

# **Vale Green Energy Springhill Farm Biomethane to Grid Project**

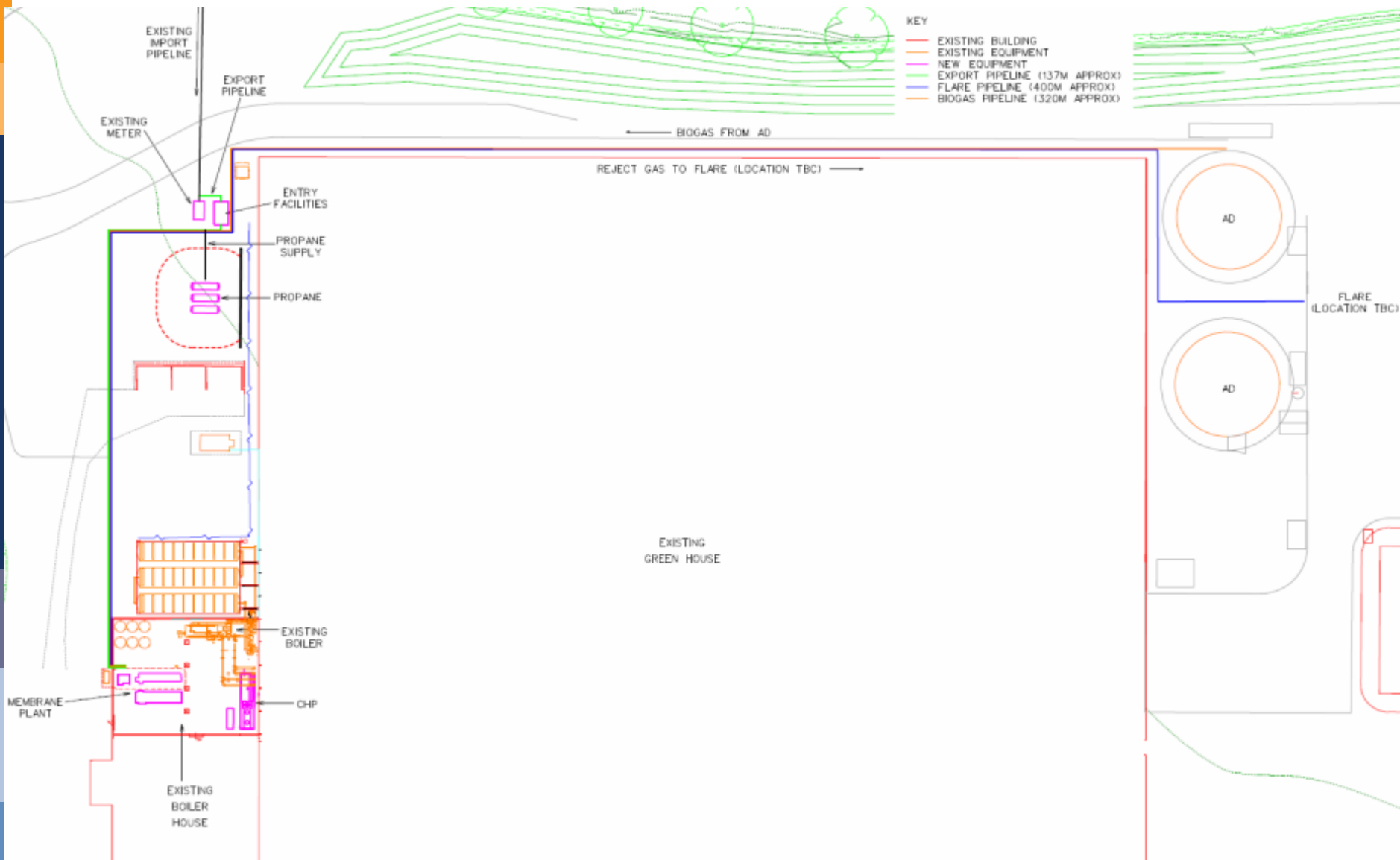
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# Springhill Farm

