



xergi



UK and Irish Biogas Market

Colin Steel

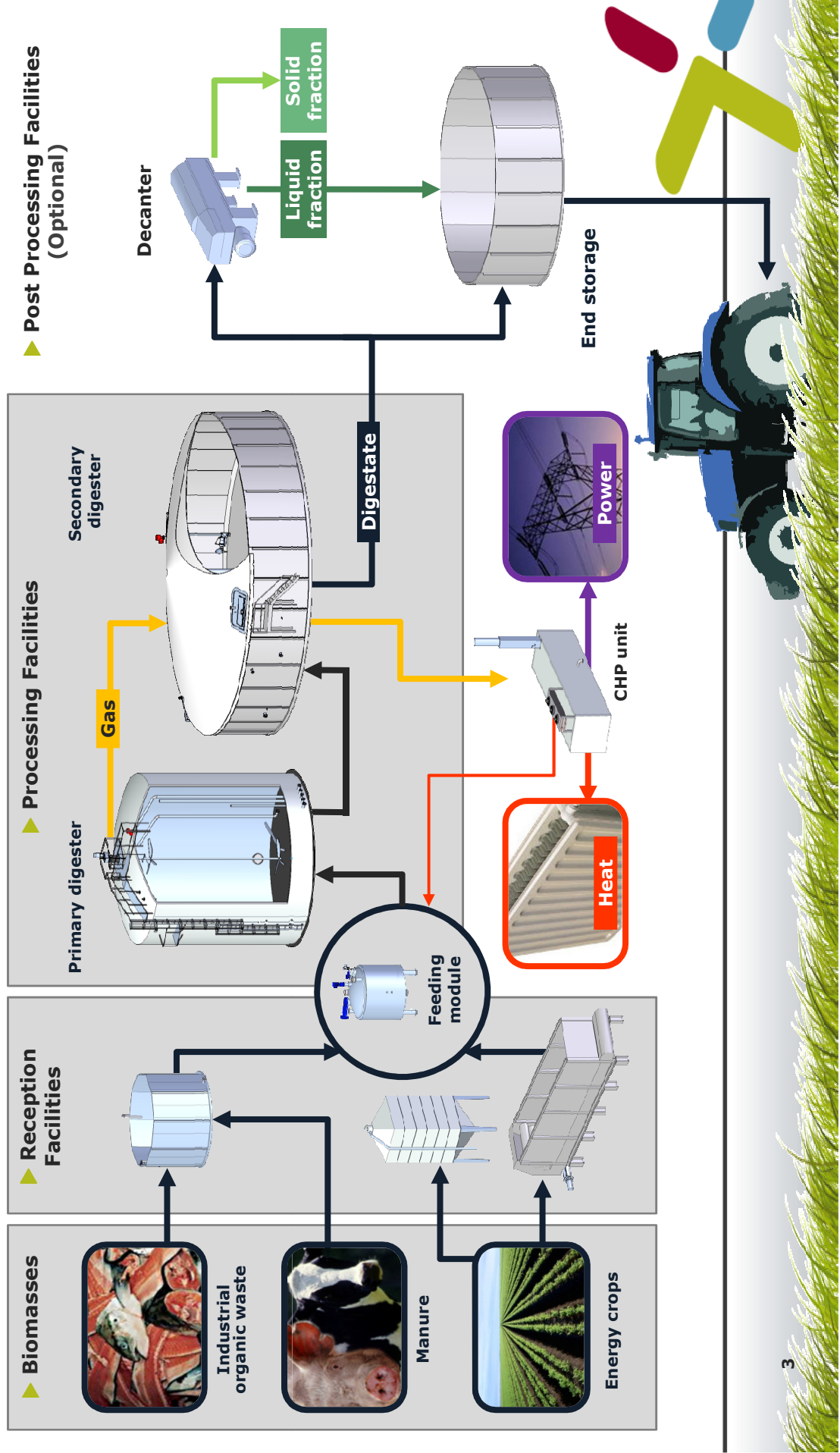
Country Manager Xergi Ltd
UK and Ireland

