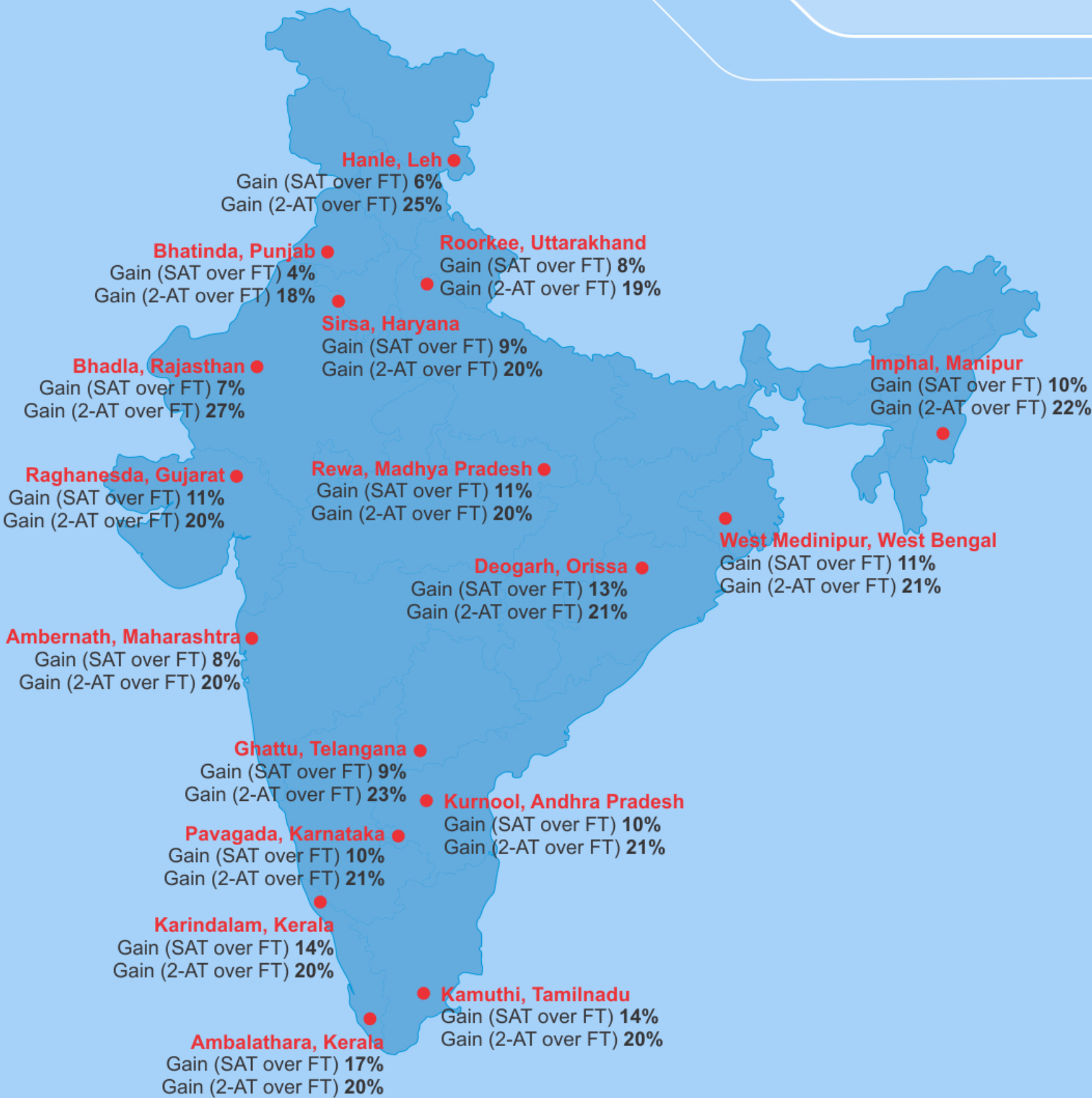


# CONSISTENTLY HIGH YIELD



## Higher performance across the country

From Northern most location in Leh to the Southern most states, Asun 2 Axis Tracker once again promises a gain in yield that can change the project economics of your installation.\*



\*In house simulation analysis, report available on request.



# FUTURE READY TECHNOLOGY



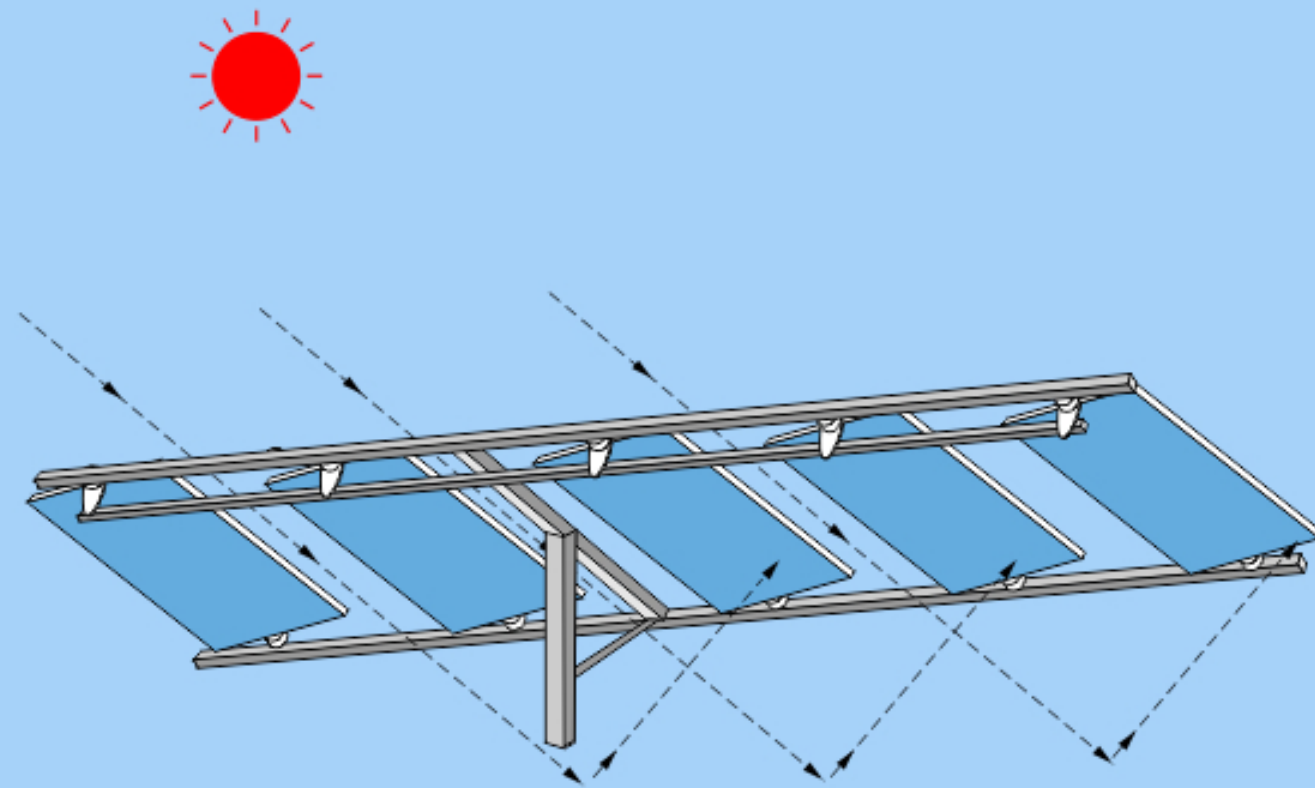
- Highly optimized structural design, meaning lower structure weight and highly competitive cost
- Decentralized design for ease of installation and higher plant availability
- Modular configuration with unprecedented terrain adaptability
- Programmable Automatic stow position in high wind conditions
- Designed to withstand wind speeds reaching upto 170 kmph
- Panel array configuration allows for maximizing the bifacial module efficiency
- Self-lubricating polymer bearings for minimal maintenance
- IoT Ready with features like remote monitoring, self-diagnostics and trouble shooting
- Increases yield by upto 28% depending on location & climatic conditions
- Ensures optimum performance in all seasons



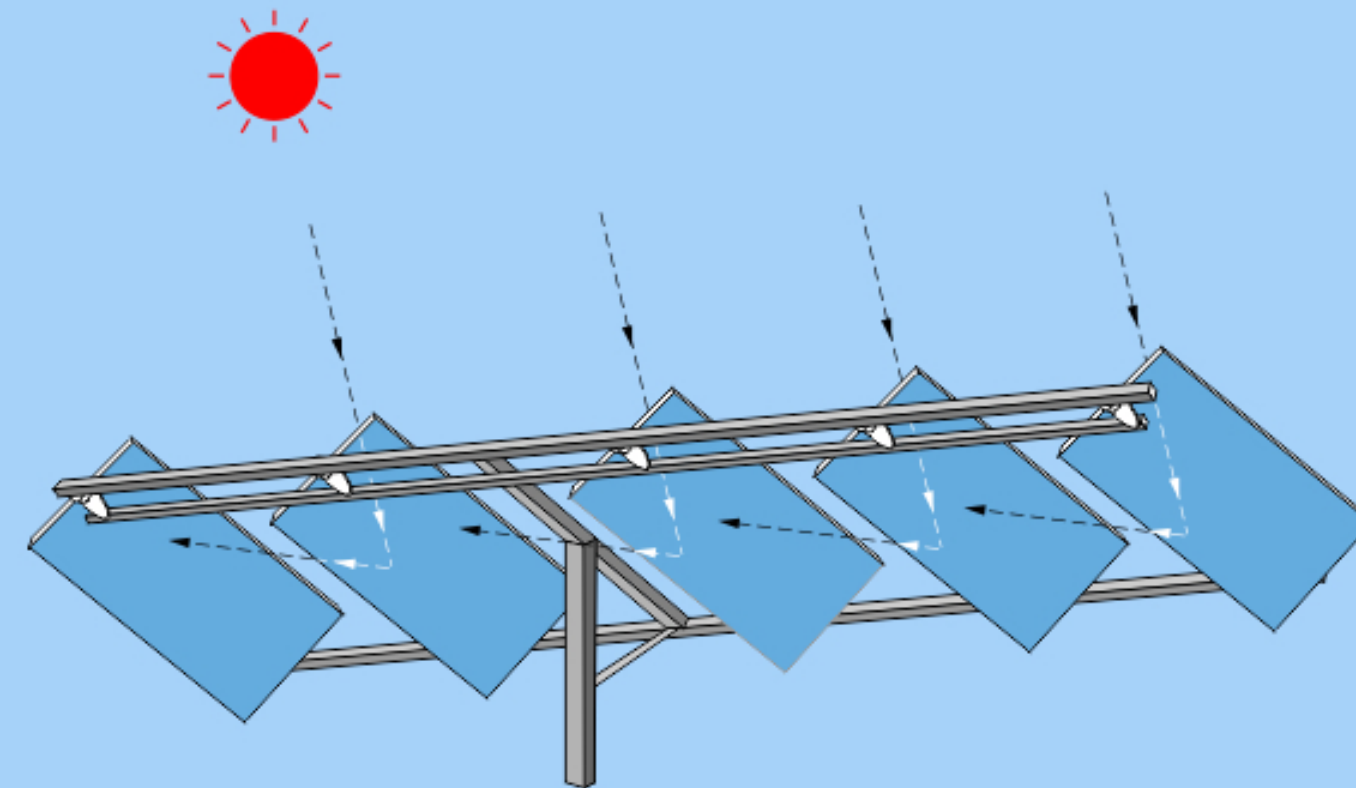
# BETTER BI-FACIAL PERFORMANCE



Asun 2 Axis Tracker's unique panel configuration gives you better bifacial module performance as compared any other tracker design.



**1.** Gap between panels allows for more radiation to bounce off the ground below the tracker



**2.** Radiation reflected off the top surface of one panel can be captured by the bottom surface of the next

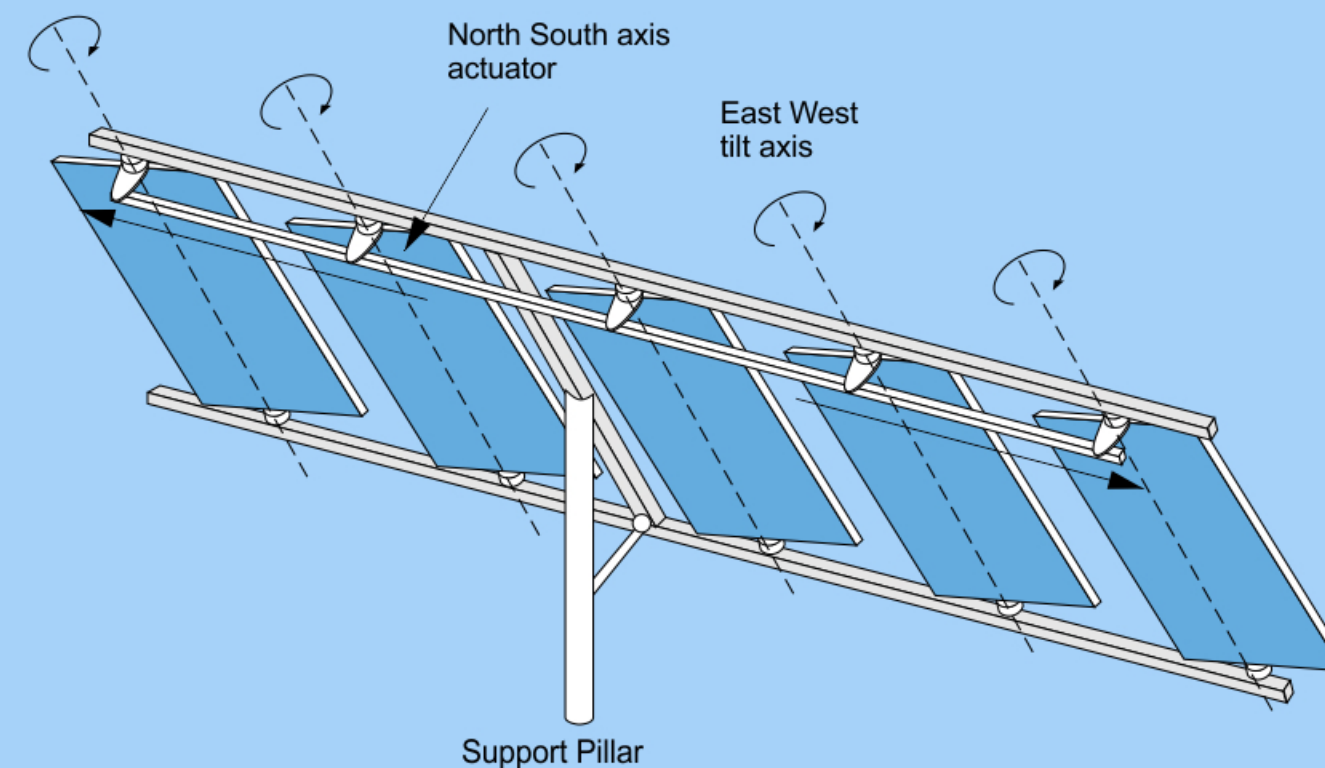


# ADAPTABLE TO SINGLE AXIS

## With significant reduction in capital cost

The innovative design is also adaptable for a single axis operation.

Making it extremely cost competitive by reduction of components and mechanisms required for the North South movement. Instead the tracker table can be set at a pre-determined North South incline, while retaining the full East to West movement.





*With falling LCoE and depleting tariffs being the global norm,  
ASUN 2 Axis Tracker has the potential to disrupt the market  
with its innovative design and aggressive pricing.*

For more details, please visit :

[www.asuntracker.com](http://www.asuntracker.com)

For business queries, please contact:

Varun Sachar, 98112 71111

**Thank You!**





Ossus Biorenewables  
**Ms. Suruchi Rao, CEO & Founder**



Ossus Biorenewables, Pre-Revenue Bioenergy Company, Bangalore.



