

# **Biomethane Grid Injection**

## **Making it Happen**

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# Summary

- Post EMIB - ownership options
- Main project stages
- Is grid injection viable?
- Concept definition
- Project delivery - engineering
- Project delivery - commercial
- Summary process

# EMIB enables two main options for Entry Facility

## “Maximum” connection

- GDN provides and owns all entry facility;

- Gas Analysis
- Pressure control
- Metering
- Odourisation
- ESD
- Telemetry

- DFO provides

- Biomethane production equipment
- Inlet reject valve

## “Minimum” Connection

- GDN provides and owns Entry Facility;

- Functional Spec for Entry Facility
- ESD valve
- Telemetry

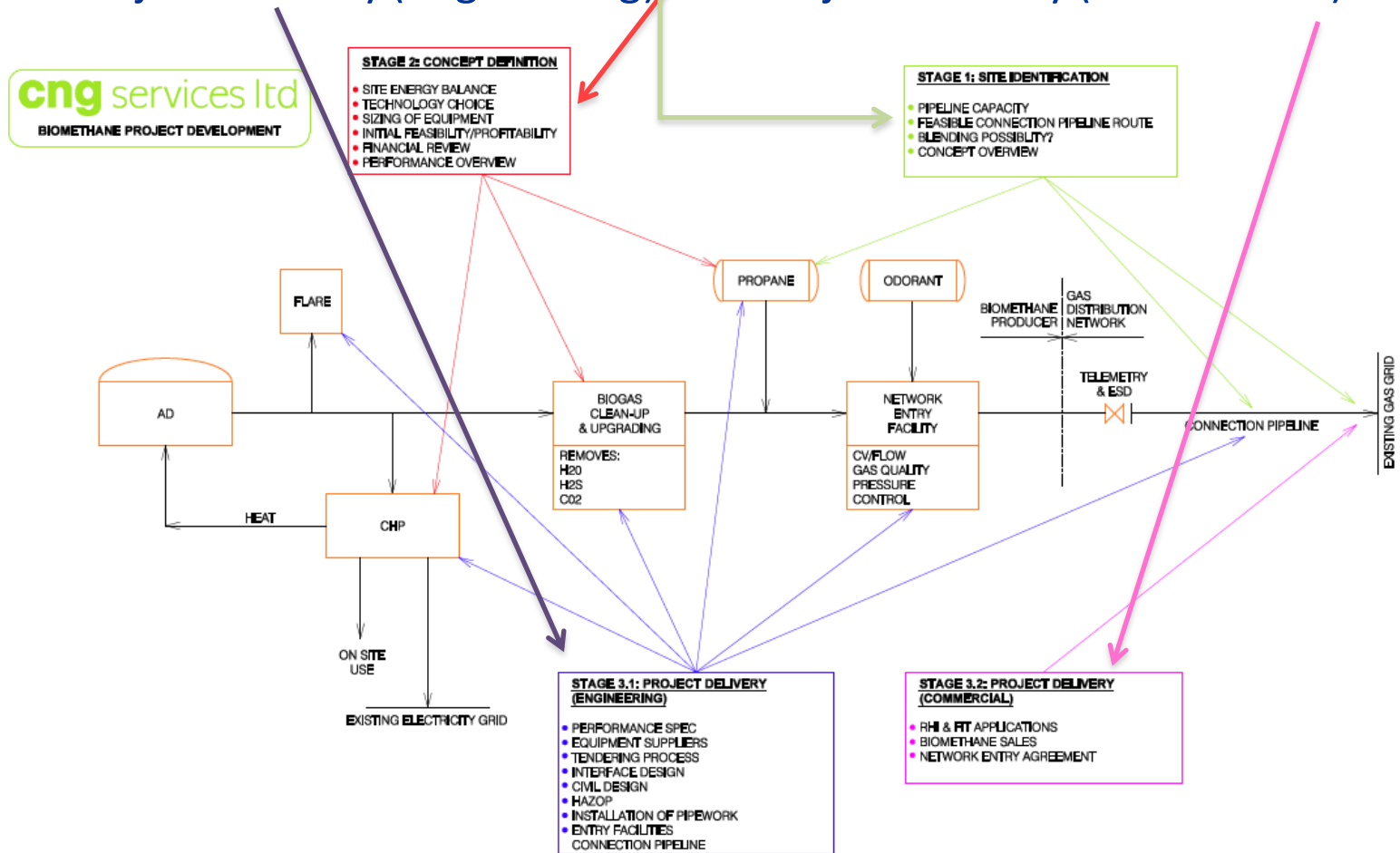
- DFO provides and owns Entry Facility

- Pressure control
- Metering
- Odourisation (option?)
- All Biomethane production plant
- Inlet reject valve
- Gas Analysers

