ENERGY CATALYST

AFRICA Briefing and Brokerage Event Series

South Africa
27th June 2022
10:00 – 13:00

UKRI Innovate UK KTN

UKaid from the British people

Department for Business, Energy & Industrial Strategy

Foreign, Commonwealth & Development Office

Agenda

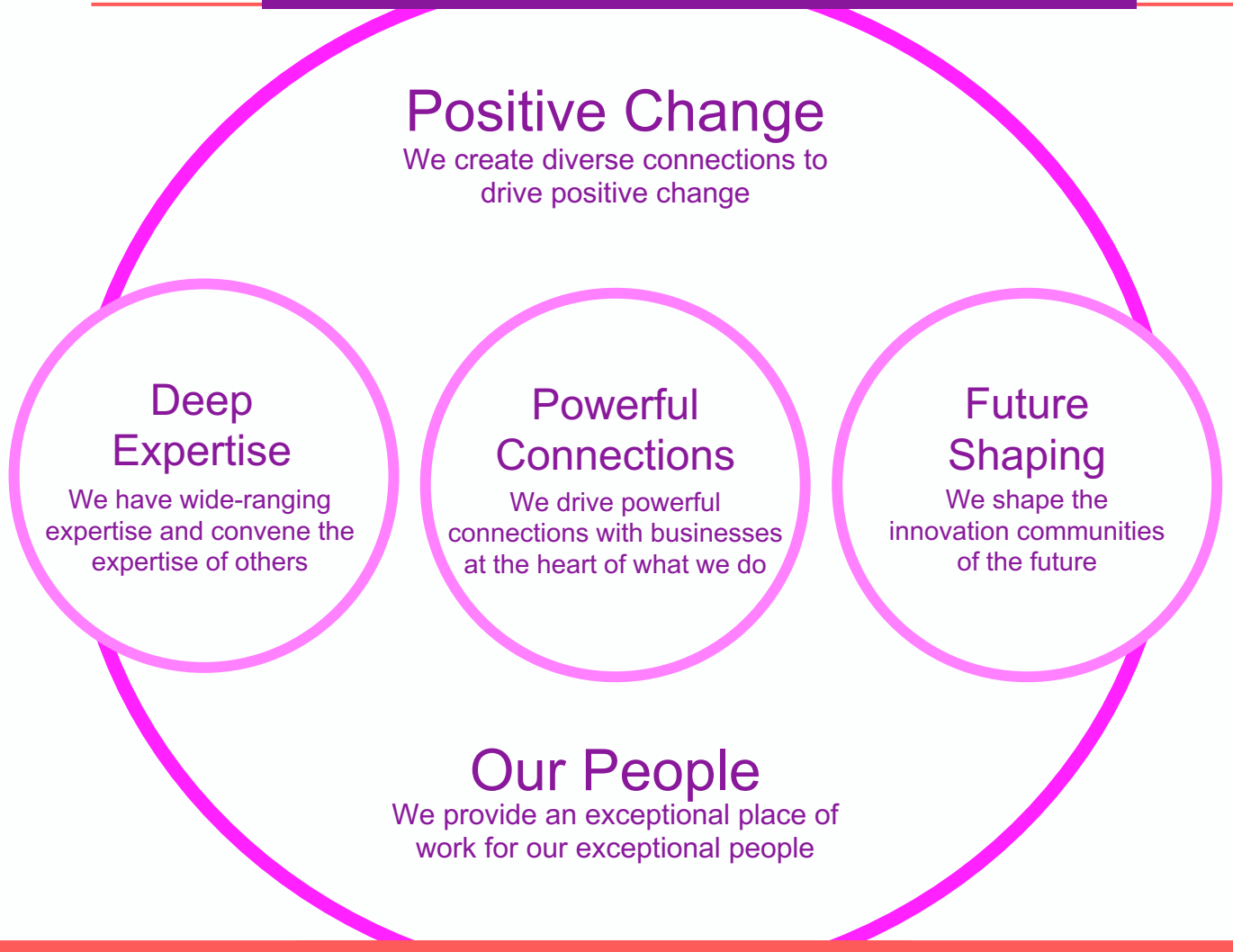
10:00	Welcome and Introduction to IUK/IUK KTN
10:20	Overview of Energy Catalyst
10:40	Innovation for Energy Security in South Africa
11:00	Making a Good Application
11:15	TIA's role in the Energy Sector
11:35	Connecting UK and South Africa partners
11:50	Case Study from a previous round of Energy Catalyst
12:00	Pitch 1 - Leaper Innovate Green Energies (LiGE)
12:15	Pitch 2 - Ducere Holdings Pty Ltd
12:30	Pitch 3 - Green Thermo Energy

About Us

Innovate UK KTN exists to connect innovators with new partners and new opportunities beyond their existing thinking – accelerating ambitious ideas into real-world solutions.

UKRI Innovate UK KTN

Positive Change Commitments



We will collaborate globally to create valuable international connections for innovators.

We will extend our activity beyond economic prosperity to also deliver sustainable societal & environmental benefit.

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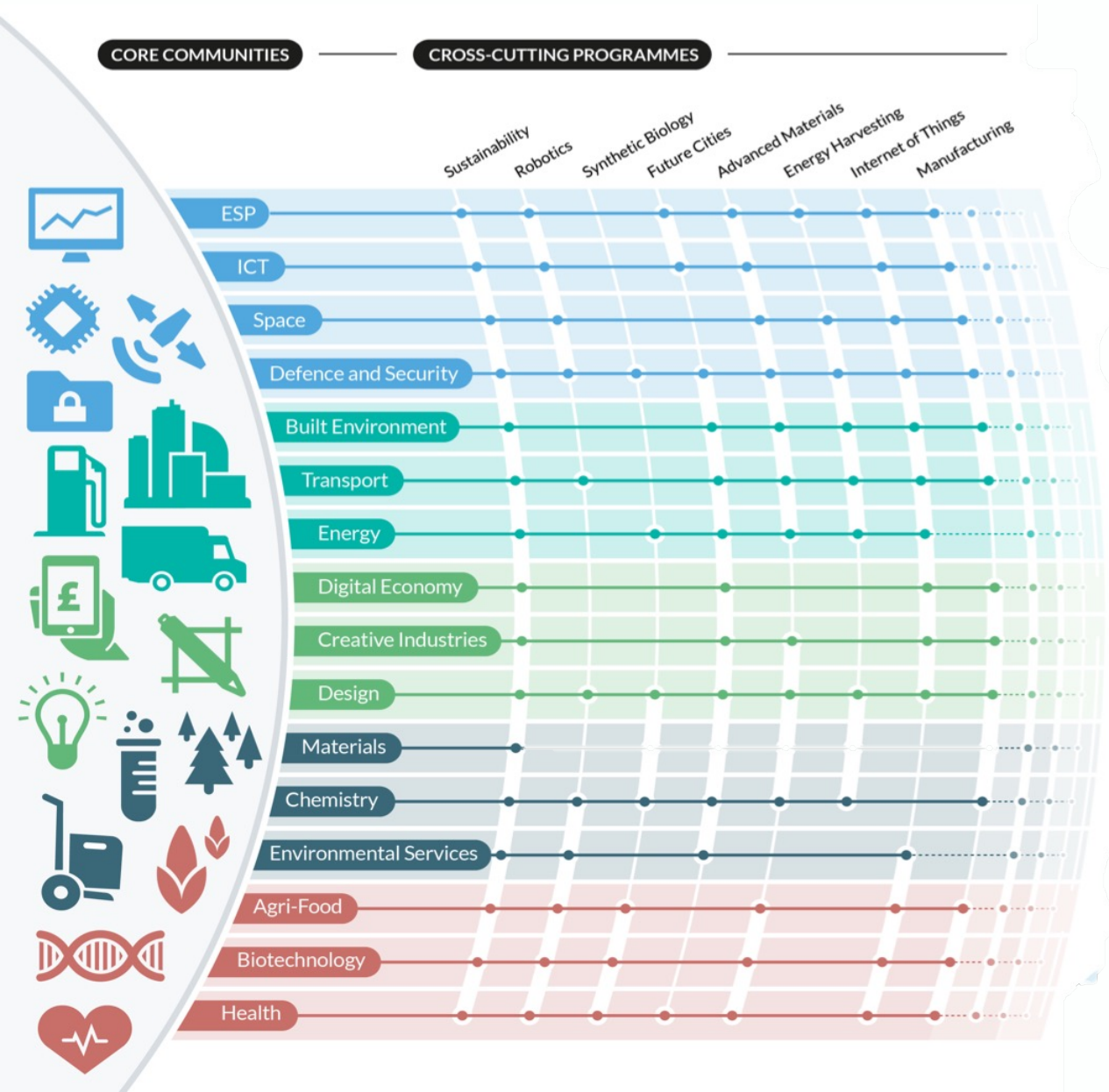
Simplifying Complexity



We are truly cross-cutting, to simplify complexity

- Deep sector expertise across 20 key economic sectors
- Comprehensive cross-sector programmes, including Global Innovation
- Working across complete innovation ecosystem
- A network of +45,000 unique organisations, c.80% SMEs, +234,000 innovators
- In the UK and with over 30 countries

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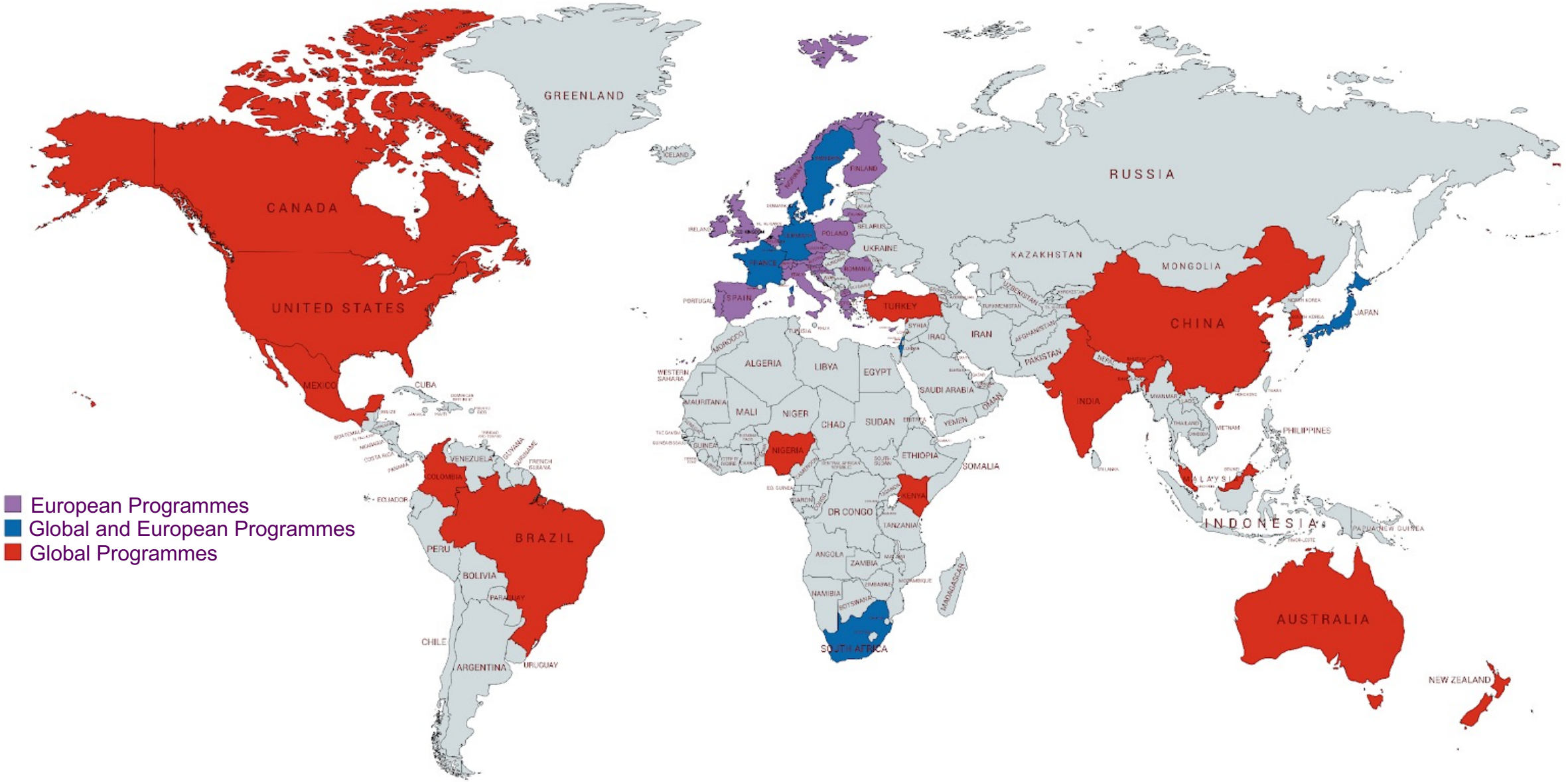
Our Reach


European Programmes
Global and European Programmes
Global Programmes
GREENLAND
CANADA
UNITED STATES
MEXICO
CUBA
VENEZUELA
COLOMBIA
ECUADOR
PERU
BRAZIL
BOLIVIA
PARAGUAY
CHILE
ARGENTINA
URUGUAY
GUYANA
SURINAME
FRENCH GUIANA
ICELAND
IRELAND
PORTUGAL
SPAIN
FRANCE
BELGIUM
NETHERLANDS
GERMANY
DENMARK
NORWAY
SWEDEN
FINLAND
POLAND
BELARUS
UKRAINE
ROMANIA
BULGARIA
GREECE
TURKEY
RUSSIA
KAZAKHSTAN
MONGOLIA
UZBEKISTAN
TURKMENISTAN
AFGHANISTAN
PAKISTAN
IRAN
IRAQ
SYRIA
LEBANON
ISRAEL
JORDAN
SAUDI ARABIA
YEMEN
OMAN
CHINA
NORTH KOREA
SOUTH KOREA
JAPAN
INDIA
MYANMAR
THAILAND
VIETNAM
PHILIPPINES
MALAYSIA
INDONESIA
PAPUA NEW GUINEA
AUSTRALIA
NEW ZEALAND
MOROCCO
WESTERN SAHARA
ALGERIA
TUNISIA
LIBYA
EGYPT
MAURITANIA
MALI
NIGER
CHAD
SUDAN
ERITREA
ETHIOPIA
SOMALIA
GUINEA
NIGERIA
KENYA
DR CONGO
TANZANIA
ANGOLA
ZAMBIA
NAMIBIA
BOTSWANA
ZIMBABWE
MOZAMBIQUE
MADAGASCAR
SOUTH AFRICA

We connect **regional, national and global** innovation

Our **Global Alliance** programme drives international collaborations with governments, societies, enterprises, institutions and people from every corner of the globe.

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Global Alliance | Africa

ktn-uk.org/programme/africa #KTNGlobalAllianceAfrica

Reinforcing the Connect and Collaborate Phase

Engagement & Inception
(Year 1 | FY19/20)

Connect & Collaborate
(Years 2-4 | FY20/21-22/23)

Growth & Impact
(Years 5-6 | FY23/24-24/25)

- **Connect ideas, build collaboration & catalyse investment** in UK-Africa innovation partnerships for mutual economic & social impact.
- Drive **inclusive innovation & economic development** through UK-Africa partnership.
- Build alliances to **strengthen local innovation ecosystem capacity**.
- **Facilitate knowledge exchange** in innovation best practices contributing towards a thriving innovation ecosystem in Africa.

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Building UK-Africa Partnership through…

Local to Global

Open Innovation

Place-Based Innovation

Access to Funding

Collaborative R&D Funding

Strengthening the Investment Pipeline

Connected Innovation

Global Innovation Network

Deep Expertise

* Manufacturing & Materials | Transport & Mobility | AgriFood | Health | Climate Technologies | Digital Economy *

* Sector coverage subject to funding level & project priorities

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Our Global Alliance Africa Team












Thank you.

Marisa Naidoo
Knowledge Transfer Manager - Global Alliance Africa
marisa.naidoo@ktn-uk.org| +27 81 4992302

Innovate UK KTN | Global Alliance | Africa

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Overview of Energy Catalyst.