Providing On-Demand Hydrogen Recovery and Wastewater Treatment as a service Via the OB HydraCel Device



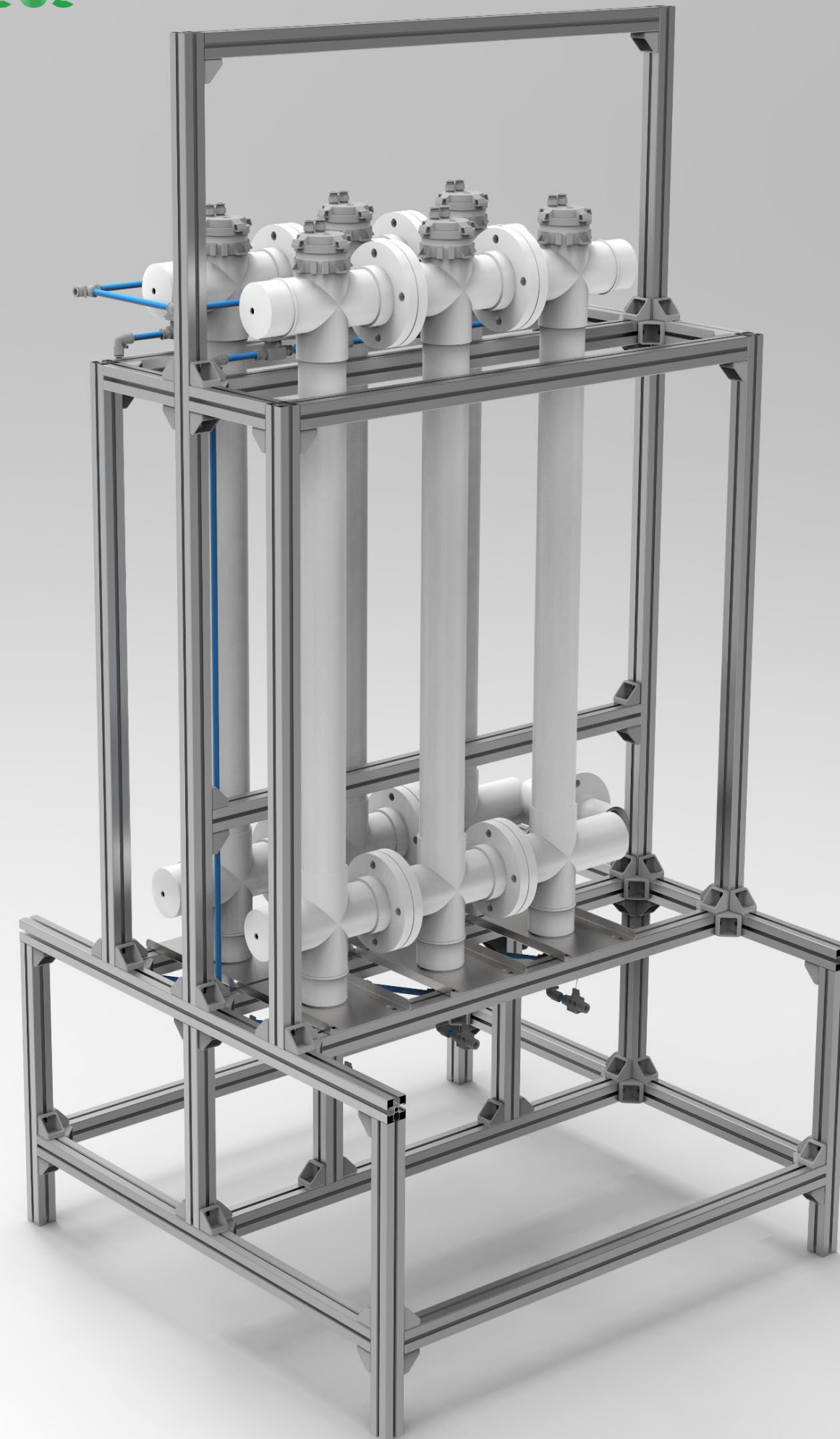


# We are a Bangalore based bioenergy company.

**We are commercialising a  
patent pending\*\* retrofittable  
hardware device for converting  
Effluent Treatment Plants into  
On-Demand Hydrogen Gas  
Generators for Green Heat and  
Power.**

**\*\*Title: "BIO-ELECTROCHEMICAL HYDROGEN GENERATION AND  
SIMULTANEOUS WATER TREATMENT"**

Filed with the Indian Patent Office on 05-Oct-2020. The application  
number assigned to this application is 202021043298.





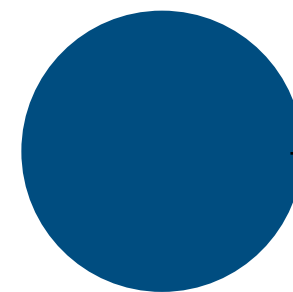
# Hydrogen Now

## Deep De-carbonisation of Heavy Industries

Cost of decarbonisation: \$11 trillion and \$21 trillion through 2050\*



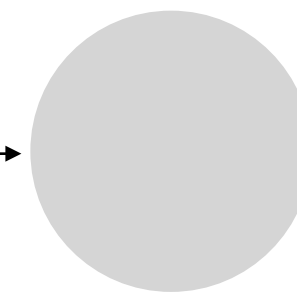
Cost of H<sub>2</sub>: USD 0.8-6/kg



Source

Distance Determines Techno-economic Efficiency

> \$ 3/kg for every 1000 Kms



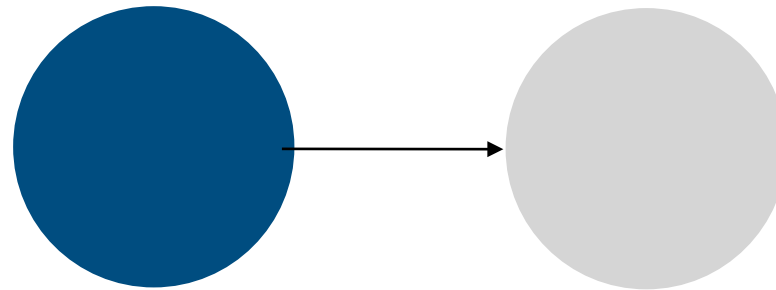
Use

What makes hydrogen unviable today is the reliance on cheap electrons from renewable sources (Wind/Solar).



# Hydrogen Now Disruption

Minimise Distance



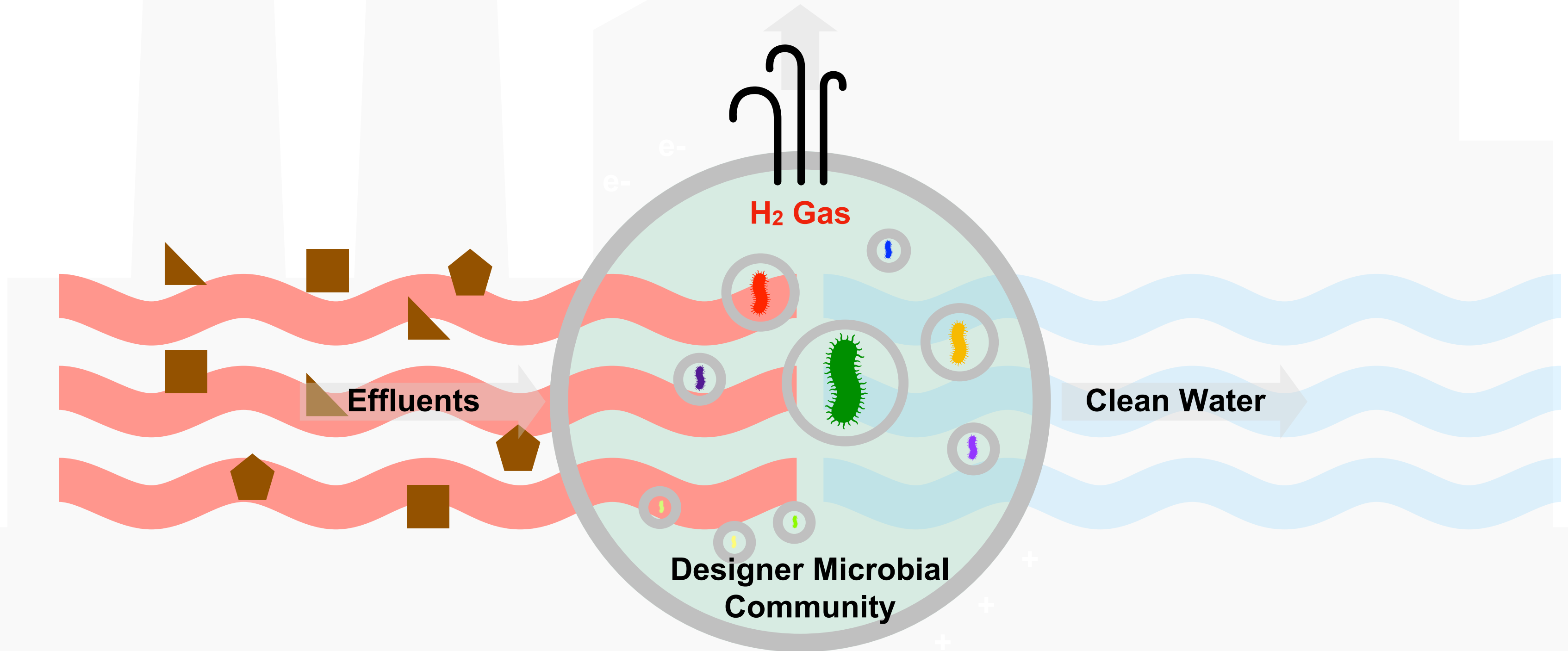
Change Source



## Hydrogen Now

# Ossus is Disrupting the Hydrogen Market

The bioelectrochemical process underlying our product involves production of current by a select group of microorganisms drawn directly from the source of the effluent. These microorganisms produce current by degrading the organic content of water and desalinate water simultaneously, resulting in hydrogen production and clean water within an electrochemical cell.





## Industries Replacing Fossil Fuels



Indian Steel Sector



Upstream US Oil and Gas



Chemicals

Based on the position of our product, our target markets lie across three key industrial sectors, Indian Steel, US Upstream Oil and Gas, and Chemicals, driven primarily by changes in policy, public perception and an increasing demand for rapidly cutting greenhouse emissions.



# Product Status: Proof-of-Concept Pilot Hydrogen Generation at Shell Technology Centre Bangalore

Current Hydrogen Generation Capacity:  
~91m<sup>3</sup> /day (7.6 Kg/day)

Total Wastewater Processing Capacity:  
14400L/Day





## Inflection Point: Pre-Pilot with Tata Steel Jamshedpur Hydrogen Gas from Jamshedpur BOTP Effluent



48 L  
Reactors

### TSL Jamshedpur Pilot

By advancing our capabilities, we will be deploying India's first fully autonomous bioreactor for hydrogen gas production using the dilute carbon content of BOTP effluent, exclusively for TSL at Jamshedpur.

We have developed critical IP in the form of a BOTP Jamshedpur specific microbial consortium named *botpbmg*, which has demonstrated the ability to produce near 100% utilization of the carbon and nitrogen content of BOTP effluent into hydrogen gas.



India >> Singapore

## What can Ossus Bring to Singapore-based Process Industries?

If you are seeking Fossil  
Fuel Alternatives for  
Heat/Power

YES

If you have a large pool of  
high organic content  
effluent on-site



India >> Singapore  
Our Wishlist

NatSteel

Chugai

Halcyon Agri

Asahi Glass

Rotary

Infineon Technologies

Hyflux

Merck, Sharp & Dohme

DyStar

Henkel

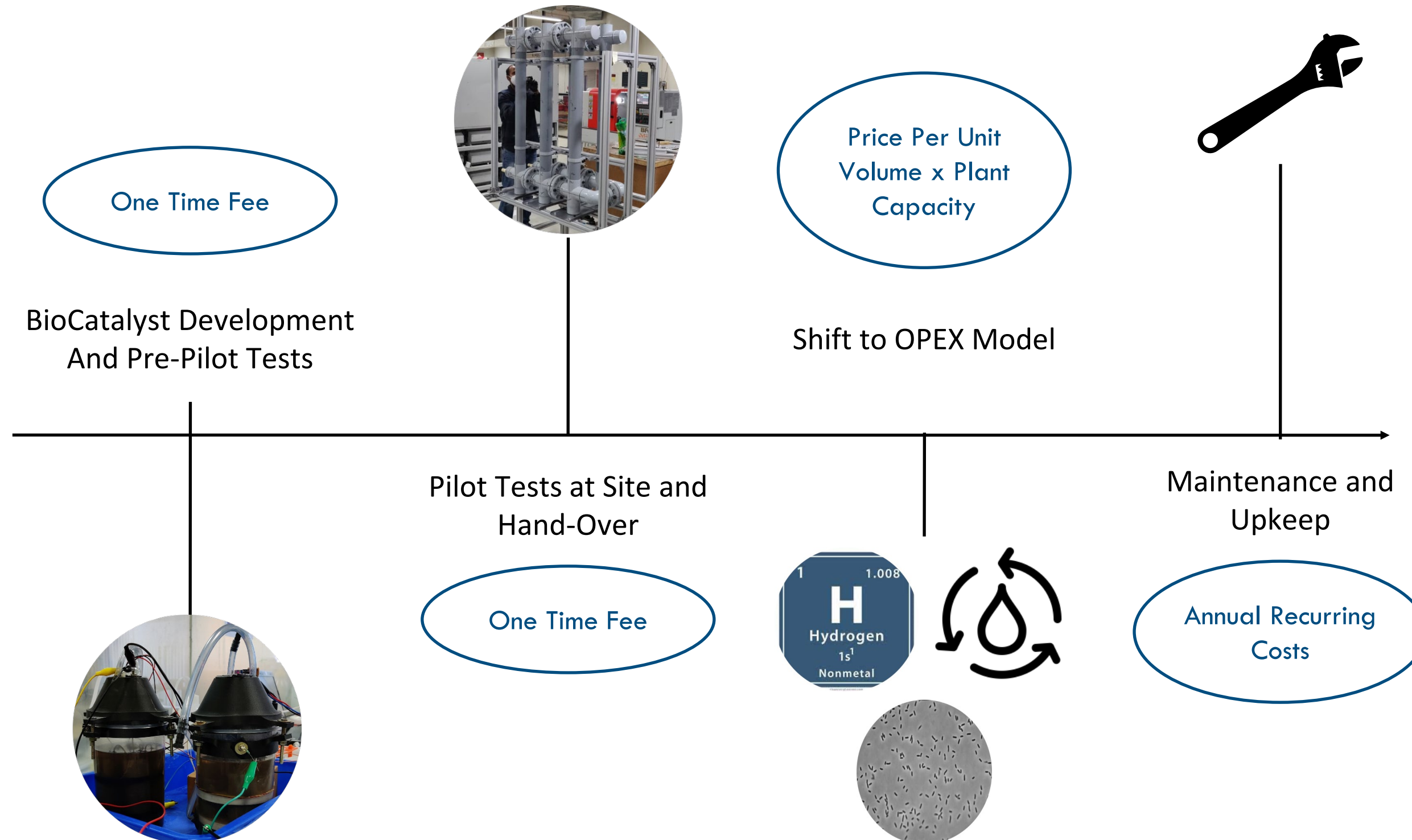
Polyolefin

GlaxoSmithKline (GSK)