- Farm crop feedstock to new build AD – Biogas Nord
- Membrane CO<sub>2</sub> removal with liquid CO<sub>2</sub> capture – Pentair Haffmans
- Hybrid CHP and Gas to Grid
  - Existing boiler as backup
  - Substantial space heating load in greenhouse
  - CHP exhaust heat recovery
  - Composite heating circuits

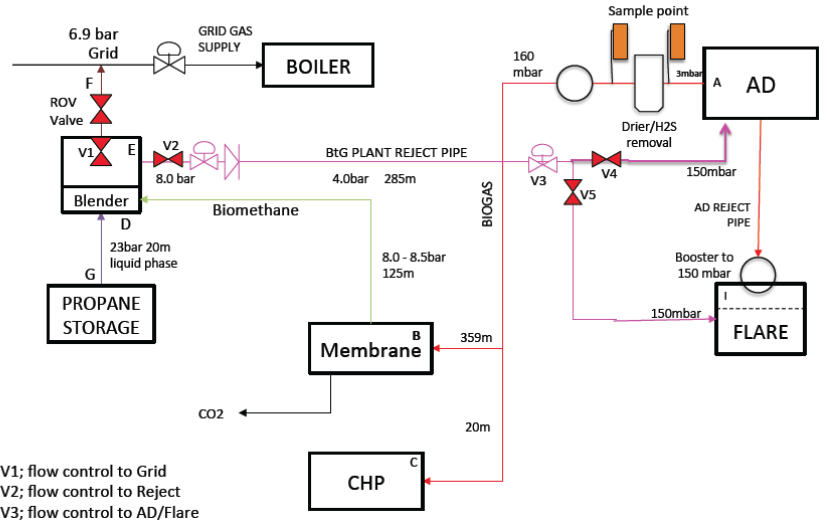


# Springhill Farm Layout





Springhill Nurseries BtG – Flow Diagram Draft v5 28 Feb 2013



# Grid Entry Connection

- EMIB “Minimum Connection”:
  - Reduced costs
  - Maximises scope for competitive supply
  - Clear definition of Transporter responsibilities
  - Minimises obligations on GDN (WWU)
  - Facilitates full plant integration
  - Compliant with all existing standards
  - Complete off-site construction and pre-testing
  - Smaller overall footprint
  - Full protection to GDN network and compliance issues

# Grid Entry Connection

- First gas to grid scheduled last week June 2013
- Other “firsts”
  - Membrane unit internally sited – but fully ATEX compliant
  - Food grade liquid CO<sub>2</sub> captured for site use/export
  - Uses Encal 3000 Chromatograph, now there are 2 approved devices (other is the Danalyser)
- Model NEA agreed with WWU

