

Delivering a Clean Energy Revolution



Bennamann

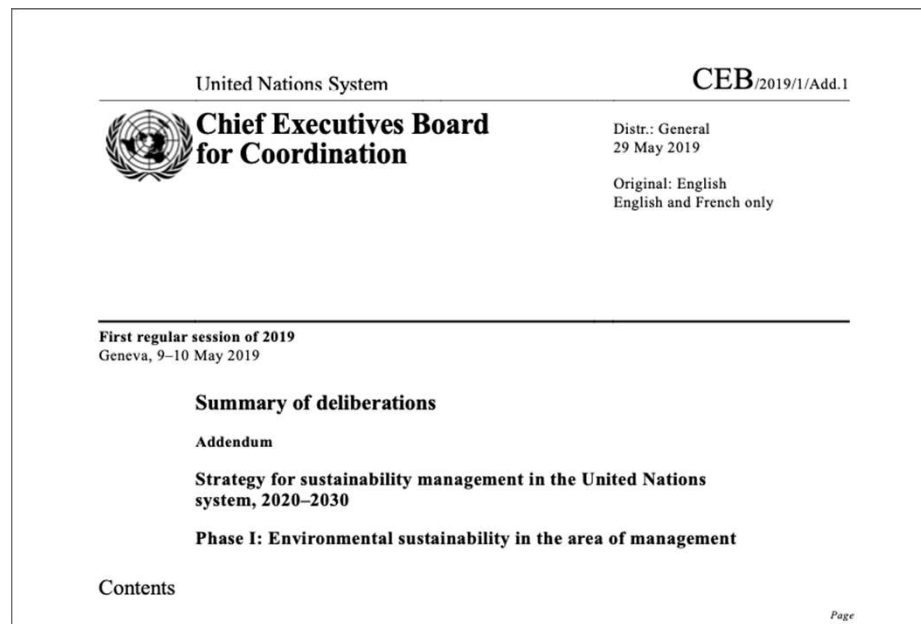
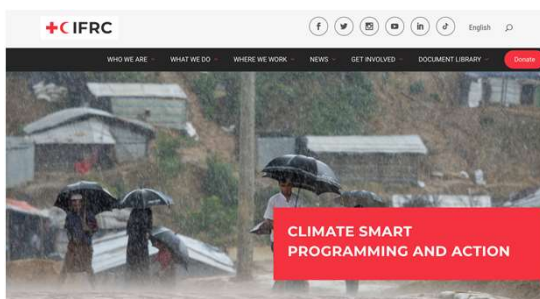
CONTEXT



“The need to clean the fleet”



ACTED ABOUT US WHAT WE DO IN THE FIELD DONATE

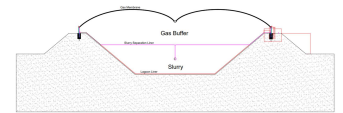


‘Ensure that United Nations premises and fleet do not contribute to or exacerbate local air quality issues, in both urban and remote community settings’

Source: UN Strategy for sustainability management in the United Nations system, 2020–2030 (May 29, 2019)

WHAT BENNAMANN DO

“We want to turn every farm, parkland & community into a green power station”