cst@xergi.com

Mobile: 07795231599

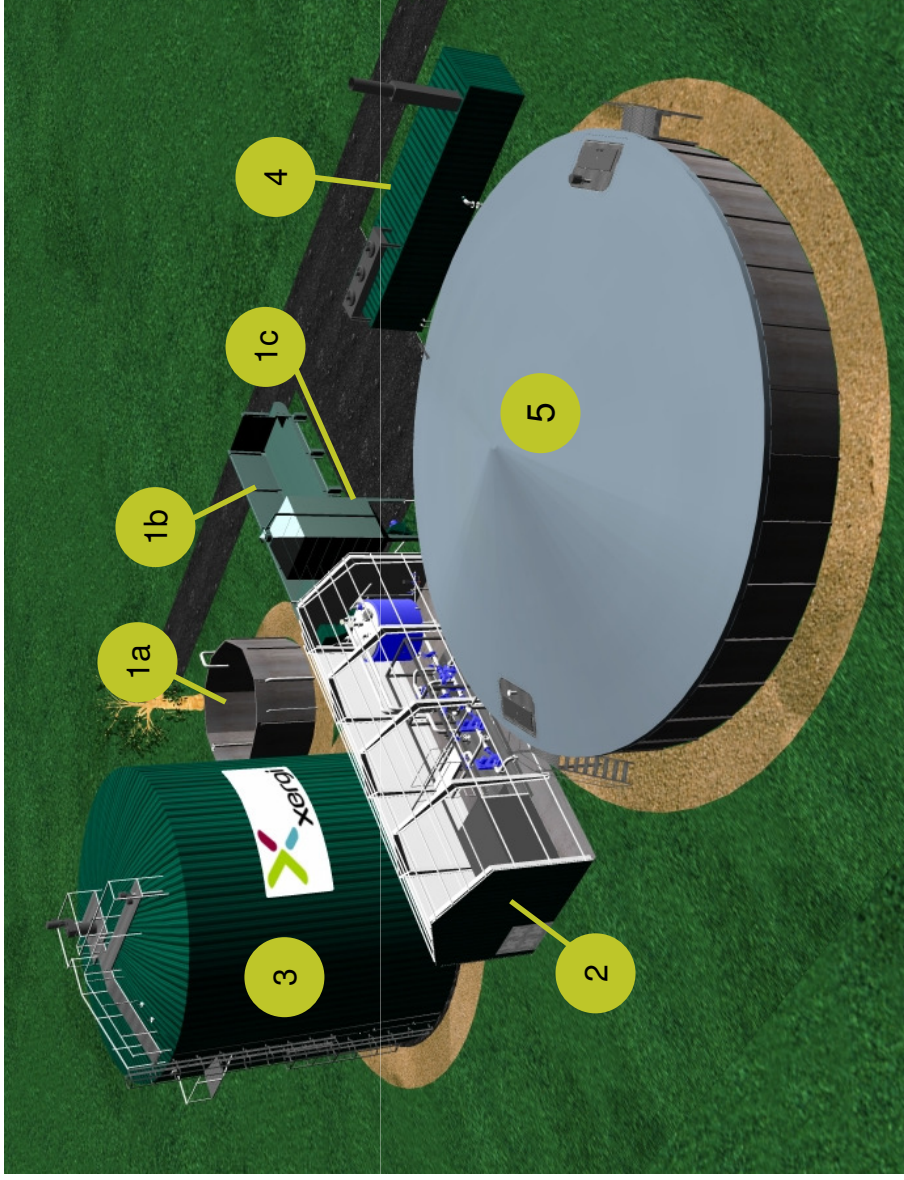


The Basics of a Biogas Plant



Xergi 500 Biogas Concept

- Layout



1. Reception Facilities
 - a) Manure
 - b) Maize
 - c) Grain
2. Technical Module
3. Primary Digester
4. CHP-module
5. Secondary Digester