We are assuming the Biomethane Producer wants Minimum connection approach - lower cost, shorter time, no issue with lack of liabilities, can integrate with entire project

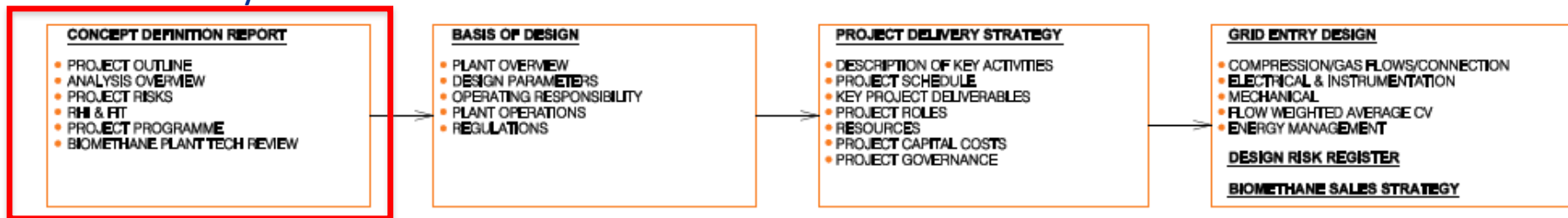
# Main Project Stages

1. Site Identification
2. Concept Definition
3. Project Delivery (Engineering)
4. Project Delivery (Commercial)



# 1. Is grid export a viable option?

- Is there capacity in the network to accept Biomethane flow at desired rates at all times:
  - Function of consumption at low demand times
  - This may be able to be enhanced; see later presentation
  - Maybe option to blend Biomethane into the grid to reduce propane enrichment costs
- Costs for a physical grid export connection
  - Where, pressure, costs
- Will it work?
  - Early determination of blockers and whether solutions exist



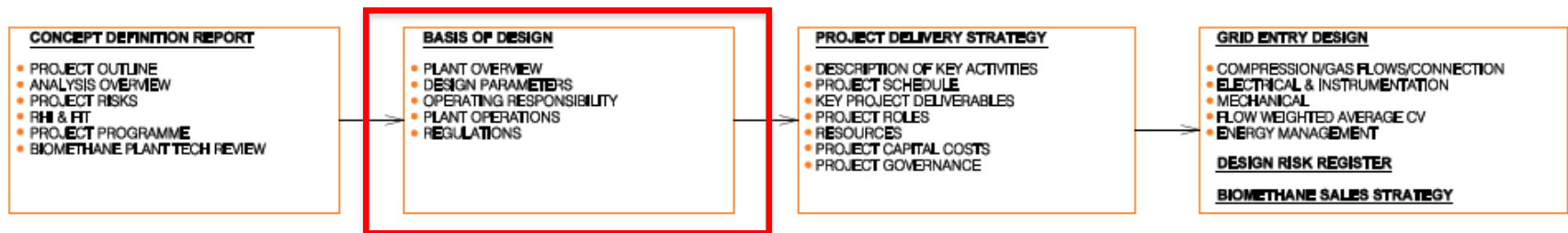
Outcome - confirm viability of proceeding to next stages

## Observations re grid export

- 20 bar LTS may be very good option if blending is available and less propane is required (eg Propane Value Loss is around 40% of opex)
  - Trade off is cost of compression plant (capex and opex)
- LTS will normally have capacity
  - Until the within grid compression option is available capacity is an issue around 40% of the time
- Cost of laying plastic pipelines is not prohibitive - can go alongside roads
  - even 10km may not be a project killer
- Ideally of course lay across fields owned by friendly neighbours

## 2. Concept Definition

- Preliminary feasibility to define utilisation concept
  - Overall energy balance (all sites are different, heat requirement key) - how much CHP?
  - Gas quality assessment (generally always the same apart from H2S and siloxanes from sewage works)
  - Process needs/existing on site plant and equipment
  - Planning issues, constraints?
- Confirm best match of clean-up and upgrading plant technology
  - Match to required flow, turn down/flow range, gas composition
  - Capex and opex (including propane value loss cost)
  - Plant location - access, screening, noise, etc
- Economic modelling
  - Accurate calculation of Economic viability/forecast profit/payback period
  - Risks and external influences