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Foreign, Commonwealth & Development Office

Department for Business, Energy & Industrial Strategy

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Amy Flynn - Innovate UK UKRI

ENERGY

Slide 3 of 172

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Innovation for Energy Security in South Africa

science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

Mandy Mlilo

Deputy Director – Hydrogen & Energy
Department of Science & Innovation

UKRI Innovate UK
Foreign, Commonwealth & Development Office
Department for Business, Energy & Industrial Strategy
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DSI ENERGY RDI INITIATIVES: POTENTIAL AREAS OF COLLABORATION

Presenter: Ms Mandy Mlilo

Occasion: Energy Catalyst Event

Date: 27 June 2022

science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

2030 NDP

Outline

- Background on the Hydrogen South Africa Programme
- Key Deployments
- Technology Deployment to support critical social infrastructure
- National Hydrogen Society Roadmap 2021
- Hydrogen Valley
- Other Potential projects
- Way forward

Scope/Principles

The DSI supports Energy RDI based on the following principles:

- ❑ Innovation in support of a developmental state
- ❑ Increased investment artisanal/technician skills (Green Hydrogen Economy TVET Study)
- ❑ Co-investments with private sector in technology innovation (HySA, Energy Storage RDI, CoalCO2-X, Renewable Hub and Spokes)
- ❑ Increased investments in local value addition (HySA, Energy Storage RDI, CoalCO2-X, Renewable Hub and Spokes)
- ❑ Support the diversification of the energy mix through the development of low carbon technologies (HySA, Energy Storage RDI, CoalCO2-X, Renewable Hub and Spokes)
- ❑ Support local companies to maintain their global competitiveness through the reduction of the carbon footprint in their products (HySA, CoalCO2-X, Renewable Hub and Spokes)

Key Deployments from Energy RDI Programmes

Fuel Cell deployed to power learner equipment at Poelano Secondary School, Ventersdorp

Fuel Cell deployment to power COVID-19 facilities at 1 Military Hospital, Pretoria

Fuel Cell deployment to preserve vaccines Windsor at East Clinic, Randburg

Facility deployed to test hydrogen use in underground mining at North West University, Potchefstroom

Fuel Cell powered forklift and refueling infrastructure deployment at Impala Platinum Refineries, Springs

Fuel Cell powered scooters deployed at SAPO Head Office, Cape Town

Fuel Cell deployment to provide power to Cofimvaba Science Centre, Cofimvaba

Fuel Cell deployed at University of the Western Cape Nature Reserve, Cape Town

Planned fuel cell deployments at Masia Village, Limpopo, Mandeni Community Hall, KZN and Mbizana police station, Eastern Cape

Fuel Cells deployed to power learner equipment at Cofimvaba Schools

Ilembe District Deployment (Methanol system)

- ❑ Partners in the project (DMRE, DSI, SANEDI, ILDM)
- ❑ Financing model:
  - Current model during trial - grant funding from DMRE & DSI
  - Post trial - ILDM/Private sector/DFI - operation and maintenance
- ❑ Participation by SMMEs:
  - Current – Bambili
- ❑ Opportunities for other SMMEs - Supply chain development (could be facilitated through DFI funding):
  - Further roll out of the deployments
  - Maintenance and operation
  - Training and capacity building.

Methanol Based fuel cell systems deployed at 1 Military Hospital in Pretoria. A 5kW System will be deployed at the Ilembe District Disaster Management Centre in KwaDukuza.

Ilembe Deployment (Hydrogen based system)

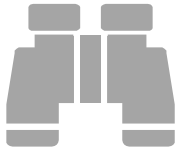
Solar PV System

On-site hydrogen production and storage system

Power Management System and Battery Storage

5 kW Hydrogen Fuel Cell System

Vision and Purpose



Vision

An inclusive, sustainable and competitive hydrogen economy by 2050 with the goal of achieving a Just and inclusive net zero carbon economic growth for societal wellbeing by 2050.

Purpose

To align stakeholders on a common vision on hydrogen related technologies in order to create an environment where investment decisions can be made to unlock the social economic benefits for the country.

High-Level Outcomes of the Hydrogen Society Roadmap

Decarbonisation of transport sectors: heavy duty trucks, shipping, aviation and rail
Lead Department: DoT
Supported by: DFFE, DMRE,DPE

Decarbonisation of energy intensive industry : iron & steel, chemicals, mining, refineries, cement
Lead Department: DTIC
Supported by: DFFE

Creation of an export market for green hydrogen and green ammonia
Lead Department: DTIC
Supported by: DIRCO, NT

Green and enhanced power sector and buildings
Lead Department: DMRE
Supported by: DPWI

Creation of a manufacturing sector for hydrogen products and components
Lead Department: DSI
Supported by: DTIC, DMRE, DSBD

Transition from grey to blue to green hydrogen
Lead Department: Presidency
Supported by: DSI, DMRE, DTIC, DIRCO, DFFE, DPE, DPWI

Priority Actions based on the High-Level Outcomes of the Hydrogen Society Roadmap

Key Actions and Milestones

2021-2024

PRODUCTION

- Small scale electrolysis production
- At least 1MW GH2 production piloted

USE

- At least 100 buses and trucks powered by H2 by 2025
- At least 20 forklifts converted to fuel cell power by 2025
- At least 5 refueling stations deployed by 2025
- Demonstration in power generation and stationary fuel cells in public buildings
- Industry demonstration including SAFs

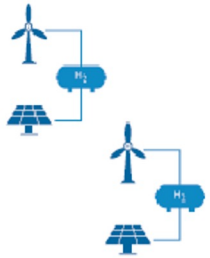
JOBS

- Upscaling of training and reskilling for new jobs

2025-2030

PRODUCTION

- 5GW electrolysis capacity under construction in NC
- 10GW electrolysis capacity deployed in NC by 2030
- 1.7GW electrolyser capacity deployed in H2 Valley by 2030
- At least 500kt H2 produced annually by 2030



USE

- At least 500 buses and trucks powered by H2 by 2030
- Power generation in turbines using H2 and ammonia
- Sector coupling and use in transport, industry

JOBS

- At least 20 000 jobs created annually by 2030

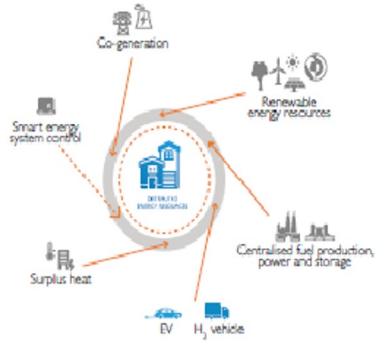
2030-2040

PRODUCTION

- Increase electrolysis capacity to at least 15GW by 2040

USE

- Sector coupling and full use in transport, industry and power



JOBS

- At least 30 000 jobs created annually by 2040

Establish targets and policy signals

Support demand creation

Mitigate investment risk

Harmonize standards and remove barriers

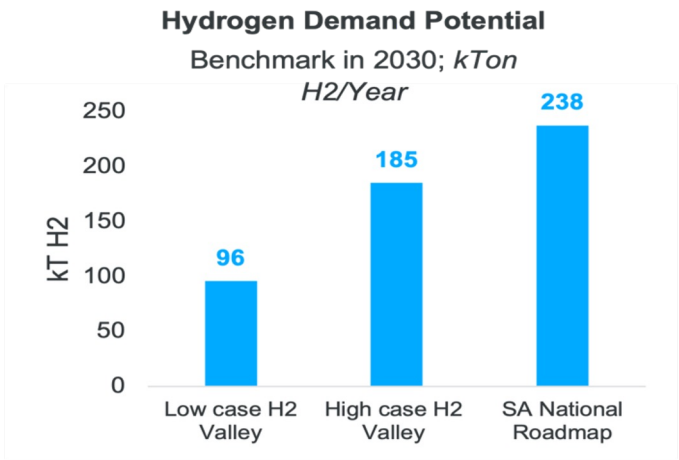
Promote Research, Development and Innovation

Strategic demonstration and deployment projects

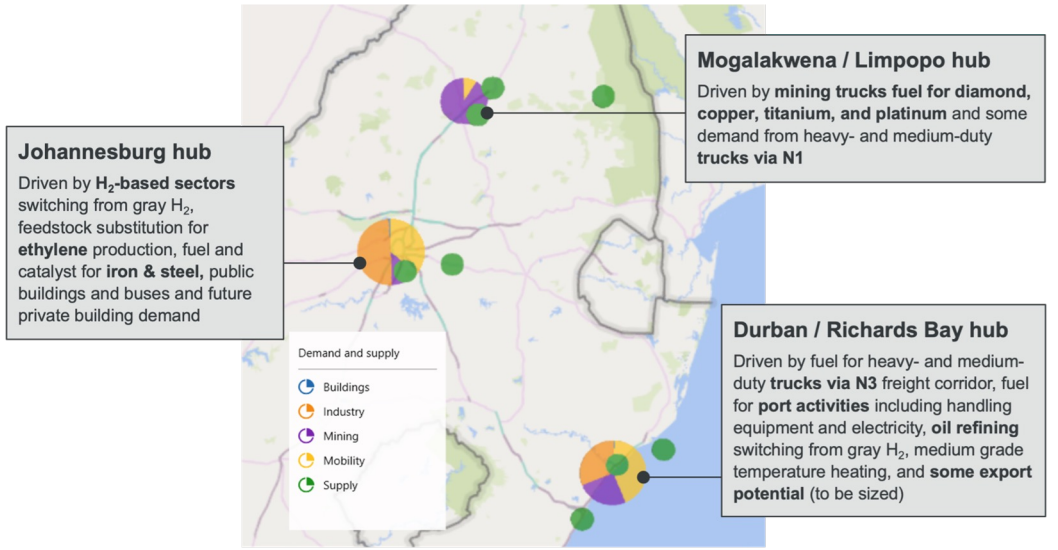
Skills development and public awareness

The backbone of the Platinum Valley is structured around three hydrogen hubs

H2 DEMAND



H2 VALLEY HUBS



- H2 demand in the Valley could reach up to 185 kt H2 by 2030, or 40%-80% of demand in the national hydrogen roadmap.
- By 2030, green H2 LCOH across hubs is expected to be ~$4 per kg H2 , still more expensive than gray hydrogen, with a green premium of $2-$2.5 per kg.

Platinum Valley Socio-Economic Benefits

Socioeconomic effects considered

- Indication of potential **socioeconomic benefits** of the H2 Valley project in terms of :
  - GDP
  - Job
  - Tax revenue

- **Qualitative** insights on jobs from a **sectoral** and **community** perspective

- Indication of potential benefits of moving towards a H2 economy in terms of **platinum production**

Outcomes

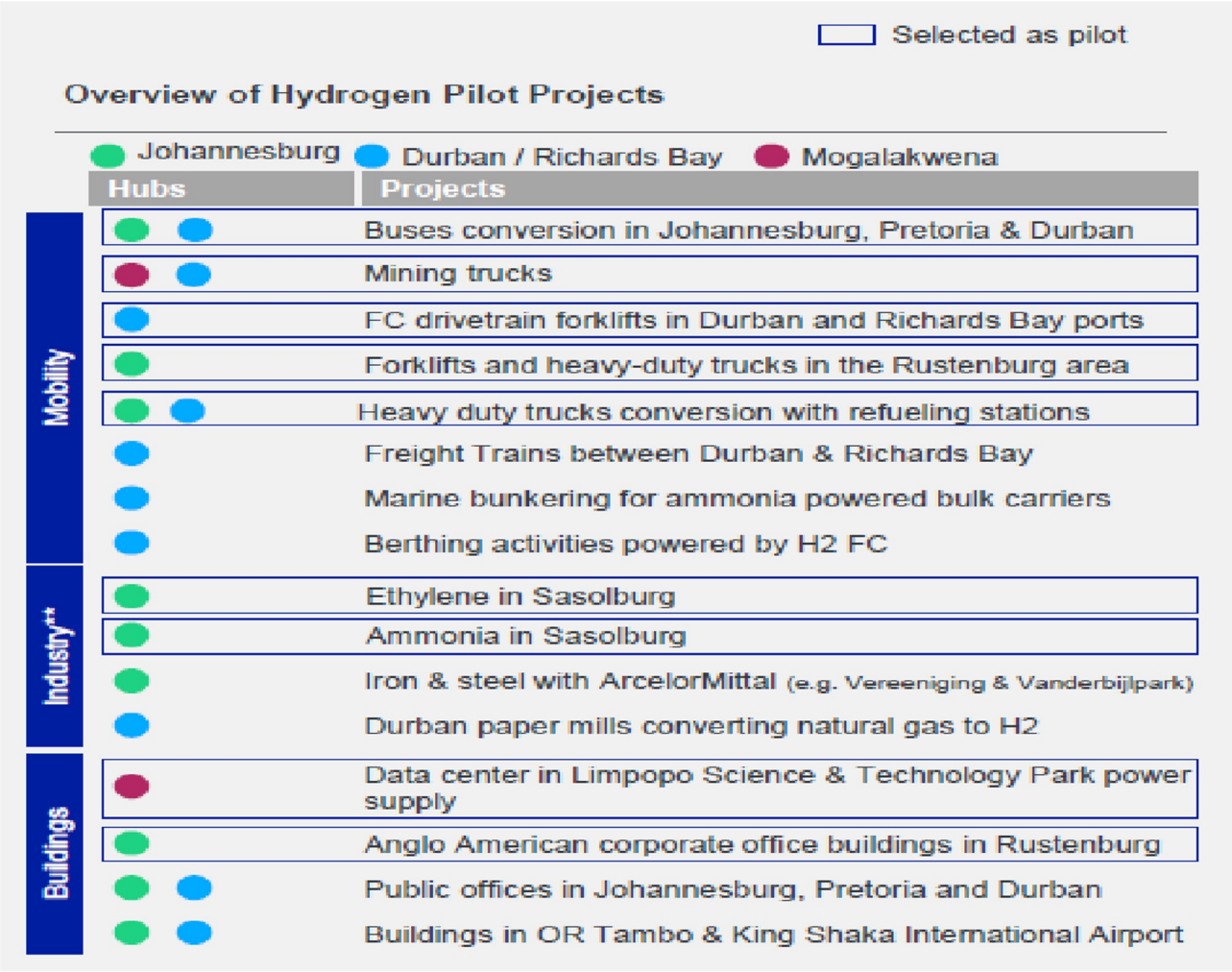
- Total Contribution to **GDP**: 3.9 billion USD (low case) to 8.8 billion USD (high case) by 2050
- **Jobs**: additional 14 000 jobs per year (low case) to 32 000 jobs per year (high case) based on RES and electrolyzers
- **Tax Revenue**: additional 900 million USD (low case) to 2,000 million USD (high case) by 2050

- Creation of **new** jobs, **preserving** of existing jobs and **conversion** from high to low carbon activities' jobs

- If electrolyzer and fuel cell investment materializes, the PGM sector will see a **marginal increase in demand** for platinum, generating up to 70 million USD (high case) in revenue to the sector in 2030
- Nevertheless, the demand from the Hydrogen Valley would remain small compared to production levels today. **No platinum supply constraints** are anticipated to satisfy the demand of the Valley

Hydrogen Valley Projects For Scale-up

- Nine catalytic projects in the mobility, industrial and buildings sectors have been identified to kick-start the Hydrogen Economy in the Valley will cost approximately $1.2 billion to implement.



Opportunities for Partnerships

The DSI seeks partnerships with both the public and private sector in:

- Testing and validation of the technology through field trials.
- Further development and optimisation of the technology.
- Developing a supply chain that supports the deployment of technology.
- Supporting skills development through internships (universities & TVETs) to support technology deployment.
- Training the end users of the technologies through local municipalities
- Stimulating local demand for emerging technologies to power social and economic infrastructure.
- Facilitating the establishment of manufacturing facilities in the country that allow for the integration of locally developed IP where appropriate.

Skills Development in support of the Hydrogen Economy

- Training programme launched by the Deputy Minister of Higher Education, Science and Innovation on 2 November 2020.
- A total of 25 TVET graduates and 9 professionals from government departments and municipalities participated in the training programme.
- Participants were trained on the operations, maintenance, and installation of stationary fuel cells.
- Three of the trainees from the Programme were offered employment contracts at the end of the 6 week course.
- More partnerships with both the public and private sector are required to scale up the training.

Partners at the launch of the Training Programme

Trainees at 1 Military Hospital for their practical Training

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BAMBILI ENERGY

EW SETA

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Solar Turtle Solution

The solution seek to address the challenges around limited access to electricity and internet connectivity by providing solar power, wifi hotspot and USB charging ports.

SolarTurtle provides reliable and sustainable solar energy through containerised systems for various applications including rural communities, emergency/disaster situation and informal sector (hawkers).

RE Solutions & Services

GeoSUN AFRICA

Solar Resource Assessment to support IPP project bankability. GeoSun services were also used in identifying Renewable Energy Zones in SA.

Solar Dish Gas Turbine Hybrid – provides both electricity (4 kW)and heat (20 kW). Uses solar during the day and may use LPG or Hydrogen at night

Masia Village Deployment

Opportunity for the deployment of renewable and sustainable energy technologies at the Masia Multi-Purpose Centre at the Vhembe District Municipality in Limpopo Province, focusing on providing energy for poor and rural communities, as well as creating an enabling environment for the community's business projects that have relevance to the Water-Energy-Food nexus.

Primary Objectives:

- To promote locally developed IP relevant to the Water-Energy-Food nexus
- To enable the market success of the IP and other renewable and sustainable energy technologies
- To support youth entrepreneurs

Planned Infrastructure projects:

- 5 kW hydrogen fuel cell system with an on-site electrolyser
- 20 kW solar PV system
- 1 kW CPV (concentrator PV) system
- A hydroponics tunnel for high quality produce and efficient water usage
- A fruit tree nursery to support emerging and small farmers
- An agro-processing facility
- A borehole for water provision

Project Partners:

- DSI
- ARC
- Stellenbosch University's CRSES
- Masia Traditional Authority
- Bambili Energy
- NMU
- SANEDI
- NYDA
- University of Venda
- HySA Infrastructure (NWU)

❑ Rooftop PV System at the Masia Multi-Purpose Centre completed on 31 March 2022

The project is aimed at supporting the agricultural activities, such as crop production, harvesting, storage and processing.

