

# Scale | Impact Cleantech

## Cohort Book

*#ScaleImpactCleantech*



Business solutions for  
startups and scale-ups  
*Demand more, get more*



# Scale | Impact Cleantech

Seven leading, purpose-driven scale-ups who are solving global problems with technology solutions have been selected to participate in our cohort. The companies work alongside PwC and Carbon Limiting Technologies to enhance their business proposition.

Our programmes support **growth businesses** through **expertise**, relationships and client connections from our global network.

Over 10-12 weeks we give scale-ups access to our insight, **new channels to market** and the full benefit of our extensive corporate community

We believe scale-up potential. We **leverage our experience** of growing and enhancing businesses to get them there quicker.



**7**  
Scale-ups

**>£30m**  
equity

**>120**  
employees

# Meet the cohort



Our scale-up programme takes 7 product ready, high potential cleantech companies and connects them to industry leaders to create mutual commercial opportunities.

We bring the latest disruptive technologies from around the world together with established expertise to create opportunities for growth.

Today, each member of the cohort is asking to be introduced to your organisation and network as they continue to scale and grow.

The logo for ccmtechnologies, featuring a stylized 'm' inside a circle followed by the text 'ccmtechnologies' in a green sans-serif font.The logo for light fi, featuring a stylized yellow 'i' icon followed by the text 'light fi' in a black sans-serif font.The logo for OXTO ENERGY, with 'OXTO' in large teal letters and 'ENERGY' in smaller teal letters below it.The logo for arvia, featuring the word 'arvia' in a blue, lowercase, sans-serif font.The logo for Virtual Power Solutions, featuring the letters 'V', 'P', and 'S' in white on green squares, with the text 'Virtual Power Solutions' below.The logo for U-EARTH BIOTECHNOLOGIES, featuring a stylized blue sun icon above the text 'U-EARTH BIOTECHNOLOGIES' in a blue sans-serif font.The logo for naked energy, featuring a stylized orange and red wave icon followed by the text 'naked energy' in a black sans-serif font.

*Founded: 2011*

*Employees: 9*

*HQ: Oxfordshire, UK*



*Pawel Kisielewski (CEO)*

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## **Overview**

CCm Technologies has invented and patented technology to efficiently use industrially segmented CO<sub>2</sub> and other waste materials; safely converting them into materials with commercial value. Additionally the process generates significant quantities of exothermic heat for application in storage and power generation solutions. The sustainable process can permanently and cost effectively remove CO<sub>2</sub> from the environment, generating energy and reducing industrial waste. CCm's process not only reduces carbon costs but also creates sustainable products of value for a sustainable Circular Economy.

## **Use Cases**

**Waste management** - CCm's technology is being used to exploit the CO<sub>2</sub> outputs of waste management plants in order to produce products of value and improve environmental performance. Energy released in this process combines with primary waste reduction to significantly enhance plant profitability and environmental efficiency.

**Fertiliser** - producing high-grade compound fertiliser and through the use of multiple waste materials, including captured CO<sub>2</sub> from industrial power generators.

**Water Utility** – In addition to upgrading bio-solids, CCm's technology is able to extract the waste Phosphorous and Ammonia from wastewater discharge.

**Plastics** - CCm Technologies has developed a fibre which absorbs large amounts of CO<sub>2</sub>. The CO<sub>2</sub> becomes permanently fixed to the fibre surface and the resultant coated fibres can be incorporated into a wide range of plastics.

**Heat Storage** – The technology's significant exothermic heat is available for critical industrial and district thermal applications.

## **Business model**

CCm is owner and licensor of the technology capable of generating IRRs of 15-18% without subsidies, enabling rapid application in multiple fields and jurisdictions. Its license business model insulates CCm from most of the challenges of Brexit. While partners have been identified in Australia, Canada and two European jurisdictions, further alliances are being pursued.

