Nottingham City Transport

Biogas Double Deck Bus Fleet

Nottingham City Transport

UK BUS AWARDS recognising rewarding inspiring

ONE AWARDS 2016 · FOR OPERATOR EXCELLENCE ·

UK Bus Operator of the Year 2016
Large Operator of the Year

Nottingham City Transport

- The major inner city bus operator in Nottingham
- Current fleet 320 buses, 225 double deck and 95 single deck / midi buses, average age 6½ years
- 66% Euro V & VI; 34% Euro III & IV; diesel and gas
- Nottingham is one of the 5 Cities outside London to have a mandatory Clean Air Zone
- UK Bus Operator of the Year 2012, 2014 and 2016

Challenges

- Desire to specify a Euro VI Double Deck bus that is both clean and as close to carbon neutral as possible, on a ‘well to wheel’ + ‘whole life’ basis
- Range – needs to be >250 miles to avoid inefficiencies in vehicle / driver duty allocation
- Must be commercially sustainable throughout the vehicles’ life
- Needs to have a ‘wow’ factor – Customer appeal
- The bus we wanted didn’t exist!

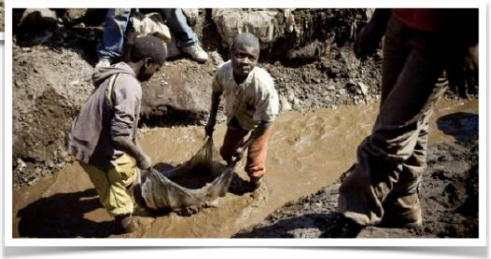
Alternatives Investigated

- Diesel – complicated exhaust treatment for Euro 6 and limited impact on carbon footprint
- Electric – insufficient range, concerns regarding battery life / costs and depot layout implications (to accommodate chargers)
- Hybrid – a ‘jack of all trades’ or a master of none? Commercial sustainability?
- Biomethane gas bus achieves our objectives