Media Lab Deployment

- A Media Lab at Mogoidwa Secondary School, Vhembe District Municipality in the Limpopo
- Province was launched on 8 December 2021 by the Deputy Minister of Higher Education, Science and Innovation.
- The project comprises of a containerised media laboratory with 30 computers powered by PV with an MLT inverter.
- The media laboratory also comprises of an interactive screen to simplify teaching and learning, so the teacher can work on the screen while the learners access the information from the laptops at the same time

- *The Medial Lab project has been established as a mechanism to support high schools with renewable energy to enable their teaching and learning in line with the 4th Industrial Revolution (4IR) and also to advance publicly funded IP to enable technology localisation.*

Ro livhuwa
Siyabonga
Re a leboga
Ha khensa
Siyathokoza
Enkosi
Dankie
Thank you

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What Makes a Good Application?

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Building a Consortium:

Who should you partner with?

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Selecting Partners

What To Look For?

If in-country Research & Development or Testing or Demonstration is a requirement…

- What country do you intend to work in?
- How well do you understand the regulations and the governance arrangements?
- Do you have access to suitable facilities or environments?
- Do you have a UK-based partner (lead administrator)?

Remember - you **must intend to use the results** to deliver clean energy access in Sub-Saharan Africa, South Asia or the Indo-Pacific region

- (Does your choice of partner(s) help you demonstrate this is likely?)

What To Look For?

- Credibility
- Legal Entity (Business, Research Entity, Third Sector)
- Trading history?
- Previous experience of similar undertakings?
- Capacity to deliver?
- Contextual Relevance and Local Adaptability?

Does It Feel Right?

- Can you see yourself working with these people for months or years?
- Can you see your partners working with each other for months or years?
- Even when things get tricky and there are problems?
- Really? *Great!*

BUT also…

- Do you have the same (or compatible) objectives?
- How well do they present themselves? How enthusiastic are they?
- Does their story ‘ring true’? How is their grasp of detail?

What Makes a Good Application?

1. Alignment to the competition scope
2. Innovation
3. A strong business case
4. A convincing value proposition
5. A credible plan for Research and Development
6. The right consortium
7. A clear need for support
8. The right kind of risk

Above all, make sure you write an application that excites and inspires!

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Writing the Submission

- **Answer the question asked**, not the one you want to answer!

- Remember that **assessors are human beings: tell a story**

- Assessors are looking for reasons to award marks: **make it easy for them**
  - Reflect the **language** of the competition scope
  - **Substantiate** any claims

Writing the Submission

- **Ask someone else** to listen to a draft of the application
  - This technology/project may be your life's work, but you need to **describe it to someone that has never heard of it before**

- Ask **someone else** to read a draft
  - This will help you spot spelling or grammar mistakes and unclear statements.
- **Re-read the competition scope** before you read your draft. Does it match?

- **Risk and Reward!**

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How to Apply?

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Department for Business, Energy & Industrial Strategy

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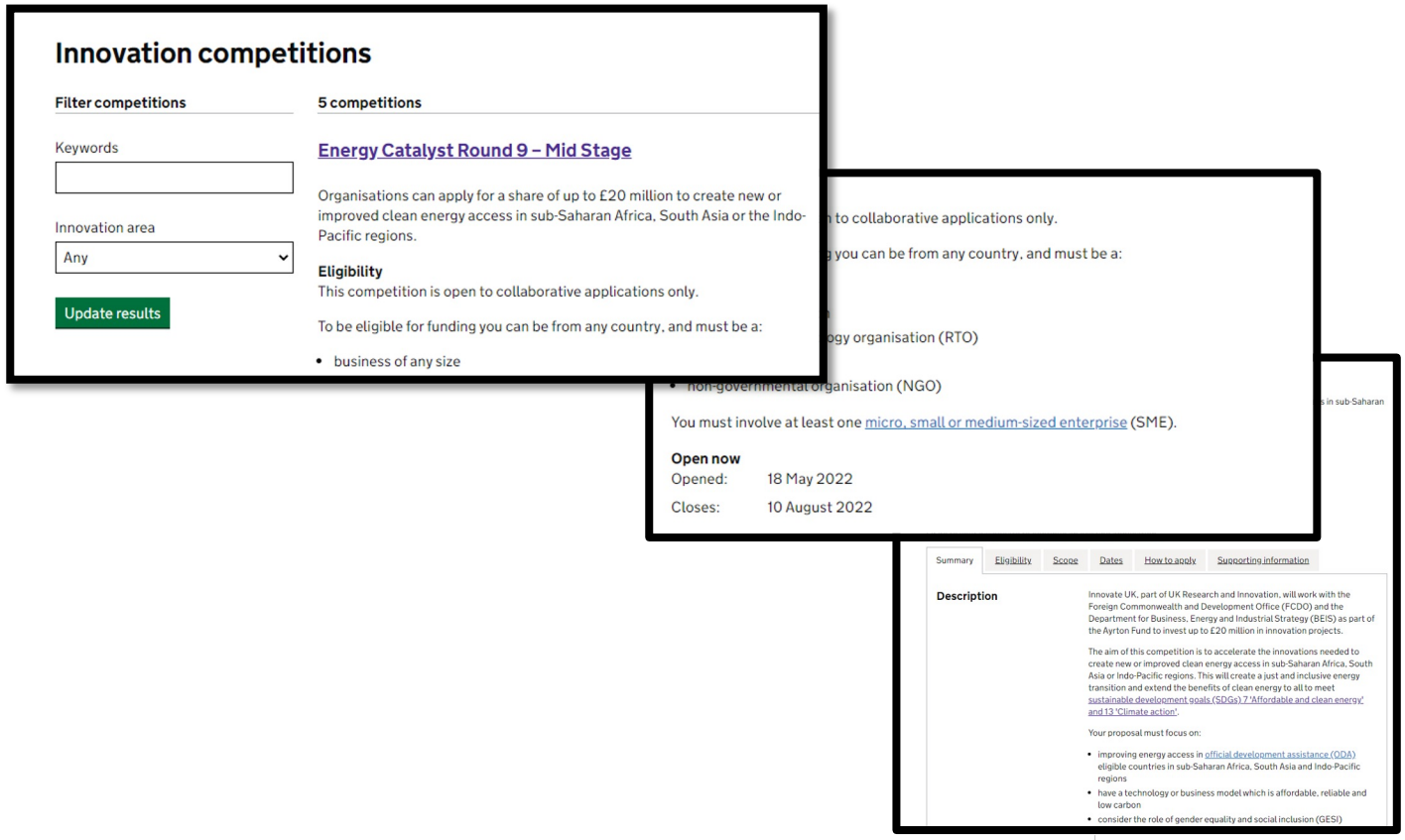
Search for a funding competition and review criteria

This competition is split into 3 strands:

- Energy Catalyst Round 9 – Early Stage
- Energy Catalyst Round 9 – Mid Stage
- Energy Catalyst Round 9 – Late Stage



https://energycatalyst.ukri.org/

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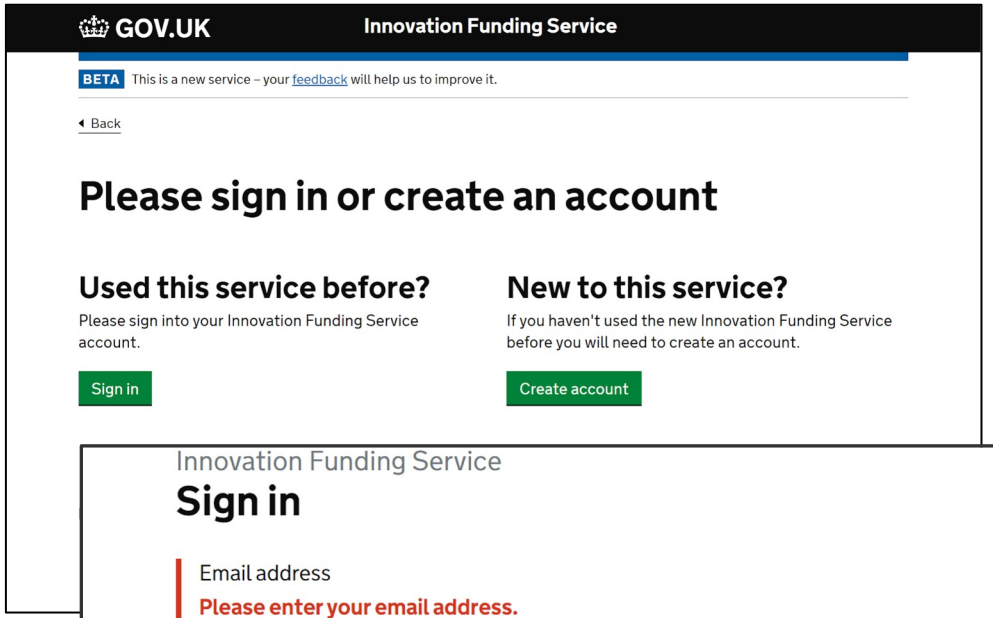
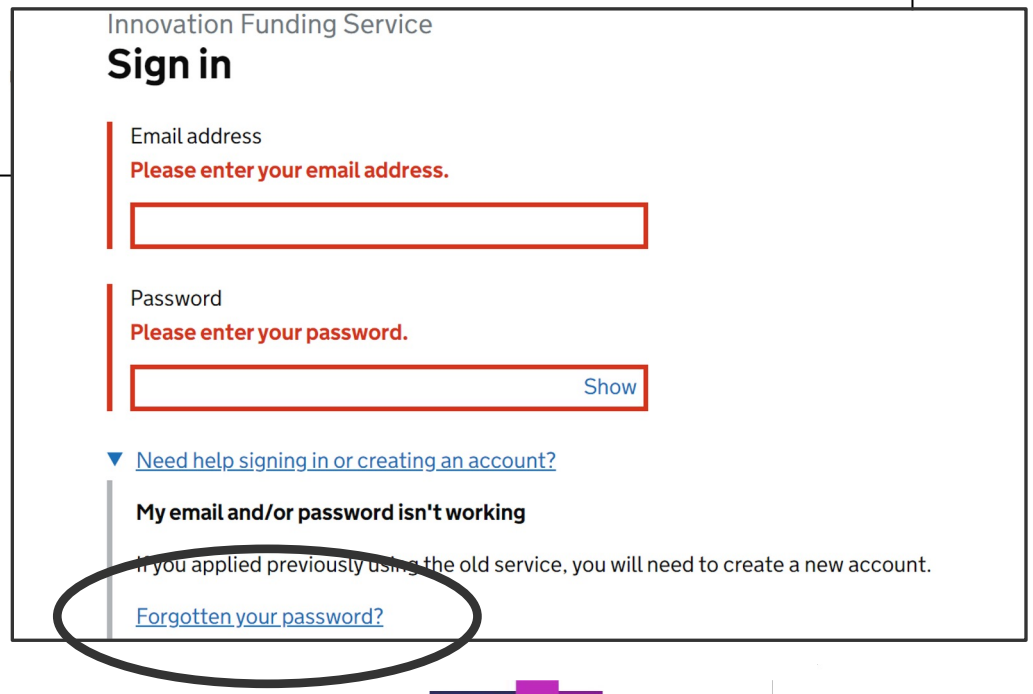
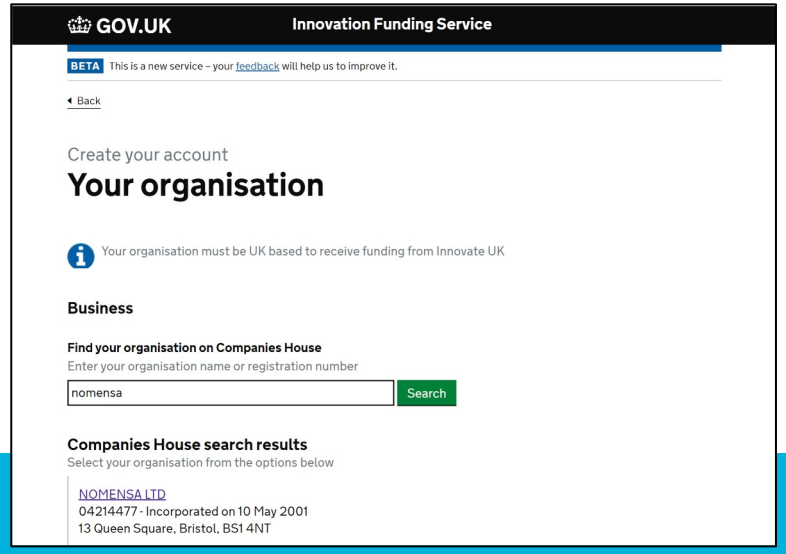
Admin Lead: Create an Account

The admin lead must create an account:

- **UK registered businesses** can use Companies House lookup as it speeds up our checks by providing your company number. You are unable to enter this at a later date.
- **Research organisations, academics and universities** should enter their information manually so you are not listed as a business on IFS and ensure you receive the correct funding.







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Project Details

Application Team - Collaborators can invite organisations who you are working with on the project. Contributors can invite colleagues from your own organisation to help you complete your application

Application Details - Title, timescales, research category, innovation area and previously submitted application (y/n)

Subsidy Basis - Will the project, including any related activities, you want Innovate UK to fund, affect trade between Northern Ireland and the EU? All participants must complete this section.

Equality, Diversity and Inclusion - External survey to complete

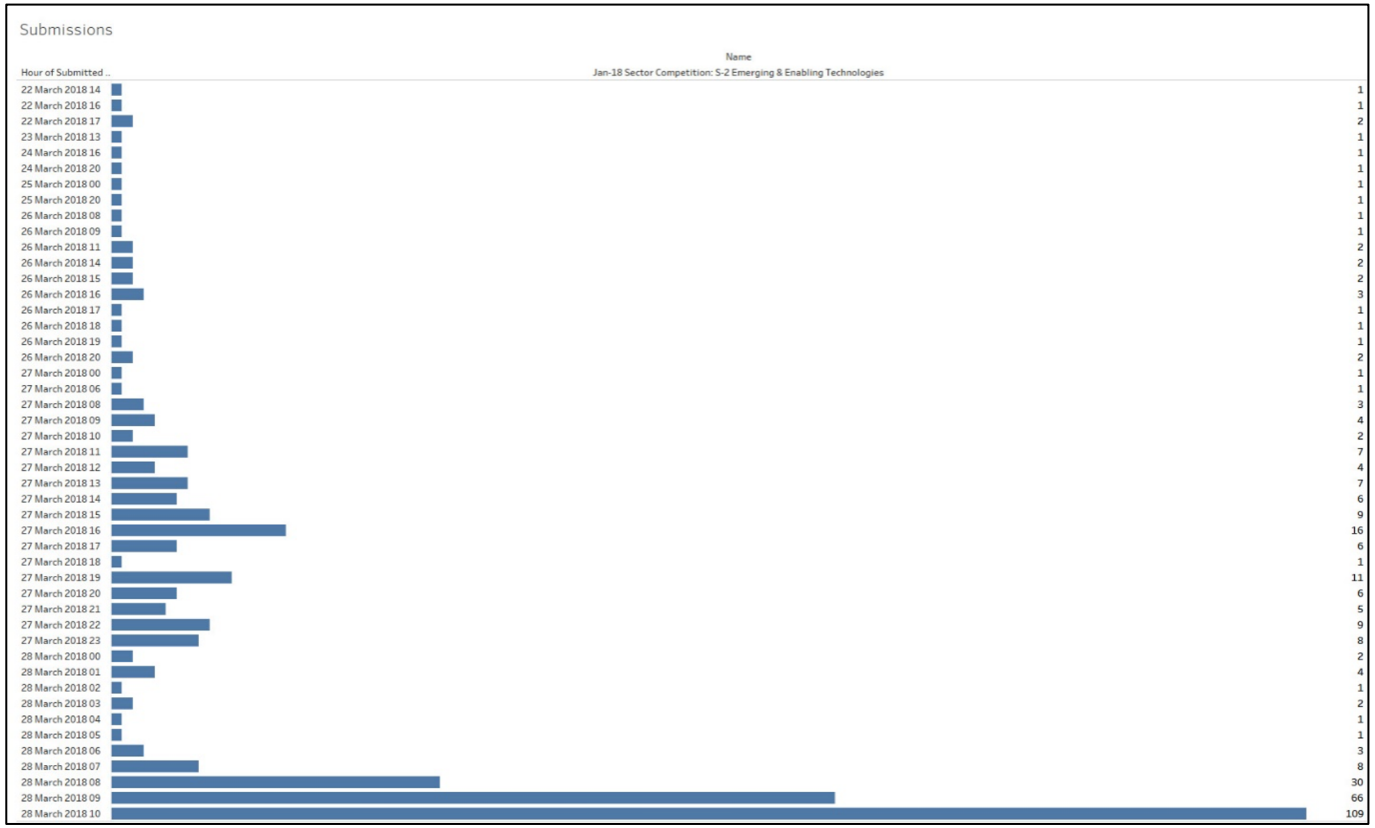
Project Summary - Short summary and objectives of the project including what is innovative about it

Public Description - Description of your project which will be published if you are successful

Scope - How does your project align with the scope of this competition? - If your project is not in scope, it will be ineligible for funding

Submit Your Application!