GRASS



FUEL, HEAT & ELECTRICITY



COMPRESSED / LIQUID BIOMETHANE

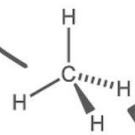


COVERED SLURRY LAGOON

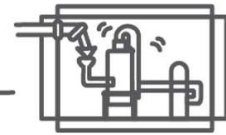
STORAGE



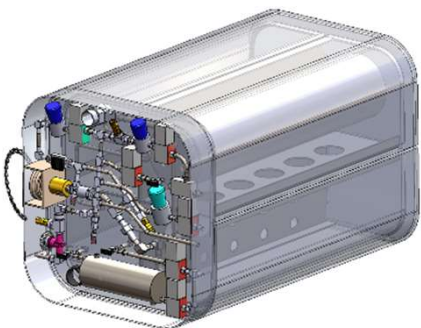
BIOGAS



BIOMETHANE

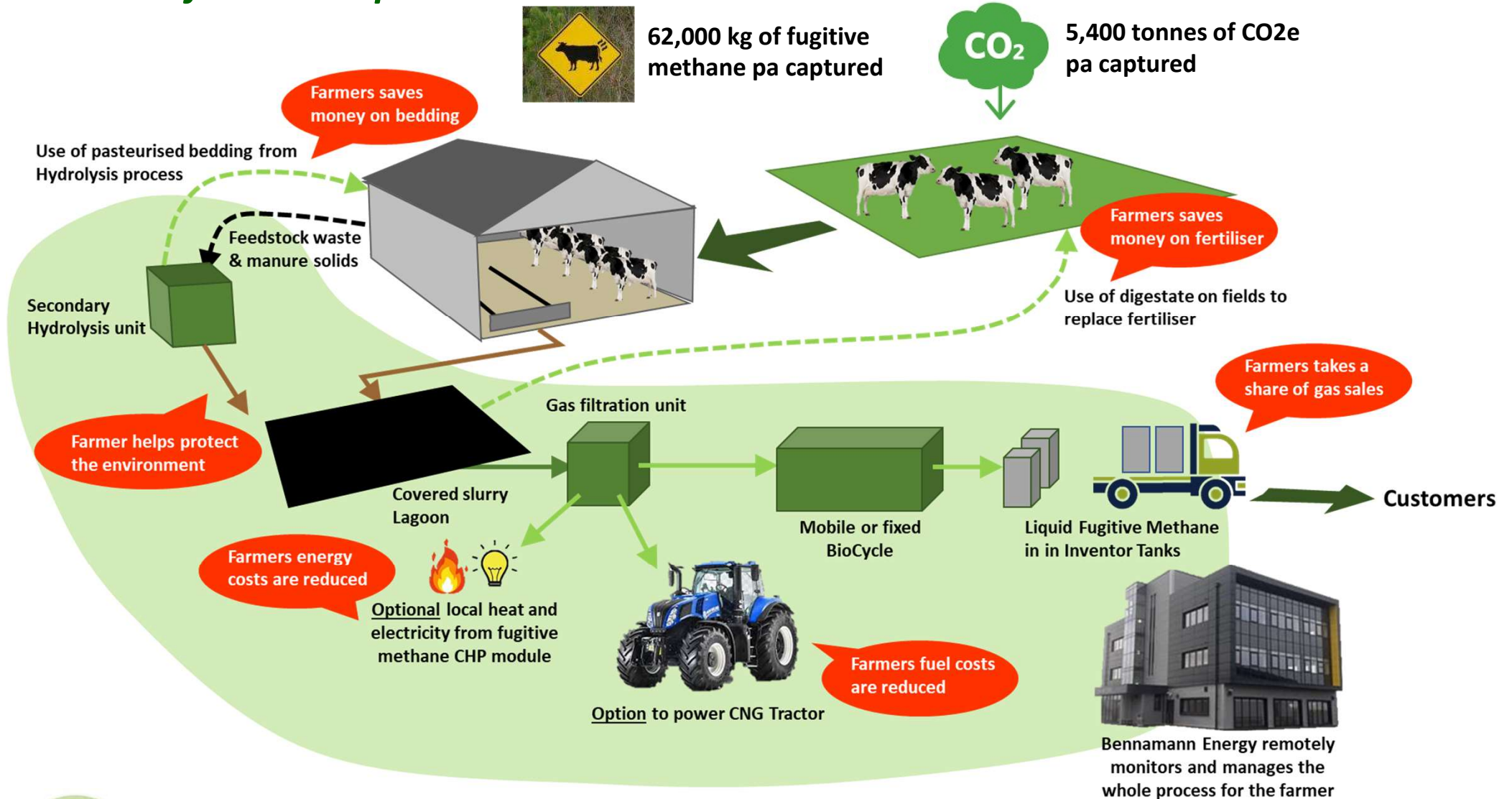


PROCESSING



TYPICAL AGRICULTURAL APPLICATION (UK)