Outcome - utilisation of biogas defined

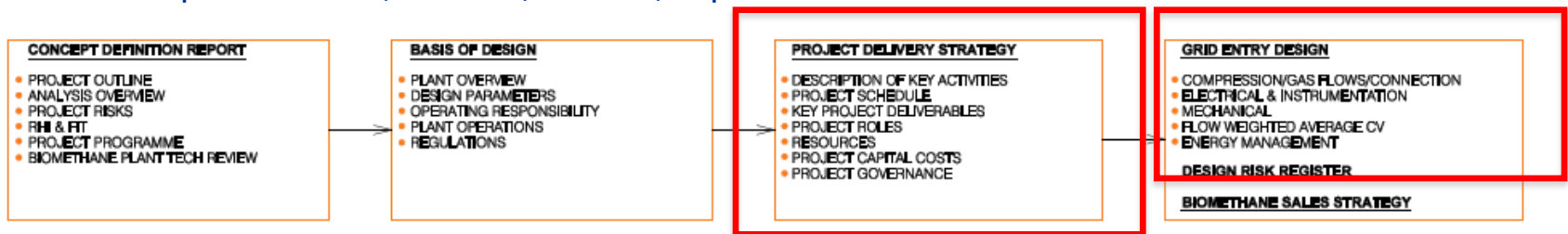
# Observations re concept definition

- Small CHP often makes sense
  - Site heating and base load electricity demand
  - Higher FIT <500 KWh
- Vehicle use rarely makes sense as not enough vehicles
  - If it does, inject all biomethane and use Green Gas Certificates
- Generally, biogas always similar, key change is H<sub>2</sub>S
  - Strategy for removing H<sub>2</sub>S an important factor
  - Air dosing attractive but needs Oxygen limit for grid entry to be changed



# 3. Project Delivery - Engineering

- Strategy and roles for project delivery - detailed plan and resourcing
- Tendering process for major bought in plant
- Detailed design
  - Integration is key to achieving max savings/avoiding operational problems
  - Grid entry specification, translate into working compliant design
  - All site preparation, M&E, Controls, power supply/export
  - GQ/8 procedure for gas composition
  - Hazop study, design reviews and appraisals, compliance reporting
- Specification of plant and equipment; Clean-up and Upgrading, Propane, Entry Facility, export pipeline/connection
- Technical compliance with GDN functional specification
- Appoint suppliers for plant and equipment, installation, materials
- CDM Regulations
- Commissioning works
- Post completion work, records, notices, reports



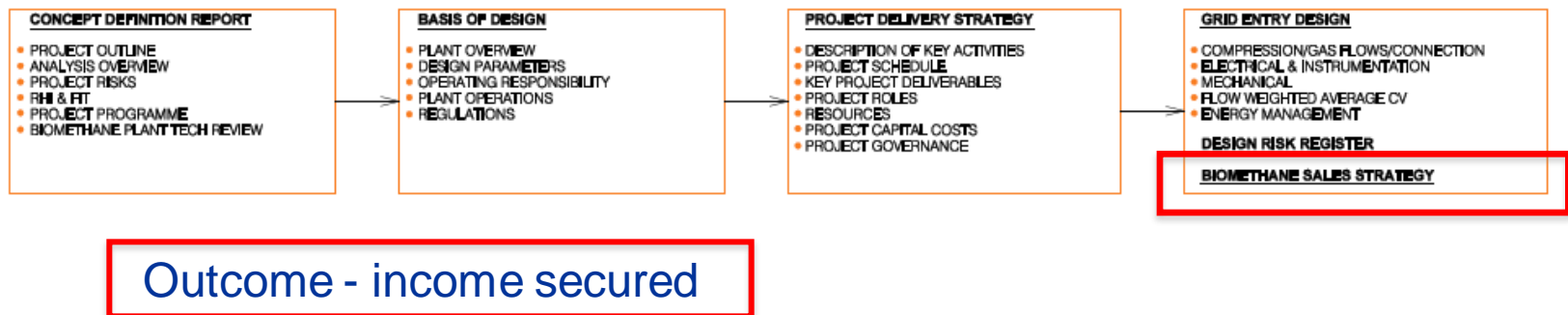
Outcome - Operational plant and Biomethane Production