Customer Support can help resolve any issues you might have when submitting but only if they are contacted before the deadline. Once the deadline has passed, your application cannot be submitted.



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Successful Applicants

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How Do You Know If You Are Successful?

If you are unsuccessful in this competition

- You can use the feedback from the assessors to develop your idea and apply into another competition that allows previously submitted applications

If you are successful in this competition

- You will be assigned a Delivery Executive who will guide you through the Project Set Up process
- You will have 7 days to complete the project team, project details and bank details
- You will then have 90 days to complete project set up – funding may be withdrawn if this is not completed within this timeframe

Please ensure all your contact details in the IFS portal are correct and up to date and that you regularly monitor it.

Key Dates

Timeline	Dates
Competition Opens	18 May 2022
Briefing Events	25th May (UK); 23rd June (Nigeria), 27th June (South Africa) and 28th June (Kenya), 2022
Submission Deadline	10 August 2022, 11:00 BST/ 12:00 SAST
Applicants informed	21 October 2022

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Technology Innovation Agency's role in the Energy Sector

Elijah Mokhethi

Head of the Energy Investment Unit
Technology Innovation Agency

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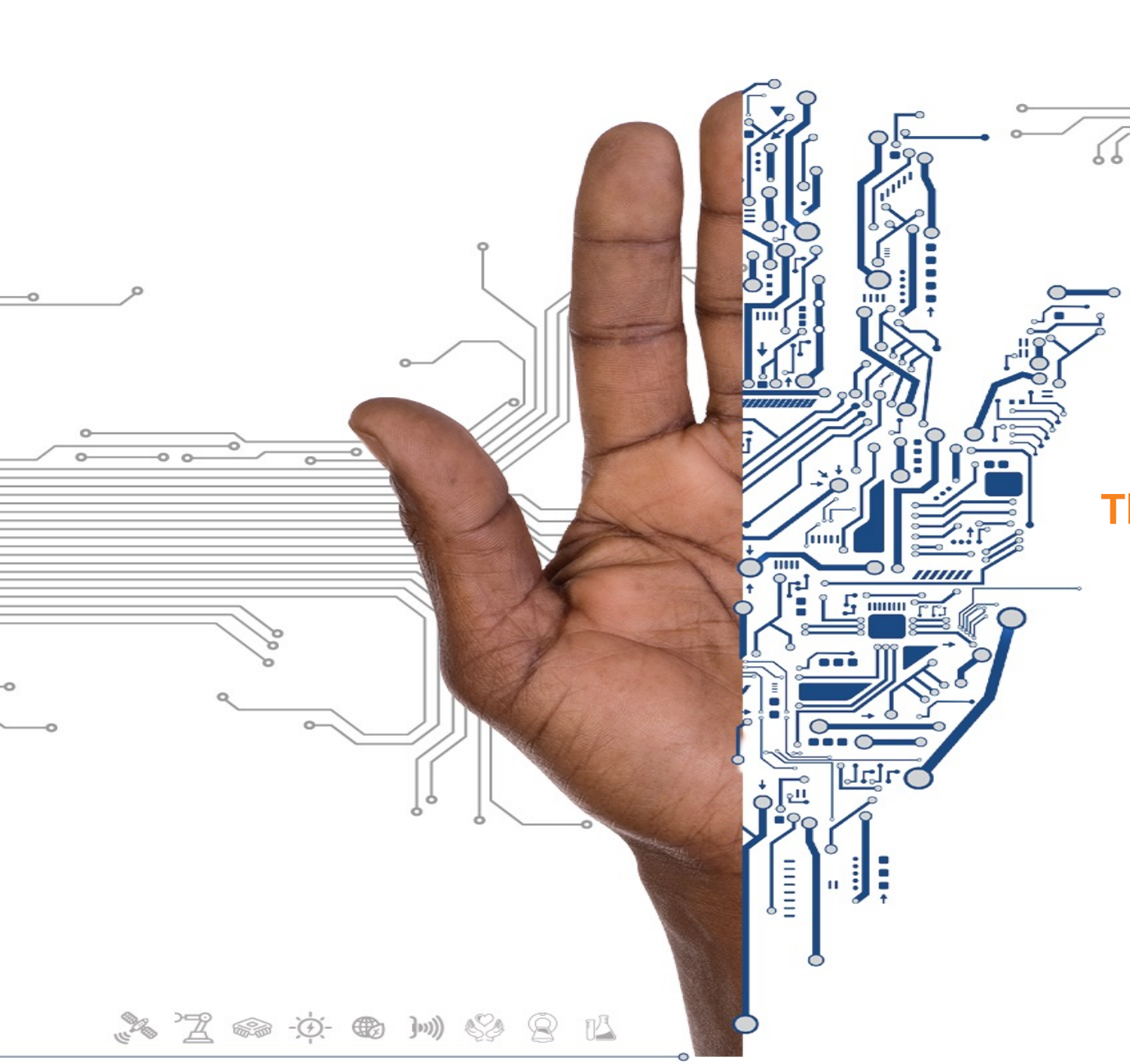


technology innovation AGENCY
Innovating Tomorrow Together

TIA's role in the Energy Sector and Innovation for Energy Security in South Africa

Elijah Mokhethi

27 June 2022

science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

TIA Mandate

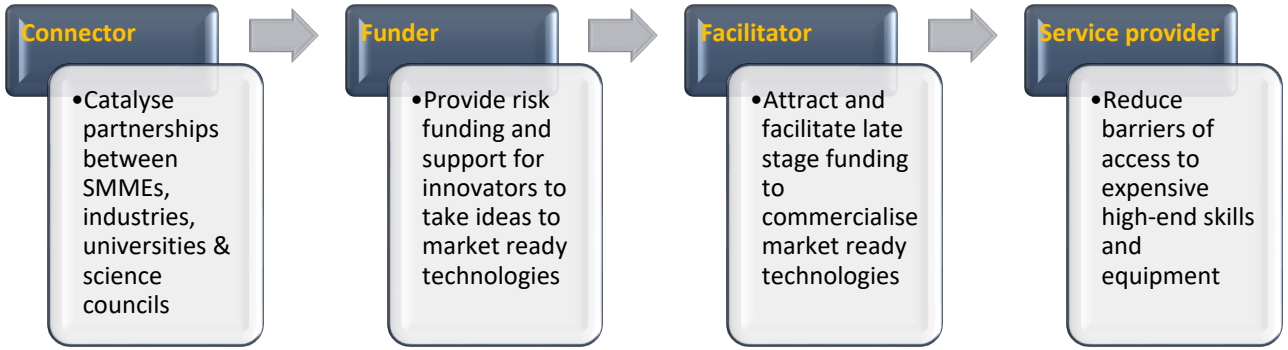
The TIA Act [No. 26 of 2008]

"The object of the Agency is to support the State in stimulating and intensifying technological innovation in order to improve economic growth and the quality of life of all South Africans by supporting the development and exploitation of technological innovations"

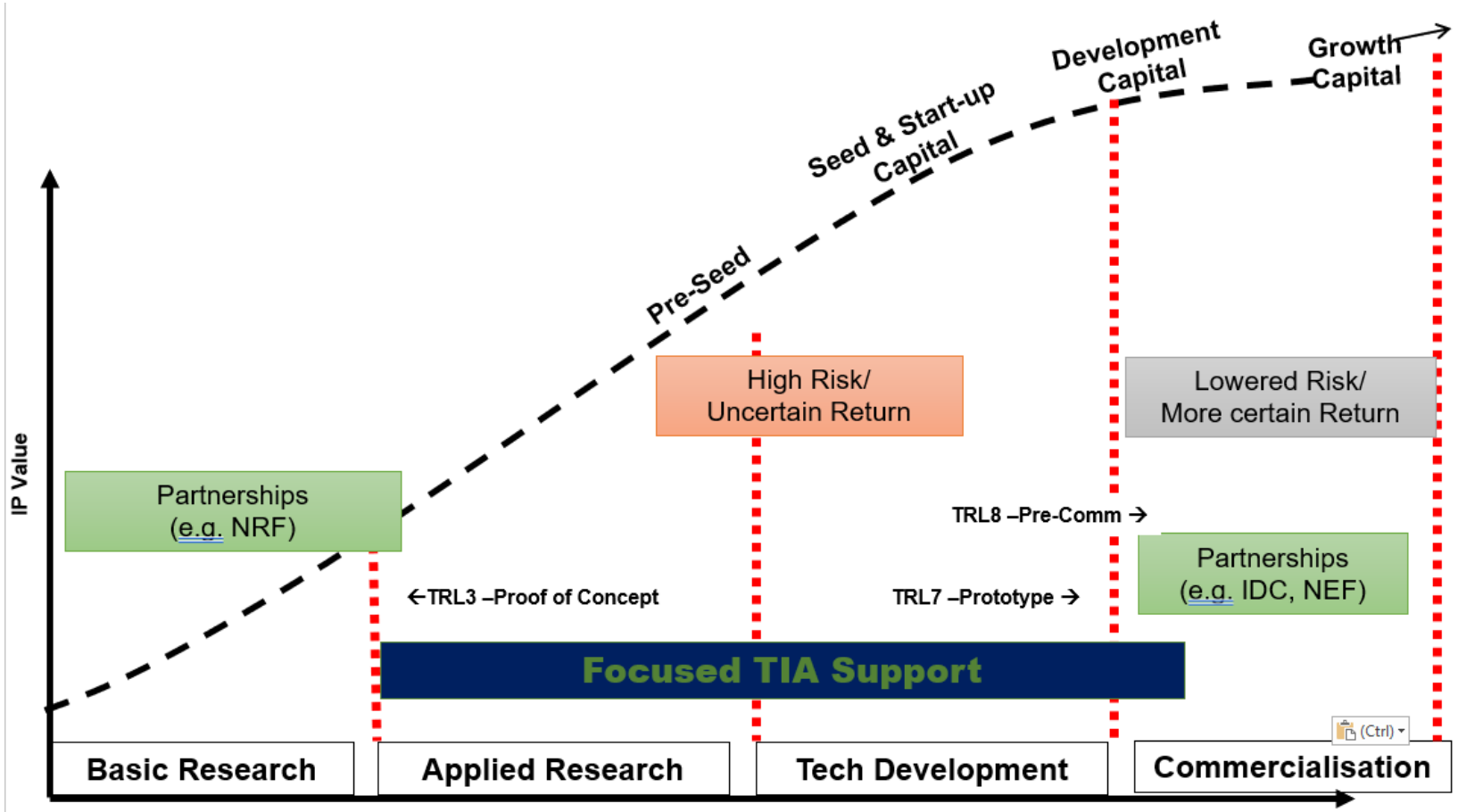
Purpose – Energy Unit

To support the development of innovative energy technologies that will result in a competitive and sustainable energy industry that supports the transition to a low carbon economy in order to improve the lives of South Africans.

TIA Roles


Connector
•Catalyse partnerships between SMMEs, industries, universities & science councils
Funder
•Provide risk funding and support for innovators to take ideas to market ready technologies
Facilitator
•Attract and facilitate late stage funding to commercialise market ready technologies
Service provider
•Reduce barriers of access to expensive high-end skills and equipment

TIA's Place Along The Innovation Value Chain

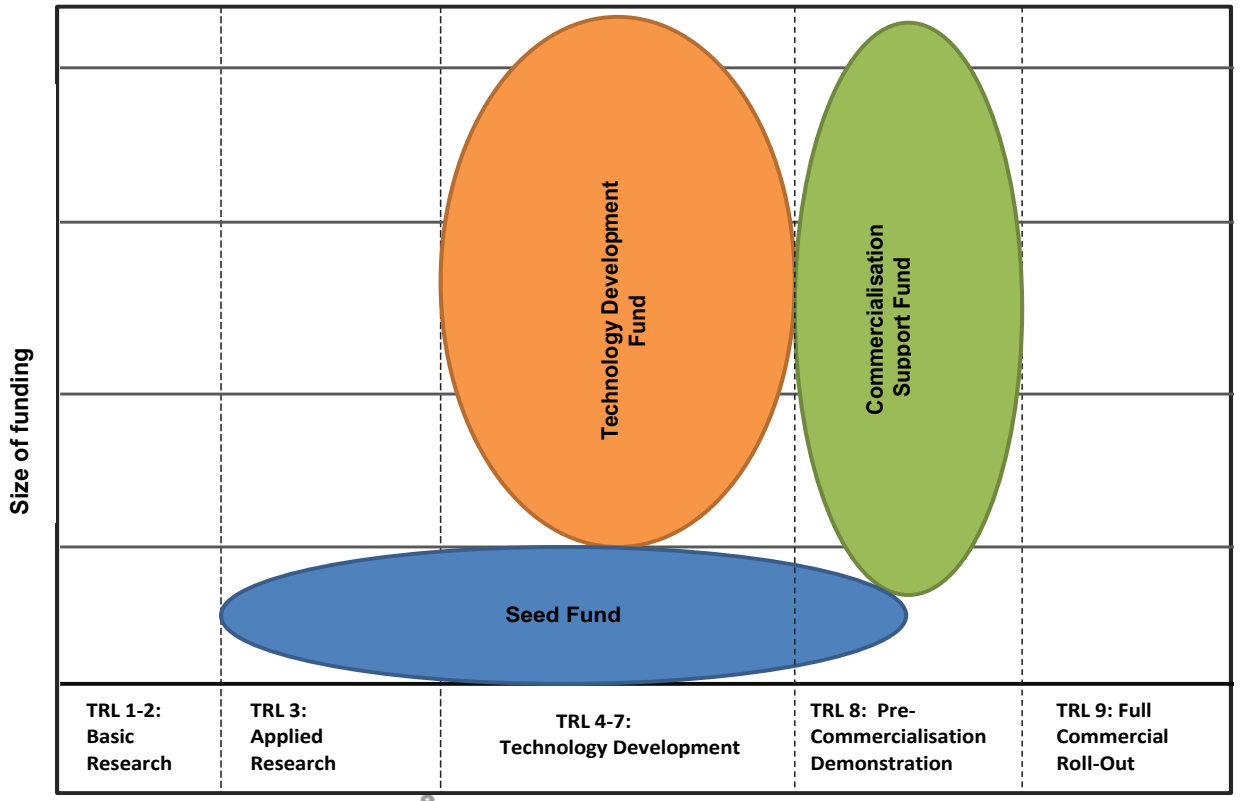


Focus of TIA financial and non-financial offerings:
Across the *innovation chasm*, operating with the required flexibility along the innovation value chain through mobilising and leveraging national, regional and international partnerships

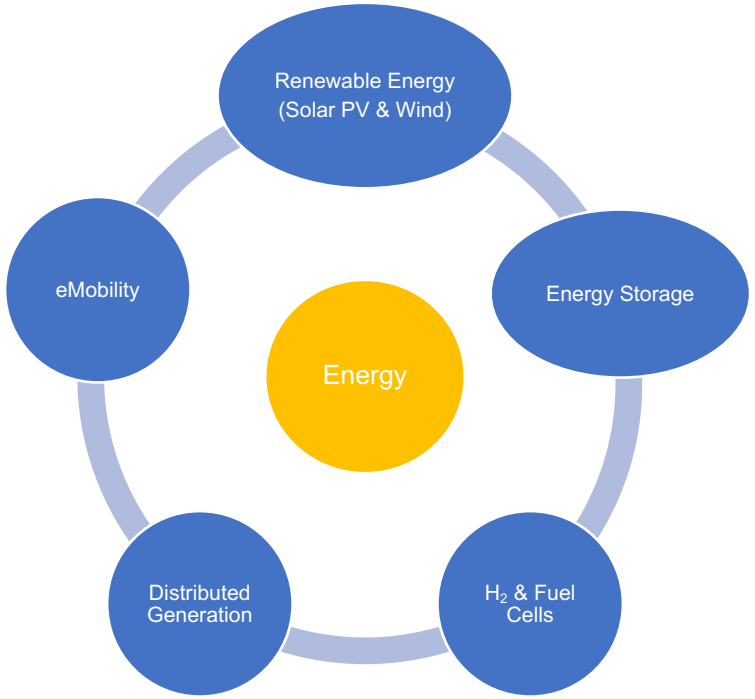
What We Fund

- **RSA registered companies/start-ups,** to enable competitiveness
- **Stage of technology development** is beyond basic research (post-proof of concept)
- **Potential for an attractive commercial** opportunity
- Some idea of **a business model**
- Product/service/technology must have **unique features**
- **Balanced team** with relevant business & technical expertise
- Potential for **socio-economic impact** e.g. potential for high tech job creation, direct improvement of lives
- Could be on emerging industries **or** for sustaining existing industries