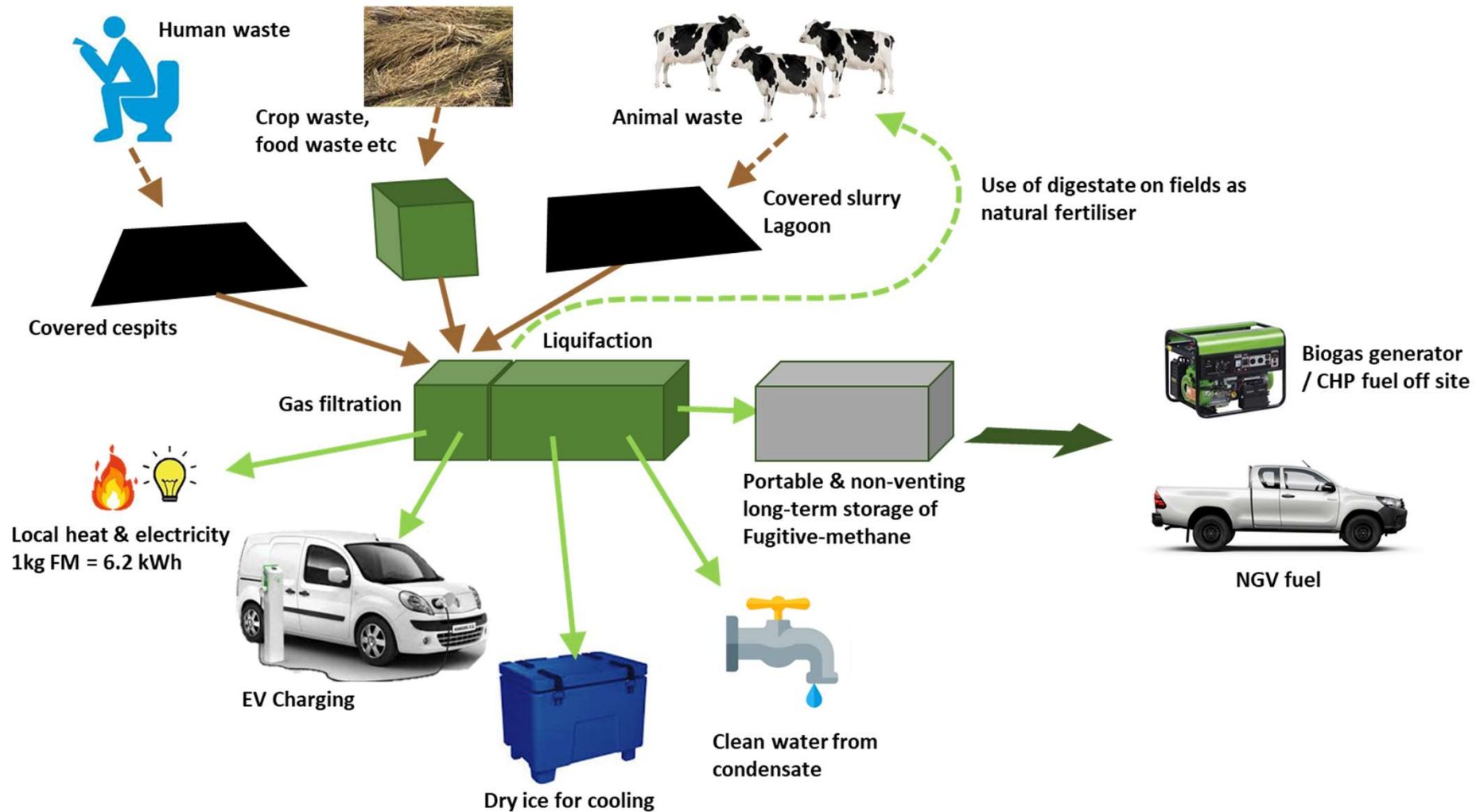
150 cow farm example



£21k of fertiliser saving to farmer
 £15k on-site energy cost savings
 £ 17k gas fuel / EV charging revenues share pa
 £ 25k RTFC and Carbon Credit subsidy share pa