# Value Proposition

## HydraCel As an ETP Add-On

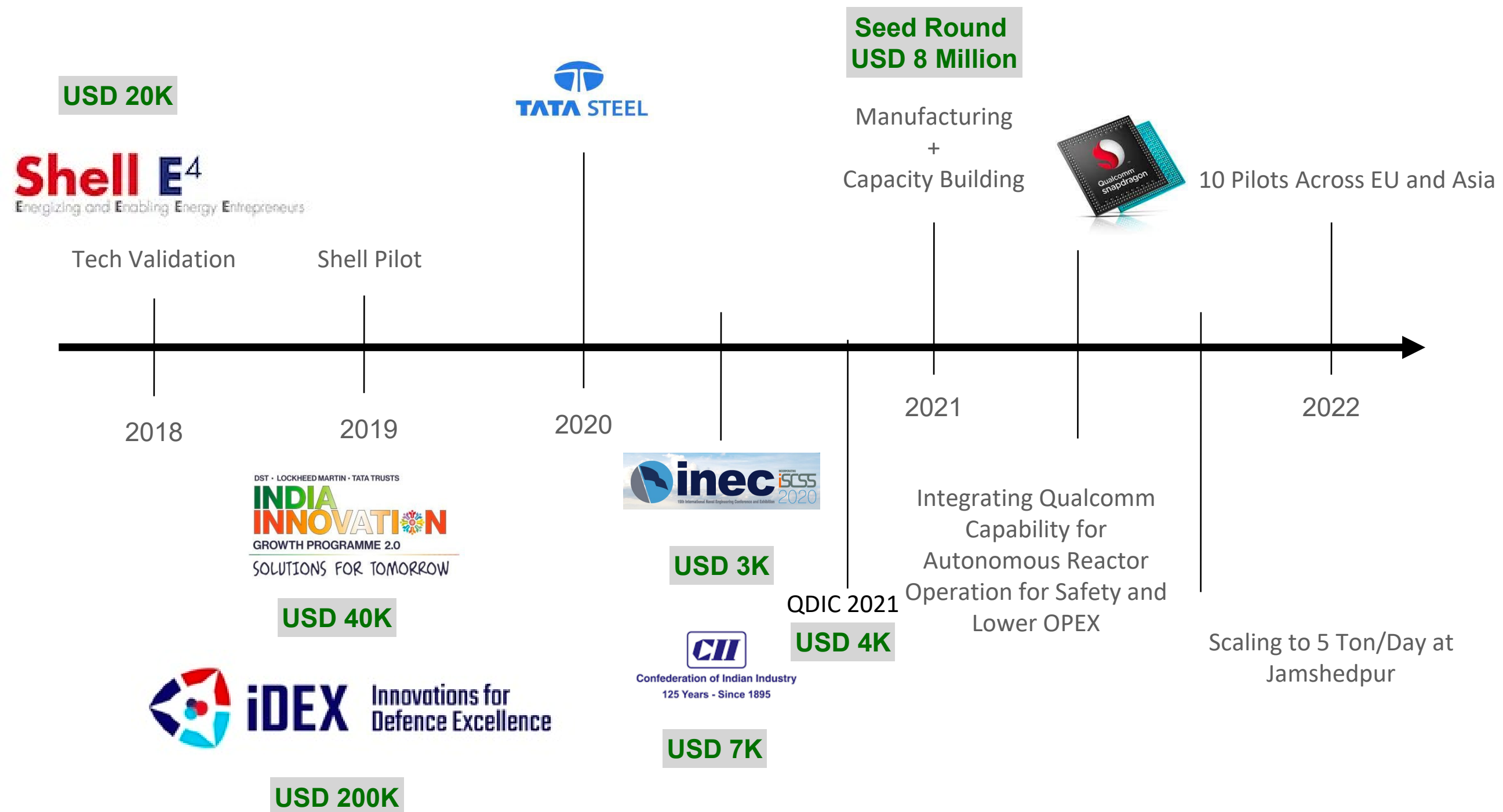




# Expansion

## 10 Pilots, 3 Continents by 2021

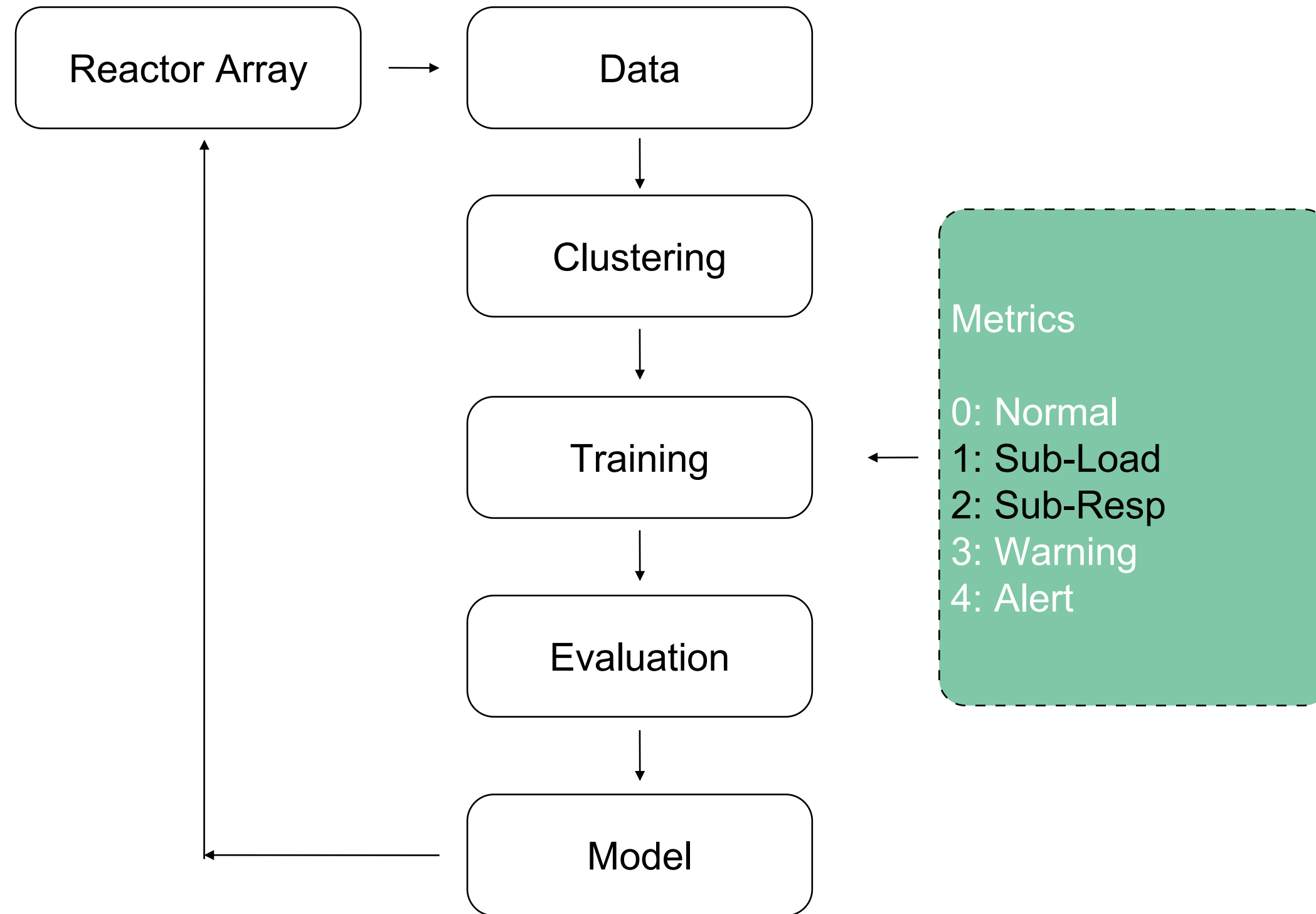
We aim to build on the traction we have generated in these sectors and launch at least 10 pilots of capacities ranging from 10-100 Kgs/day, across India and EU. To support these pilots, one of the key activities is to build in-house capacity for microbial and system 3D printing.





# OB HydraCel 2.0

## ML for Autonomous Intelligent Reactors

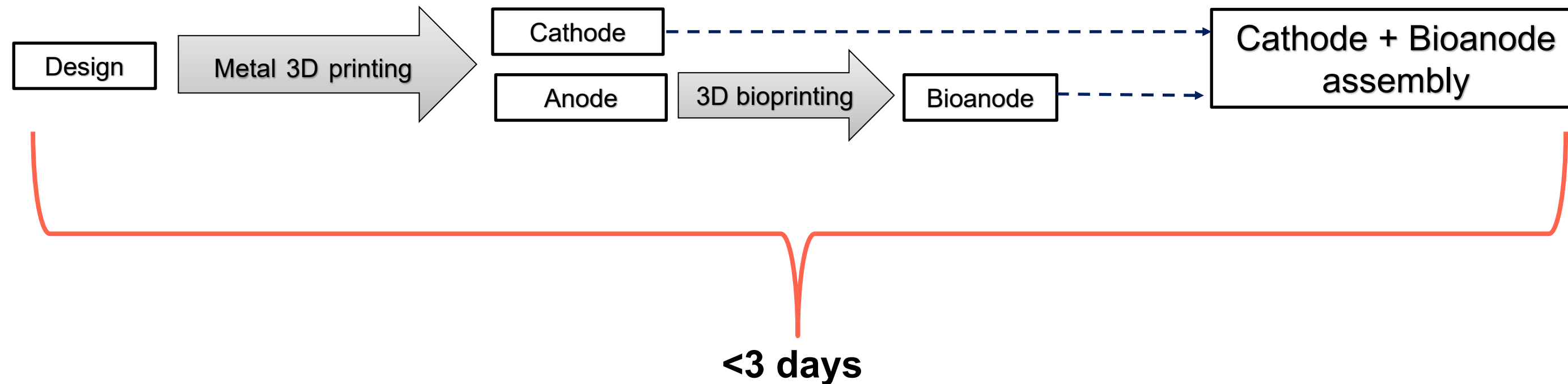


We are developing fully autonomous reactors which learn from each reactor pass to enable active control of microbial growth and hydrogen gas generation.



## OB HydraCel 2.0

### Smart Materials for 3D Printing



- 3D printing our electrodes will help us optimise our design and improve our reactor efficiency by at least 1.5 times.
- 3D bioprinting will help us prime our electrodes faster and do away with the capacity limit that comes with priming electrodes in a conventional biolab.

To move to this stage, we are looking to lean on Dassault's expertise in 3d printing and product development.



Singapore >> India  
We Seek Collaborations

Horizon Fuel Cell

Applied Materials

Zelta 3D

NUS/NTU



## Team

# Building the Future of Energy

With the right mix of experience in business development, biology, and engineering, we believe our team is ideally situated to achieve our dream of making hydrogen the preferred fuel of choice.



SHANTA RAO  
CLO, Intellectual Property and  
Business Development,  
25+ Years in Industry.



SURUCHI RAO  
CEO, Bioengineering and Business  
Development,  
PhD in Bioenergy from UDCT, Mumbai



KAMAR SUHAIL BASHA  
CTO, Ossus Bio  
Design and Engineering,  
Mech Eng.,  
PESIT, Bangalore.

9 Employees  
Incubated at IKP EDEN, Bangalore





FlyCatcher Technologies LLP  
**Mr. Kabir Udeshi, Founder & CTO**





## Zero Landfill Community with the Rhino Digester System





# Need

**Acute need to process solid waste and stop the barbaric practice of dumping!**

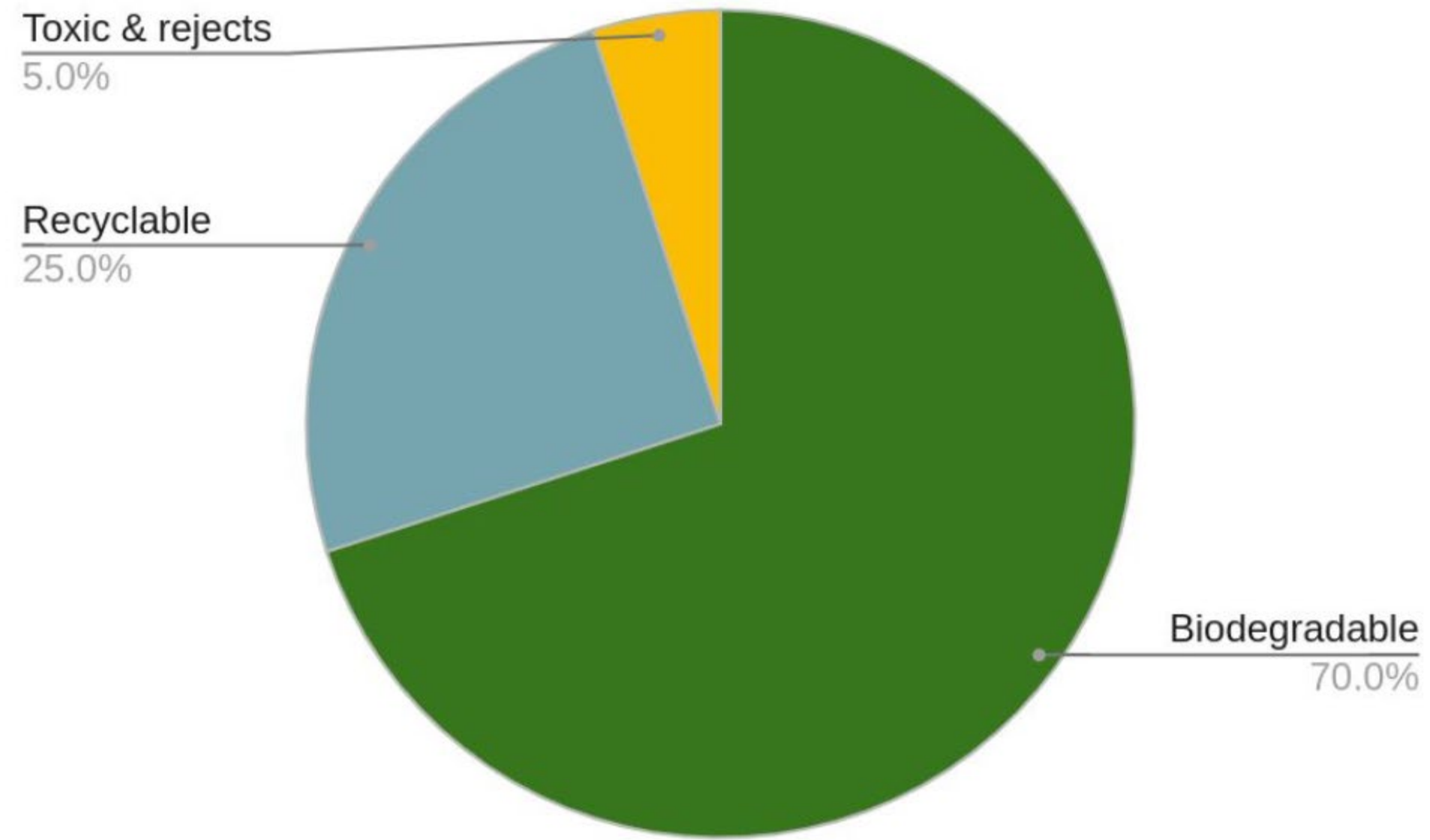
- **Qutub Minar** = dumps in Mumbai & Delhi
- Caused the **Plague** in Surat 1994
- Focus area of India – PMO & Supreme Court
- United Nations Millennium Developmental Goal