Surface area: 1,572 m²

[PI diagram](#)

[3D Tour](#)



AD Plant Design Criteria (Basic)

- **HRT** - *Hydraulic Retention Time*
- **Process Temperature** (*Mess or Therm*)
- **Nitrogen Loading**
- **OLR** – *Organic Loading Rate*



Market Segments

- **Waste Xergi**
- **Commercial and Farm Waste and Energy Crop Xergi**
- **Energy Crop and Farm Waste Xergi (large scale)**
- **Energy Crop and Vegetable Waste Xergi**
- **Energy Crop Only Xergi (large scale)**



Market Drivers

- 1) **Landfill diversion tax escalator (2010/11 = £40.00 per ton)**
- 2) **Gate fees (£34.00 to £50.00 per ton)**
- 3) **FIT's (UK <500kw = 11.5 pp/kwh,
>500kw = 9.0 pp/kwh)**
- 4) **ROC's (UK AD = 2, Northern Ireland <500kw = 4,
>500kw = 3)**
- 5) **RHI (heat and gas to grid) (Approx 4.5 pp/kwh)**
- 6) **Energy " Brown Price "(Electricity and Heat approx 4.5 pp/kwh)**
- 7) **Renewable Energy Targets**
- 8) **CO2 Reduction targets**



Early Adopters

- **Waste Plants**
- **Large Agricultural Plants**
- **Small Plants**
- **85% over 500 kw (only 2 x 500kw) currently**