*The ask  
from us*

**Potential clients (UK) and partners (international) in the waste, water utility and renewables sectors are being sought to exploit the IP protected commercial technologies.**

***Founded: 2016***

***Employees: 5***

***HQ: London, UK***



***Alex Bak (CEO and Co-Founder)***

 [alex@lightfi.io](mailto:alex@lightfi.io)

 <https://www.lightfi.io>

## ***Overview***

LightFi's vision is to transform existing buildings into energy efficient and healthy buildings, and make it easily accessible to everyone.

Using wireless signals and machine learning LightFi gives you a detailed view of how, where and when people are using your space in real-time. Seamless integration with BMS enables demand based HVAC automation that is responsive to what is actually happening in the room.

LightFi adds value across the built environment industry, with an easy plug-and-play install: no rewiring; and only a few LightFi sensors per large floor plan.

## ***Use Cases***

- Corporate clients with multiple offices
- Facilities management
- Real estate management
- Landlords
- Airports
- Universities
- Retail
- Energy saving & carbon reduction
- Improve indoor air quality
- Showcase a healthy working environment
- Know how your buildings are being used
- Optimise soft services (cleaning, security)
- Utilise space

## ***Business model***

Product sales and installation support for energy saving (option: shared energy savings).  
Subscription model for environment and occupancy data on cloud platform.

*Founded: 2016*

*Employees: 12*

*HQ: Guildford, UK*



*Michael Willemot (CFO & Business Development)*



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

## **Overview**

OXTO Energy was created with the vision of delivering high performance, full life cycle, environmentally friendly energy storage solutions to help transition to a low-carbon world at the lowest possible cost. Its passionate and experienced team have successfully developed an innovative flywheel system, using mechanical battery technology that stores energy in the form of kinetic energy in a rotating mass. Designed to work alongside renewable technologies such as wind and solar, the flywheel allows intermittent renewable generation to continue generating, even when the energy is not necessarily required. The excess energy gets stored in OXTO's steel flywheels and then released when demand increases. The product has achieved unseen cost reductions, the highest reliability and lowest operational costs compared to other existing technologies while being easy and fast to install, scalable and without using scarce resources.

## **Use Cases**

OXTO helps renewable integration. OXTO works with utilities and energy companies, by developing co-located projects with renewables to provide grid services, frequency response and inertia capabilities. Salzburg AG, an Austrian Utility, and Energy Australia, a vertical integrated energy company, will install pilot projects with our flywheels.

Flywheels can be also used for fast-charging electric vehicles by topping up to grid connection. Flywheels are adapted for industrial applications of power quality, voltage support and UPS.

## **Business model**

OXTO Energy is a technology provider and has a flexible business model, depending on the client constraints and preferences. OXTO energy storage system is either:

- sold, transferring the ownership to the client
- provided as a service, using a commercial agreement with a basic amount of energy included and additional energy use charged in supplement
- deployed in a partnership structure such as JV, with revenue sharing.

**The ask  
from us**

**We are looking for clients and partnerships with energy companies,  
utilities and electrification of transport.**

**Founded:** 2007

**Employees:** 40

**HQ:** Cheshire, United Kingdom



**Mike Lodge (CEO)**

 [mike.lodge@arviatechnology.com](mailto:mike.lodge@arviatechnology.com)

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

## Overview

**A UK-based team of commercial professionals and water treatment engineers with over a decade of system design, manufacturing and installation experience. Arvia offers robust and cost-effective solutions for targeted tertiary treatment.**

Arvia's Nyex™ Treatment Systems reduce hard-to-treat organics, micropollutants and colour from water and wastewater streams. Our skill in design and product application ensures that each system is tailored to meet all of your water treatment requirements, guaranteeing regulatory discharge compliance, safe water reuse or inlet water treatment.

## Use Cases

The system has proven to be a successful treatment method in a variety of different applications around the world. Due to its modular nature, it can easily be scaled and retrofitted to existing treatment works to tackle emerging contaminants and to meet changes in regulation.

