Acorn Bioenergy

Presentation for Community Councils

Fearn, Nigg and Shandwick and, Hilton and Balintore

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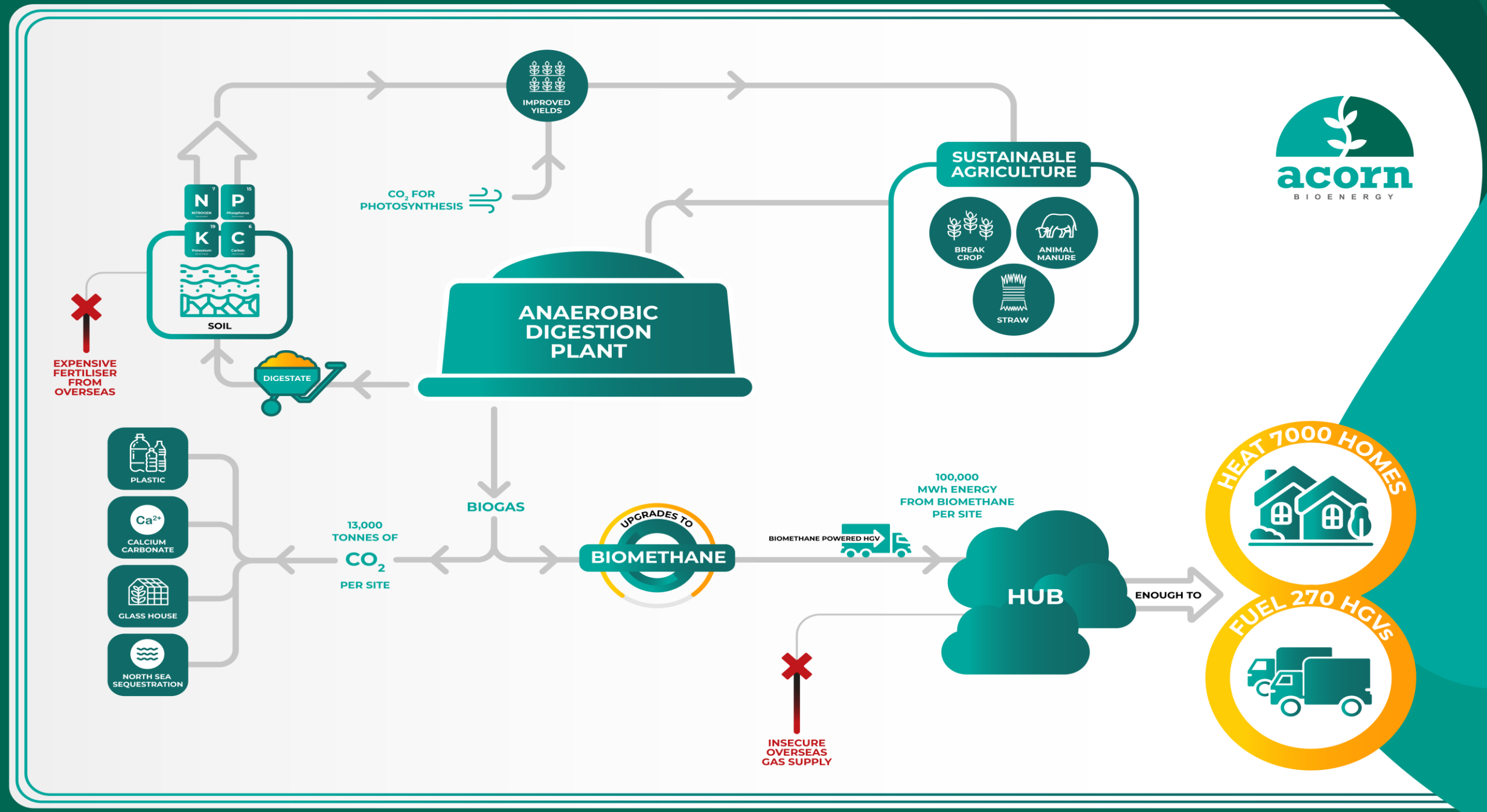
Acorn Bioenergy

What is Acorn Bioenergy? Company Update.