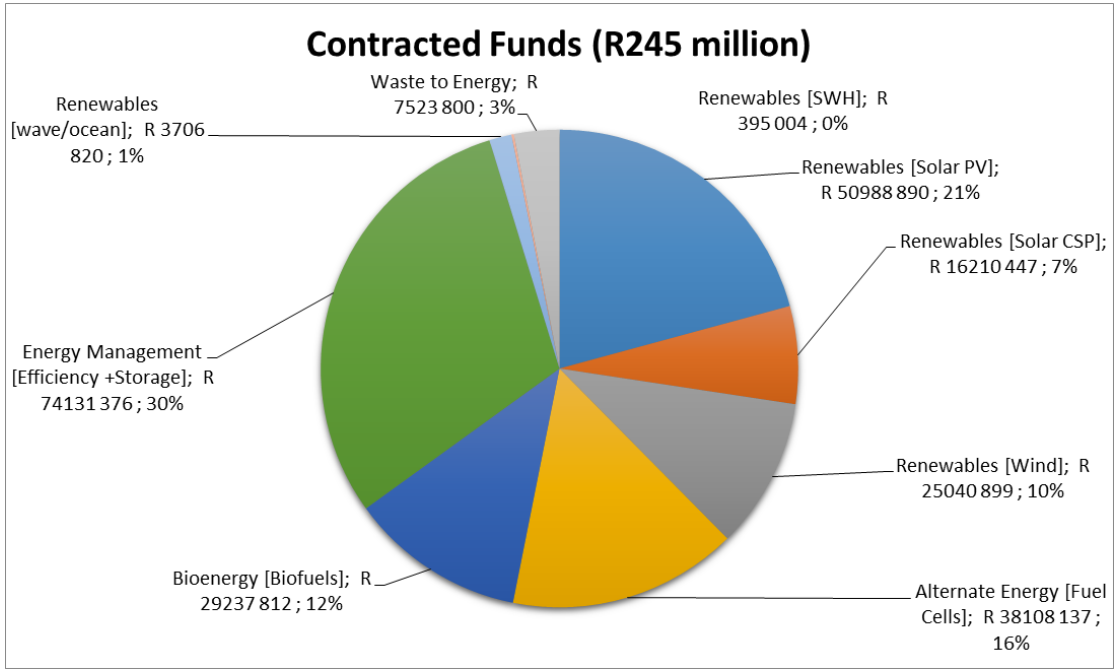
Funding Instruments



Focus Areas


Renewable Energy
(Solar PV & Wind)
Energy Storage
H_2 & Fuel
Cells
Distributed
Generation
eMobility
Energy

Energy Portfolio



uYilo eMobility Programme

- uYilo is an eMobility Programme established with the aim of: ‘Enabling, Facilitating and Mobilising Electric Mobility in South Africa through enabling technology innovations and strategic collaborations with the aim of exploiting the opportunities of an emerging industry for economic, social impact and industrial knowledge gain.
- Established in 2013 by TIA through its Automotive Components Technology Station; eNtsa based in Gqeberha (formerly Port Elizabeth).
- A multi-stakeholder collaborative Programme operating in alignment with national multi-departmental objectives such as energy, environment, and the automotive industries.

uYilo eMobility Programme

UYILO
E-MOBILITY PROGRAMME
enabling electro-mobility innovation

CORE STRATEGY 1

Facilitate an enabling environment which will support the increased uptake of electric mobility

- Public Policy Advocacy
- Stakeholder Engagement and Thought Leadership
- Kick Start Funding

CORE STRATEGY 2

Create technology solutions and deploy innovative business models

- Advanced Energy Storage
- Smart Grid Ecosystem

CORE STRATEGY 3

Develop a skills-base that can support innovation as well as commercial activities

- Skills Development
- Enterprise Development

CORE STRATEGY 4

Create public awareness through technology showcasing and demonstration

- Technology demonstrations
- Pilot Projects

technology innovation AGENCY
Innovating Tomorrow Together

Our role in Hydrogen

- Hydrogen South Africa (HySA) aims to stimulate and guide innovation along the value chain of hydrogen and fuel cell technologies in South Africa
  - ✓Sustainable energy
  - ✓Platinum beneficiation

- Centres of Competence:
  - ✓***HySA Systems*** – UWC: Hydrogen systems integration and technology validation
  - ✓***HySA Infrastructure*** – NWU and CSIR: Hydrogen generation, storage and distribution
  - ✓***HySA Catalysis*** – UCT and Mintek: Fuel cell catalysts
- HyPlat (Pty) Ltd is a spin-off company from UCT's HySA Catalysis

Our role in Hydrogen

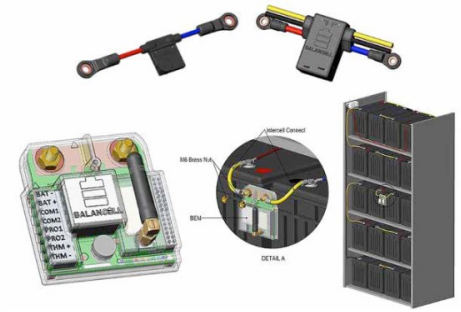
High level outcomes of the HSRM

❖ Hydrogen

- ✓ In 2021, the DSI published the Hydrogen Society Roadmap (HSRM) which is one of government's strategies and policy direction aimed at bringing together a variety of stakeholders and institutions (both public and private) around a common vision on how to use and deploy hydrogen and hydrogen related technologies as part of our economic development and greening objectives.
- ✓ The HSRM serves as a national coordinating framework to facilitate the integration of hydrogen-related technologies in various sectors of the South African economy and stimulate economic recovery.

Funded Projects

BALANCELL®
ENERGY EQUILIBRIUM



PTiP innovations

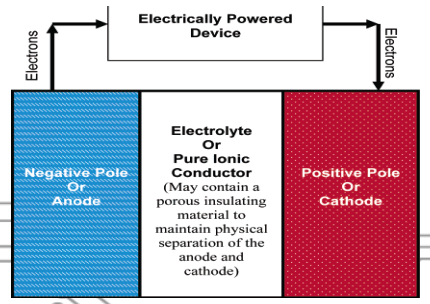
Solar incidence

HELIO100

HyPlat

UYILO
E-MOBILITY PROGRAMME
enabling electro-mobility innovation

CSIR
Touching lives through innovation



UNIVERSITY OF CAPE TOWN
CENTRE FOR CATALYSIS RESEARCH

HySA Catalysis
Hydrogen South Africa

technology innovation AGENCY
Innovating Tomorrow Together

THANK YOU

technology innovation AGENCY
Innovating Tomorrow Together

ENERGY
CATALYST

Connecting UK and South Africa partners.

ENERGY
CATALYST

Energy Catalyst Virtual Brokerage: How to use b2match effectively

Innovate UK

Foreign, Commonwealth & Development Office

Department for Business, Energy & Industrial Strategy

UKaid
from the British people

18 May 2022 - 10 August 2022
United Kingdom

Energy Catalyst International Brokerage

Energy Catalyst Virtual Brokerage

Join the virtual brokerage to find partners for your Innovate UK Energy Catalyst Round 9 application.

From May through to August, this website will host a series of webinars and 1:1 virtual meetings to discuss project opportunities and facilitate introductions between organisations to help provide clean, affordable and secure energy in sub-Saharan Africa, South Asia and the Indo-Pacific Region.

The aim of these webinars and the virtual Marketplace is to help organisations gain an understanding of the energy access issues in a particular country and to develop equitable partnerships leading to a collaborative application for Energy Catalyst Round 9.

Round 9 of Energy Catalyst is open now, with further infirmation available via this link: https://apply-for-innovation-funding.service.gov.uk/competition/1173/overview

To register for our Competition Briefing Session on Wednesday, 25th May 2022, please visit: https://ktn-uk.org/events/energy-catalyst-briefing-launch-and-brokerage-events/ - this session will detail the competition scope and eligibility alongside how to apply and the support available to you in preparing your application.

Energy Catalyst Round 9 makes available up to £20m to support businesses to develop

Register now
Open until 10 August 2022

LOCATION
United Kingdom

ORGANISED BY

ENERGY CATALYST

UKRI Innovate UK

UKRI Innovate UK EDGE

UKRI Innovate UK KTN

Marketplace

Your virtual shop window - the higher the quality, the more participants will be interested in talking to you!

- Profile – Expertise, Project Cooperation or Request
  - Everything must be clear & coherent
- Advantages and innovative aspects
- Specific requirements and requests, sufficient detail for a potential partner to know whether they can help
- Role of the partner

Jens Böhm

Innovation & Growth Specialist at Innovate UK EDGE
Manchester, United Kingdom

Edit my profile

View my profile

Overview
My availability
My opportunities
Company representatives
Organizer questions
Account settings
Logout

Your local support office

Innovate UK EDGE (North)

Jens Böhm
+44 (0) 1925 607 040
jens.boehm@rtcnorth.co.uk
https://www.innovateukedge.ukri.org/

Booking phase has started!

You haven't requested any meetings yet. The number of available time slots is limited. You can request or accept up to 100 meetings. The booking phase closes on **August 10, 2022**.

Book meetings now

I

Application Support / Authority/Government

Innovate UK EDGE

Innovate UK EDGE is a key part of the UK innovation agency's deep investment in the pioneering businesses that drive economic growth. It is a publicly-funded service available to all high potential small to medium sized innovation-driven companies, including Innovate UK grant winners.

Innovators are motivated to improve the ways we live and work. We support those building scalable businesses to achieve their goals, in every sector and from seed to scale stage. Our innovation and growth specialists are at the centre of our service. Each client engagement results in a bespoke strategy but common priorities include:

- Exploiting business innovation: Developing a commercial strategy and building a team to deliver it; protecting & harnessing your IP; improving innovation management & accessing the innovation ecosystem globally
- Sourcing funding and finance: Applying the right strategy to secure grants and capital for your business, enhancing investor appeal and getting investment ready to propel your growth
- Opening new markets: Creating connections to partners & leveraging insights to expand into vertical & international markets and achieve scale

Often these priorities are closely linked, especially in the case of scaling businesses which must align all business functions to achieve a step change in growth. Our Scaleup Programme prepares companies who have already benefited from our high growth service and other innovation-driven businesses with 50%+ growth potential for just such a transformation.

TECHNOLOGY INTERESTS

Other

I

Innovate UK EDGE

Authority/Government | Manchester, United Kingdom

OVERVIEW MARKETPLACE

Create an opportunity

Cancel

+

Project Cooperation

Add this if you are interested in finding a partner for your project.

+

Expertise

Add your area of expertise and describe what you can offer to other participants.

+

Request

Add if you have anything specific you are looking for.

I

Innovate UK EDGE

Authority/Government Manchester, United Kingdom

OVERVIEW MARKETPLACE

New Project Cooperation

TITLE *

This field is required.

DESCRIPTION *

(0/5000)

PROJECT STAGE

Early Stage | Mid-Stage | Late Stage

TOPIC

Bio Energy | Business Model Design | Clean Cooking | Cooling | Demand Side Technologies | Energy Efficiency | Gender and Social Inclusion | Grid Networks | Heating | Hydrogen and Fuel Cells | Mini Grid | Official Development Assistance (ODA) | Solar | Storage | Wave and Tidal | Wind | Other

CALL

East Africa | Central Africa | West Africa | Southern Africa | South Asia | Indo-Pacific Region | Other

TYPE OF COOPERATION SOUGHT

Project Lead | Project Partner | Administrative Lead | Test or Demonstration Site

IMAGE UPLOAD

Add image

Maximum upload file size: 22MB.

FILE UPLOAD

Click here to upload or drag and drop files...

Maximum upload file size: 22MB.

VIDEO

+ Add video

← Back Cancel Save

Event organiser

Innovate UK

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Authority/Government | Manchester, United Kingdom

OVERVIEW MARKETPLACE

New Expertise

TITLE *

This field is required.

DESCRIPTION *

(0/5000)

FIELDS OF EXPERTISE

Bio Energy | Business Model Design | Clean Cooking | Cooling | Demand Side Technologies | Energy Efficiency | Gender and Social Inclusion | Grid Networks | Heating | Hydrogen and Fuel Cells | Official Development Assistance (ODA) | Solar | Storage | Wave and Tidal | Wind | Other

IMAGE UPLOAD

Add image

Maximum upload file size: 22MB.

FILE UPLOAD

Click here to upload or drag and drop files...

Maximum upload file size: 22MB.

VIDEO

+ Add video

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b2match

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Authority/Government Manchester, United Kingdom

OVERVIEW MARKETPLACE

The organiser will review this opportunity before it gets published.

PROJECT COOPERATION

Example Project Cooperation

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

JB Jens Böhm May 14, 2022

The organiser will review this opportunity before it gets published.

EXPERTISE

Example Expertise

Contrary to popular belief, Lorem Ipsum is not simply random text. It has roots in a piece of classical Latin literature from 45 BC, making it over 2000 years old. Richard McClintock, a Latin professor at Hampden-Sydney College in Virginia, looked up one of the more obscure Latin words, consectetur, from a Lorem Ipsum passage, and going through the cites of the word in classical literature, discovered the undoubtable source. Lorem Ipsum comes from sections 1.10.32 and 1.10.33 of "de Finibus Bonorum et Malorum" (The Extremes of Good and Evil) by Cicero, written in 45 BC. This book is a treatise on the theory of ethics, very popular during the Renaissance. The first line of Lorem Ipsum, "Lorem ipsum dolor sit amet..", comes from a line in section 1.10.32.

JB Jens Böhm May 14, 2022

The organiser will review this opportunity before it gets published.

REQUEST

Your virtual shop window

This is your virtual shop window - the higher the quality, the more participants will be interested in talking to you! Do provide sufficient info about your organisation and create at least one entry for the Marketplace (Expertise, Project Cooperation, Request, etc.). Please indicate in detail what you can offer to others to help them further their activities and/ or what you would like to gain in order to further your own organisation's activity.

So what makes a good presence on the Marketplace? A couple of questions to keep in mind:

1. Is your expertise, project cooperation or request, clear? Are all the paragraphs coherent?

2. Are the advantages and innovative aspects of your expertise or project cooperation on offer clearly explained? Are they clearly described in relation to competing projects on the market? Is your competitive advantage clearly stated? Are your specific requirements and requests clearly formulated, with sufficient detail for a potential partner to know whether they can help?

3. Please assure a good level of linguistic accuracy and avoid using slang. For many participants English is not their first language.

4. Is the role of the partner explained?

If you have any questions regarding your profile or the Matchmaking in general please contact your local Innovate UK EDGE partner or one of the event organisers. We're here to help!