Failure to comply with regulation can result in a loss of permit, operational downtime, limited production volume and severe fines. By adopting a wastewater treatment process which has the ability to remove trace levels of organics, you can meet regulation and prove commitment to the protection of the environment.

Industry applications:

Pharmaceutical

Chemical

Municipal

OEM/CPCs

Food and beverage

Oil and Gas

Textiles

Pulp and Paper

## Business model

We sell Nyex™ Treatment Systems, and offer service and maintenance of our products. The technology is typically deployed in a container, where it is made into a plug and play design to seamlessly integrate into a treatment train.

**The ask  
from us**

**Connections to sustainability and environmental teams in relevant industries to provide safer water for future generations.**



Virtual Power  
Solutions

*Founded: 2015*

*Employees: 37*

*HQ: London & Coimbra, Portugal*



*David Smith (UK Operations Director)*

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## **Overview**

Virtual Power Solutions is an innovative, market leader in the design and operation of dynamic connected platforms, providing real-time granular data to consumers, network operators and utilities. We minimise consumption by increasing energy efficiency, optimising the time of use and monetising loads.

Our team of experts has a strong and proven track record in providing significant benefits to all stakeholders in the modern energy network. We aim to be the largest European Virtual Power Plants' builder and operator.

The Power to do more with less.

## **Use Cases**

- **Kisense** analyses energy consumption data in real time, providing vital information and knowledge so that your company's decision making concerning energy management is easy and quickly adapted.
- **Kiplo** provides utilities and energy communities with the option to build Connected Networks, so you can own and operate your customers demand and generation as a single Virtual Power Plant.
- **Cloogy** allows you to discover where you can save energy and get key information about the best way to optimise your electrical appliances, putting an end to waste and unnecessary costs.

## **Business model**

Energy as a Service – offers it's self as a long term energy management & optimisation partner to companies.

***The ask  
from us***

**We are looking for additional Commercial relationships and partnerships that drive large scale commercial orders.**



*Founded: 2009*

*Employees: 15*

*HQ: London, UK*



*Betta Maggio (CEO and Founder)*

 [betta.maggio@u-earth.eu](mailto:betta.maggio@u-earth.eu)

 [www.u-earth.eu/](http://www.u-earth.eu/)

## *Overview*

U-earth will plant powerful virtual forests to help nature get rid of pollution and finally breathe the air quality every human deserves.

It will be done by planting one machine at a time.

The machines – or bioreactors – come with a proprietary formula of non-pathogenic, non-GMO bacteria that eat and destroy any air pollutant, virus and odour.

The machines are multisize and fully-scalable. They can be used both indoor and outdoor, and produce no harmful waste. Spaces treated are certified “Pure Air Zone”, creating a community united by the goal of actively contributing to making the world a better place.

## *Use Cases*

Having been in development for nearly 8 years, U-earth tested and validated the solution across different industries. In any industry, clients end up saving on energy bills as they need less ventilation and air conditioning.

- 1. B2B:** - If used in **offices**, employees get sick less often
  - If used in **factories** and farms, it intercepts and destroys pollutants at their source
  - If used in **hospitals**, it prevents cross-contamination between patients
- 2. B2B2C: Hotels, Gyms, Restaurants,** and similar use it to attract more clients.
- 3. B2G: Airports, Subways, Schools, Parks...** there should be a machine everywhere to prevent every one of us from getting sick and being a cost to the State.

## *Business model*

1. Sale: the customer buys the bioreactor and periodically purchases the refill of bacteria (every 3 months)
2. Leasing: the customer pays a monthly fee to get the bioreactor and full maintenance (incl. bacteria)

*The ask  
from us*

**We would love to improve people’s health through pilots with corporate and government clients.**

# naked energy™

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*Founded: 2009*

*Employees: 8*

*HQ: Gatwick, UK*



*Christophe Williams (CEO)*



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[www.nakedenergy.co.uk](http://www.nakedenergy.co.uk)

## **Overview**

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“More energy, less space”

Naked Energy Ltd, is an energy company that can help businesses take control of their energy costs with a distributed solar solution called Virtu. The patented hybrid solar technology produces heat and power from the same roof area, delivering 30-50% more cash savings and 80-300% more carbon savings, compared to solar PV.