*This is 115% more income than from milk at £0.04 per litre pa.
 I.e the farmer will more than double their income*

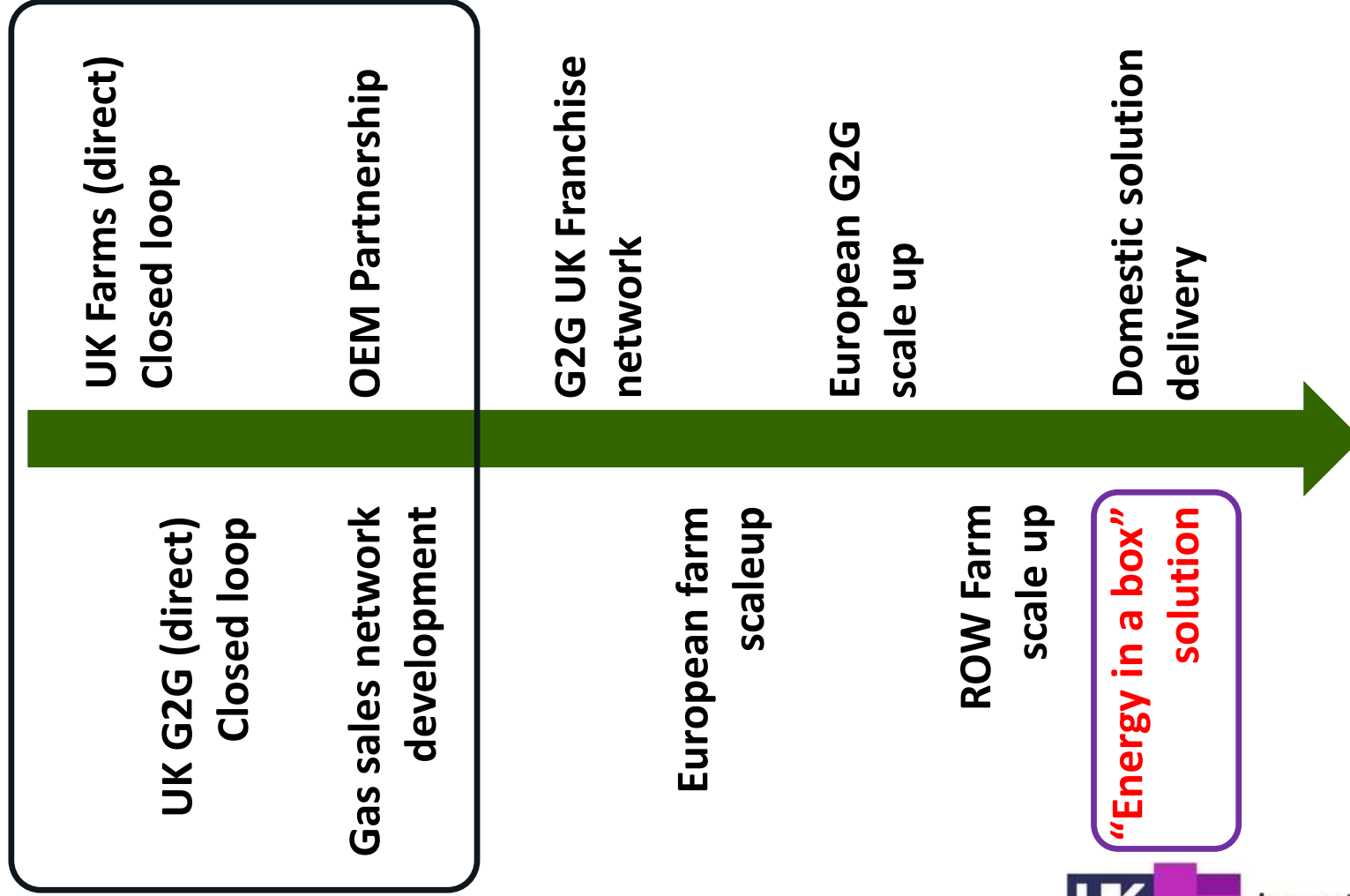
BENNAMANN'S "ENERGY IN A BOX" VISION



1. *De-carbonise aid operations*
2. *Help protect the local environment in terms of fugitive methane & Ammonia*
3. *Improve public health*
4. *Support self-sufficiency*
5. *Help combat fuel poverty*