JB Jens Böhm May 14, 2022

Event organiser

Innovate UK

Help

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Agenda

All session types

NIGERIA INNOVATE UK MALAWI RWANDA KENYA NEPAL TRAINING INDONESIA

EVENT AGENDA MY AGENDA

All times are displayed in the event time zone (Europe/Zagreb, currently: 13:27). Change to recommended time zone (your time zone)

Wednesday, May 25, 2022

09:00 - 16:00

Energy Catalyst (Round 9) Briefing Event

ONLINE

Join Online Session

Add

Participants

Relevance

39 Participants found

Search

BOOKMARKED

MATCHMAKING

PARTICIPATION TYPES

ORGANIZATION TYPES

AREAS OF ACTIVITIES

COUNTRIES

COMPETITION MANAGEMENT

Jens Böhm
Innovation & Growth Specialist at Innovate UK EDGE
MANCHESTER, UNITED KINGDOM
View organisation profile →

David O
Founder at Tribes Capital
LONDON, UNITED KINGDOM
Request meeting
View organisation profile →

KH

Kirsty Hinchliffe
Projects and Grant Manager at FeTu Limi...
HALIFAX, UNITED KINGDOM
Request meeting
View organisation profile →

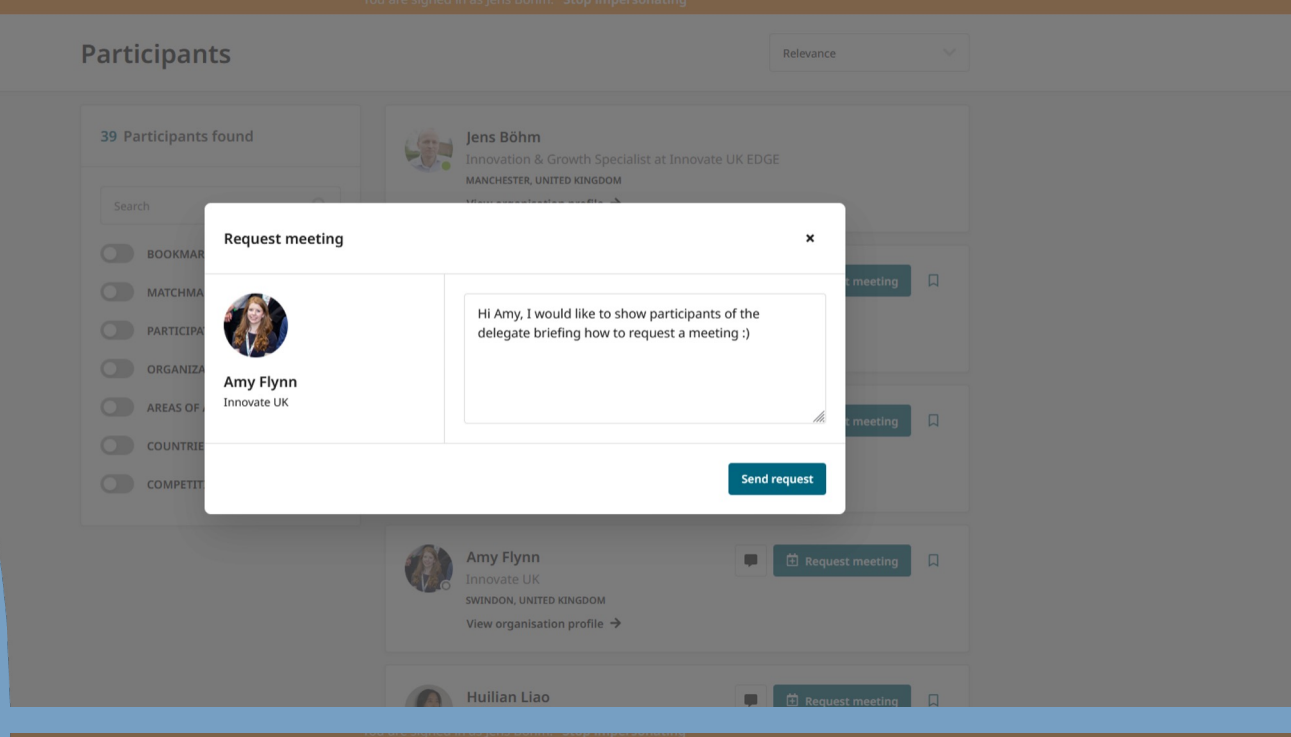
Amy Flynn
Innovate UK
SWINDON, UNITED KINGDOM
Request meeting
View organisation profile →

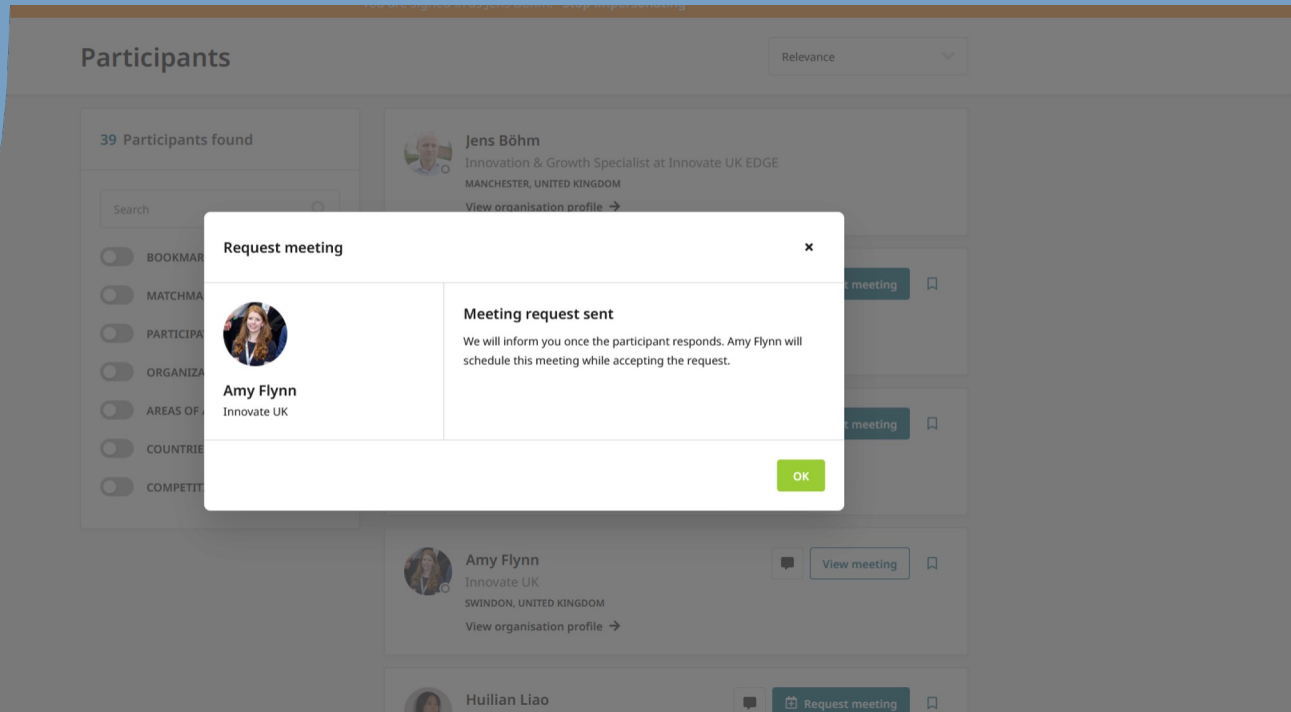
Huilian Liao
Senior Lecturer, consultant at Sheffield H...
SHEFFIELD, UNITED KINGDOM
Request meeting
View organisation profile →

1

Request Meetings

- Be proactive
- Meetings will be scheduled by the recipient and can be moved/ rescheduled
- Use the Marketplace to find out about specific projects, expertise and requests





ENERGYCATALYST

Marketplace

Add an Opportunity

6 Opportunities found

Search

PROJECT COOPERATION (5)

EXPERTISE (1)

PROJECT COOPERATION

Updated on May 24, 2022

Electricity mini-grids in rural Sub-Saharan Africa

We can provide micro hydropower electricity mini-grid installations in rural communities of Sub-Saharan Africa, south-east Asia and Latin America.

Other Cooling Mini Grid South Asia Early Stage East Africa +6

Martyn Cowsill
Director at MicroGen Renewables (Oldham, United Kingdom)

Request meeting

PROJECT COOPERATION

Updated on May 24, 2022

Watto

Watto is a clean energy innovation developed by an African engineer while working in rural Africa. As a father of three girls, it was designed out of the frustration seeing rural villagers living amongst abundant energy sources but do not have the tech-...

Early Stage East Africa +3

Hanlie Wessels
CEO at Watto by Impact Business Development (Centurion, South Africa)

Request meeting

PROJECT COOPERATION

Updated on May 24, 2022

Manufacturer's of Solar , wind, biogas, Energ...

We seek cooperation for Renewable energy manufacturer's

1:1 Meetings

Camera and microphone test

My meetings

ALL 1 ACCEPTED 1 PENDING 0 CANCELED 0 AVAILABILITY

All times are displayed in the event time zone (Europe/Zagreb, currently: 15:26). Change to recommended time zone (your time zone)

Next meetings

Jens Böhm, Innovation & Growth Specialist at Innovate UK EDGE
Amy Flynn, Innovate UK

09:15 - 09:30
Wednesday, May 25
Online Video Meeting

MEETING SCHEDULED

Cancel Reschedule Invite guests Starts in 18 hours

Summary

- Your virtual shop window
- Create a clear and concise profile to raise your visibility
- Be active not reactive;
- Attend webinars, regularly browse the agenda for additions and updates
- Browse profiles to find out who is offering interesting opportunities
- Make yourself available for meetings!
- Message other participants & request meetings
- Website: https://energy-catalyst-networking.b2match.io/

ENERGY
CATALYST

Energy Catalyst Case Study.

Innovate UK

Foreign, Commonwealth & Development Office

Department for Business, Energy & Industrial Strategy

UKaid
from the British people

ENERGY
CATALYST

Pitch 1:
Leaper Innovate Green Energies (LiGE)

Innovate UK

Foreign, Commonwealth & Development Office

Department for Business, Energy & Industrial Strategy

UKaid
from the British people

COMPRESSED AIR ENERGY STORAGE
LiGE "AIR BATTERY"

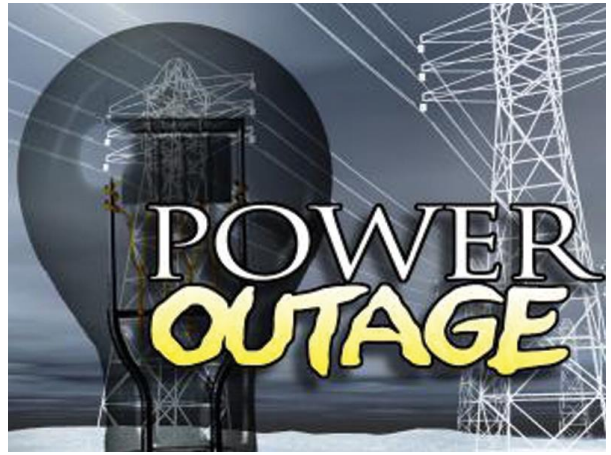
Operation based on: Renewable energy solutions

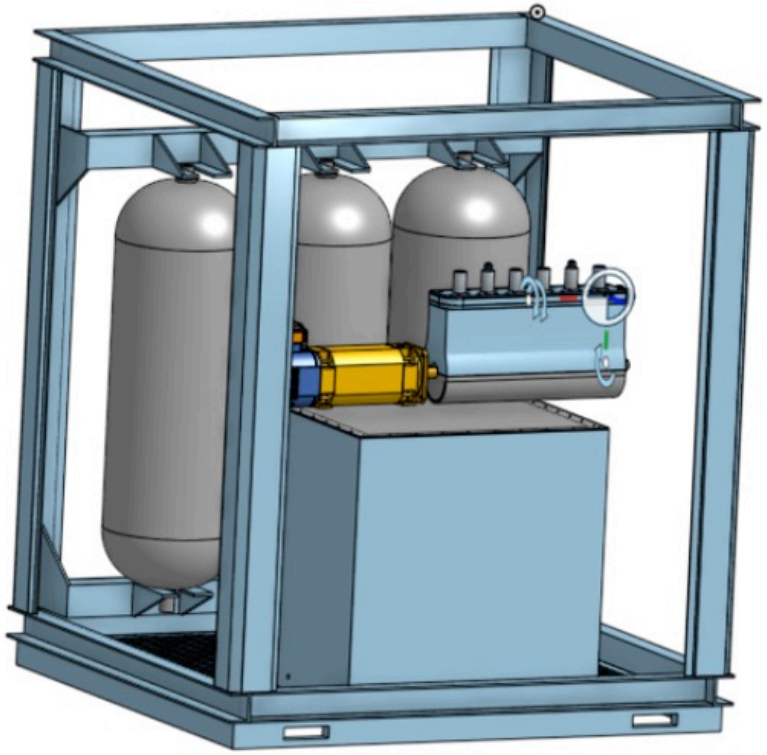
Solar PV and/or Wind Turbines

Works with Grid-linked and Grid-tied

Presented by:
Warwick Leaper
Managing Director
warwick@lige.co.za
www.lige.co.za
078 431 2721

ENERGY SECURITY





Electricity users major pain:

- Outages;
- Rising electricity costs;
- Peak load management;
- Storage for PV is underutilized. (Cost/Lifespan)

LiGE AIR BATTERY BENEFITS

- **Zero Carbon Emissions;**
- **Water as a by-product;**
- **Clean Air;**
- 65% saving on the CLIENT'S electricity bill when connected to the grid – peak shaving/load levelling;
- Low maintenance costs;
- 30 year life-span (match to PV systems);
- Scalable from 50Kwh to greater than1Mwh storage, modular format;
- Renewable Solutions i.e. Solar PV / Wind needs storage;
- Grid storage, grid-linked and grid-coupled solutions.

LiGE PATENTED TECHNOLOGY

Leaper Innovate Green Energies (Pty) Limited holds 2 patents on this technology
IP owner/designer Warwick Leaper

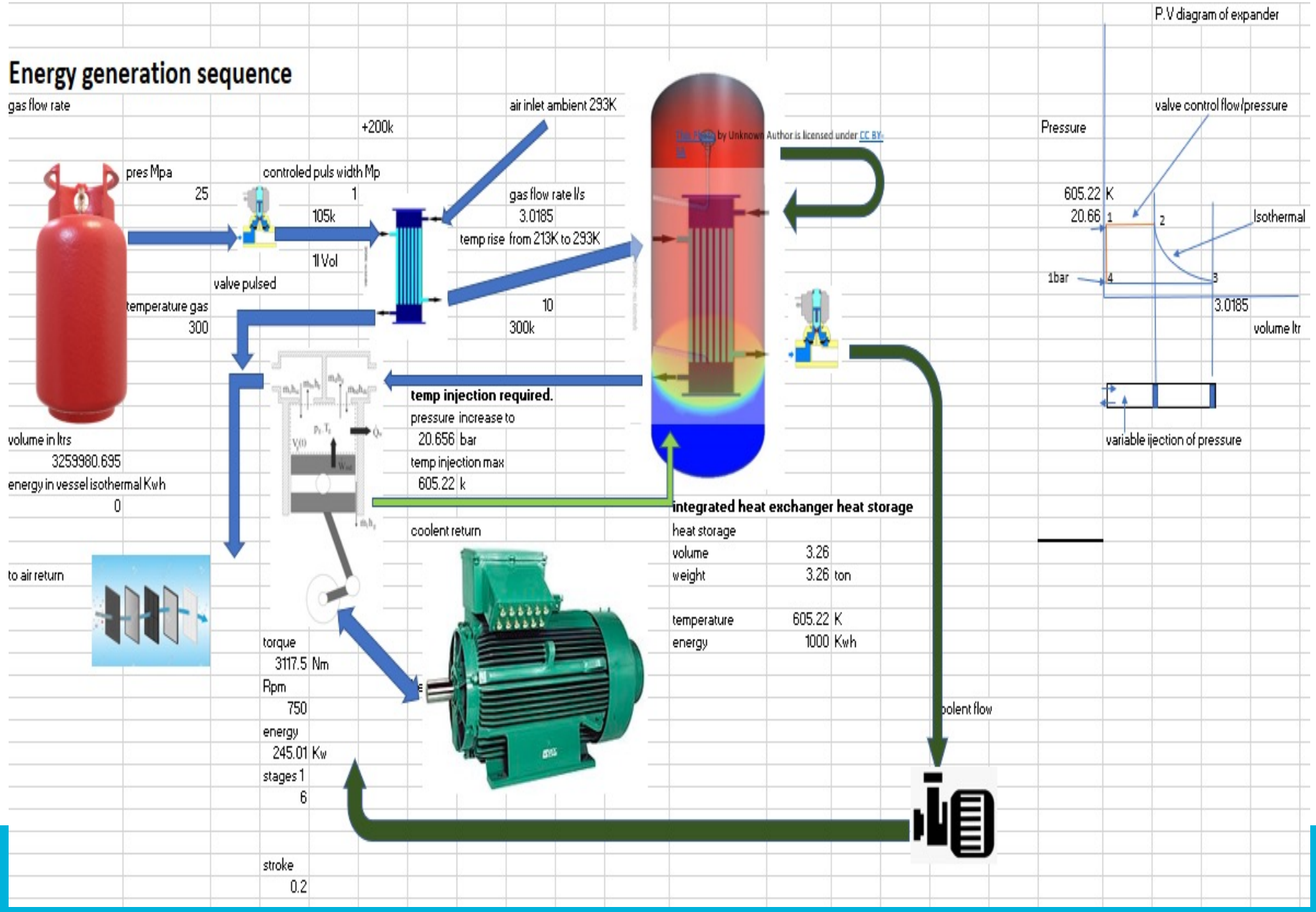
1. South African patent filed 2012 granted 2014 – **2012/07661** Energy Supply System

2. PTC patent filed December 2017 – **2017/08356** – Compressed Air Energy System and Apparatus

   Filed & Granted in April 2020:
   ARIPO - **AP/P/2020/012369** and Europe – **European 18888081.9**
   2020 - 24 claims defended