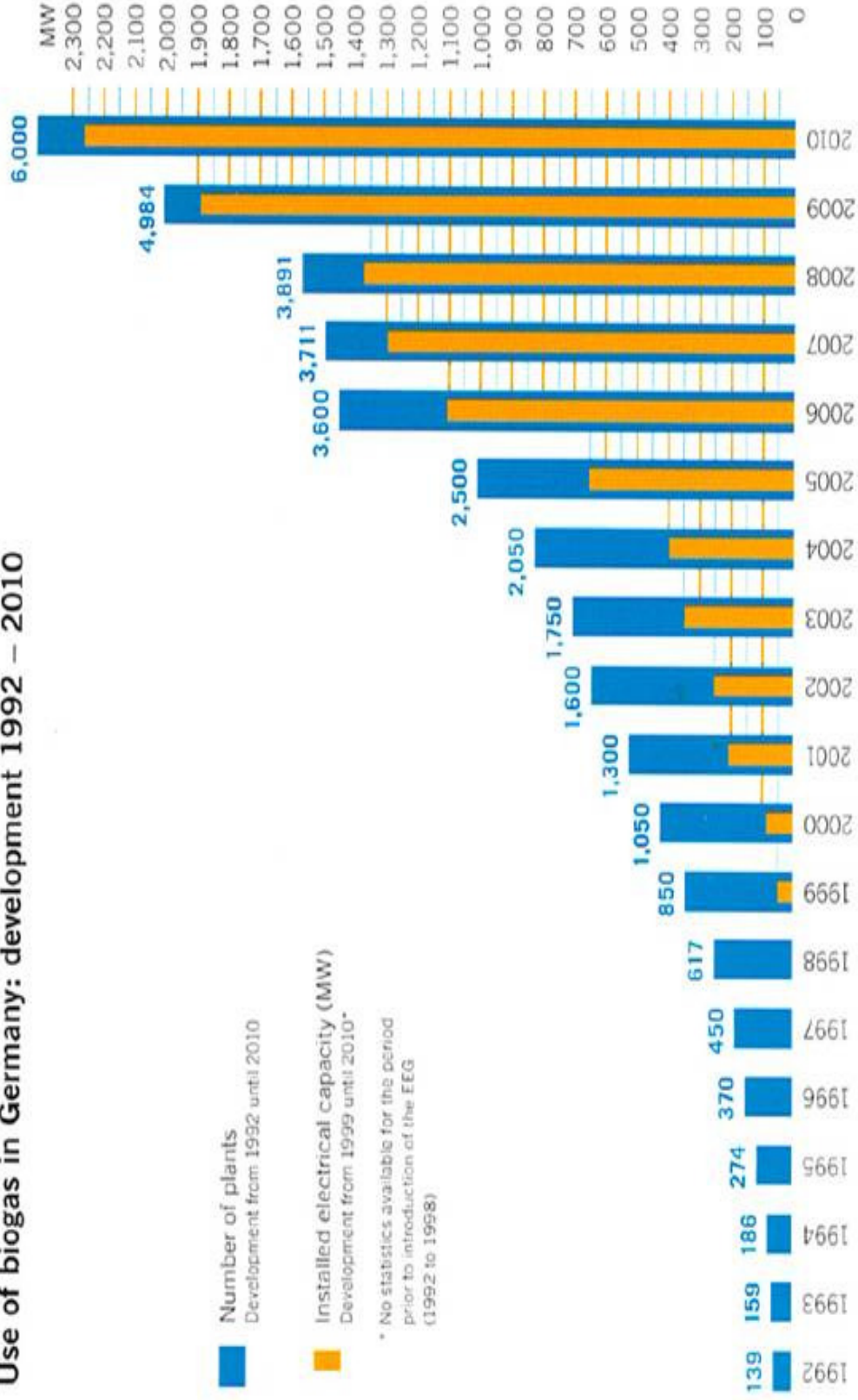
The Case For Agriculture

- *Easier to gain planning consent*
- *Assets to raise debt funding against*
- *Home grown feed-stocks (quality)*
- *A solution to waste problems (NVZ)*
- *Agronomical benefits from digestate (+£)*
- *Land bank to spread digestate.*
- *NPK management.*
- *Alternative Income.*
- *A use for heat ?*
- *Simple design*