**85%**

**Global waste ends up in Landfill**



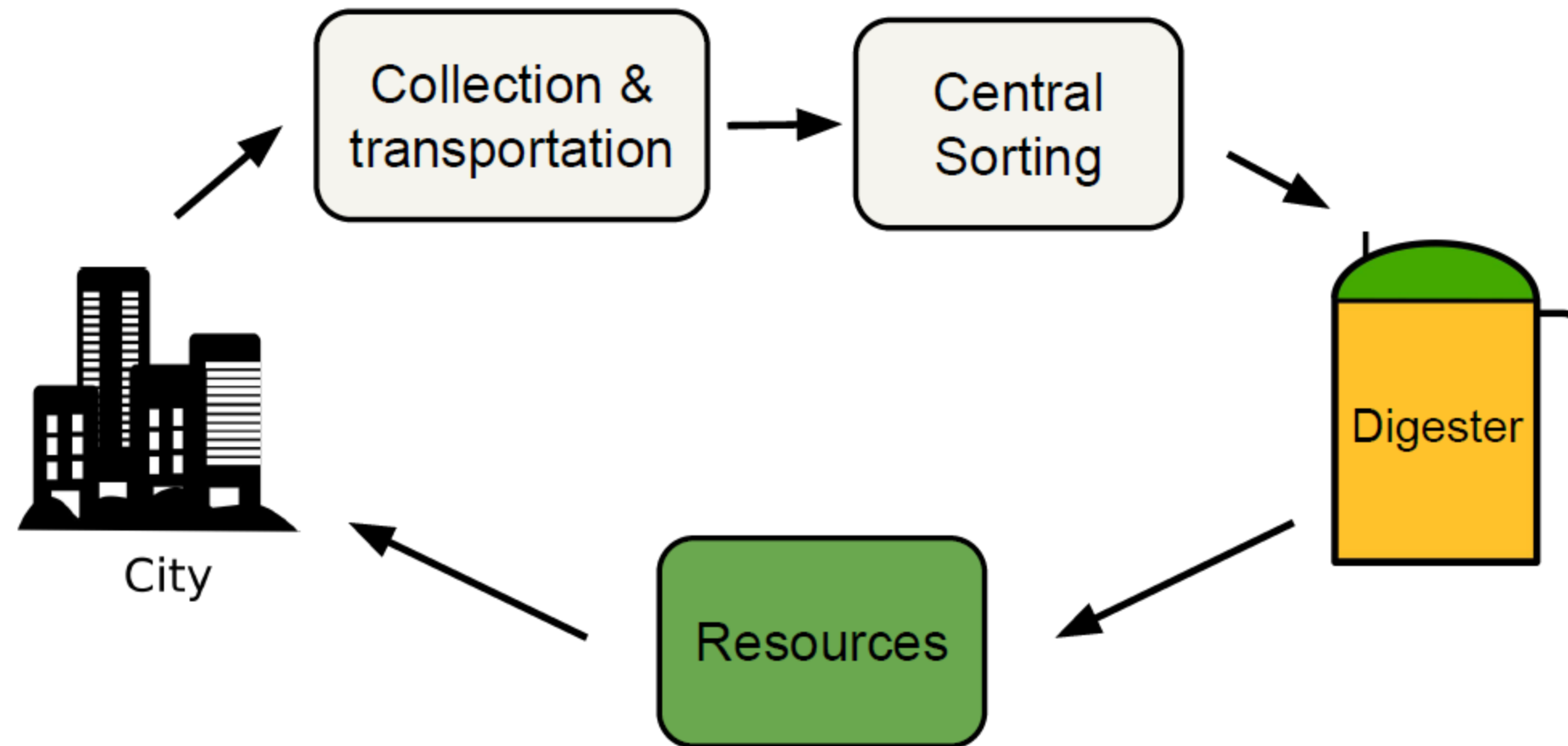
## Waste Composition | India





## Norm of current times

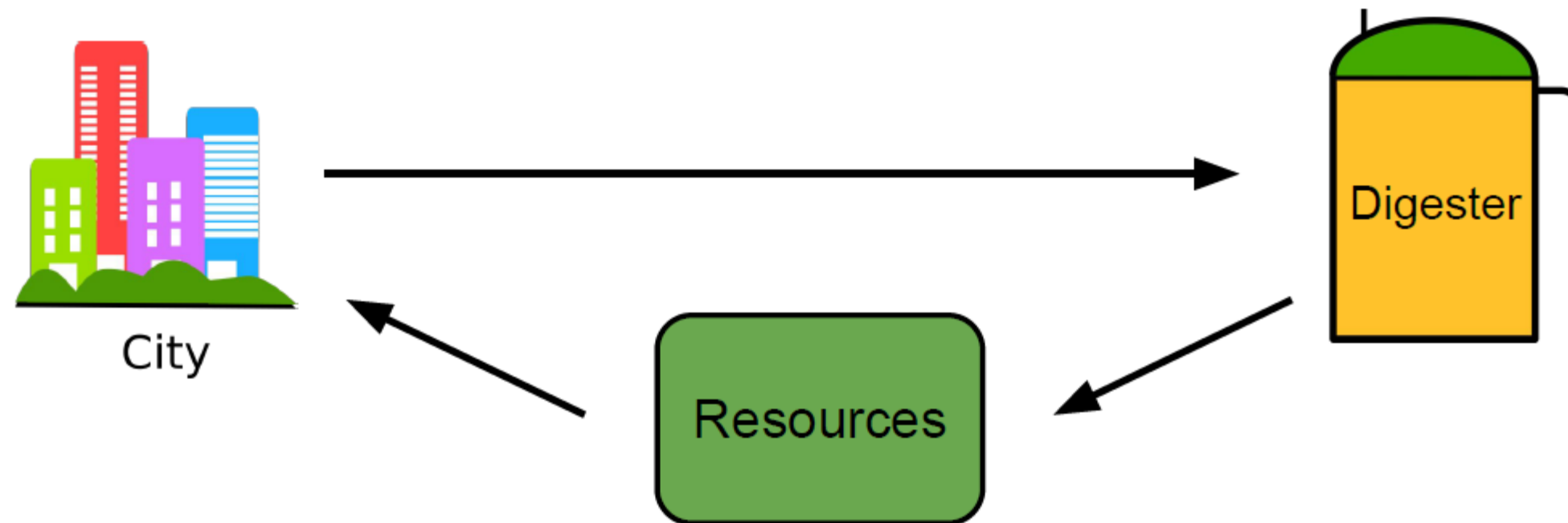
- Transport & **central processing**





# Sustainable Solution | *Process In-situ*

- Process **at source**





# Corporation of the City of Panaji | Goa



Inauguration by Hon' CM of Goa

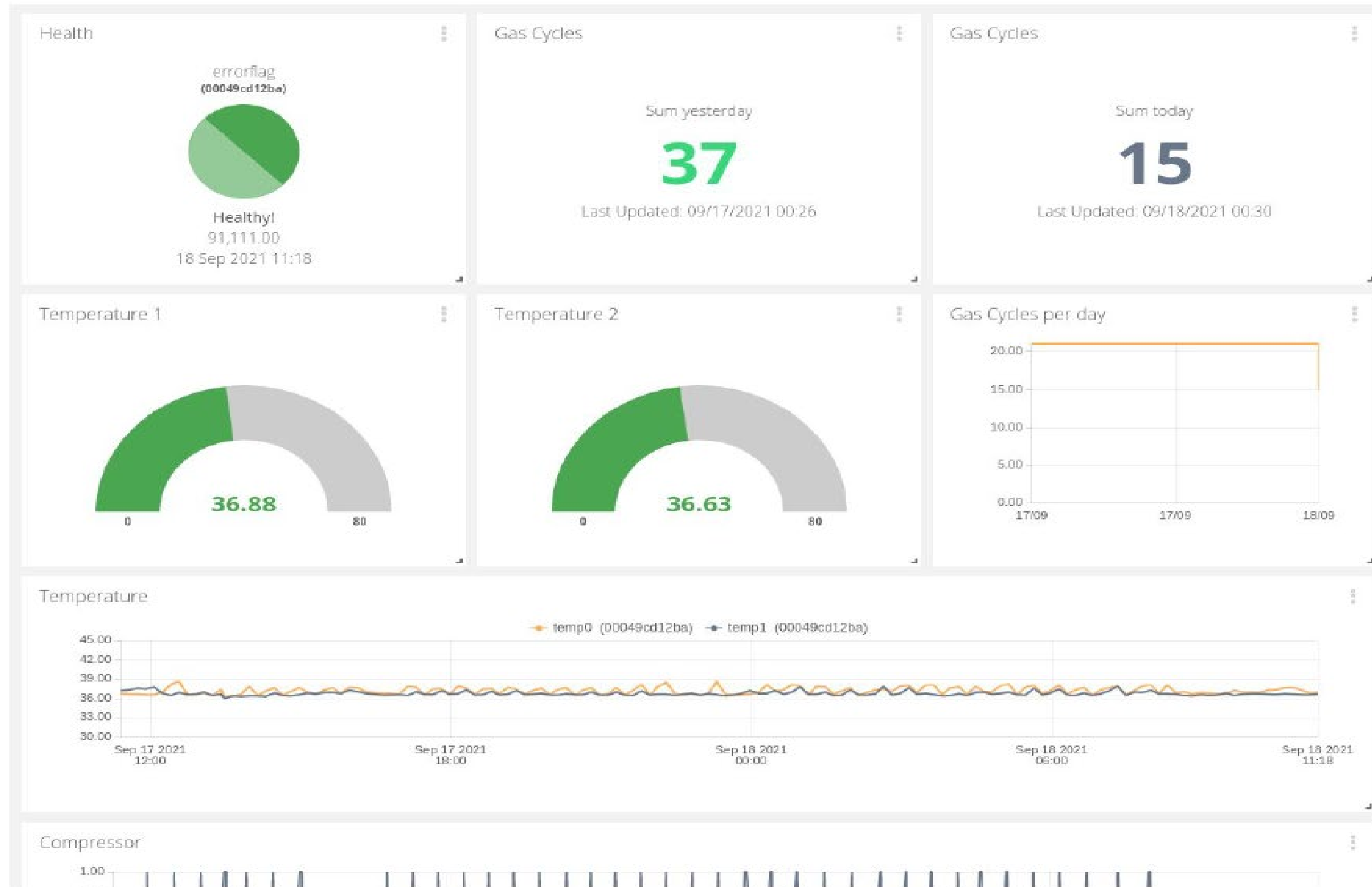


# Processing | At source





# Monitoring | On-line IoT Based





# Industrial design | **Factory made**



**Rhino Digesters at Municipal Garage, CCP**



# Biogas | Usage for cooking



**Polytechnic**



**Aaram Hotel**  
**CCP**



# Plant Growth Promoter | Soil Health





# Hospital Mumbai: 2018



- Holy Family Hospital



# Technology – Globally Unique



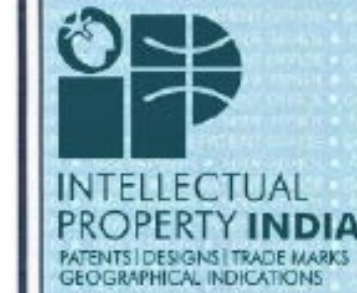


# IPR

## Patent granted

Patent No. : 295520

System and Method For  
Liquid Circulation and Gas  
Generation Measurement



क्रमांक : 022102276  
SL No :



भारत सरकार  
GOVERNMENT OF INDIA  
पेटेंट कार्यालय  
THE PATENT OFFICE  
पेटेंट प्रमाणपत्र  
PATENT CERTIFICATE  
(Rule 74 Of The Patents Rules)

पेटेंट सं. / Patent No.	295520
आवेदन सं. / Application No.	201721007670
फाइल करने की तारीख / Date of Filing	04/03/2017
पेटेंटी / Patentee	FLYCATCHER TECHNOLOGIES LLP

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में बर्णित SYSTEM AND METHOD FOR LIQUID CIRCULATION AND GAS GENERATION MEASUREMENT नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख 4th day of March 2017 से बीस वर्ष की अवधि के लिए पेटेंट अनुदान किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled SYSTEM AND METHOD FOR LIQUID CIRCULATION AND GAS GENERATION MEASUREMENT as disclosed in the above mentioned application for the term of 20 years from the 4th day of March 2017 in accordance with the provisions of the Patents Act, 1970.



अनुदान की तारीख : 05/04/2018  
Date of Grant :

*OK Singh*

पेटेंट नियंत्रक  
Controller of Patent

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, 4th day of March 2019 को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।

Note. - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 4th day of March 2019 and on the same day in every year thereafter.



# Trained team **Delivery | Monitoring**

## Team

- Designed and made by Indian Engineers & Technicians
- **Local** resources and components





# Prominent Clients





# Recognised





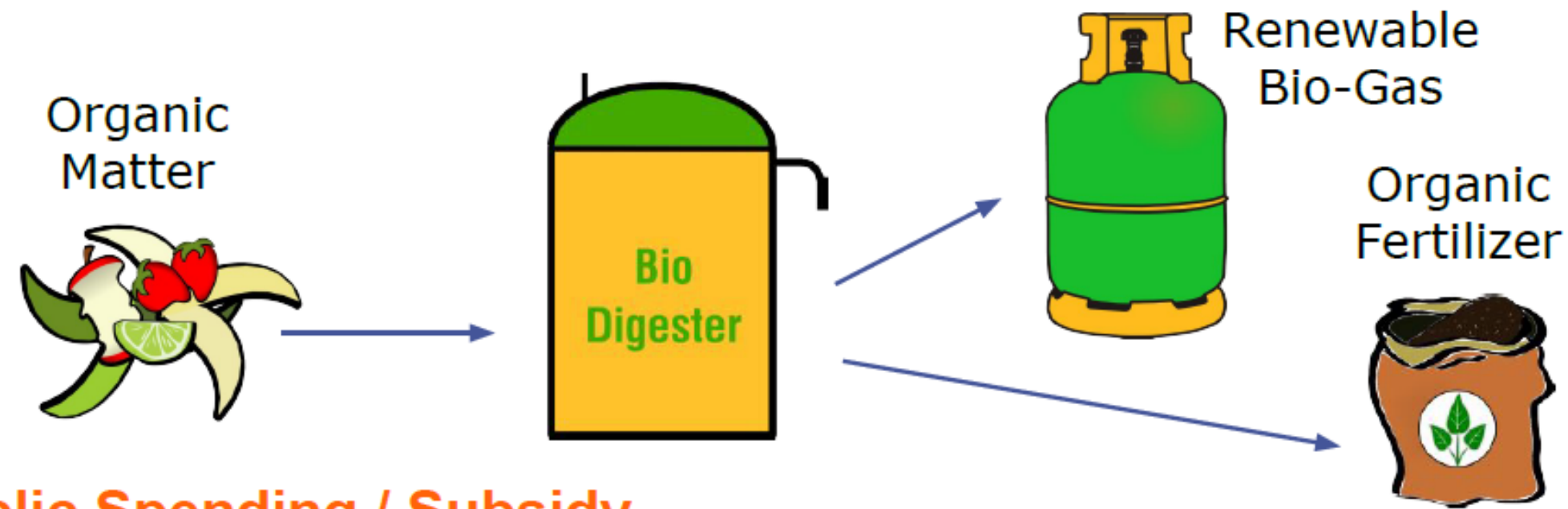
# Challenges & Opportunities

- Training service personnel **readiness to address challenge**
- We currently use cow manure and inoculum for startup -  
opportunity to productise
- **Technology refinements**



# Policy Distorting Market

- Sustainable Solution



- Public Spending / Subsidy

---



- Collection, transportation & Dumping

**100%**



- LPG – Fossil Fuel

**50%**



- Chemical Fertilizers

**80%**





Arishti Cybertech  
**Mr. Kanak Kawadiwale, Founder & CEO**





**A NextGen Enterprise Messaging Platform for Sensitive Communications**

---





# SECURITY

71% of employees share sensitive and business-critical data using instant messaging and business collaboration tools

Nextgov

Insecure Communications Like WhatsApp Are Putting U.S. National Security at Risk

techradarpro

Don't share sensitive stuff on video calls, or you could be in serious hot water

By Sead Fadilpašić 3 days ago

Employees feel comfortable sharing pretty much anything on

Enterprise Communications are

Sensitive

Not Secure

Critical

TECHNOLOGY

Financial services risk data security breaches with insecure instant messaging

THE NEW INDIAN EXPRESS

Law enforcement should have access to source of messages spreads fake news: Prasad

The issue of traceability has been a flashpoint between the government and messaging giant, WhatsApp.

HOME | CYBERSECURITY

The enterprise hazard of using consumer messaging apps in the workplace


Making the right investments now will safeguard an organization's mobile communication infrastructure from future cyber-attacks




# Problems with consumer messaging

Problems with  
insecure  
communications

**Insecure**



**Insecure Messaging**  
(Traditional Encryptions)




**User Identity Spoofing**

**Distrupted**




**Lack of Data Control & Monitoring**




**Unrestricted File Sharing**

**Unreliable**



**Lack of Business grade Features & Flexibility**



**No Forensic Data available**

## SECURITY

71% of employees share sensitive and business-critical data using instant messaging and business collaboration tools

Nextgov

**Insecure Communications Like WhatsApp Are Putting U.S. National Security at Risk**

informa

SECURITY

**E2EE: A Cornerstone for Securing Business Communication**

Shifting work paradigms make end-to-end encryption in enterprise mobile messaging platforms a business essential.

techradar pro

**Don't share sensitive stuff on video calls, or you could be in serious hot water**

By Sead Fadilpašić 3 days ago

Employees feel comfortable sharing pretty much anything on

SIW SECURITY INFOWATCH.COM

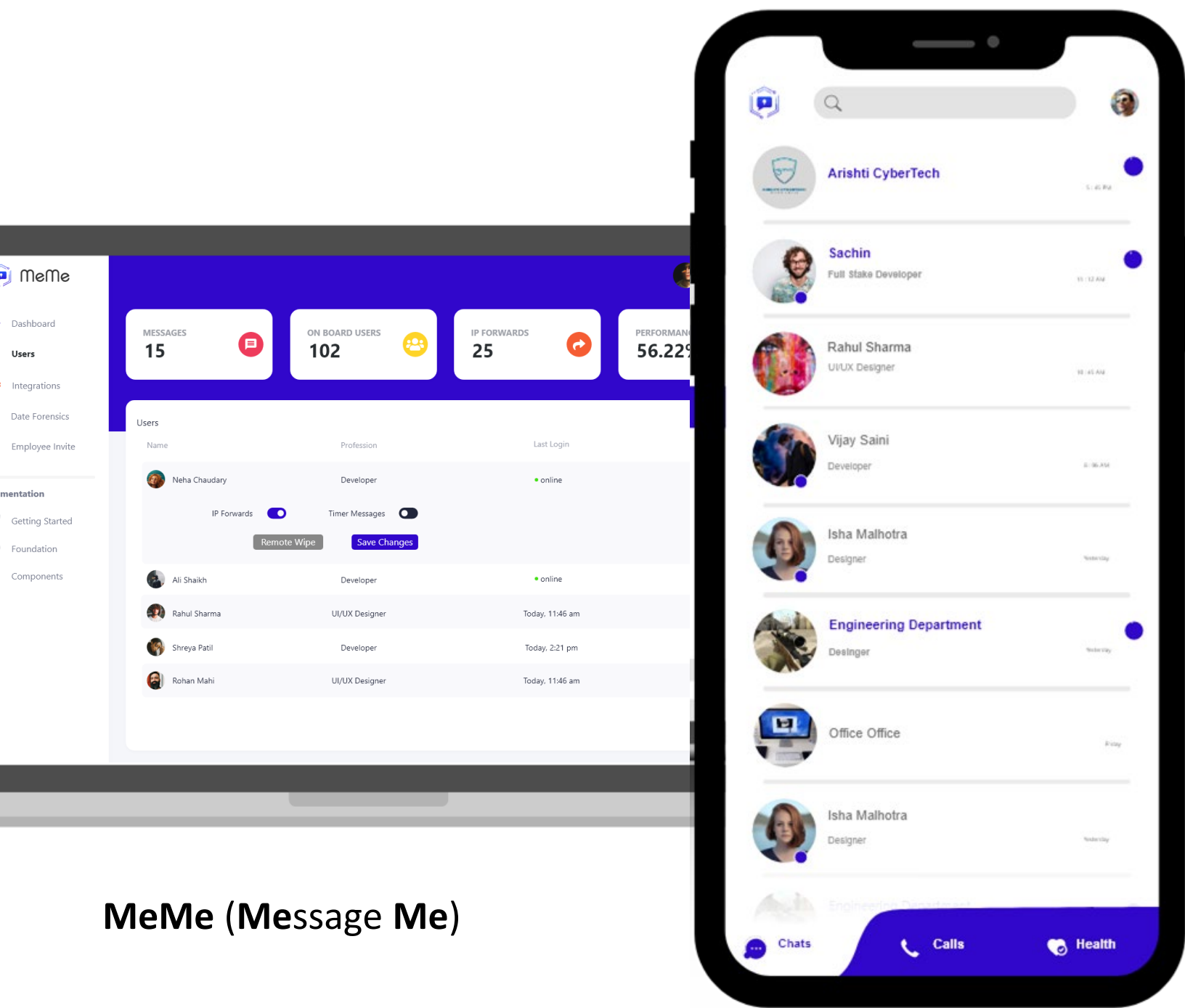
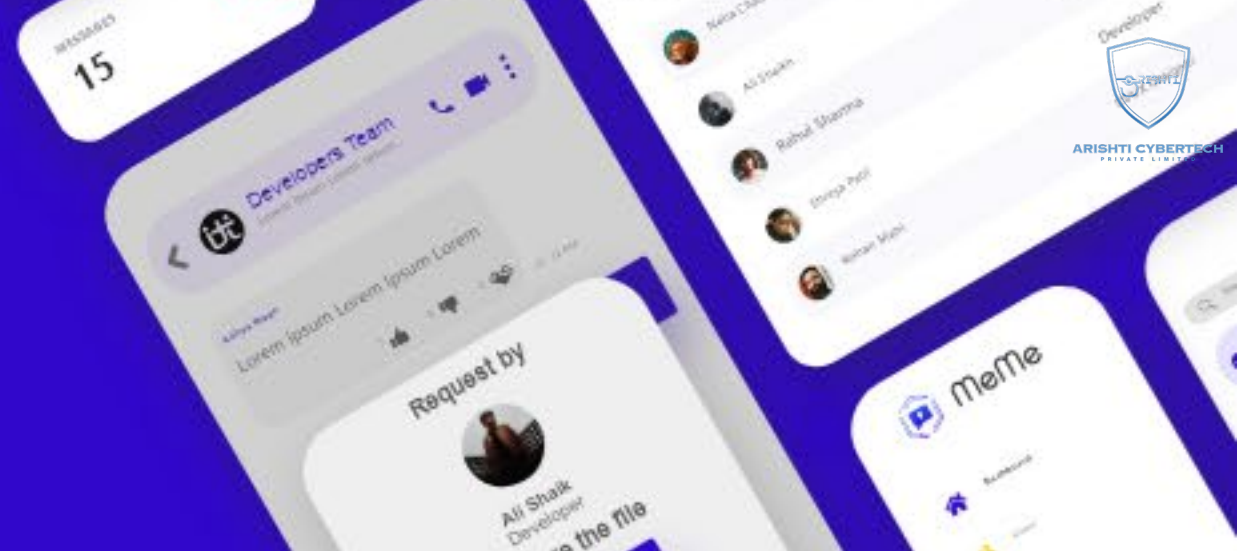
HOME | CYBERSECURITY