# Observations re project delivery

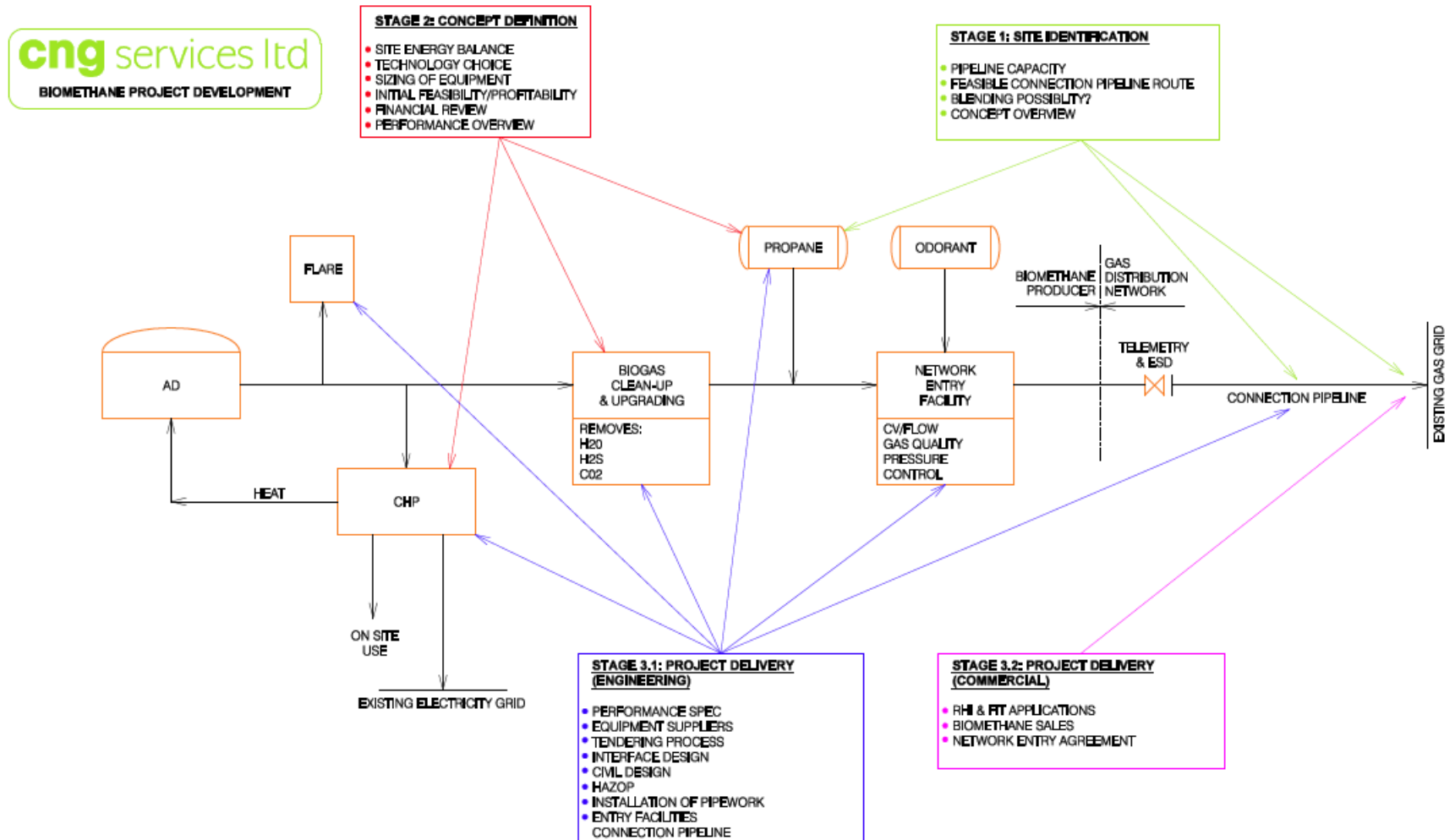
- For a new AD plant, key is to integrate all works, so one flare system, one M&E contract, one civils contract, one control system, one Hazop etc
  - This requires Project Delivery Strategy that defines all roles and accountabilities and eliminates any duplication
- Installing biomethane plant at existing AD may require significant 'other' costs
  - Eg flare may not operate
  - No other work to share costs
- Because biogas is always the same (H<sub>2</sub>S/Siloxanes apart), and the grid spec is always the same, projects should be similar for same technology
  - Move to standardised designs important ahead of RHI review in 2014

# 4. Project Delivery - Commercial

- Biomethane sales and Green Gas Certificates
  - See later presentations
- Network Entry Agreement
  - See NG presentation
- RHI Registration
  - See later - key issue is treatment of heat
- FIT registration
  - Hybrid scheme may be attractive and so includes FIT as some CHP



# Summary Process



Outcome - completed project with delivery overhead minimised

**Questions please?**