- We were acquired by Q-Energy in Summer 2022 who are eager to accelerate the energy transition with investment in renewable energy sources.
- We are committed to decarbonizing 'hard-to-abate' sectors by unlocking the full potential of biomethane production in the UK.
- We plan to reduce transport, industry and agriculture CO2 emissions, commencing in **2023**

Why?

- In 2021 HGVs produced **18%** of transport emissions, despite comprising **1%** of vehicles on the road
- Biomethane is a mature and well understood fuel that can be used today as a carbon-negative source of energy for heating while hydrogen and electrification solutions are in development
- Biomethane production will help Fearn and the UK transition to meet emissions targets
- Provide farmers extra sources of income and access to agronomical planning options
- Distilleries putting draff into AD enables them to be supplied with biomethane which decarbonises their operations and results in increased production to be supplied to AD and other purposes, hence driving a virtuous cycle


IMPROVED YIELDS
CO_2 FOR PHOTOSYNTHESIS
SUSTAINABLE AGRICULTURE
BREAK CROP
ANIMAL MANURE
STRAW
N
P
K
C
SOIL
EXPENSIVE FERTILISER FROM OVERSEAS
DIGESTATE
ANAEROBIC DIGESTION PLANT
PLASTIC
Ca^{2+}
CALCIUM CARBONATE
GLASS HOUSE
NORTH SEA SEQUESTRATION
13,000 TONNES OF CO_2 PER SITE
BIOGAS
UPGRADES TO
BIOMETHANE
BIOMETHANE POWERED HGV
100,000 MWh ENERGY FROM BIOMETHANE PER SITE
HUB
ENOUGH TO
HEAT 7000 HOMES
FUEL 270 HGVs
INSECURE OVERSEAS GAS SUPPLY
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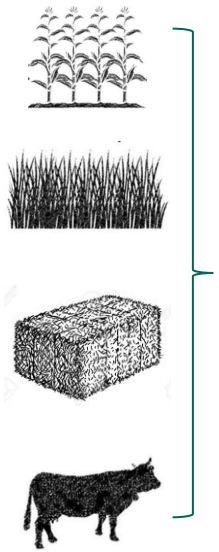
Physical vs Virtual Pipeline

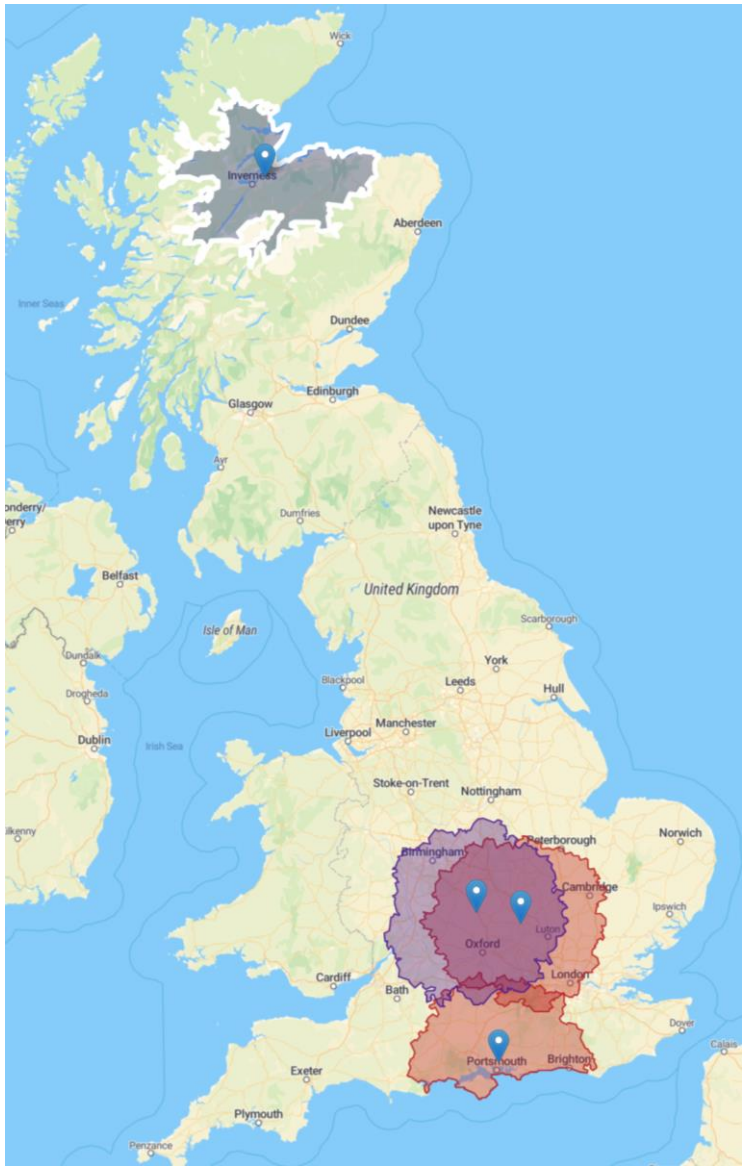
Virtual Pipeline unlocks development of AD plants in areas where not previously feasible