**The enterprise hazard of using consumer messaging apps in the workplace**

Making the right investments now will safeguard an organization's mobile communication infrastructure from future cyber-attacks



# Addressing the Risk through MeMe



MeMe (Message Me)



**Hybrid Encryption** using  
Quantum Technology



**Anti-Spoofing**  
Biometric Recognition



**Admin Controlled**  
Communications



**Consent Based**  
Sharing of Files



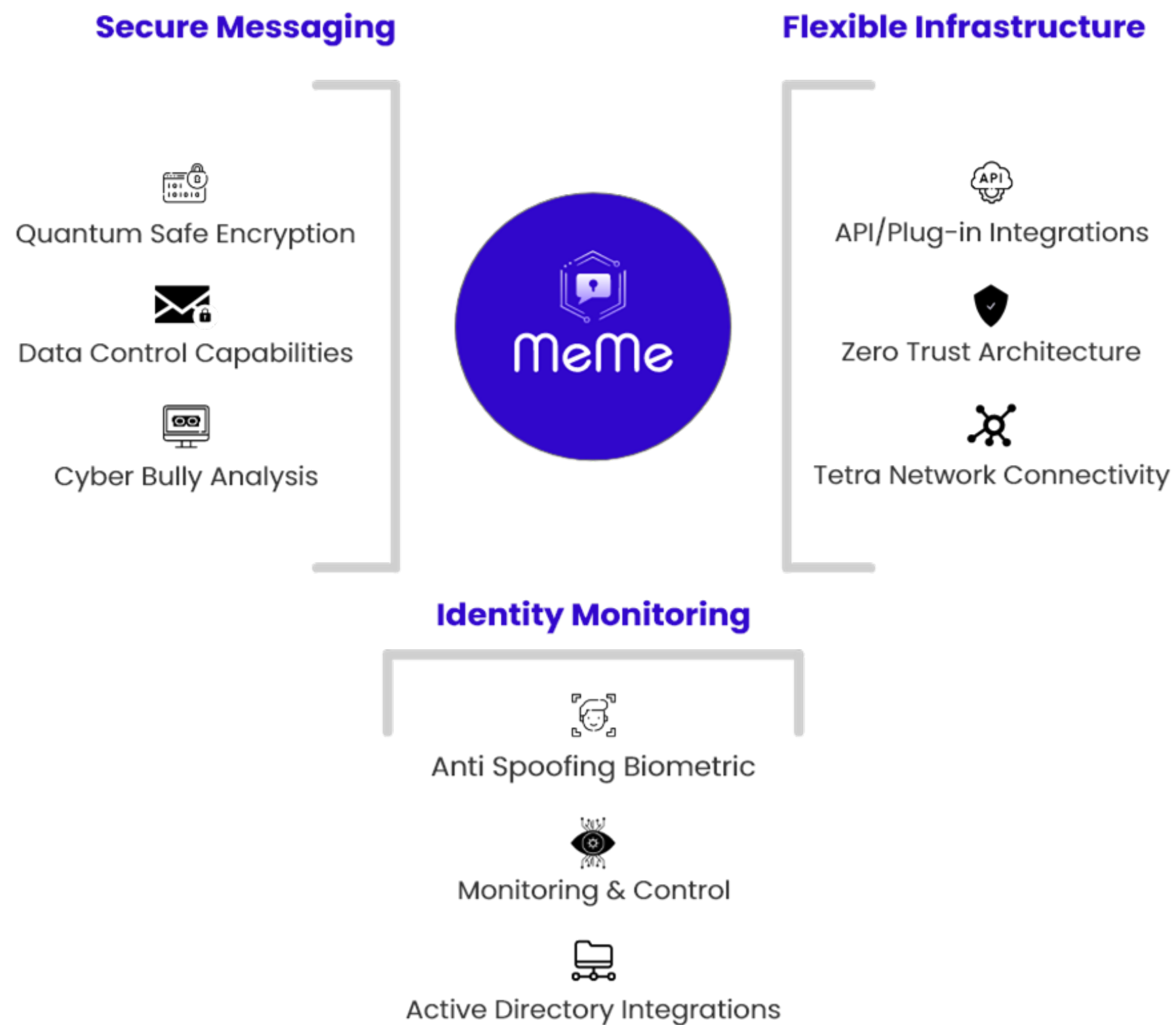
**API Driven and Easy**  
Integrations



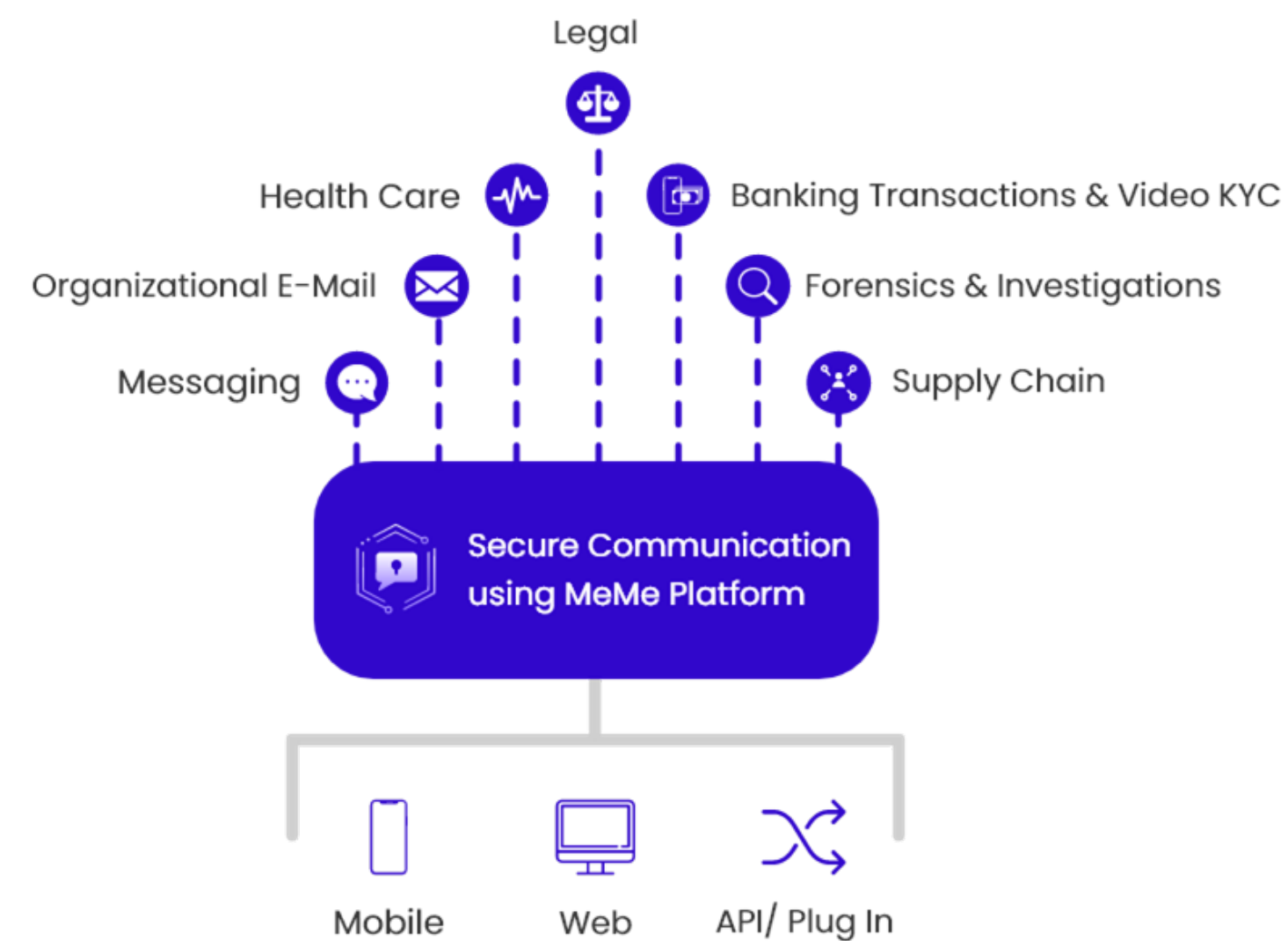
**Forensics**  
Capabilities



# MeMe: Innovative platform



**Indian Patent Pending Technology**

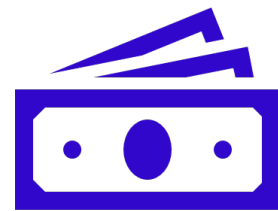




# Target Customers

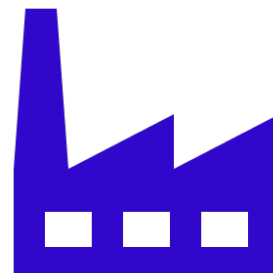
---

We currently target the **B2B and B2G and B2B2C** Kind of market. Below are some of our specific target customers with use cases:



## BPO / BFSI / Telecom

Banks / Finance industry can use our technology to secure the transactions inside out



## Manufacturing & E-Commerce

Providing the platform for industries to Share the IP Content securely and Easily with access rights



## Trading and E-discovery Platforms

MeMe can be used for closed group communications for trading and Lawsuits firms



## Law Enforcement Agencies

Law Enforcement Agencies can use MeMe Platform for Secure Communications with Forensics & Investigation capabilities



# Business Model

## Revenue Sources

1. **SaaS** Subscription
2. On Premise **licensing**
3. Cost of providing the **historical data** in case of Cyber Crime

## Business Models

### SaaS

#### For Small / Medium Size

- Pay Per **User / Month**
- **Slab Pricing** for large organizations

Basic  
\$2

Pro  
\$4

Premium  
Slab

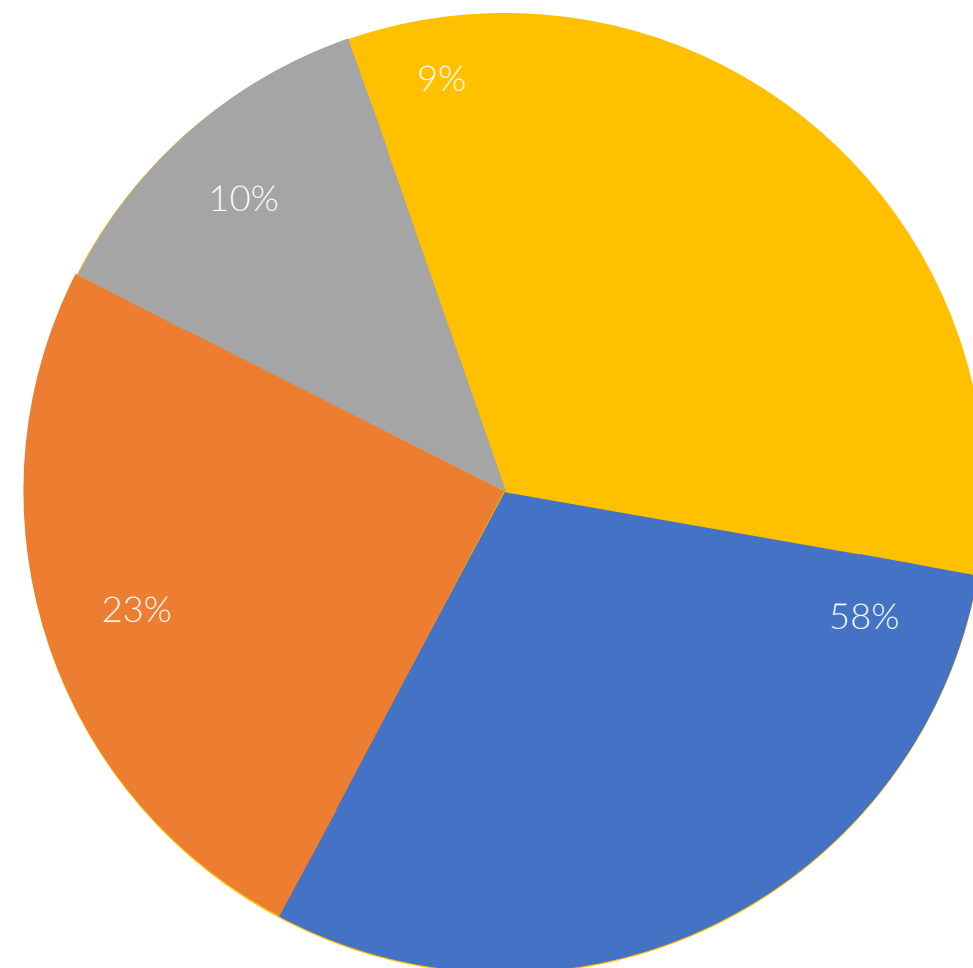
### On Premise

#### For Large Enterprise

- One time **License fee** + yearly maintenance (**13% TCO**) cost depending on number of users



# Current Product Traction



■ Users ■ IPR ■ Pilots ■ Awards & Grants



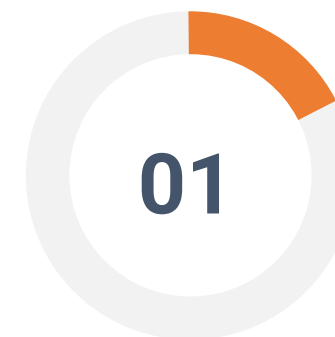
## Early Users

We tested our early product with various industry veterans and **C Level executives**



## Total Pilots

Few organization have used our application in **alpha stage** and have received great feedback.



## Patents and IPR

Filled our first **process patent** for security algorithm in Indian jurisdiction



## Awards & Grants

**7 Awards** from Industries and Government organizations. **3 Grants** for product development

## In talks with Enterprises

- BFSI
- BPO
- Government LEAs

+02

+02

+01

## Beta available on:





# SaaS subscription Variants

Features	Basic INR 130 per user/ Month	Pro INR 190 Per User/ Month	Premium Slab Pricing
E2E Encryption using Quantum Technology	✓	✓	✓
Multimedia File Sharing (Exceptional File Formats Supported)	✓	✓	✓
Message Restrictions /Tracking	✓	✓	✓
Anti Spoofing Face Lock		✓	✓
Self Destructing Messages / Timer Message		✓	✓
Remote Data Wipe		✓	✓
Role Based Access Control			✓
Admin Panel Control			✓
Cyber Bully Analysis			✓
Active Directory Integrations			



# Use case: Banking and Financial Enterprises

## Use of Consumer Messaging applications in BFSI



- Lack of Explicit Consent
- Lack of ability to delete information
- Lack of ability to get your own data back
- Data being transferred outside the Enterprise



## Increasing the risk of Sensitive Data Breach

- Organizations using Consumer Messaging platforms, expose & open themselves to the serious Sensitive Data Breaches which could cause great compromises.