## Grid Entry Unit Details (1)

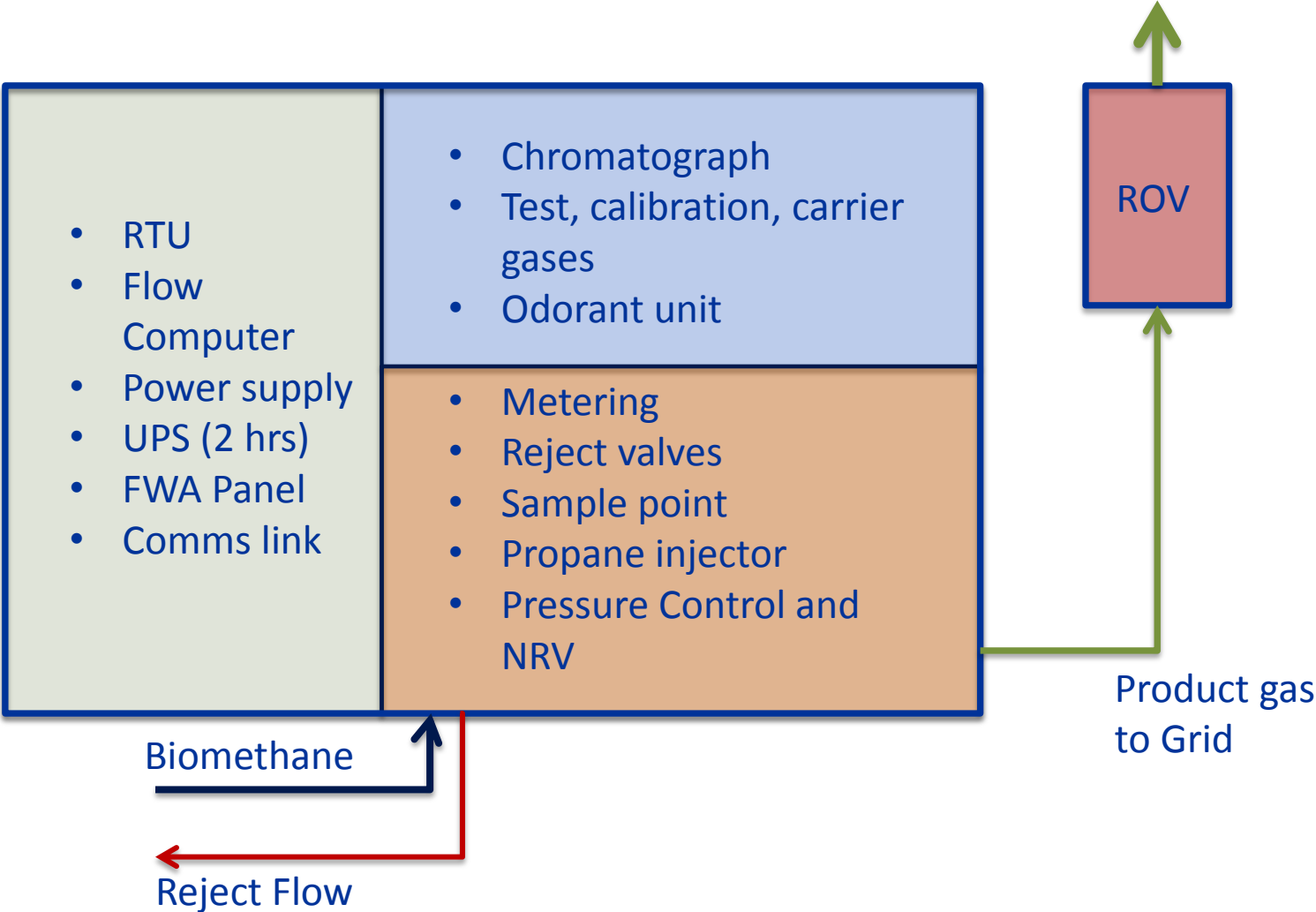
- Combined kiosk for all plant - Elster
  - compact 5.5m x 3m unit
  - only outlet ROV housed in small separate kiosk
- ISDN connection for telemetry and HPMIS
- Full FWA functions
- Small cage fitted to RTU for interference protection (sole access by WWU)

## Grid Entry Unit Details (2)

- Integrated Propane injection
- Fibre Optic comms network
  - AD, Membrane, GEU and Flare spaced apart
- Reject gas management
  - Pressure controlled to overcome flare ignition delay
  - Absolute minimum flared volume
  - Un-propanated gas returned to AD



# GEU Layout



# GEU Operation (1)

- All plant is responsibility of DFO (producer)
  - Procurement
  - Compliance demonstrated to WWU
  - O&M, callout
- Reject valves automatically divert off-spec gas at GEU entry
  - During start up, testing etc
  - Processing fault
  - Manual intervention required to start flow to grid

## GEU Operation (2)

- Propanated gas to flare, all reject gas to AD
  - Other site usage retains heating value
- ROV under sole control of WWU
  - Reject valves must fail before ROV is required
  - Remote closure or manual on site
  - Remote opening facility retained

## GEU - Future developments (1)

- Remove need for FWA
  - EMIB recommendation - BM sites cannot materially change value and propane added so no risk of lower CV gas to customers near by
- Data logger in lieu of flow computer
  - No need for high security devices

## Future Developments (2)

- Remove need for high accuracy chromatograph
  - Alternative instruments lower cost
  - Reduced level of CV measurement accuracy for small flows
- Support to Blending
  - Reduce enrichment