AD plant in rural area 100%

Virtual Pipeline
100% availability
adds only 2 gCO2e/MJ to carbon intensity

Local pipeline connection
Winter 100% capacity
Summer 25% capacity

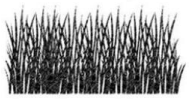


Bringing Circular Economy to Rural Areas

A local biogas project, for local people

Local farmers & businesses

Crop & grass silages:
Break crops & cover crops



Residues:
Straw
Brewery/distillery co-products

Wastes:
Farmyard manures

Acorn AD facility

Creates local jobs and employs local firms

Promotes energy security & resilience

Ability to size plant according to local feedstock supply or planning restrictions

Dispensing of biomethane as a cleaner and cheaper fuel for distilleries

Dispensing of biomethane as a cleaner alternative to diesel

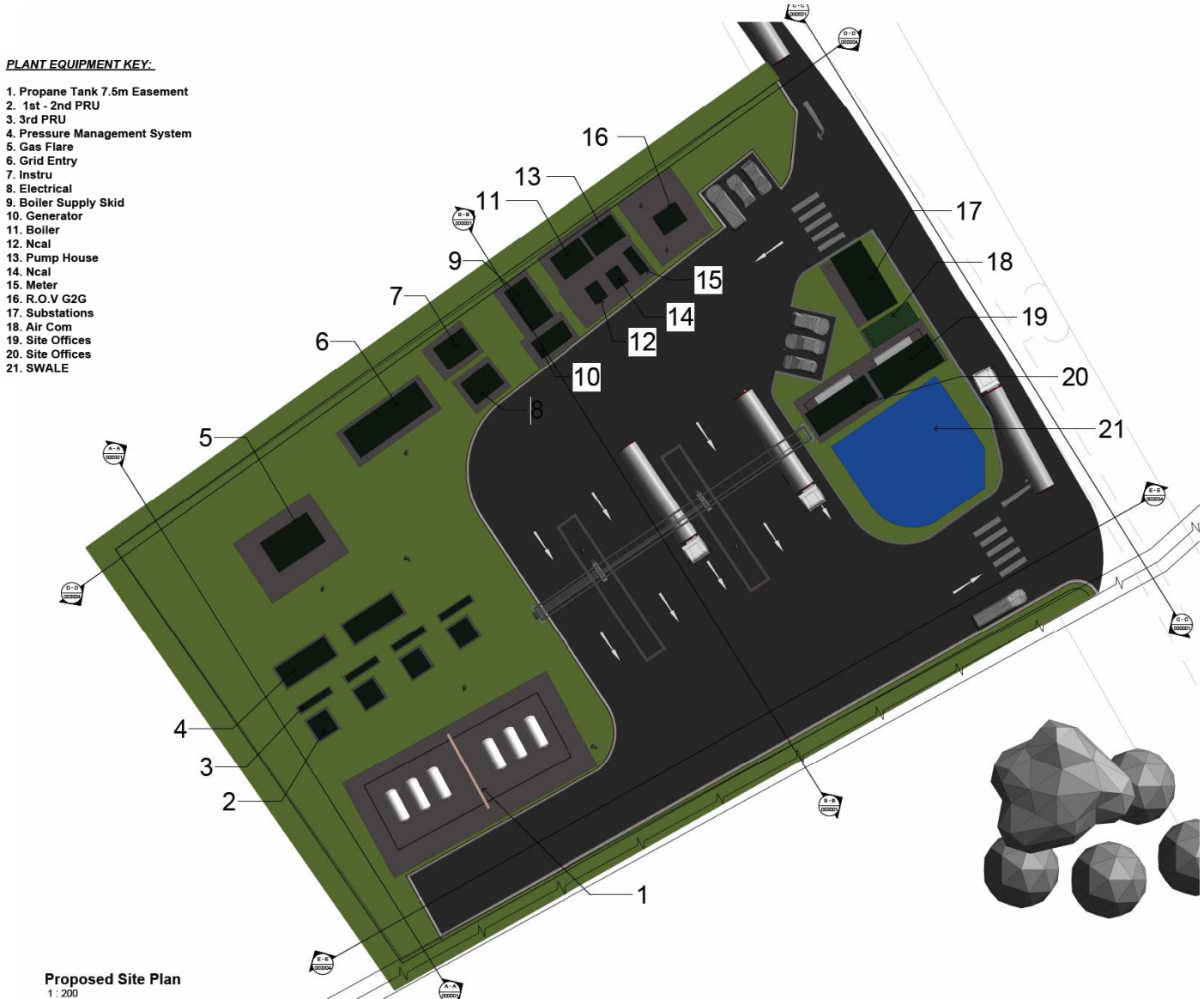
Digestate and organic fertiliser

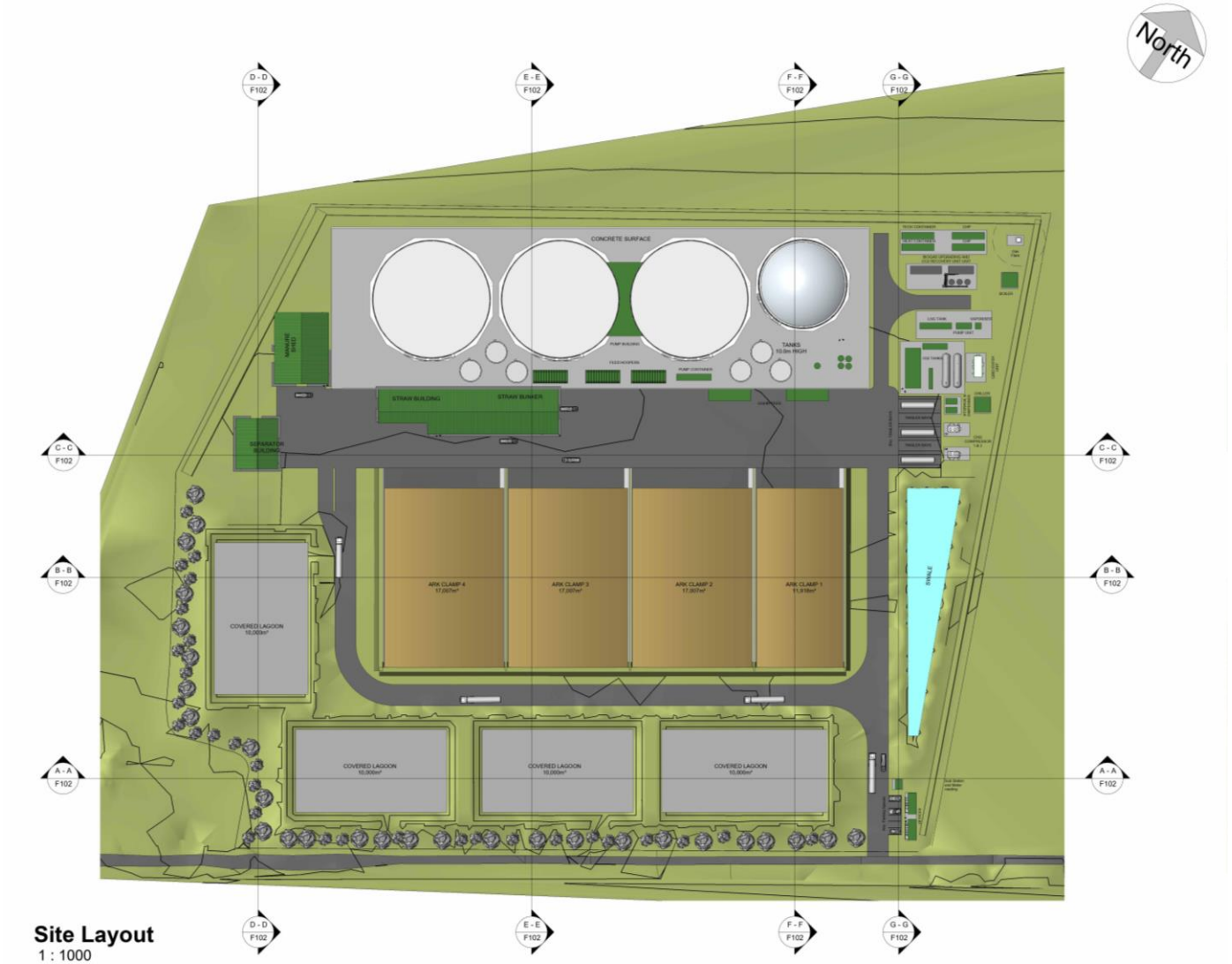
Compressed or liquefied biomethane

Green CO2

Hub Layout

Layout of Tornagrain injection hub





Fearn Site Layout

Fearn Assessments

Air Quality
- Emission sources, receptors, dust assessment, NOx, SO2, VOC, O2
- Not significant impact on ecological sites
- Insignificant impact on human exposure

Bioaerosol Risk Assessment
- Digestate / feed hoppers / biogas upgrading
- Not significant impact

Odour
- Feedstocks – delivery, handling, storage / biogas – handling, processing / digestate – storage, handling
- Not significant impact