Germany

Use of biogas in Germany: development 1992 – 2010

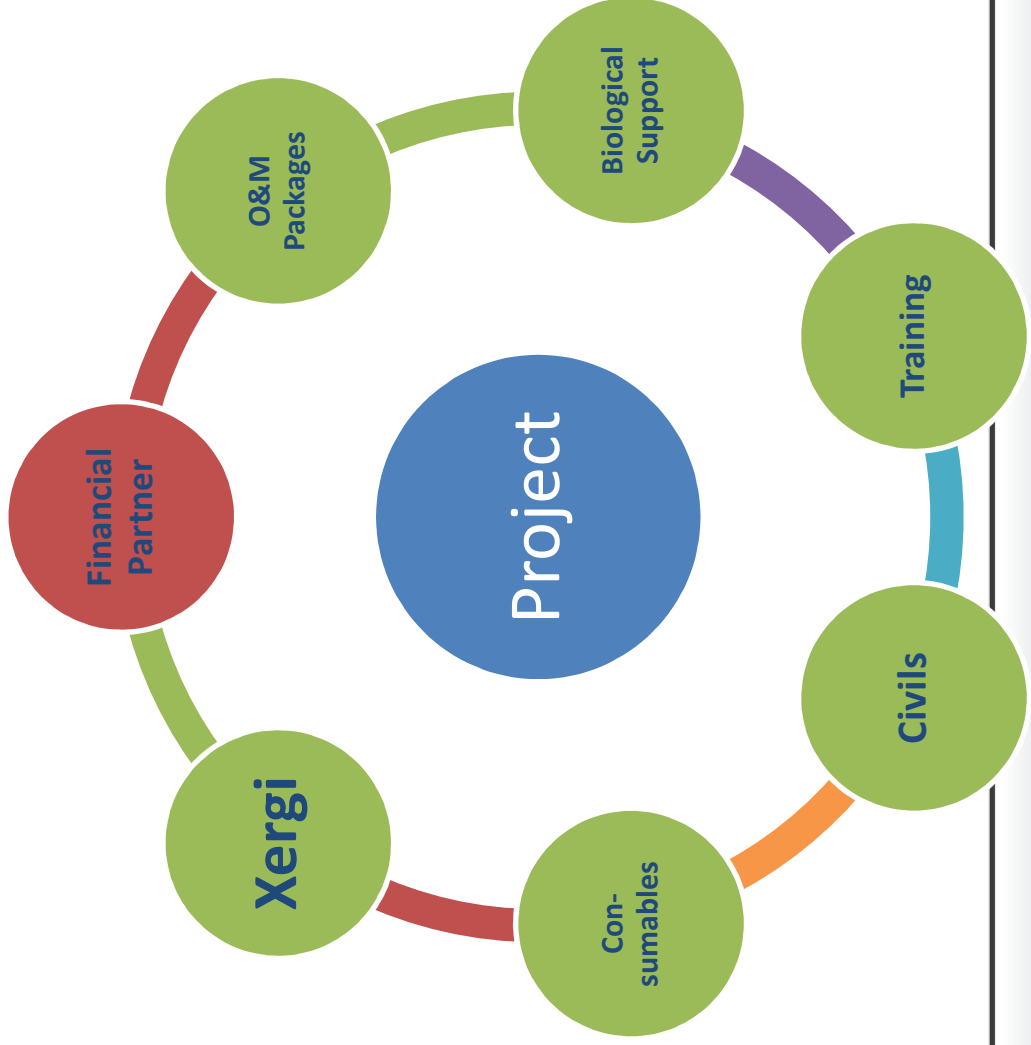


Risks in Agriculture

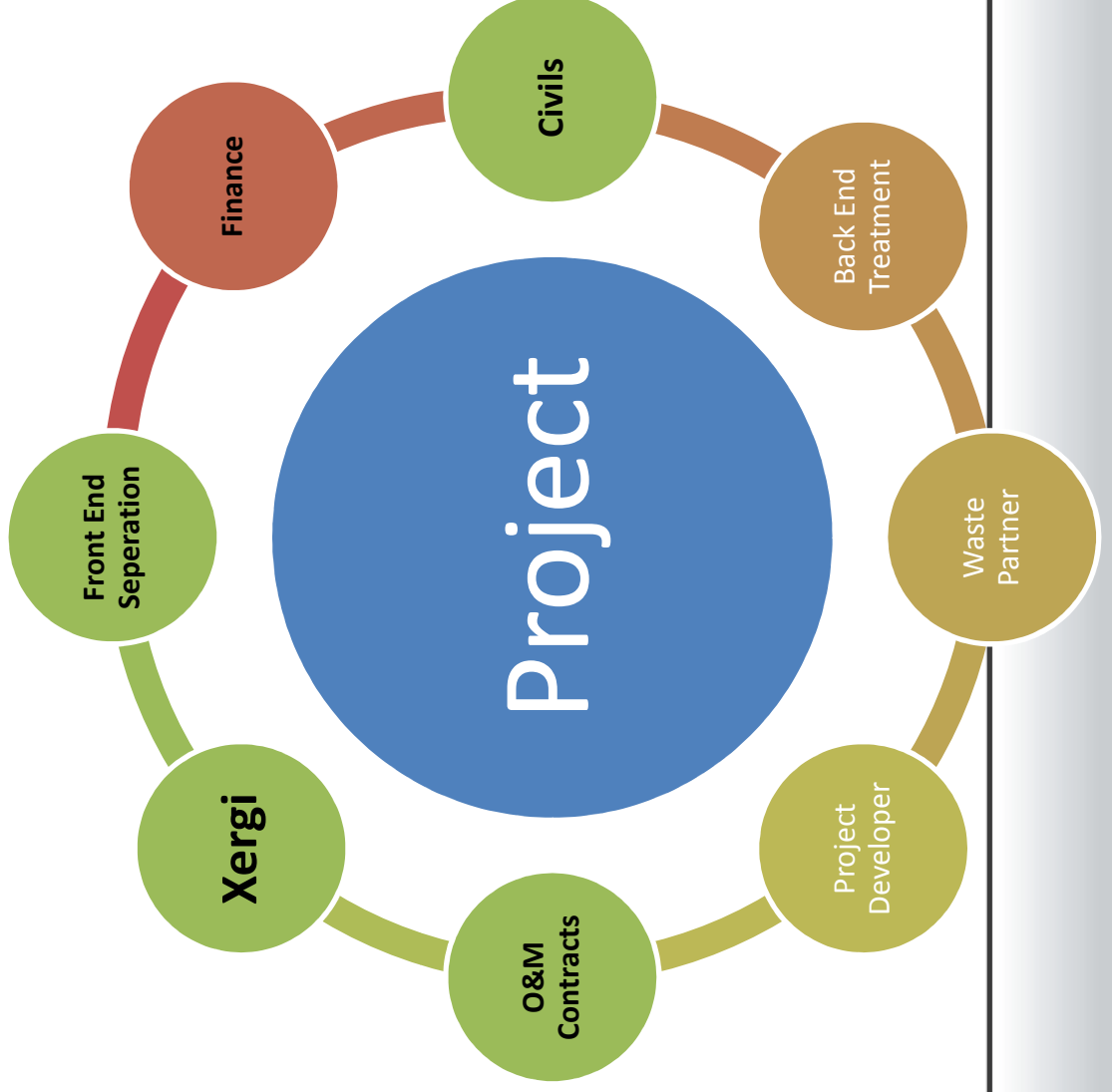
- ***Food v Fuel (recent government action plan)***
- ***Scale and Size***
- ***Feed-stock quality***
- ***Poor operation and control***
- ***Poor maintenance and service***
- ***Bankability (small scale)***
- ***Financial pressure on small scale***
- ***Grid connection***
- ***UK population***
- ***Commodity prices***
- ***Environmental permitting***