LiGE AIR BATTERY GENERATION SEQUENCE

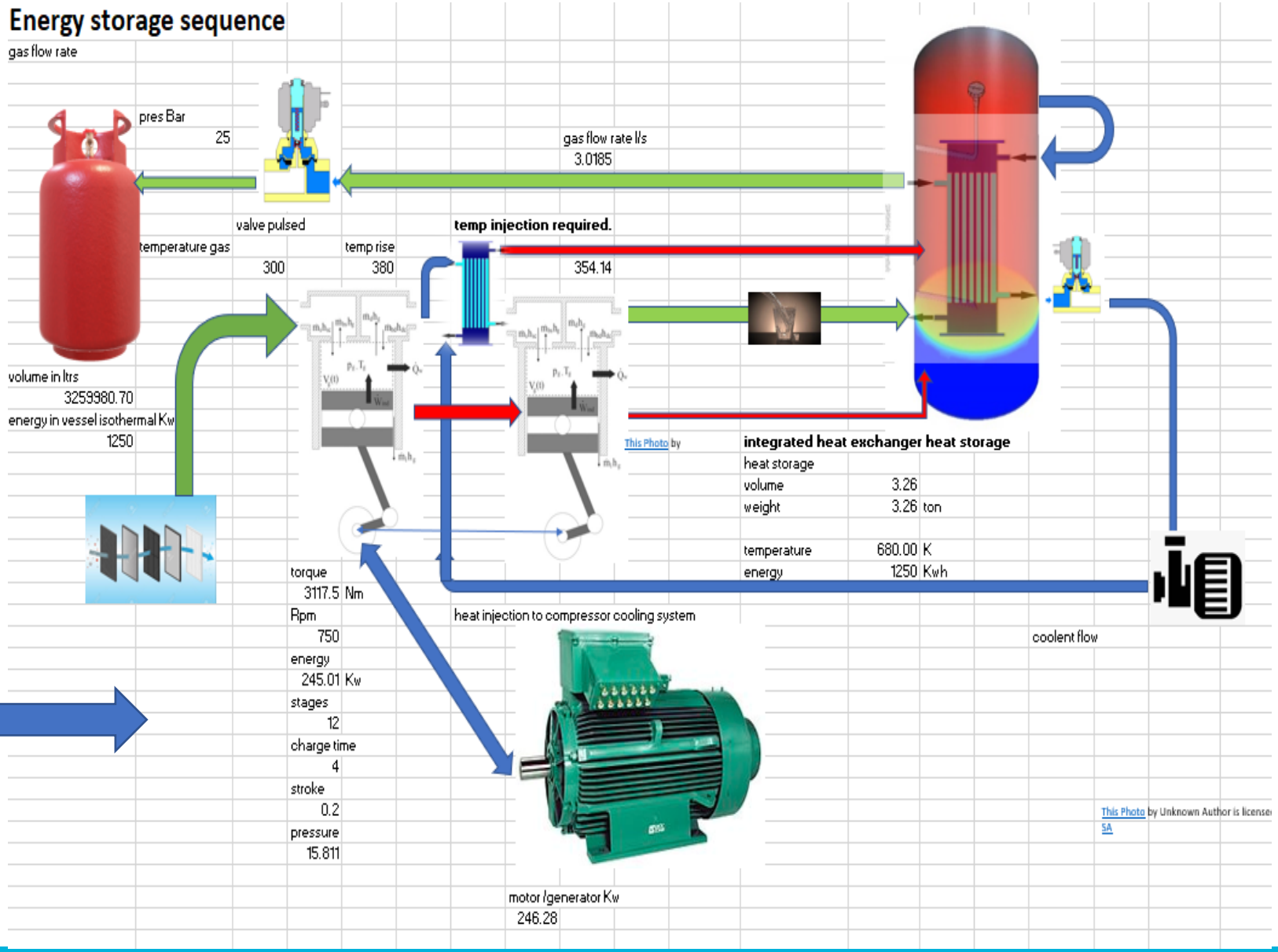
A snapshot of a working excel document enabling rapid design interaction where all the formulas and various subdivisions, including heat storage, compressor capacities, engine/motor specifications and the expected pressure in and subsequent energy out is sequenced.



LiGE PATENTED TECHNOLOGY

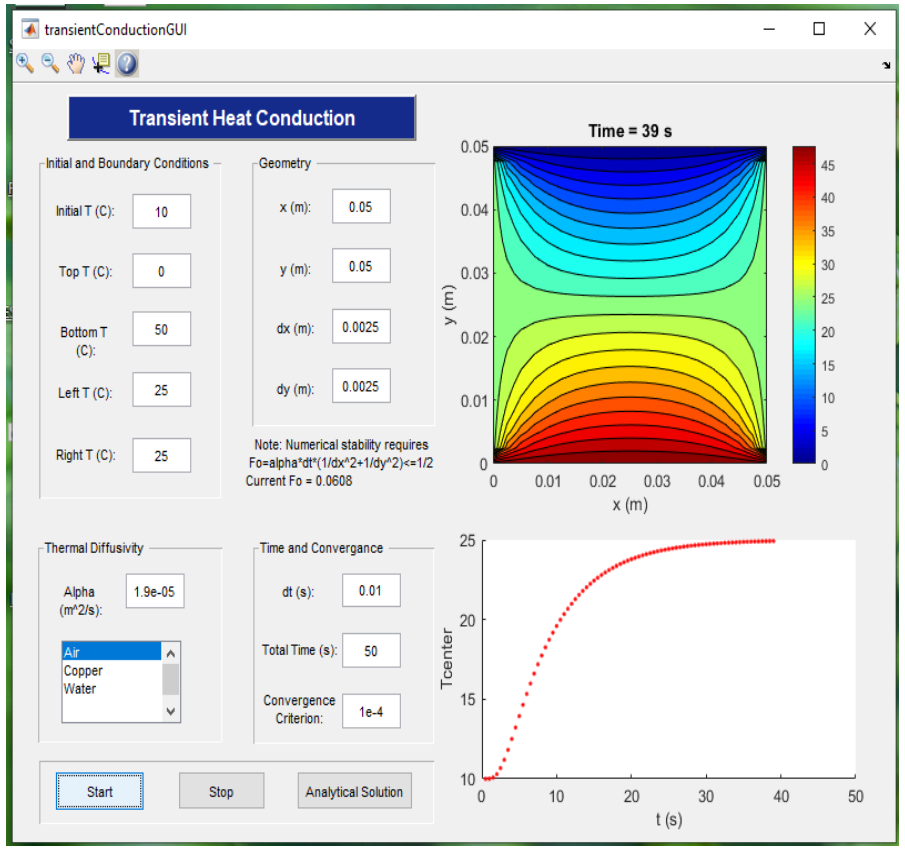
Power input phase drives the motor and the compressor. The heat and the water are removed, and the compressed air is stored in the tanks, the heat in heat-storage and the water is available for use.

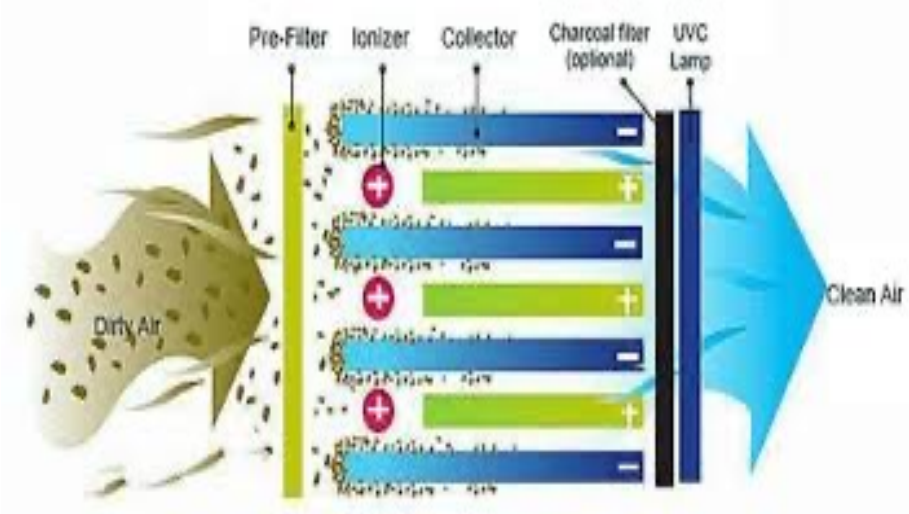
Refers to a 1Mhw unit



Test results for: Water, Heat and Air Systems

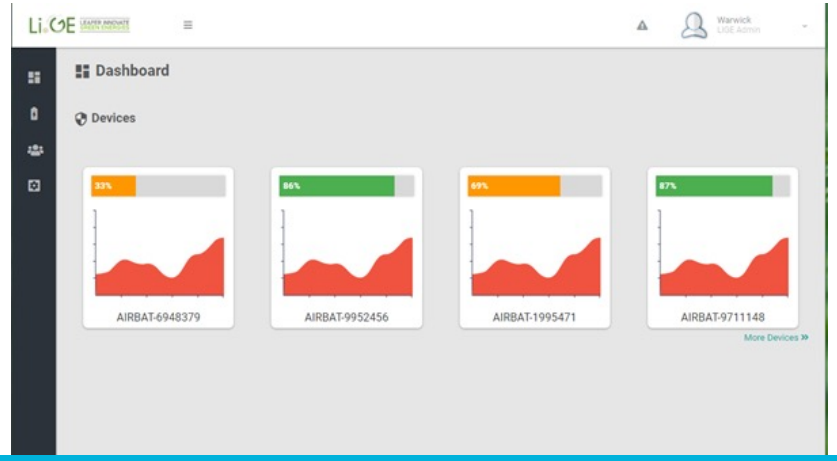
water seperation systemat current design.										
			radius of cylinder		length		volume ltsr			
cylinder dimentions			50		480		3.769911			
cylinder dimentions main compressor			150		400		500		28.27433	
Desiccant type			activated alumina							
absorbtion per ltr			0.3				1.130973			
time to saturation at RH% air temp 25Deg C	10	20	30	40	50	60	70	80	90	100
saturation index g per kg air	2	3.99	5.99	7.99	9.98	11.98	13.97	15.97	17.97	19.96
cubic mtrs air number of strokes	1130.973	566.9039	377.6205	283.0972	226.648	188.8102	161.9146	141.6372	125.8735	113.324
time at 1 stroke a second in hours	0.314159	0.157473	0.104895	0.078638	0.062958	0.052447	0.044976	0.039344	0.034965	0.031479
litres of water per hour	3.6	7.182	10.782	14.382	17.964	21.564	25.146	28.746	32.346	35.928

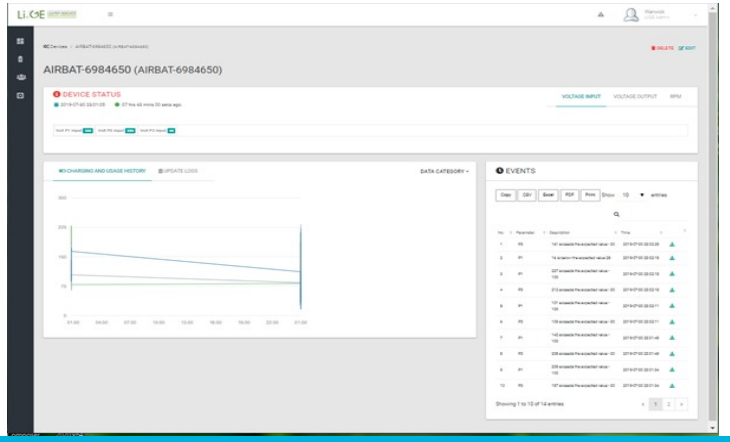




LIGE MONITORING DASHBOARD

- The ability to remotely monitor and correct the storage units and other products through a secure structure is of paramount importance, the software developed for LiGE is owned and operated by LiGE.
- Screen grabs of the existing and operational program below.
- The ability to monitor worldwide is inherent in the choice of system provider via GSM links.
- The storage of and manipulation of date and alarm / call out algorithm is housed at AWS and will be upgraded as the need arises and the footprint grows.



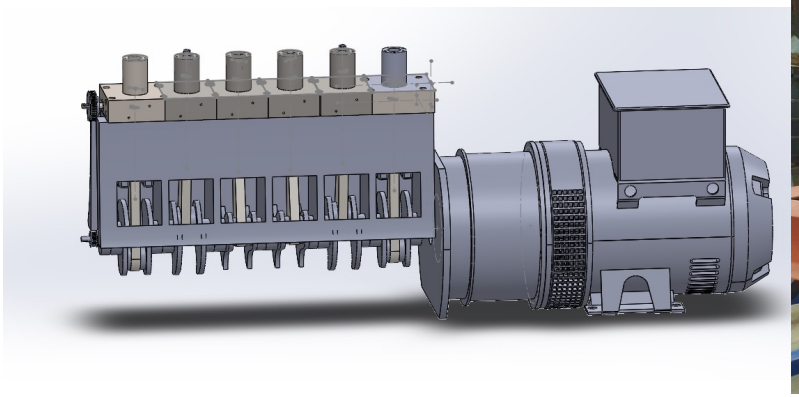


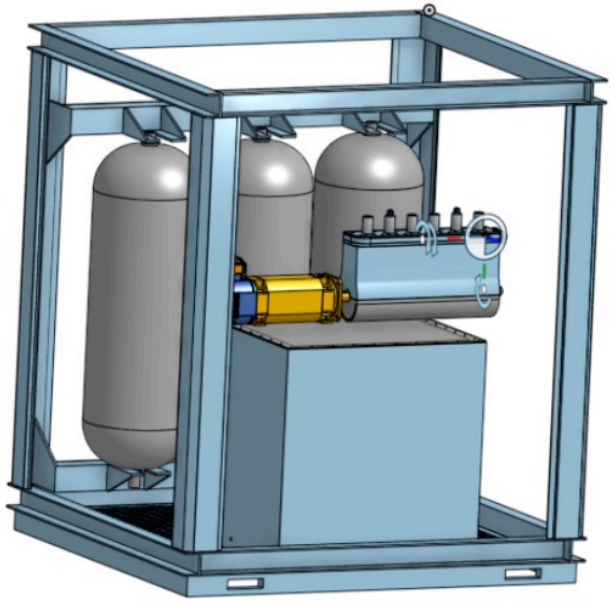
LiGE PATENTED TECHNOLOGY VERSION 4

During the power return phase, when the stored energy is required, the system releases the air via the heat exchanger, which, connected to the heat storage, warms the expanding air into the compressor - now working as a motor (but not reversing the direction of rotation).

This in turn drives the generator three phase motor, a flywheel is attached to the generator to act as a compensator for fluctuations and produces a stable load regulated AC source.

A single motor is used for the unit.





LiGE MARKET POTENTIAL

Signed License Agreement with an Australian Company Essential Water and Energy Services

Revenue from this Agreement:	
Yearly License Fee	Royalty Fee per unit sold
Compressor purchase “black box” from LiGE	Current interest in 50kwh, 300kwh and 1 Mwh Systems
Potential earnings R460 million over 5 years.	
5 x 1Mwh p/m peak after 3 years 30 x 1Mwh p/m	

Advanced discussions in territorial license for manufacturing/assembly/distribution

Pacific Islands – RKA Strategix Partners

Cambodia – Solar Partners Asia

Chile – Novatech

LiGE Primary funding/partner requirements

Current trends in energy supply and use are unsustainable:

Economically, Environmentally and Socially

So, it's time for us to make a difference

LiGE will be setting up distribution networks in Africa, Asia, Australia.

We require:

Demonstration systems and partners to set up manufacturing/assembly in the major hubs both providing work and energy stability in that region.

For this we require investment i.e. grant funding, and/or loan funding - £4 million

Primarily in building demonstration storage systems, setup of factories in Johannesburg, Australia, Chile, Kenya, Ghana, Cambodia and Turkey.

COMPRESSED AIR ENERGY STORAGE
LiGE "AIR BATTERY"

THANK YOU

Presented by:
Warwick Leaper
Managing Director
warwick@lige.co.za
www.lige.co.za
078 431 2721

ENERGY
CATALYST

Pitch 2:
Ducere Holdings Pty Ltd

Innovate UK

Foreign, Commonwealth & Development Office

Department for Business, Energy & Industrial Strategy

UKaid
from the British people

About the Company

Ducere Holdings (Pty) Ltd

- Engineering product development in the transport and utilities environments, specific to energy efficiencies.
- Completed the development of MISER-HKS, a retrofit hydraulic hybrid transmission = **proven 20%+ fuel savings and emission reduction.**
- Currently busy with MISER-HTS **(Up to 60% improvement shown in simulation** on the HKS efficiencies in specific scenarios.
- Tri-MISER – initial Technology demonstrated at Gerotek, and successfully achieved **peak current reduction of 50%, lower power usage up to 28%**, effective range extender = longer battery life, reduced lifetime costs.

The Project

The now…MISER-HTS

"The best electric vehicle is a hydraulic electric vehicle!"

Why? Because it reduces peak power and average load of the batteries resulting in improved operating range and a longer lifespan.

The future…**Electric-MISER** (The Project)
Utilizes and grows the technologies of MISER-HTS and Tri-MISER with regenerative braking and engine optimization = **improved fuel saving** and **reduced emissions**.

Our Capabilities

- Our capabilities have been proven with the development of MISER-HKS.
- We have mechanical and mechatronic engineers in our team = system design, program, build and test.
- Our control system was developed by our own people, and we continue to grow it.
- We scale from small to large mobility.
- We enjoy and thrive in the technology space.