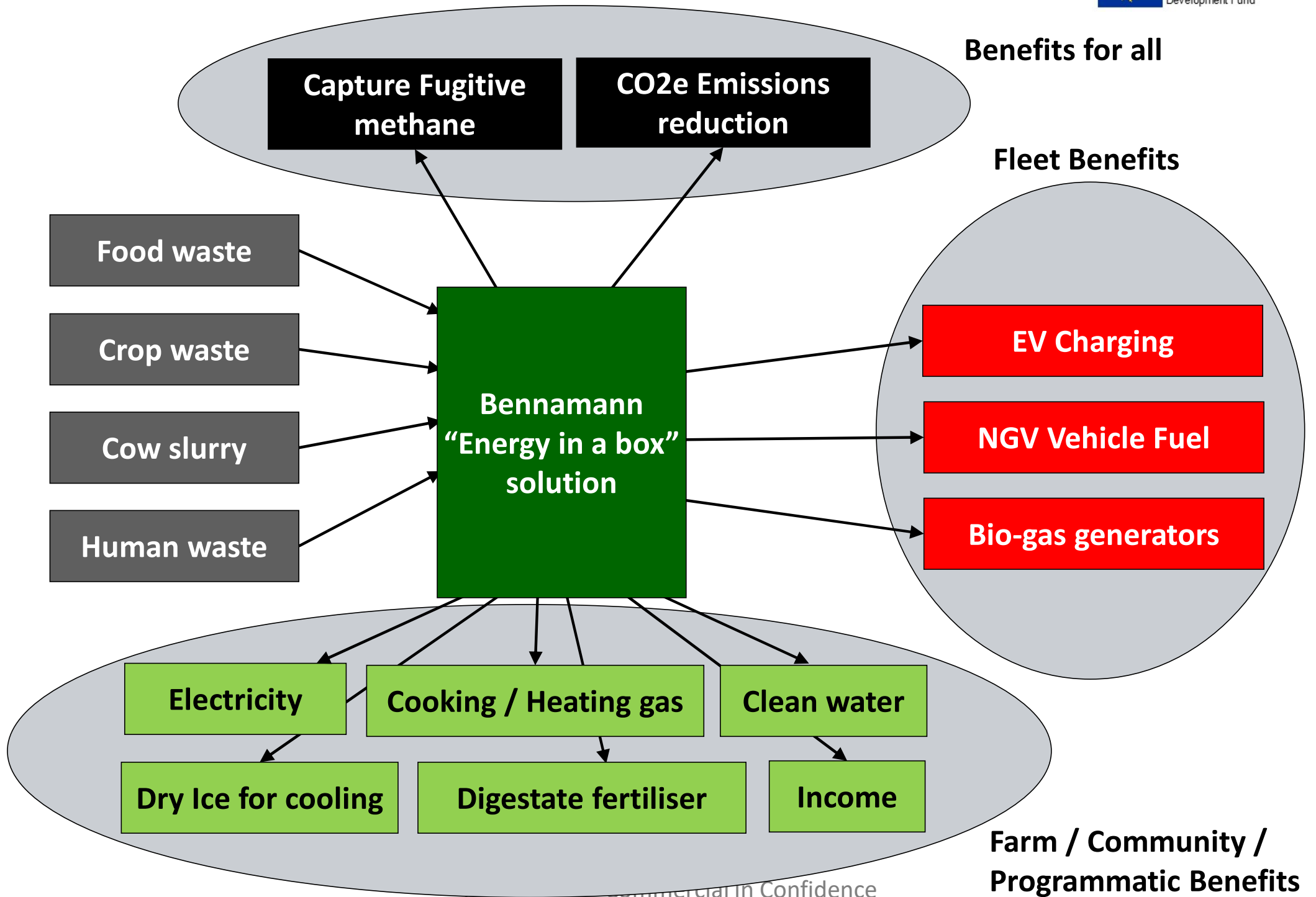
HIGH LEVEL ROADMAP

NOW



Environment?
Simplification?
Cost down?
Security?
Support?
Logistics?

BENEFITS FOR ALL



FLEET MANAGEMENT BENEFITS

De-carbonise fleet operations

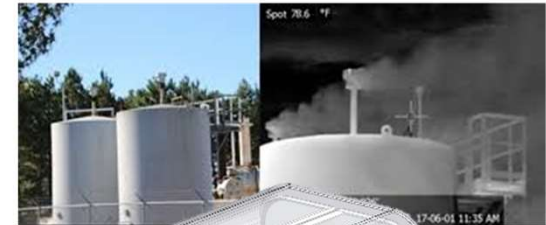
When combusted 1 kg of diesel emits 2.7 kg CO₂

When combusted 1 kg of fugitive / bio-methane is carbon neutral

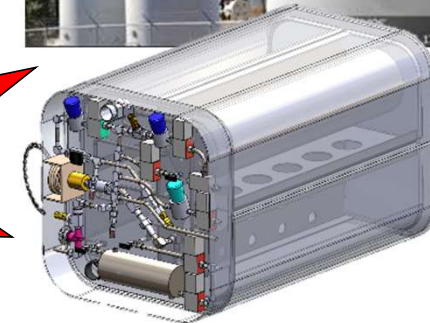
60% NO_x emission reduction as well as other pollutants (Sulphur, Ammonia etc)

Capturing 1 kilo of fugitive methane removes a further 86 kg of CO₂e from the atmosphere

What about boil off?
Do we need to flare?



**GAME
CHANGER**



By burning Fugitive methane in NGV vehicles or to generate electricity & heat you will be **CLEANING** the planet

Inventor tank storage means ZERO venting of the Liquid Fugitive Methane, non-polluting, easy storage & distribution