Agricultural Markets



Waste Plants

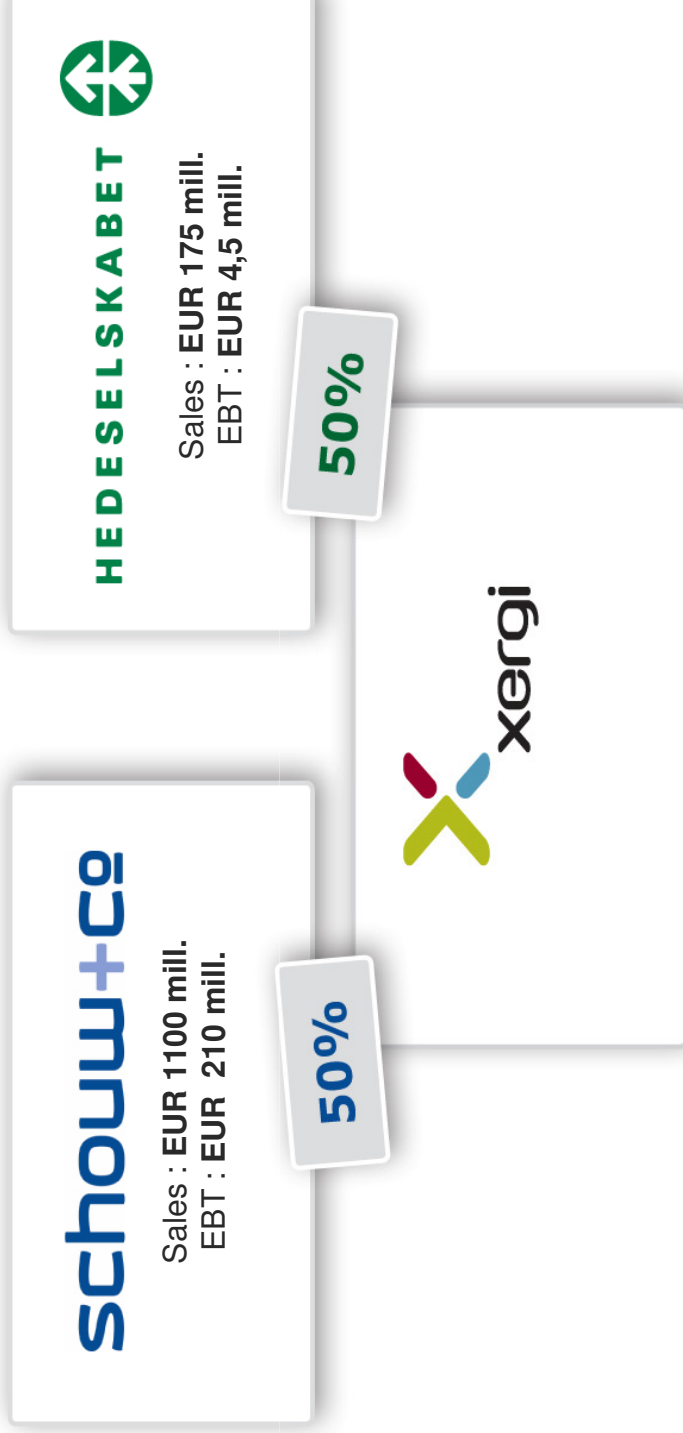


AD Technology Provider Qualifications (UK)

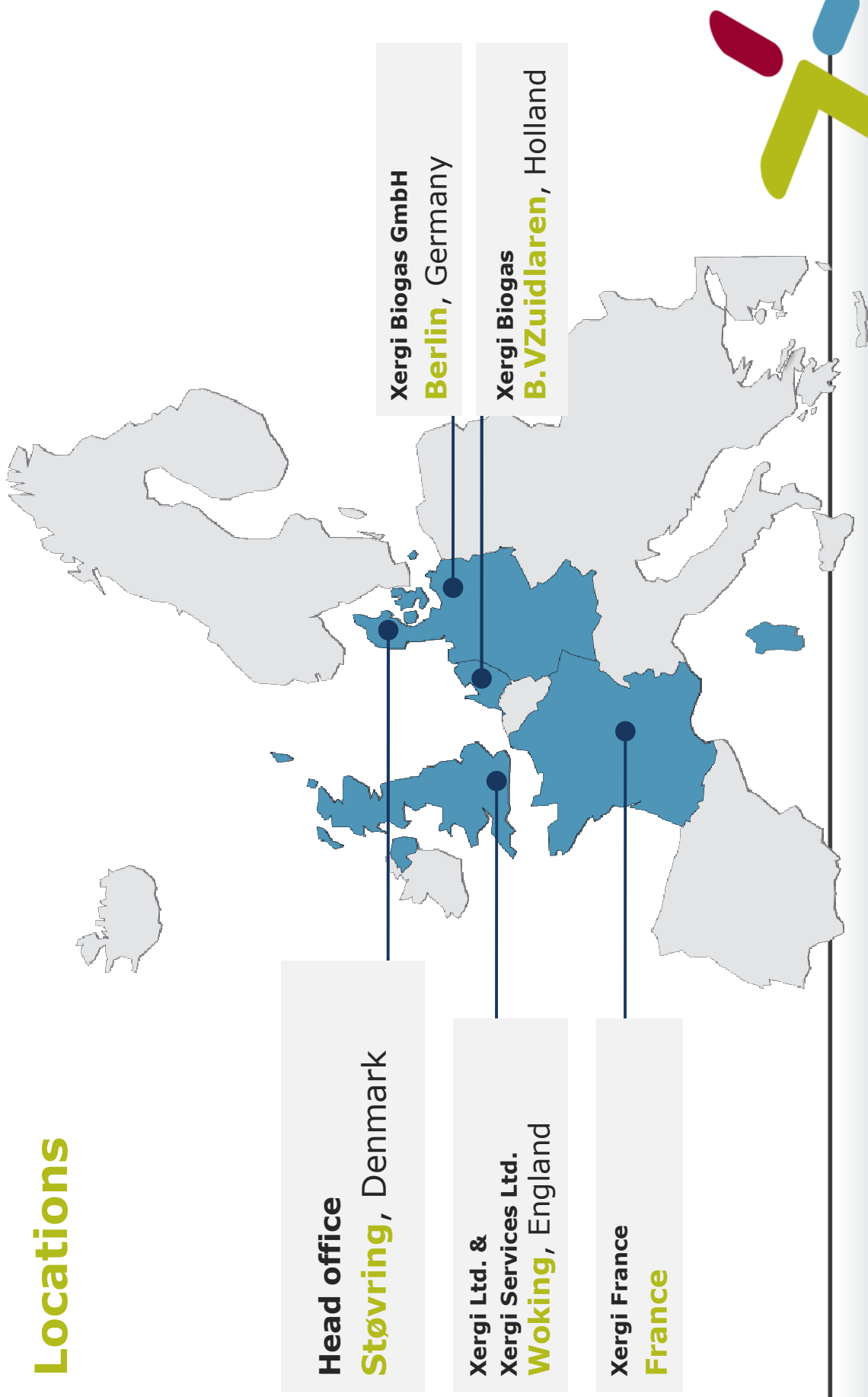
- **Accredited to UK procurement association (Achilles)**
- **Track record**
- **Punching at the correct weight (Balance sheet)**
- **Turnkey (If required)**
- **Commissioning contract**
- **Process guarantee (supporting protocol)**
- **Operator training**
- **O&M Contracts**
- **Due diligence**
- **Warranty guarantee (bond)**