## How can MeMe mitigate those risks

<i>Data Loss Prevention</i>	Avoid losing KYC, PII, Critical Messages using Consent based Content sharing
<i>Data Governance</i>	Monitor and Track the communications using Admin Panel
<i>Security</i>	More than just AES, MeMe secures your data using Quantum Tech
<i>Integrations</i>	Open APIs, Plug-In



# Use case: BPO/BPM

## Use Case:

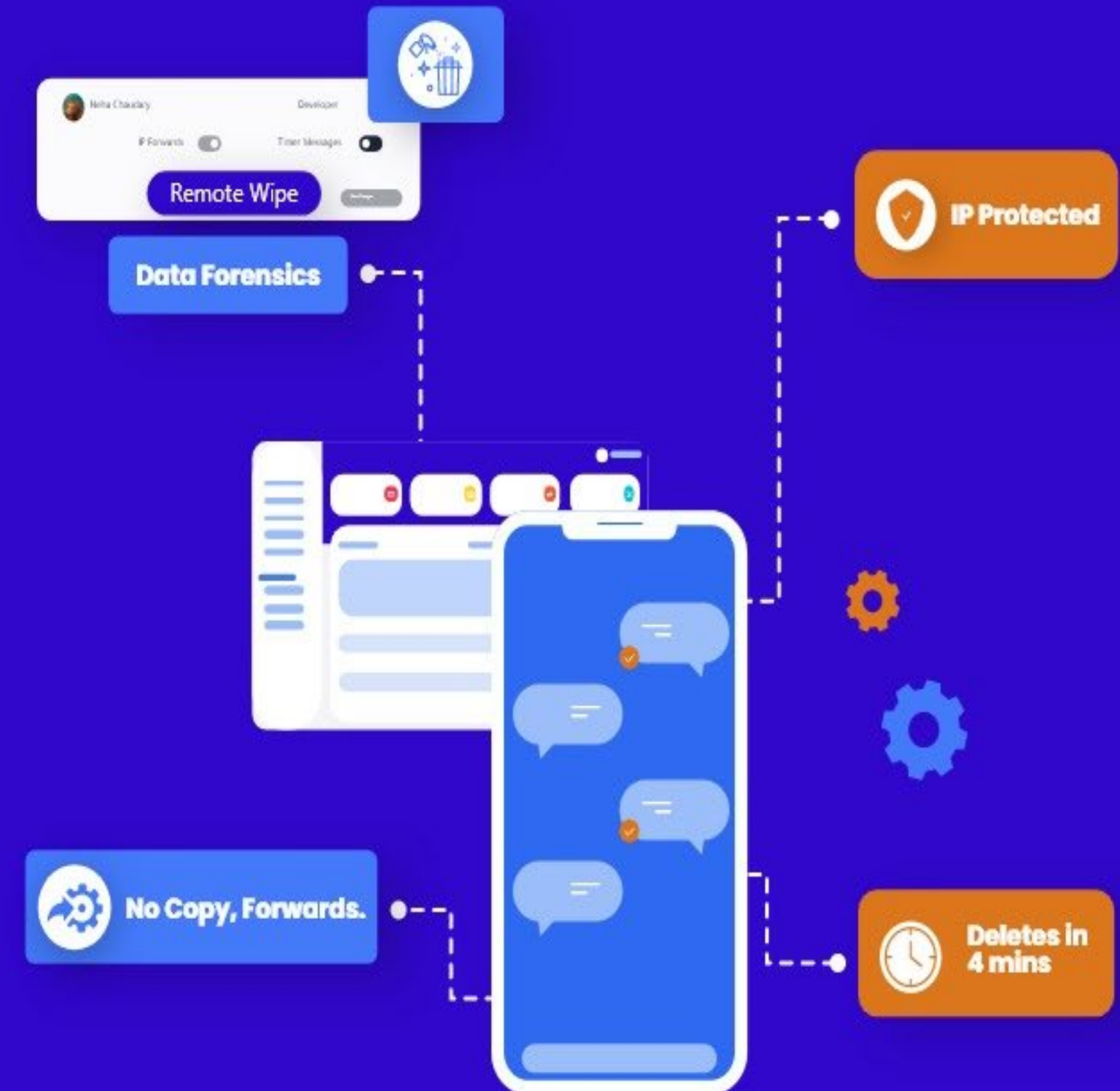
In BPO/E-Commerce industry the Executive – Client/Agent/third party vendor communications is the mainstream of Business Continuity. These communications needs to be secure as sensitive data is being constantly shared within the agents/customer.

## MeMe Solves it through:

1. E2E Encrypted Mobile Messaging
2. IP Protected Sharing
3. Consent based Content Circulation
4. Remote Data Wipe
5. Tracing the Content Circulation

## Impact:

Through MeMe, the communications within various departments in BPO/E- commerce could be secured and data sharing can be made easy with Control features and Monitoring.



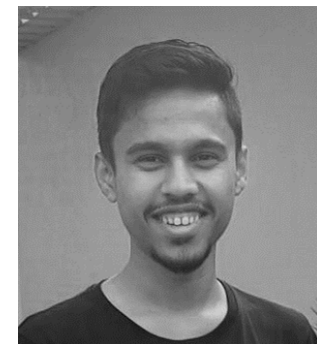


# Leadership & Advisory board



**Mr. Kanak Kawadiwale**

**Founder & CEO**  
BTech - Computer  
Cyber Security | Cyber Forensics



**Mr. Parth Prajapati**

**Team Lead - Technology**  
BTech- Computer  
Product Development & Delivery



**Mr. Suresh Srinivasan**

**Mentor & Advisor**  
Group Head – Cyber Defense  
Axiata Group



**Mr. Sanjay Kanvinde**

**Mentor & Advisor**  
Co-founder - Lavni Ventures  
Ex-Schlumberger



**Mr. Vijay Talele**

**Mentor & Advisor**  
CEO – COEP's Bhau Institute

**55 Years**

**08 Awards**

Combined Industry Experience  
Accolades

**22 Years**

Cyber Security Experience

Recognitions and





# Achievements & Recognitions



## SINE IIT Bombay

DST Supported NIDHI  
Entrepreneur in Residence



## Cyber Security Incubator

Funded and supported under  
Startup India Seed Fund Scheme



## 5G Hackathon- DoT

Top 100 Startups under 5G  
hackathon



## B2B Accelerator Program

B2B startup ecosystem to develop  
and Scale SaaS Products



## Ministry of HRD

Finalist at National Innovation  
Contest 2020



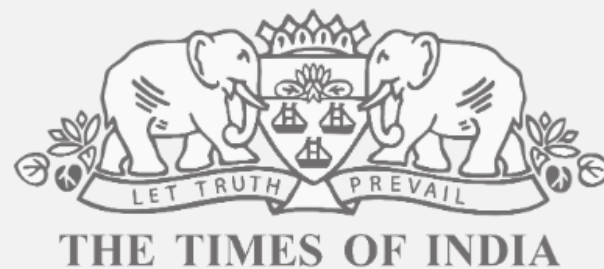
## National Center of Excellence

supported and recognized by  
NASSCOM - DSCI



## Inspiration Award

Awarded Persistent Inspiration at  
Smart India Hackathon 2018







# meme

A next generation Secure Enterprise Messaging Platform for  
Sensitive Communications

---

## Contact Us

 Arishti CyberTech Pvt. Ltd, 1<sup>st</sup> Floor, COEP's Bhau  
Institute, Pune

 +(91) 9403311409

 [kanak.k@arishti.in](mailto:kanak.k@arishti.in)

 [arishti.in](http://arishti.in)

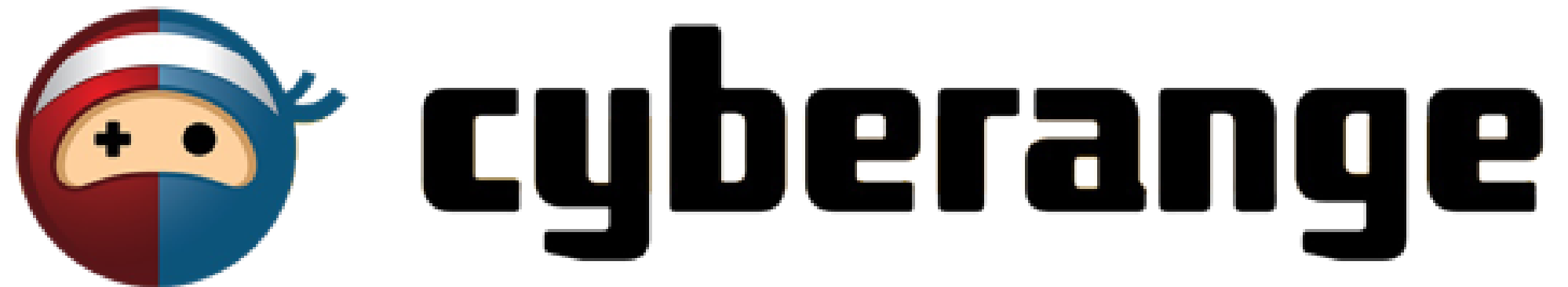






Cyberange  
**Mr Rajshekhar Pullabhatla, Co-Founder &  
Director**



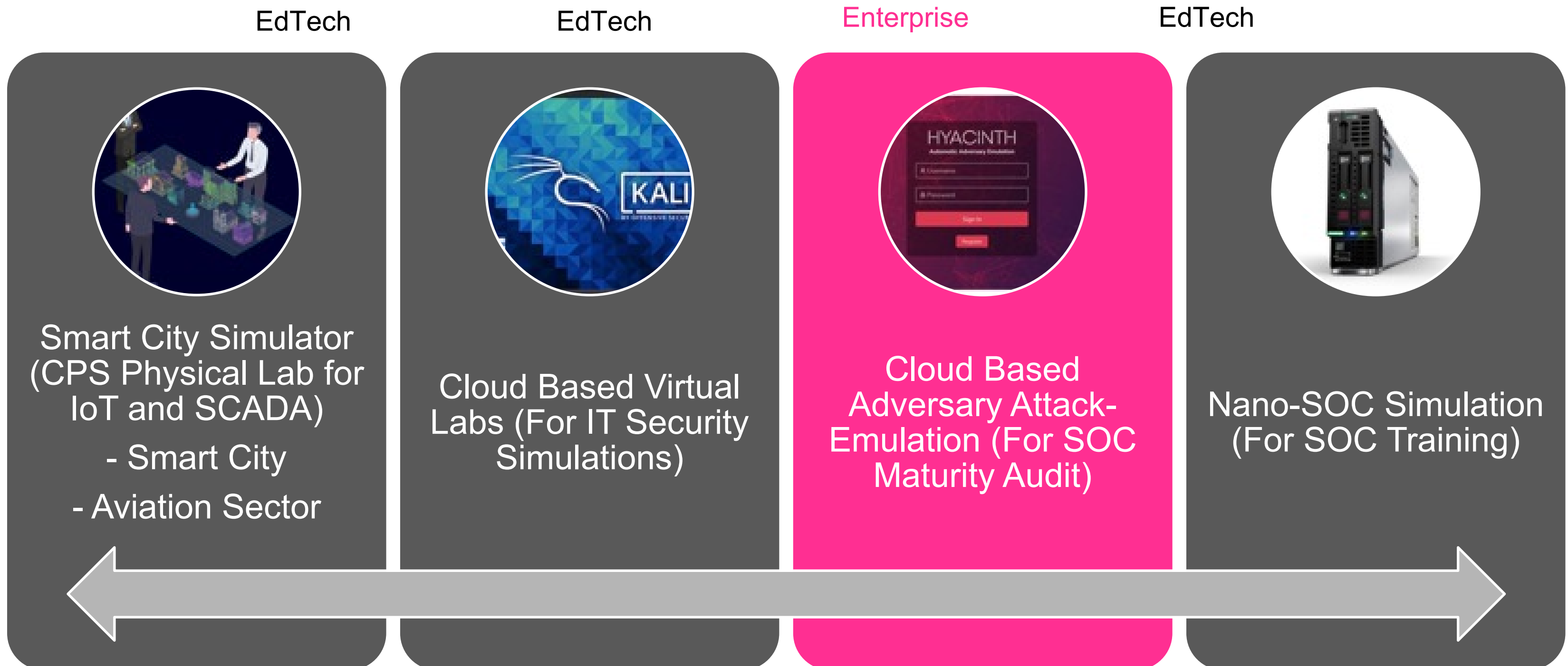


We are a fast-growing niche EdTech start-up focused on creating real-world cybersecurity simulation platforms.

Our start-up provides world-class physical and virtual simulation products, allowing organizations and universities to rapidly build capacity and upskill professionals in cyber security.



# What are the products designed by Cyberange?





# Demo



## Physical Labs

- <https://www.youtube.com/watch?v=pc8NAiFGj24>
- <https://www.youtube.com/watch?v=RAEFG-ust4U>

## Virtual Labs

- <https://www.youtube.com/watch?v=7uVHQCzdjQQ>





- 50+ SCADA/PLC security scenarios with simulations
- Covers scenarios in over 10 critical sectors
- 20 CPTED Scenarios for Smart Building Security
- MITRE ATT&CK Emulation



# Virtual Labs Platform



# Bug Bounty

## Bug Bounty



## Pen Testing



## Digital Forensics



CVEs



## Reversing



## Sample Labs



## IoT Challenges



## Reconnaissance



## Social Engineering



## Systems Security



## Password Hacking



## Viruses and Trojans

## BUG BOUNTY HARD

## XML External Entity Injection - Out of Bound Interaction

[view](#)BUG BOUNTY **HARD**

## XML External Entity Injection - SSRF

View

BUG BOUNTY MEDIUM

## XML External Entity Injection

View

BUG BOUNTY HARD

## Server Side Request Forgery (SSRF)-6

[View](#)

BUGBOUNTY MEDIUM

## Server Side Request Forgery (SSRF)-5

View

BUGBOUNTY MEDIUM

## Server Side Request Forgery (SSRF)-4

[View](#)



# HYACINTH

Automatic Adversary Emulation

Sign In

Register

**Adversary attack simulation based on MITRE ATT&CK**



# How can you benefit from our tech?



## Education

- Launch new courses as University, get global students
- Conduct hands-on CS training & Hackathons
- Power your e-learning platform with our virtual labs

## Critical Sectors / Companies

- Get Ransomware Simulation services
- Conduct SOC Maturity audit with complete simulation of cyber kill-chain
- Conduct Red Teaming for sensitive environments safely

## Governments

- Build cyber offensive & defensive capabilities for your armed forces
- Setup cyber ranges to enhance jobs in your country
- Use simulations to test efficiency of cyber security start-up offerings for investment & funding decisions





The banner for Sainya Ranakshetram 2021 features a red and orange header bar. Below it, the event title is in large red letters, followed by a subtitle in parentheses. Three icons represent the benefits: free workshops, internship opportunities, and national recognition. A central orange box highlights '3 Tracks'. Below this, three icons represent the tracks: Secure Coding, Software Defined Radio (SDR), and Capture the Flag (CTF). A large dark blue shield-shaped graphic on the right contains the text 'Be a part of Indian Army's Prestigious Talent Hunt', 'PRIZES UPTO 15 LAKHS', and 'conducted by' followed by the logos of the Indian Army and ISAC. A red button at the bottom left contains the registration link.