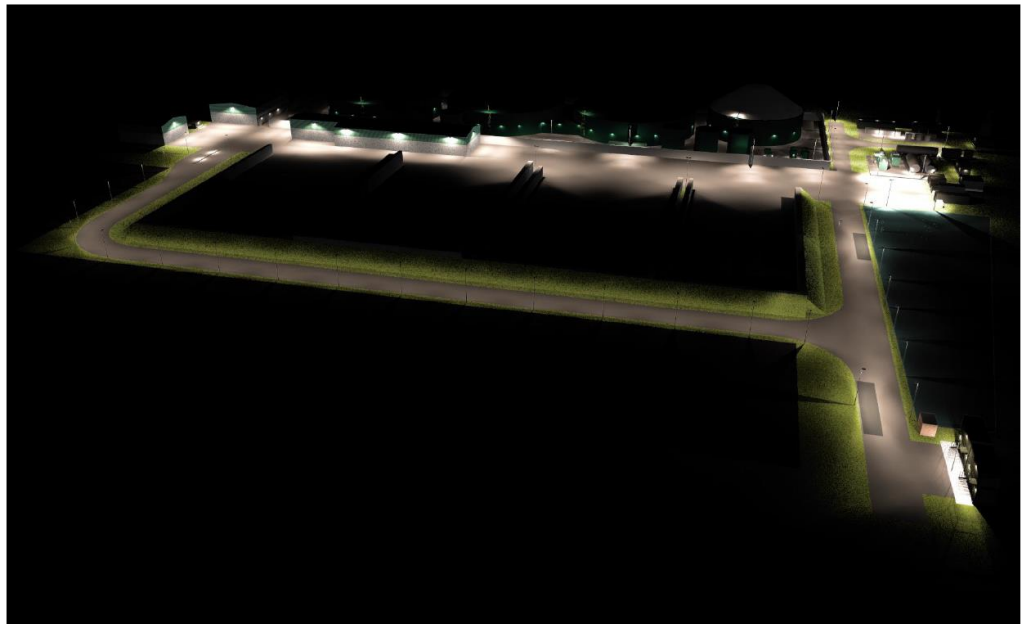
Ecology
- Mitigations

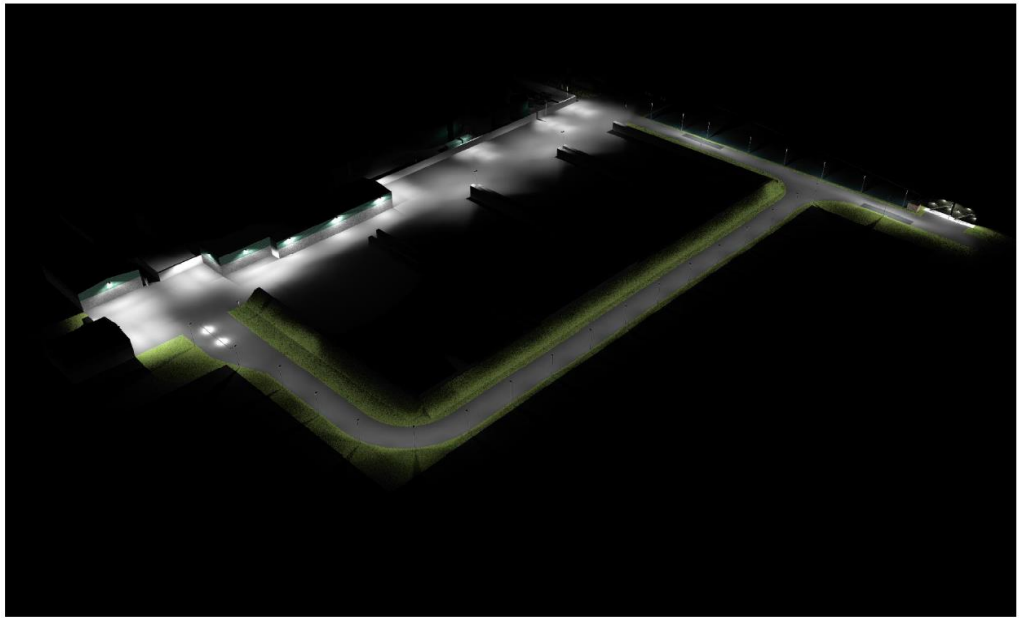
Noise
- Construction and operational assessment
- Daytime – negligible / low impact on receptors. Night-time – slight increase in levels. Report to be concluded.