Naked Energy has partnered with a global manufacturing group and market leading energy design group to help businesses around the world take control of their energy costs.

## **Use Cases**

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Businesses with the most to gain from decarbonising the production of both heat and power for their buildings include organisations in construction, real estate, hospitality and the food and beverage industries.

Depending on location, typical paybacks can range from 3 - 7 years and IRR 12 - 25%.

## **Business model**

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Naked Energy has developed significant IP portfolio and uses an outsourced model for manufacture. Fully integrated projects can be delivered with Naked Energy's established design and installation partners.

***The ask  
from us***

**We are looking for commercial sales and flagship projects.**

# *PwC and Carbon Limiting Technologies*



***With the combined network and business expertise of PwC and Carbon Limiting Technologies, we are well positioned to identify and nurture fast-growth impact ventures across all stages of the growth cycle.***



In this age of uncertainty, with the opportunities of emerging technology and an increasing sense of social responsibility, the order of business is being reimaged. PwC wants to help create an ecosystem of players of all sizes working together to reach the ambitious 2030 global agenda of the Sustainable Development Goals. Through PwC's Social Entrepreneurs' Club, we have been supporting socially motivated entrepreneurs for years, and we now aim to extend this support to impact-driven scaleups that are ready to accelerate their growth.



CLT works with early stage companies, corporates, investors, and government organisations to support and grow businesses developing sustainable technology innovations in the UK and internationally. Over the past 12 years, our multi-disciplinary consultancy team has worked with over 350 low carbon innovators in the transport, power, industry, waste and buildings sectors. Through provision of commercialisation support services including market engagement, access to finance, creating industrial partnerships and building strategic business plans we accelerate business growth and drive value into venture portfolios.

## *“Innovation tailored to your business.”*

Scale<sup>+</sup> brings cutting edge technology scale-ups to large organisations to embed innovation, enable co-creation and solve important problems. Using our established network of experts, leading scale-ups, and advisory specialists, we make innovation simple, cost effective and repeatable.



**Hand-picked scale-ups** to solve your challenges and enhance customer experience



**Integrated partnerships** with game-changing technology



**Increased competitiveness** in the digital market environment



**Unleash entrepreneurial talent** of your employees



**Showcase your brand** in innovation



**Rapidly test** new technologies cost effectively

- PwC's Scale<sup>+</sup> offers large organisations tailored access to relevant scale-ups who are at the forefront of solving your business challenges. We bring process know-how, well-founded market knowledge and our extensive scale-up network to you.
- PwC experts work with you to diagnose your search criteria, identify appropriate scale-up profiles and prepare your business and founding teams for co-creation.
- Through your active involvement in the personalised process, we bring a high and sustainable level of know-how transfer to your own organization, embedding entrepreneurial culture.
- Our bespoke service, enables you to have the skills to develop innovations with scale-ups in all dimensions (organisation, processes, technology) and accelerate digital cultural change within your organisation.





**200 Scale-ups**



**8 locations, 9 sectors,  
21 programmes**



**25 ecosystem  
partners**



**16 countries  
represented**



**2,000 corporate  
executives**



**2,500  
introductions**



**500 PwC Partners  
& Staff**



**150+ pilots**



**+£1bn scale-ups  
valuation**





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The programme has given us access to an amazing range of skills and talent inside of PwC and has enabled us to generate a significant pipeline of corporate clients that have expanded and accelerated our growth plans.

**Lorren Wyatt**  
**MD Select Research**

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# ***Notes***

Lined area for notes.



***Demand more, get more***  
*[pwc.co.uk/demandmore](http://pwc.co.uk/demandmore)*

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