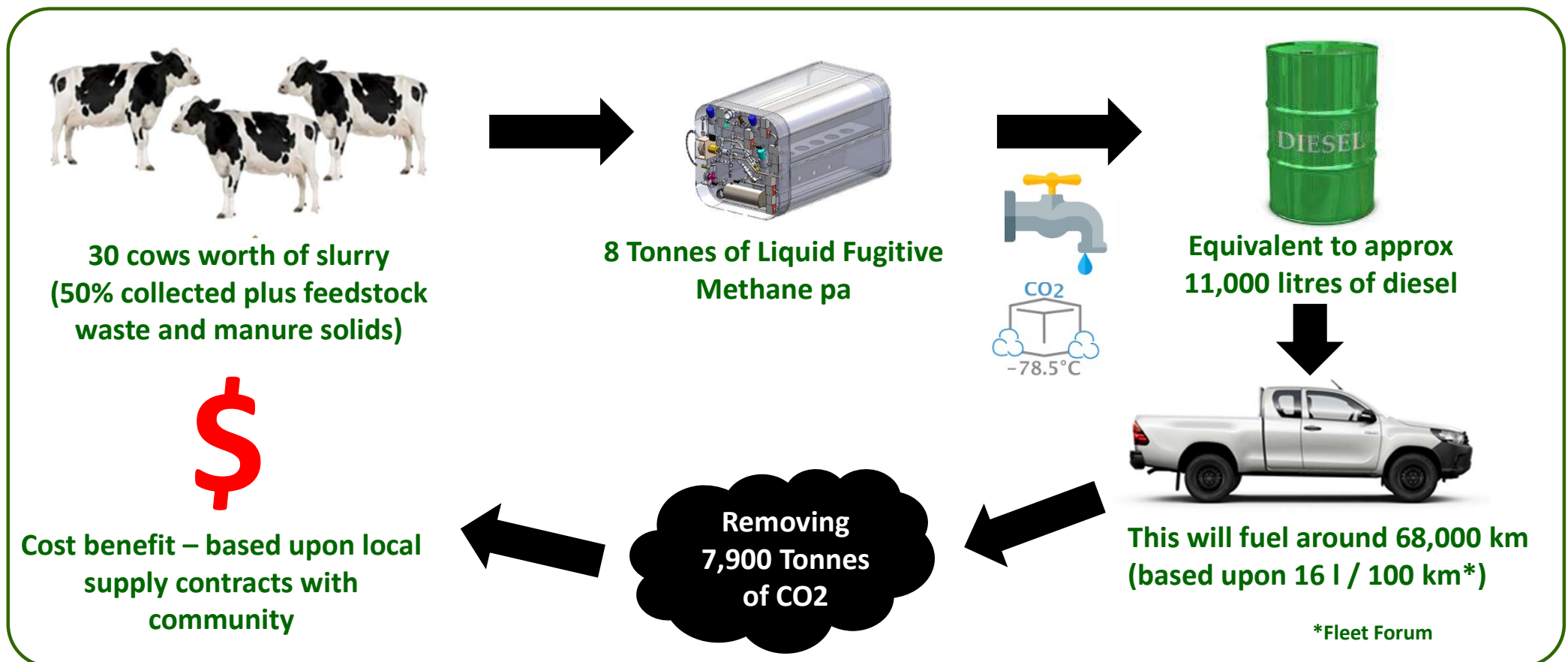
FLEET MANAGEMENT BENEFITS

De-carbonise fleet operations by supporting Natural Gas Vehicle fuelling

LFM can be used as CNG or LNG equivalent

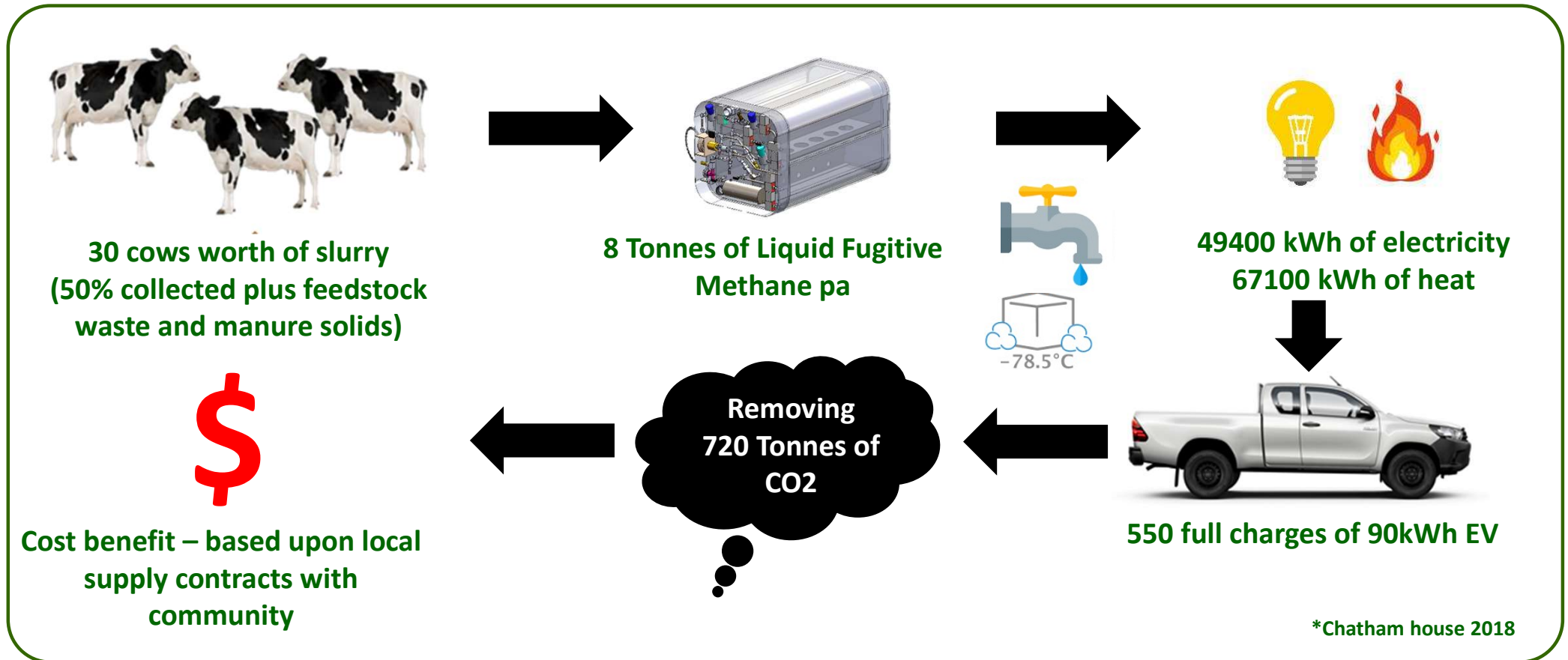
Even with current methane engine slip levels, the carbon negative value of fugitive methane means a less than zero CO₂e impact. (20% methane slip through engine still means a 69kg CO₂e benefit per kg of liquid fugitive methane)

The Inventor tank on vehicles (ie not just for storage) will improve range as and when incorporated into vehicles (working with some OEMs now)




FLEET MANAGEMENT BENEFITS

Providing local heat and power (including for EV charging)



THE INNOVATE UK FUNDING OPPORTUNITY

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Funding competition
Energy Catalyst round 8: clean energy access, feasibility projects

Organisations can apply for a share of up to £20 million to develop and demonstrate innovative solutions for clean, affordable and secure energy access in sub-Saharan Africa, South Asia or South East Asia.

Competition opens: Tuesday 16 June 2020
Competition closes: Wednesday 16 September 2020 11:00am

Description

The aim of this competition is to support highly innovative, market-focused energy solutions in any technology or sector.

Your project must encourage the development of products and services that help countries in sub-Saharan Africa, South Asia, South East Asia or multiple regions access secure, low cost and low carbon energy. They must be targeted at people, public services and local enterprises who are unable to afford or access existing solutions, or who lack the time or expertise to successfully use those solutions.

Your proposal must also address all 3 elements of the energy 'trilemma':

- cost
- emissions
- security of supply and energy access

There are 3 options to apply into this competition. These are referred to as strands and will be run in parallel. The strands are dependent on the stage your project is at:

1. Early stage for feasibility studies (this strand).
2. [Mid-stage for industrial research.](#)
3. [Late stage for experimental development.](#)

It's a feasibility study right now:

- *The problem*
- *Potential solutions*
- *Cost, Benefits, Risks*
- *Day to day practicalities etc*

<https://apply-for-innovation-funding.service.gov.uk/competition/612/overview#scope>

NEXT STEPS

1. Expression of interest /
2. Letter of support for our bid

If we are successful in our IUK bid in September...

Help to answer key questions around environment, supplychain, costs, politics, culture, security, support & maintenance etc etc

Typically, two follow up phases we can then bid for...

1. *Field trial of prototypes*
2. *Production-ready solution*



Thank you

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