Ownership Structure



Locations



UK Projects

1) Staples Vegetables, Wrangle. Boston, Lincs

Family owned vegetable grower, producing around 10k tons of waste and out of spec vegetables. Support by WRAP funding a 1.4MW Plant has been build and is currently in commissioning phase. PAS110 compliant.

2) Barkip, North Ayrshire

Developed by ZEBEC the project was purchased by Scottish and Southern Energy. The plant is ABP and PAS110 compliant. Supported by Zero Waste Scotland this 2.5MW plant is currently completing construction and will commence commissioning in April



Selected References - Biogas Plants

DJF, Denmark



Complete full-scale biogas plant including transmission line and gas engine. In addition, delivery of a biogas test plant with 4 small biogas digesters.

- ▶ Size of digestion tank: **Full-scale plant 1,200 m³**, test plant 2 x 30 m³ and 2 x 10 m³
- ▶ Engine: Jenbacher **312, 625 kW**
- ▶ Power production: **3.0 mill kWh/year**



Selected References - Biogas Plants

Huckabay Ridge, USA



Complete biogas plant with upgrading of biogas for natural gas quality and distribution through the natural gas distribution network

- ▶ Size of digesters: **28,000 m³**
- ▶ Maximum manure capacity: **650,000 tons/year**
- ▶ Gas production: **76,000 MWh NG**



Summary

- **1) Site location**
- **2) Electricity Wholesale or Home wire**
- **3) Heat usage**
- **4) Land-bank for digestate**
- **5) Availability of feed-stock and security**
- **6) Grid connection.**
- **7) Environmental permitting**
- **8) Planning consent**
- **9) Digestate standards**
- **10) NVZ regulations**
- **11) Land requirements (nutrient)**
- **12) ROC's or FiT's**



Questions ?

- **Thanks for listening**
REA, ADDBA, IEA, CLA, NFU, DEFRA,