**SAINYA RANAKSHETRAM 2021**  
(First ever Hackathon by Indian Army)

FREE WORKSHOPS    INTERNSHIP OPPORTUNITIES    NATIONAL RECOGNITION

**3 Tracks**

Secure Coding    Software Defined Radio (SDR)    Capture the Flag (CTF)

**Register Now - [sainya-ranakshetram.in](https://sainya-ranakshetram.in)**

Be a part of Indian Army's Prestigious Talent Hunt

**PRIZES UPTO 15 LAKHS**

— conducted by —

1. Cyberange wins big to execute the first ever cybersecurity hackathon for the Indian Army due to its technology simulation platforms
2. The Sainya-Ranakshetram will be an annual cyber security event starting from 2021 by the Indian Army
3. The winners will be awarded during the Army Day by the Prime Minister of India



# Recent News - 25<sup>th</sup> October 2021



1. MoU signed with Karnataka Digital Mission Economy (KDEM), Karnataka Government, to establish Centers of Excellence in Cyber Security using Cyberange® technologies
2. Large organizations including TCS, Infosys, L&T have committed their support to train and hire manpower from the COEs
3. Four locations identified as technology clusters by the Karnataka Government for setting up the COEs **to make Karnataka the preferred destination for Jobs & R&D in Cybersecurity**

# Closing Notes



1. You can collaborate as partners to sell the digital/virtual labs as white-label solutions to Universities and e-learning Platforms globally
2. You can partner with Center of Excellence Centers in India to train, hire and build capacity in cyber security
3. You can partner to establish large scale cyber ranges for your Government / Defence customers





Payatu  
**Mr. Aseem Jakhar , Co-Founder/Director  
R&Dz**





# Payatu

---

*Research-Powered Cybersecurity*





# Summary

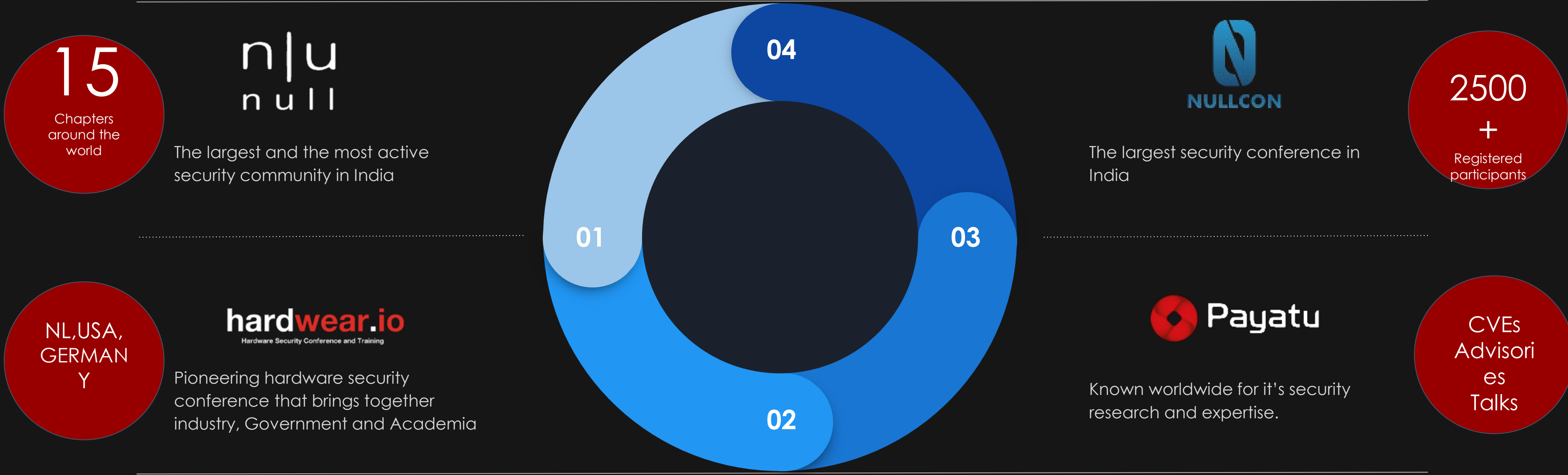
- ▶ Cutting edge cybersecurity solutions
- ▶ Bootstrapped, Profitable and Growing
- ▶ Large clients – NXP, Google, Microsoft, Facebook, Philips, Stryker, UKG, TCS, FICO.....
- ▶ Acquisition Offers
- ▶ Growth (Revenue, Profit before tax) > 50%

# Company Purpose

Empower every organization and team with *Knowledge*, *Assurance* and *Tools* to proactively defend against next-gen cyber threats.



# Our Journey



# Over a decade of Impact

## Knowledge



**hardware.io**  
Hardware Security Conference and Training

## Assurance



## Platforms



IoT Auditor





Knowledge



# Cyber Security Conferences

- ▶ Content
  - New Research
  - New attacks
- ▶ Format
  - Annual Events (Training and Conference)
    - Duration - 5 Days each
  - Training Only events
    - 2-3 Days each
- ▶ Benefits
  - Knowledge on new attack vectors and techniques
  - Highly skilled Talent search
- ▶ Revenue
  - Conference Tickets
  - Training Tickets
  - Exhibition
  - Sponsorships





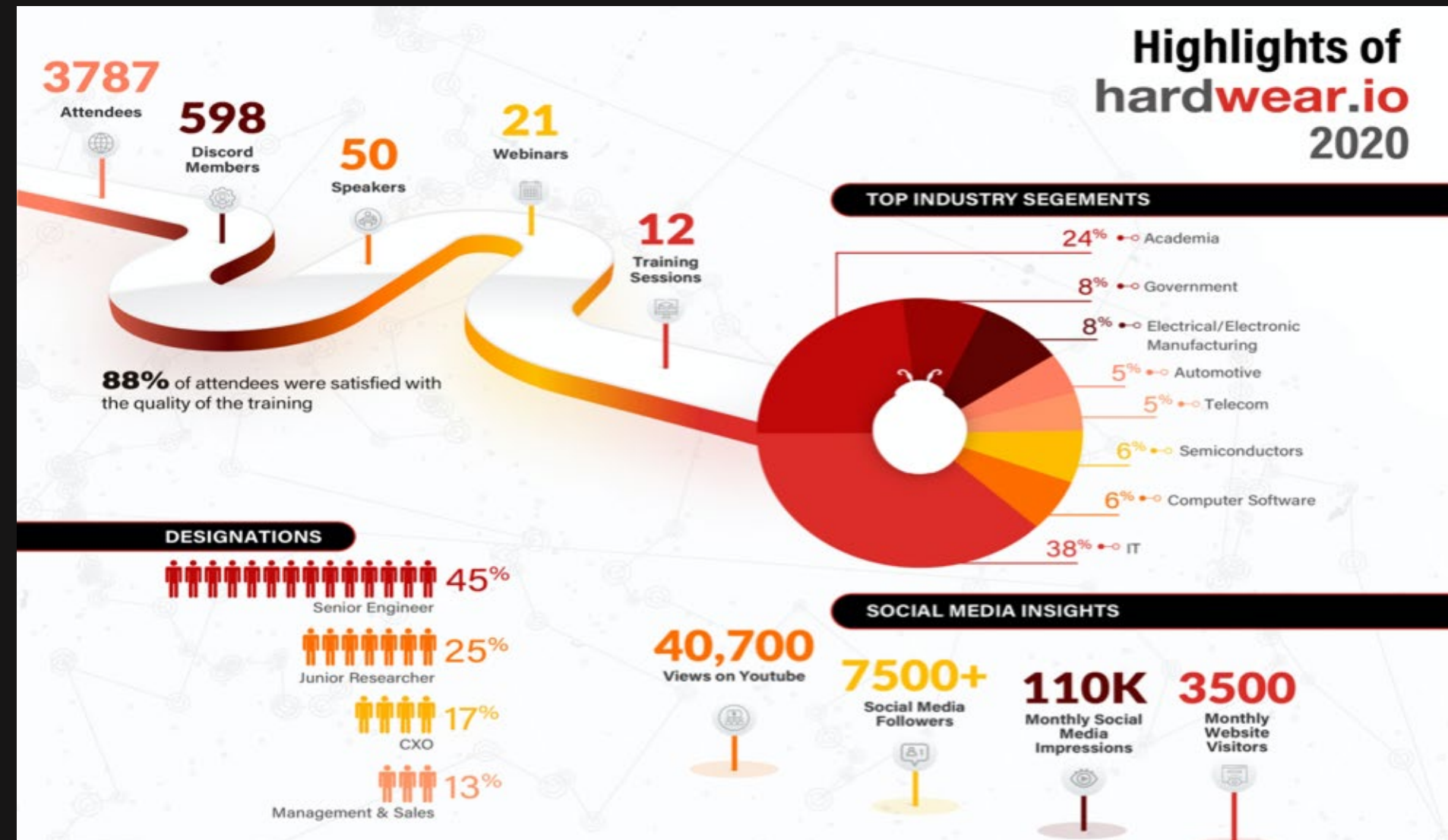
# Nullcon Conference

- ▶ Goa | Delhi | Bangaluru
- ▶ Started in 2010



# Hardwear.io Conference

- ▶ Netherlands | USA | Germany
- ▶ Started in 2015







Assurance

# Services



## IoT/IIoT/Embedded Security Assessment

50+ Projects



## Web & Mobile App Security Assessment

400+ Projects



## Red Team Assessments

50+ Projects



## Cloud Infra Security Assessment & Config Review

100+ Projects

### Management Security

- Cloud Storage
- Cloud / Web APIs
- Cloud Analytics
- Mobile / Thick Client / Web Apps

### Service Security

- Service provider infra

### Communication (Protocol) Security

- IoT / IIoT Protocols
- Network / Internet Protocols
- Radio Protocols

### Device Security

- PCB and components
- Bootloader / Firmware
- Sensor / Actuator
- Vendor application

Domains : Industry 4.0, Healthcare, Automotive, Enterprise IoT, Telecom, Transportation

### IoT Product Ecosystem

All major Web / Mobile Technologies



All major Cloud Services





# IoT/Hardware Security Testing and Validation Lab



# Security Research and Responsible Disclosures

- ▶ More than 4 Dozen CVEs credited to us - <https://payatu.com/advisory>
- ▶ Vulnerabilities across multiple technologies and stacks



Bypassed **Android MDM** with **Electromagnetic Fault Injection** on RAM using a \$1.5 Electric Lighter



- Firmware Extraction and manipulation
- Infrared Command Injection on an X-Ray Machine



Multiple Zero-days in **ICS, IIoT, Telecom, Automotive, medical, consumer devices and more**





# Research Talks/Workshops/Trainings at Premier Events

- **Blackhat** USA/EU/Singapore
- **44Con** UK (London)
- **Brucon** Belgium
- **Xcon** China (Beijing)
- **Power of Community** Korea
- **Hacktivity** Hungary
- **Defcon** USA/China
- **Zer0Con** Korea
- **Hack in Paris** France
- **DEEPSEC** Vienna
- **Bsides** Las Vegas/Vienna
- **DefCamp** Romania
- **Cansecwest** Canada
- **AusCERT** Australia
- **PHDays** Russia
- **OWASP AppSec** USA
- **X33fcon** Poland
- **Nullcon** India



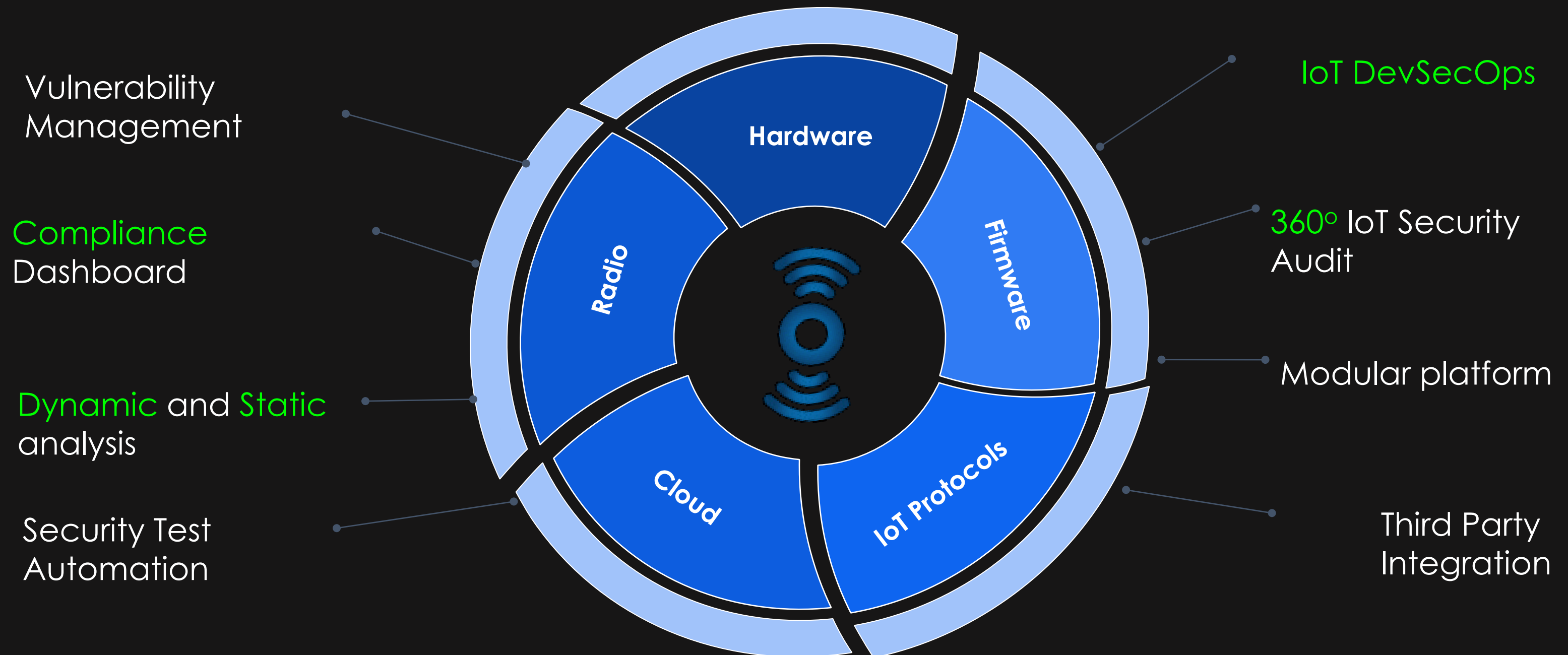


Tools (Platforms)

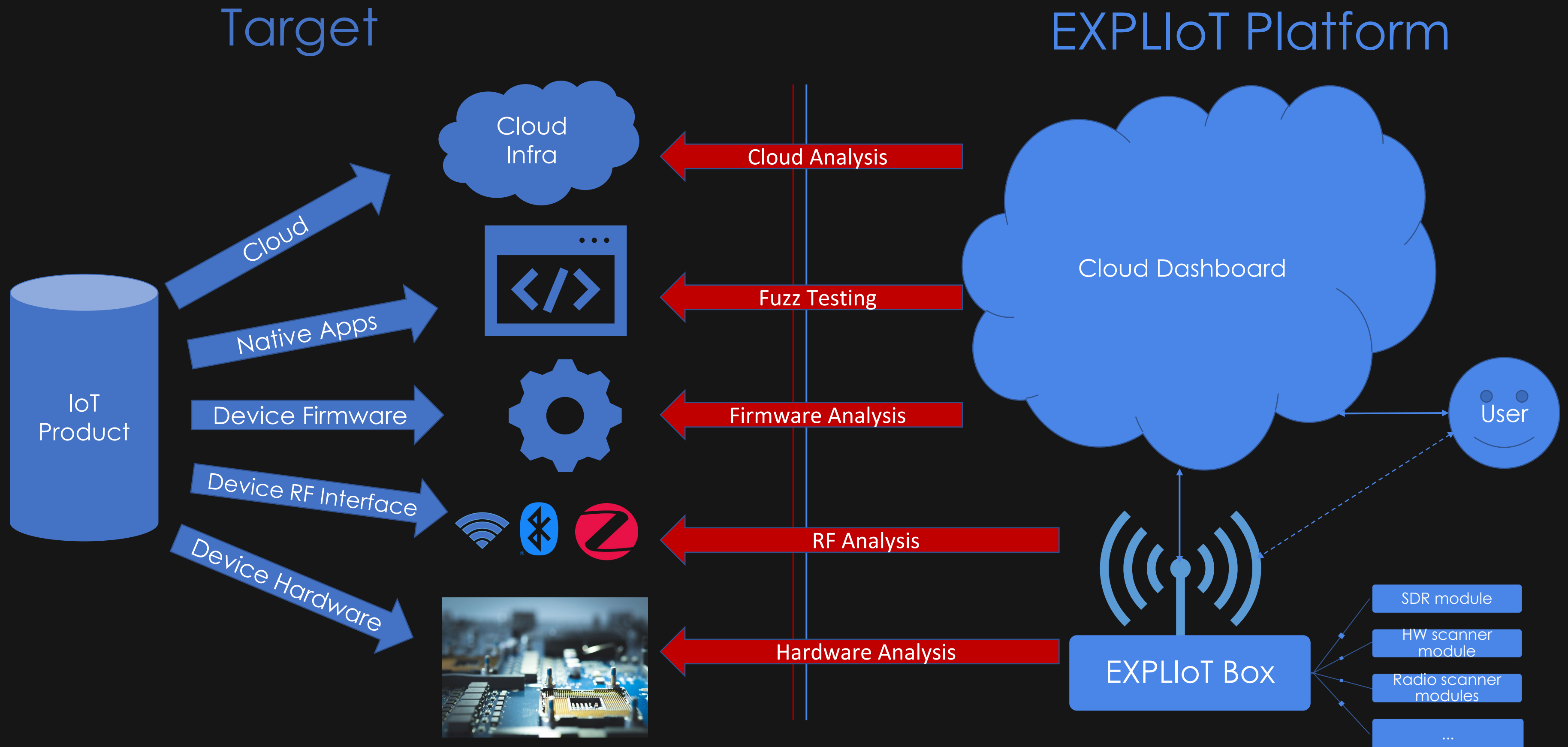


# EXPLIoT Platform

- ▶ Comprehensive IoT Security/Compliance Testing and Vulnerability Management Platform
- ▶ Enables Engineering Teams continuously security test, validate and fix vulnerabilities in IoT.



# EXPLIoT Platform - Overview





# EXPLIoT Online Store

## Software

### Open Source

#### EXPLIoT Framework

A framework for security testing IoT products and smart infrastructure. It is written in Python 3.

Log in:  
<https://expiot.io/pages/firmware-auditor>

### Community Edition

#### IoT Auditor

Blackbox pre-emptive cloud based firmware security analyser for finding security issues, threats

Source:  
[https://gitlab.com/expiot\\_framework/expiot](https://gitlab.com/expiot_framework/expiot)

## Hardware

100%

#### ZigBee Auditor

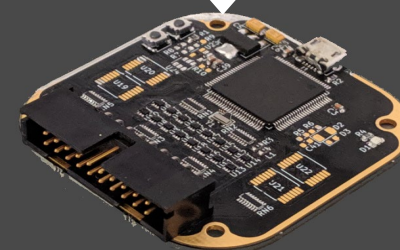
ZigBee packet sniffer and injector. It can sniff, dump and replay ZigBee packets in standard PCAP format.