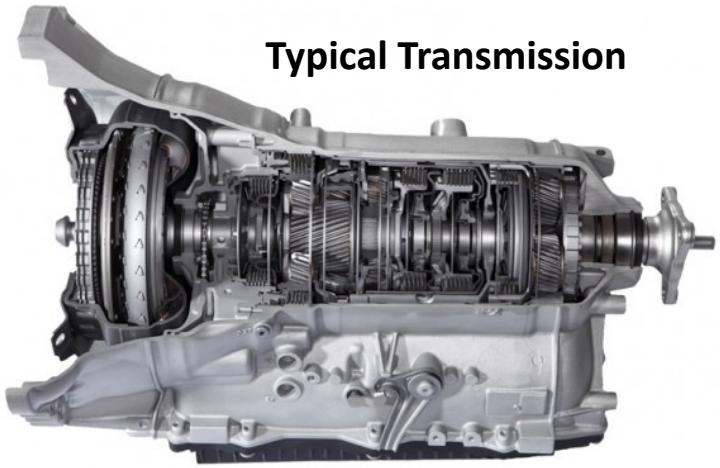
Desired Partners

- Industry specific role players such as vehicle OEMs or Tier 1 or 2 component OEMs for collaboration and final stage adoption.
- Networking for purposes of the international marketplace.
- Financial.

MISER® HYBRID TECHNOLOGIES

www.misertechnologies.com, Tel: +27-11-0251812, andrer@ducere.co.za

Typical Transmission



POWER = Hydraulic

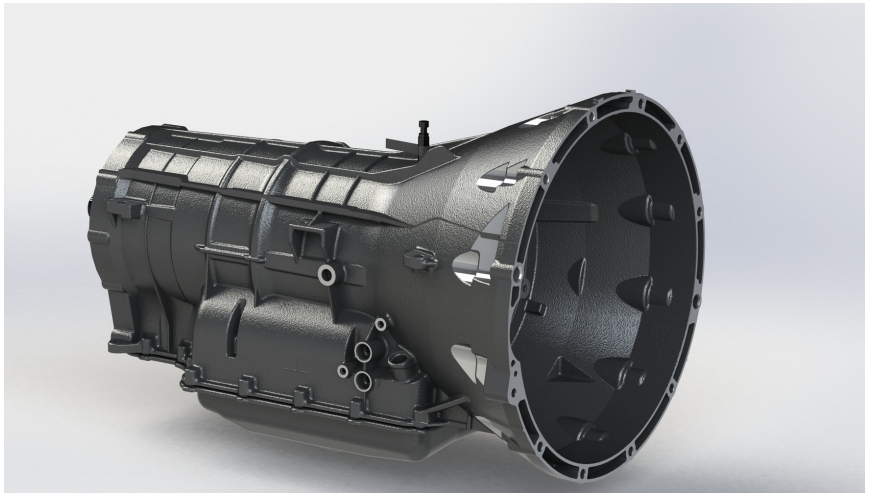
vs

ENERGY = Electric

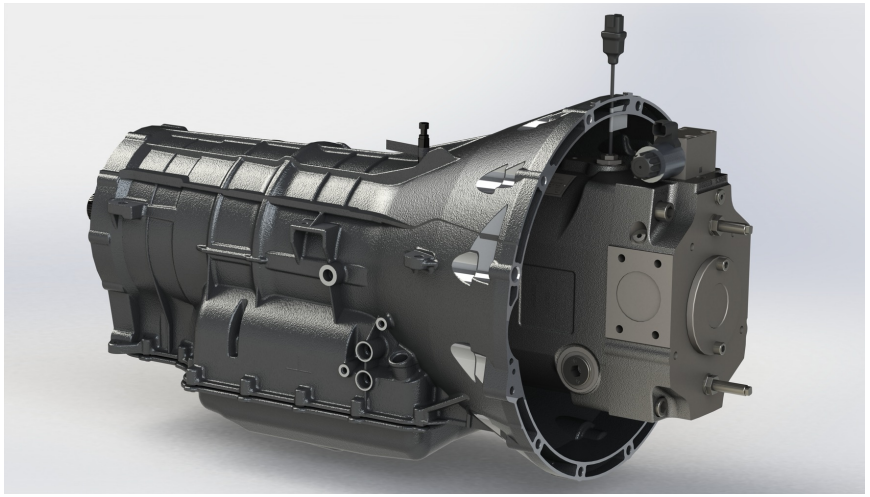
"TIME"

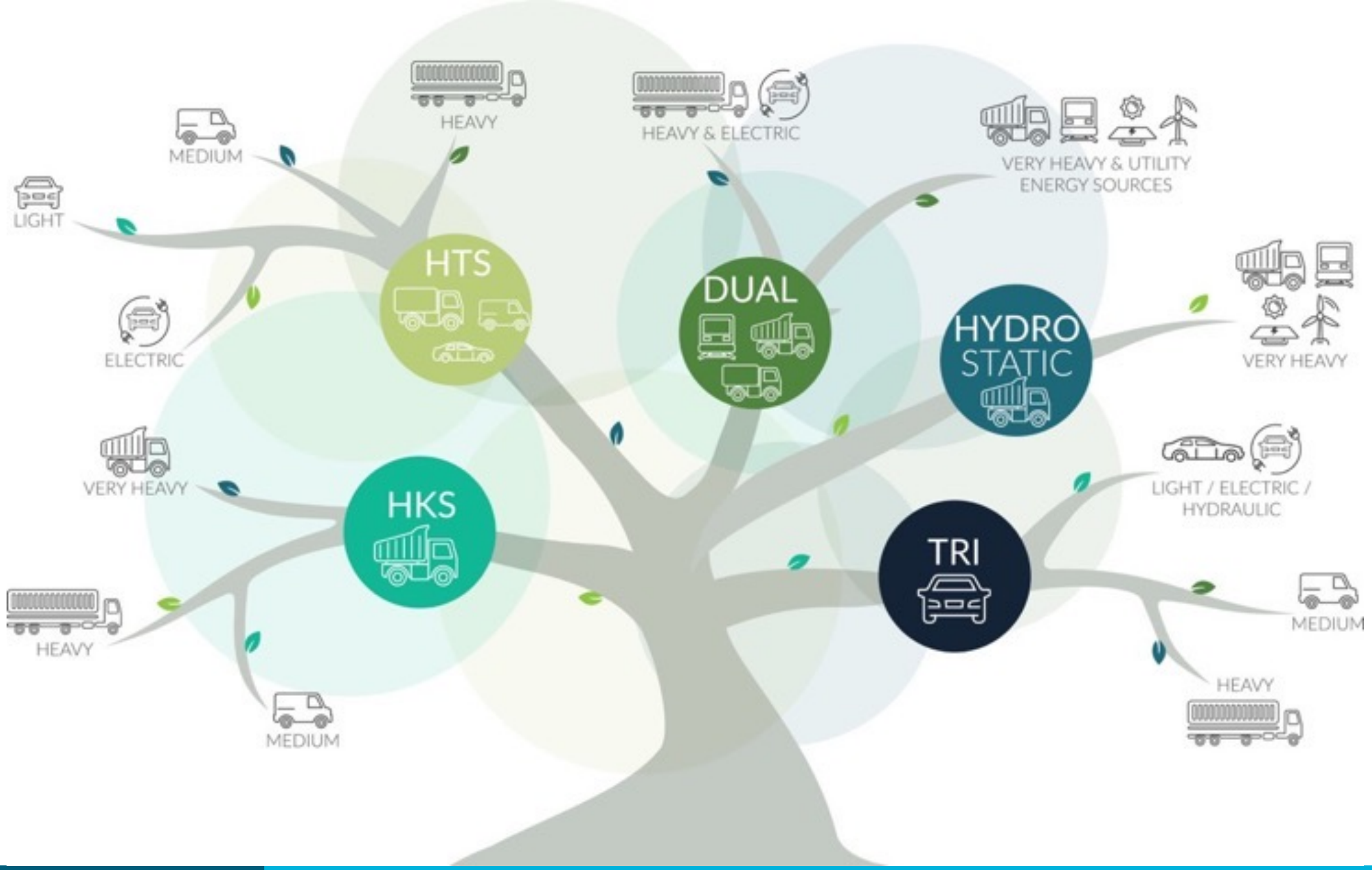
The Project = Combine the above to create the best electric vehicle, for now and for the future!

No need for torque converter or flex plate



Hydraulic or electric unit with regenerative braking and engine optimization efficiencies




HEAVY
HEAVY & ELECTRIC
MEDIUM
LIGHT
VERY HEAVY & UTILITY ENERGY SOURCES
HTS
DUAL
HYDRO STATIC
ELECTRIC
VERY HEAVY
VERY HEAVY
LIGHT / ELECTRIC / HYDRAULIC
HKS
TRI
HEAVY
MEDIUM
MEDIUM
HEAVY

ENERGY
CATALYST

Pitch 3:
GreenThermo Energy

Innovate UK

Foreign, Commonwealth & Development Office

Department for Business, Energy & Industrial Strategy

UKaid
from the British people

GREENTHERMO ENERGY

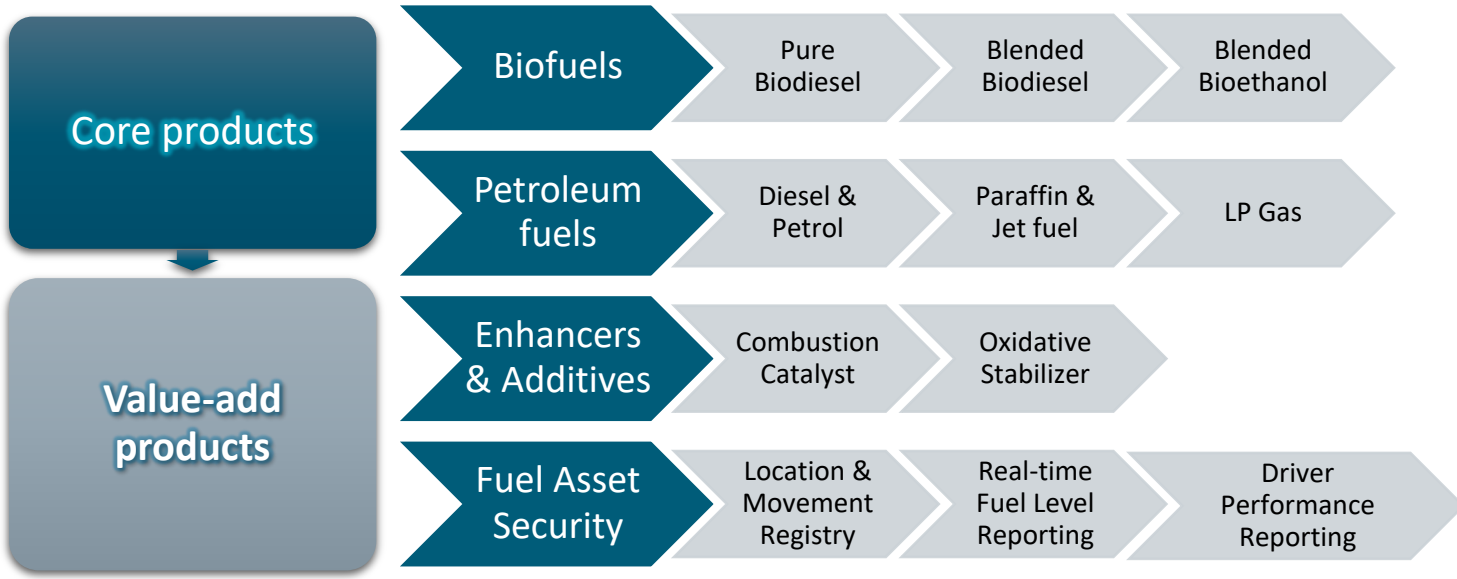
ENERGY CATALYST PITCH

COMPILIED BY: REARABETSWE DIRE

ABOUT THE COMPANY

GreenThermo Energy (Pty) Ltd:

- Emerging SMME and a B-BBEE Level 1 contributor
- Fully licensed and authorized to supply Fuels and value-added ancillary Products, with particular focus on **Clean Renewable Fuel**.



Email: rea@greenthermo.co.za
Cell: +2783 6127 243

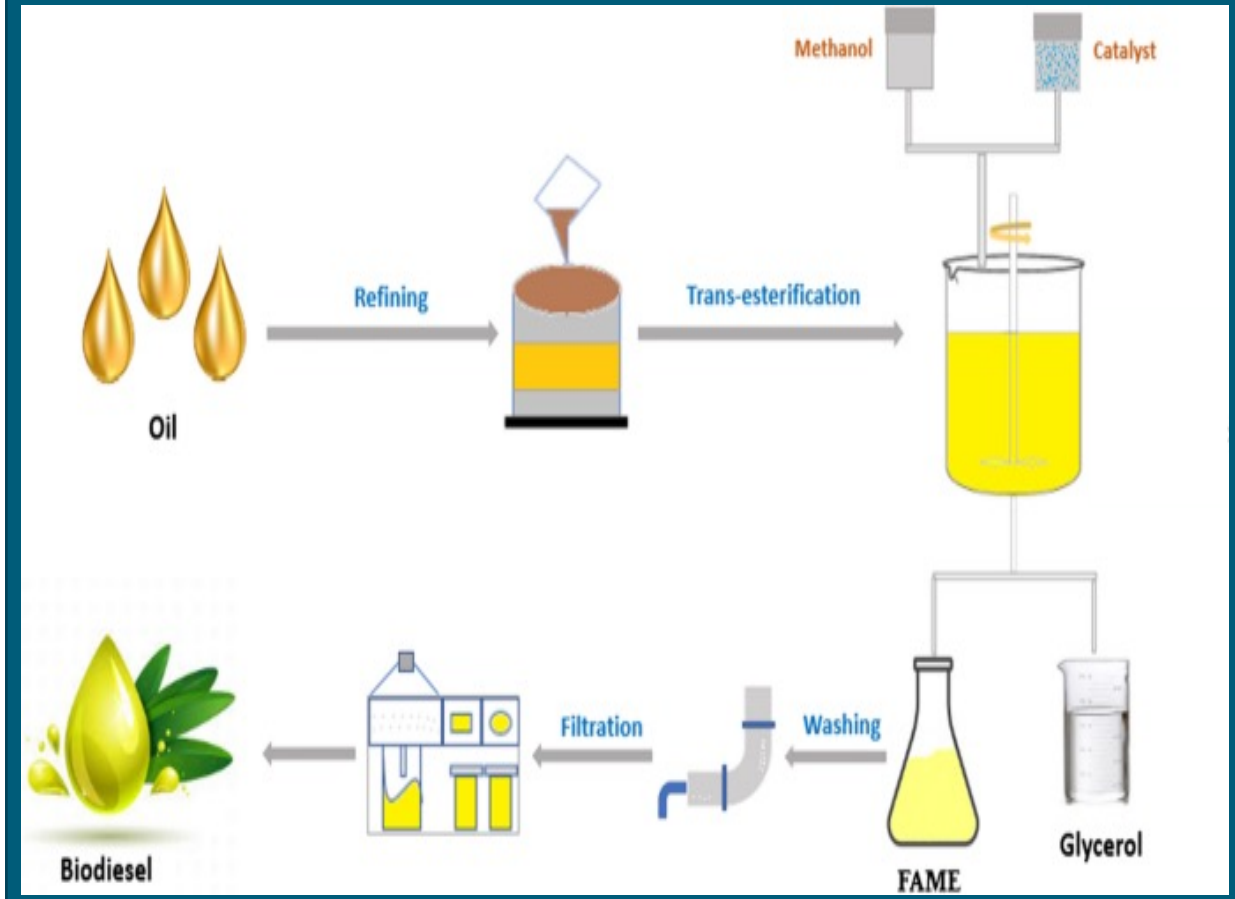
THE PROJECT

- Manufacture of B100 Biodiesel for supply to the Client, a leading international Petroleum Major in SA, requiring 2.5mil Lit in project Year-1.
- Product to be delivered to the Client's nominated blending depots
- R8m is required for funding of the project infrastructure plus initial working capital
- Client is open to provide a 'significant' part of the required funding (value TBA), which will be gradually written off against invoices, in accordance with its ESD policy
- GTE appeals for bridging finance of at least R2.5m

Current Status of the project:

- GTE has completed the Client's vendor onboarding requirements and due-diligence processes
- Client has internally approved the Business Case and value proposition, with the key suppliers for plant; equipment; and raw materials vetted and accepted
- Client has appointed a specialist consultancy to compile the bespoke ESD Funding Proposal on behalf of GTE. Kick-off engagement with the consultants took place on 7th June'22

Biodiesel Production Process Diagram :



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OUR CAPABILITIES

- Expertise on the production of high quality biodiesel.
- GTE currently holds a fuel wholesaling license which permits us to produce and supply up to 300,000Lit/yr of biofuel, as well as an import-export license. In addition we are in the process of obtaining a biodiesel manufacturing licence, which will allow us to produce biodiesel at a commercial scale.
- We have a leased warehouse at which we store & prepare our locally sourced UCO.
- We have participated in Tolling arrangements with other parties for the production and supply of biodiesel.

Email: rea@greenthermo.co.za
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DESIRED PARTNERS

- Funders that can assist with funding of the project
- Technical Experts on how to optimise the production and refining of our biodiesel
- Feedstock (UCO) suppliers
- Offtakers for our By-product (glycerol)

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ENERGY
CATALYST

Thank You!

You are welcome to join us for a light lunch and ecosystem networking.

UKRI Innovate UK

Foreign, Commonwealth & Development Office

Department for Business, Energy & Industrial Strategy

UKaid from the British people