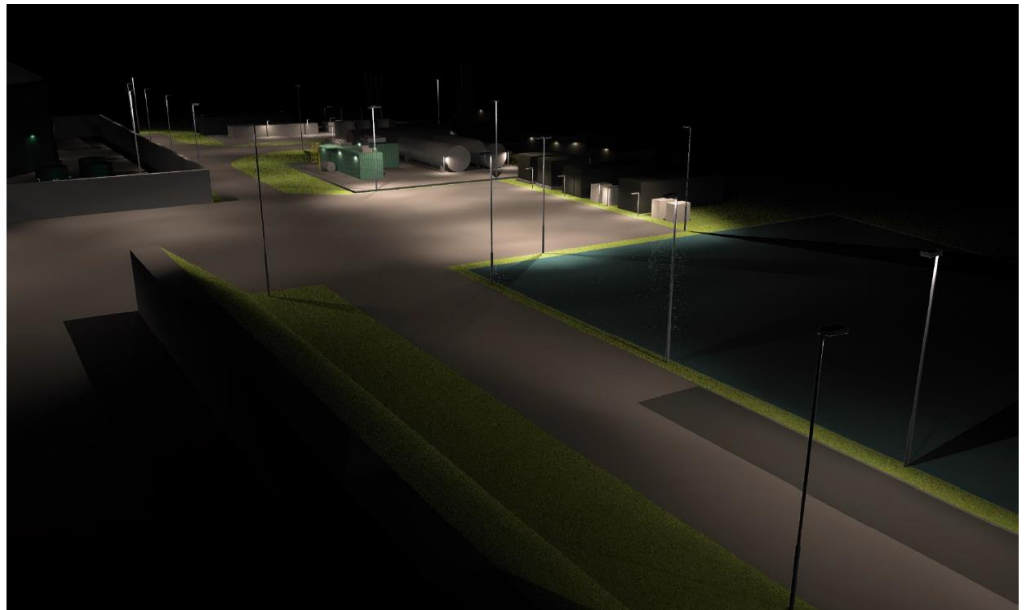
Landscape and Visual Impact Assessment

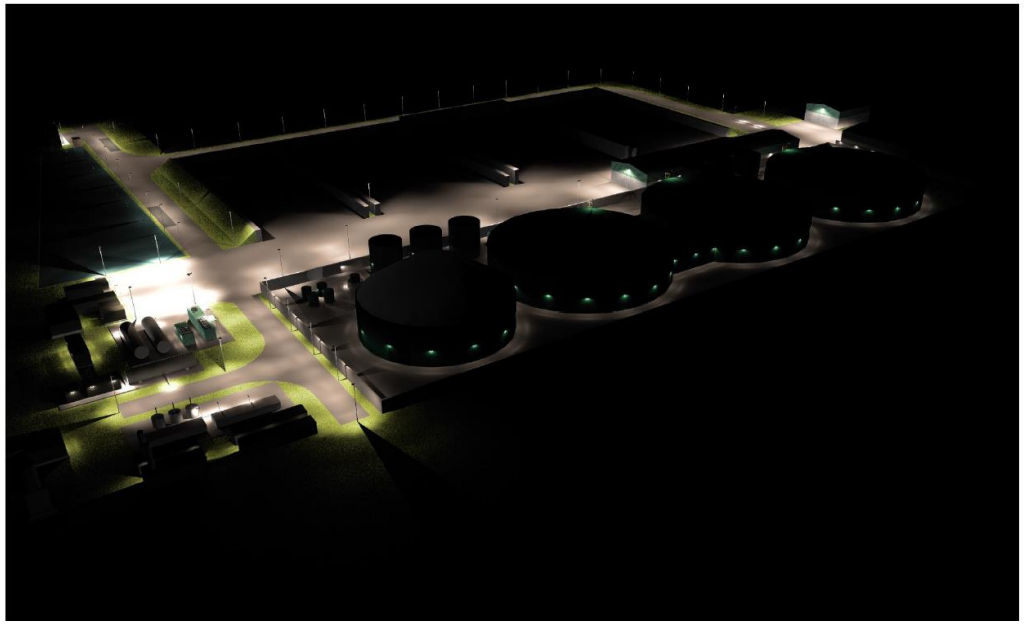
Lighting Review

Lighting









Traffic Movements

What will be the traffic impact?

- All traffic links will experience a less than 10% increase in traffic (approx. 18 trips a day)
- According to our traffic data, all roads in the immediate area of the site benefit from significant spare capacity
- Agricultural vehicle movements are limited to Monday-Friday 7:00-18:00 and Saturday 7:00-13:00, except during peak harvest periods
- Vehicle movements will be timed to avoid peak traffic periods (8-9am, 5-6pm)

Where will the traffic be routed?

- The former Fearn Airfield is accessed directly from the B9166 to the north west of the site via a simple priority junction designed to accommodate HGVs.
- The junction provides access to private, internal access roads and has sufficient visibility splays
- The existing junction has had no recorded accidents or operational issues
- The site is ideally located to access key strategic routes such as the A9(T)
- Movement of feedstock materials already contribute to existing traffic on the local road network.

Traffic Movements

Route	2024 Weekday Base + Committed Traffic Flow 0700 to 1800 (vehicles)	12hrs Development Traffic Flow	Percentage Increase
B9175 between Arabella and the A9	2,282	34	1.5%
Unclassified road between B9175 and B9165	861	49	5.7%
B9165 at Hill Of Fearn	1,133	52	4.6%
B9166 between Tullich Farm and B9165	1,116	112	10%

Potential Benefits

- Help tackle climate emergency
- Ensure energy security
- Secure crop diversity and income for local farms
- Ensure soil health to preserve agricultural land
- Provide environmentally friendly fuel for HGVs while other solutions are developed
- An improvement in biodiversity
- 15 Additional jobs, plus HGV drivers – above Scottish average wage
- Supply cheaper CO2 to local businesses
- Provide opportunity for educational trips
- Employ local firms

Next Steps

Planning Application

Autumn 2022
Submission of planning application

Spring 2023
Determination of planning application

Summer 2023
Construction Start on site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Thank You