100%

#### Bus Auditor

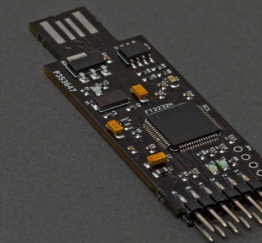
Hardware debug port scanner. It can scan a pcb board pinouts to identify debug protocols like JTAG, SWD, UART.



100%

#### EXPLIoT Nano

A multi hardware protocol adaptor for communicating with target hardware.



100%

#### DIVA IoT Board

Damn Insecure and Vulnerable App for IoT. An intentionally vulnerable IoT board for demo and learning hw security



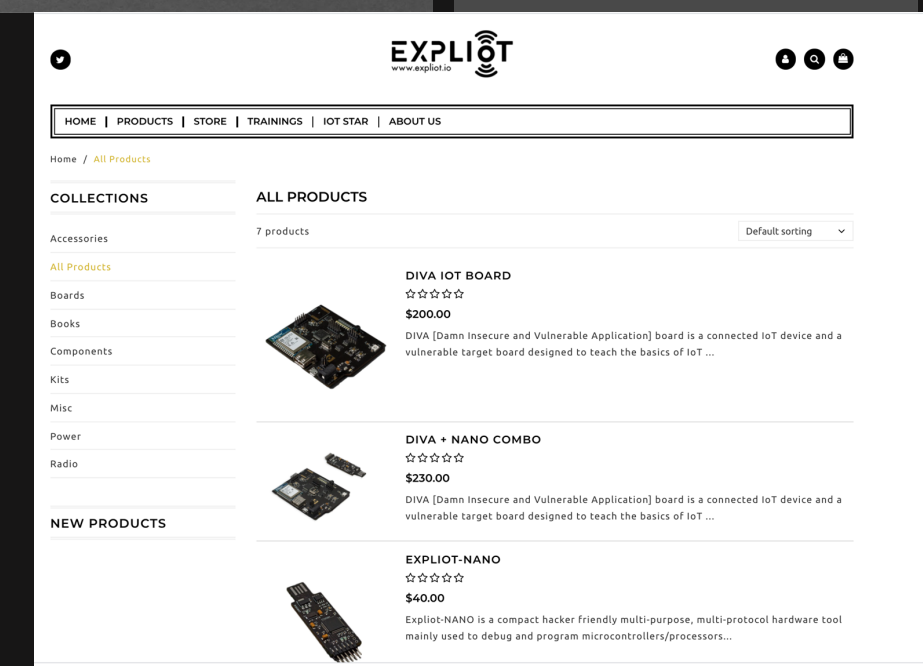
100%

#### IoT Security Learning Kit

A DIY hardware kit for learning and demonstrating IoT hardware and radio attacks.

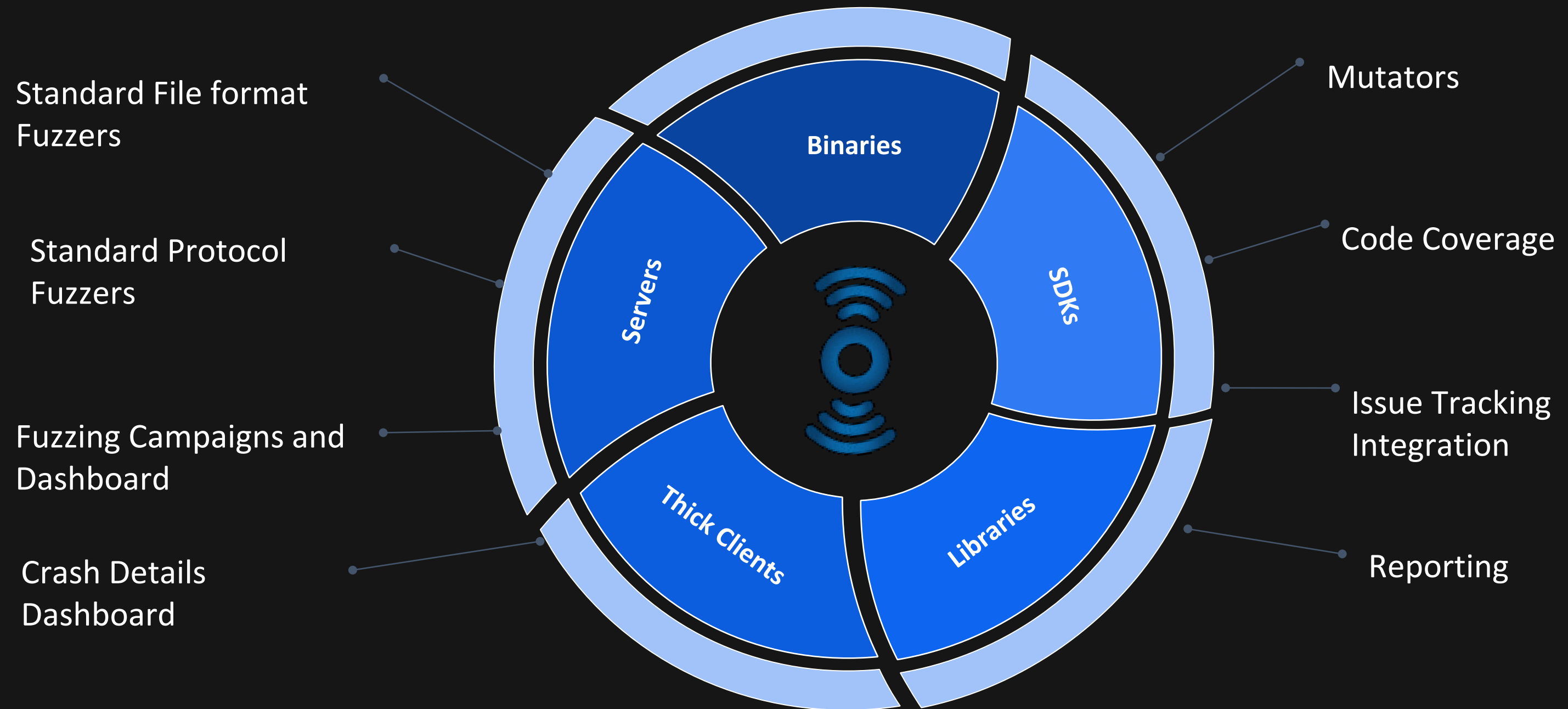


Worldwide Shipping



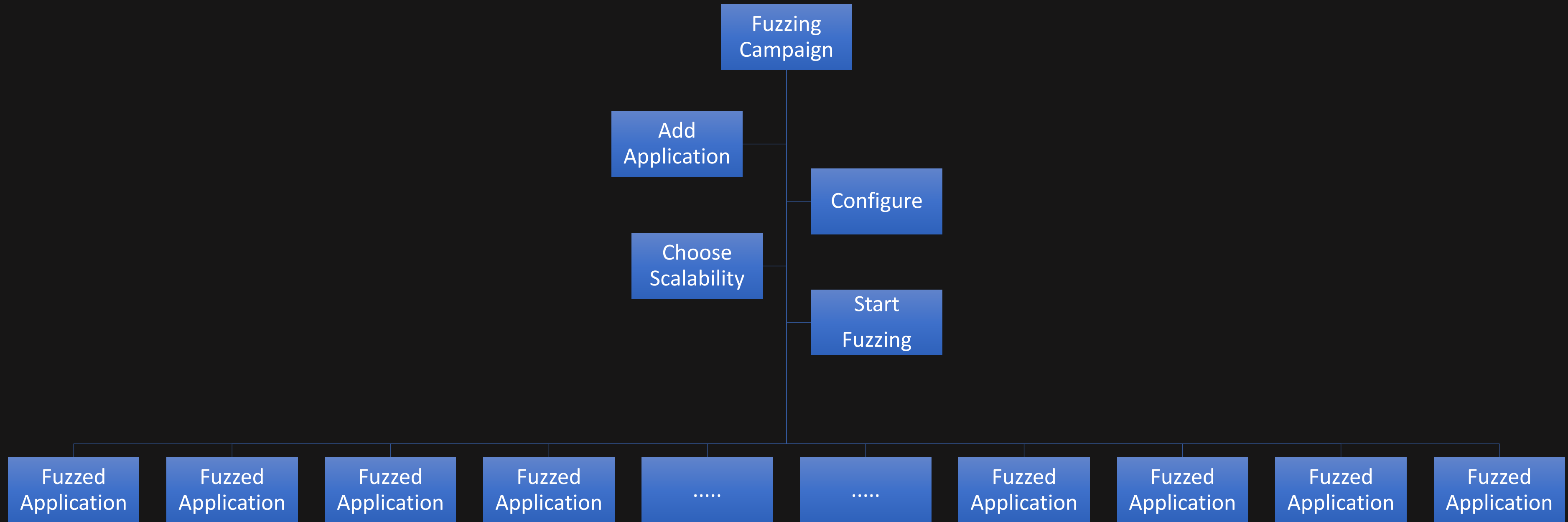
# CloudFuzz Platform

- ▶ Highly Scalable and Intelligent Fuzz Testing Platform
- ▶ Enables Engineering Teams to continuously identify Zero day (unknown) vulnerabilities and fix bugs





# CloudFuzz – How it works?



# Traction

- ▶ IoTSF Champion Award Global Shortlist 2019, UK - Payatu
- ▶ Finalists in MEITY Cyber Security Grand Challenge
- ▶ Open Source Downloads (pypi only) ~ 800 Per month
- ▶ Contributing Member of ISO, BIS, TEC – DOT, IoXt Alliance, IoTSF
  - ISO – 27400, 27402
  - TEC, DOT – Code of Practice for Securing IoT

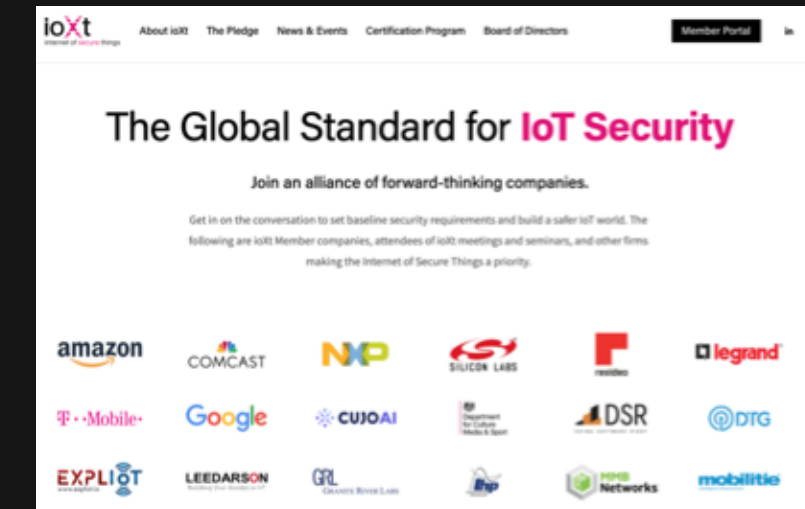
## IoT Security Foundation Champion Award 2019 SHORTLISTED COMPANIES



Sponsored By  
Paratus People

Winner Announced 6th November at the TechWorks Awards Ceremony & Gala Dinner

[www.techworksawards.com](http://www.techworksawards.com)



Star

79



Fork

36

~800

Downloads  
per month

DEFCON



hackinthebox  
Keeping Knowledge Free for Over a Decade

black hat







## Contact Us

Aseem Jakhar

Email: [aseem@payatu.io](mailto:aseem@payatu.io)

Phone: +91 9881376590

Website: <https://payatu.io>



**GLOBAL  
CONNECT  
@SBF**

Connecting  
your business to  
global opportunities

AN INITIATIVE OF



SUPPORTED BY

**Enterprise  
Singapore**

CORE PARTNERS

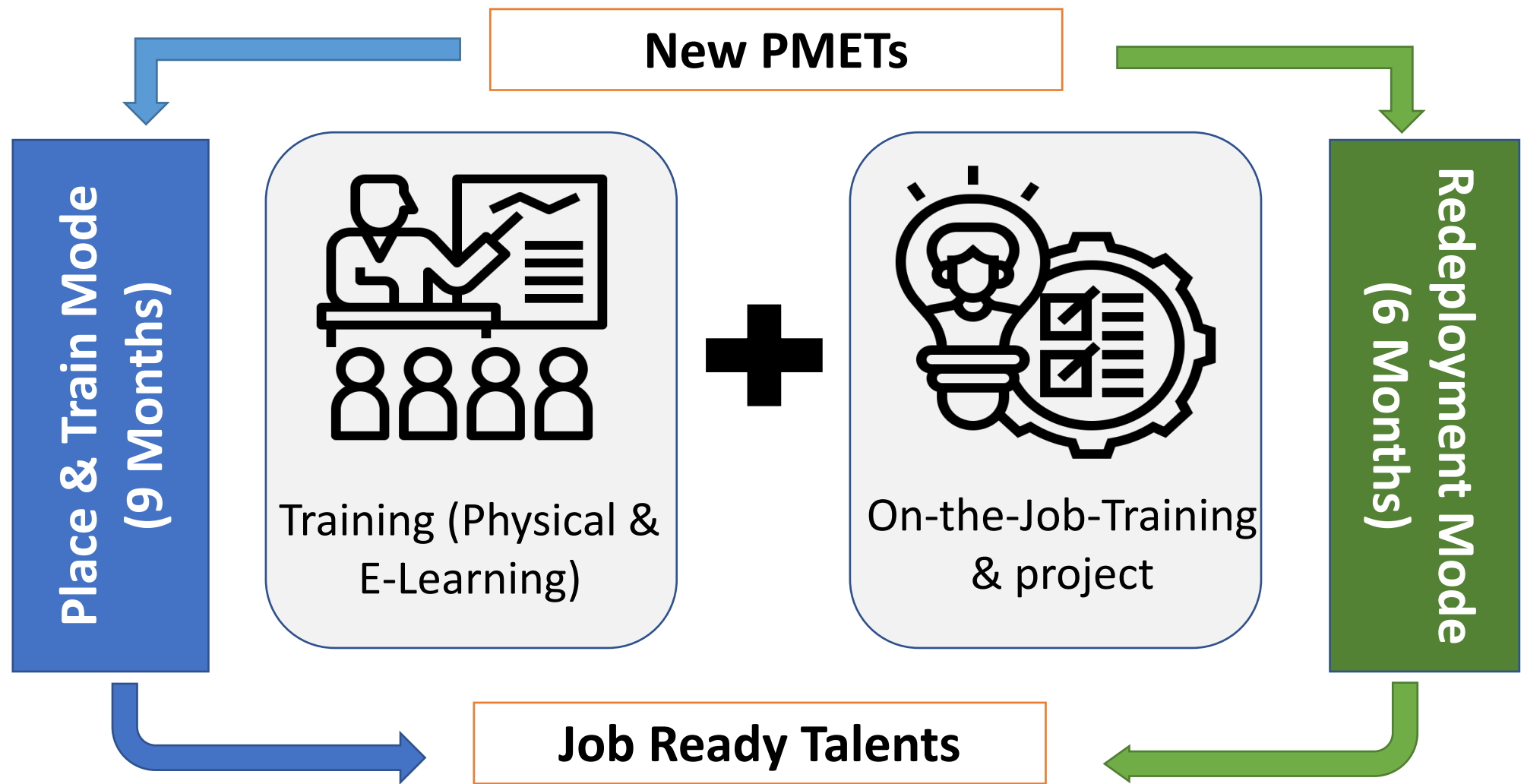


Q & A



# Career Conversion Programme: Internationalisation Professionals (CCP-I)

## Helping Companies Build Internationalisation Capabilities



Scan / Email us for  
more information



Mr Eady Ng

Email: [eady.ng@sbfb.org.sg](mailto:eady.ng@sbfb.org.sg)

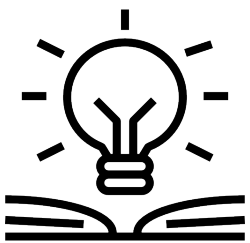
Ms Elizabeth Wee

Email: [elizabeth.wee@sbfb.org.sg](mailto:elizabeth.wee@sbfb.org.sg)

### Grant Support



6 Months / 9 Months  
Up to 90% Salary Support



70% of \$13,000 training  
course subsidy



**GLOBAL  
CONNECT  
@SBF**

Connecting  
your business to  
global opportunities

AN INITIATIVE OF



SUPPORTED BY

**Enterprise  
Singapore**

CORE PARTNERS



**Thank you!**

Questions? Comments?  
We'd love to hear from you!

Scan QR Code to give your feedback:



**You may also connect with us at:**

**GlobalConnect Hotline  
GlobalConnect Email  
GlobalConnect@SBF Hub**

**+65 6701 1133  
globalconnect@sbf.org.sg  
Level 6, SBF Centre, 160 Robinson Road, Singapore 068914**