Alternatives Investigated

Lithium, Cobalt, Graphite

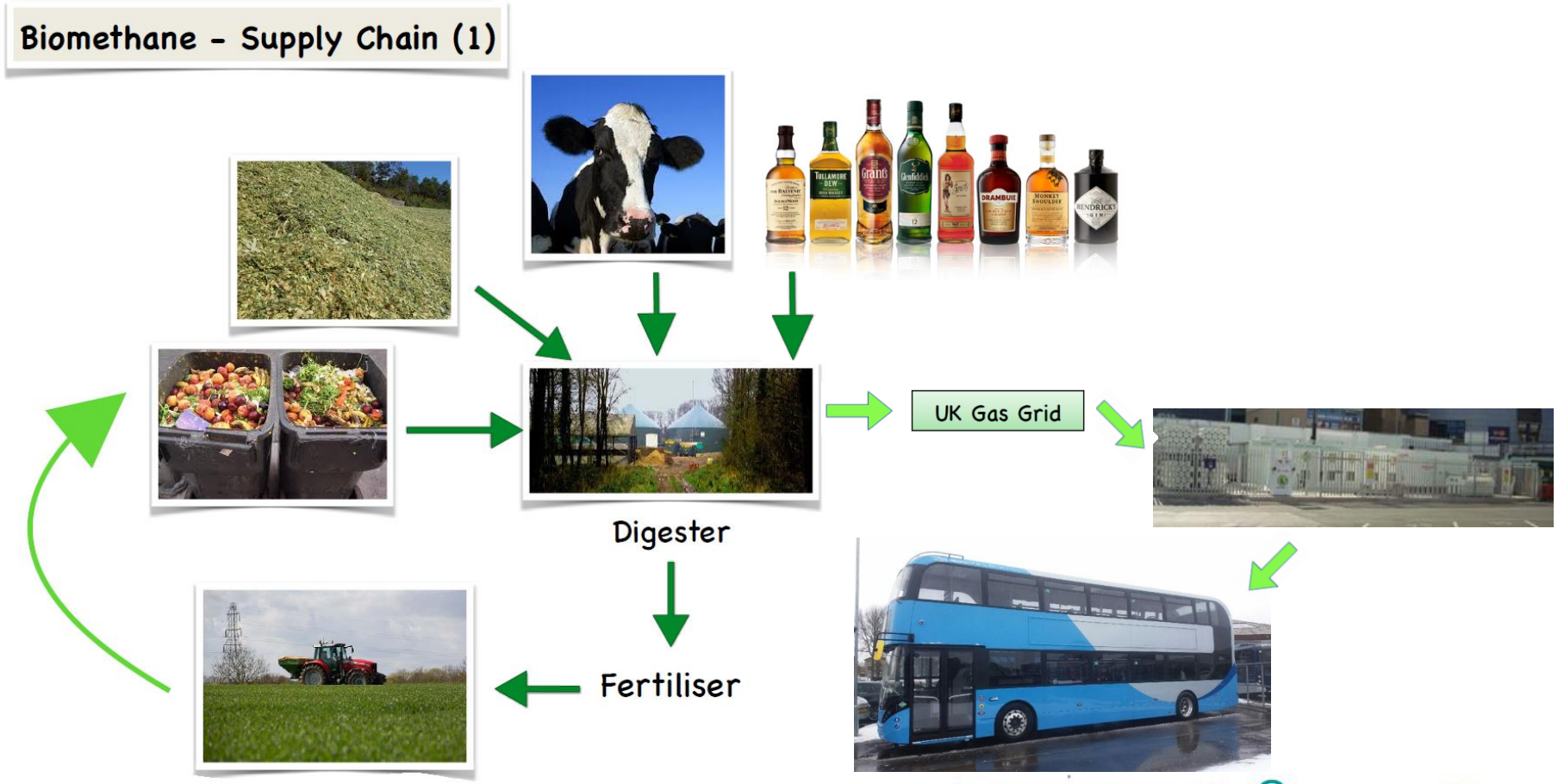
Cobalt



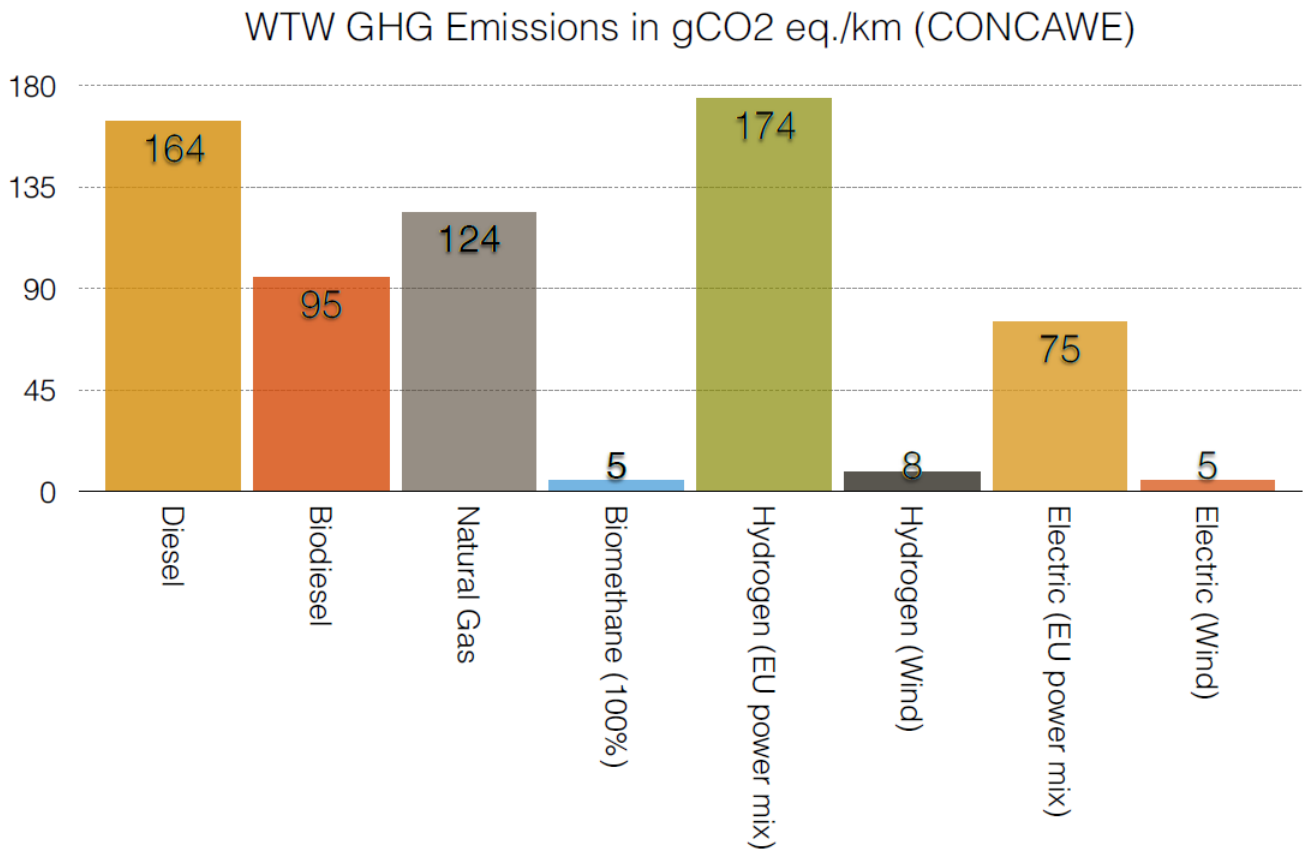
Lithium extraction & refining

3Kg Lithium Carbonate = 1 Kwh

Biomethane Production Cycle



CO_2 Comparisons



Timing

- Planning and engineering phase throughout 2016
- OLEV project approved July 2016
- Infrastructure installation started December 2016
- Phase 1 buses (30-off)into build at ADL Falkirk January 2017 – public launch May
- Infrastructure commissioned June 2017
- Buses in service 4th July 2017 – 30 double deck buses already in service
- Phase 2 buses (23-off) currently being delivered

Results

- Buses cleaner, quieter, smoother running
- Customer and driver acceptance very good
- No technical problems on introduction – conventional driveline, minimal engineering training necessary
- Fuel consumption meets expectations
- Infrastructure operating trouble free
- Requirement to purchase at least 67 further buses

Challenges

- Funding support is still required whilst infrastructure investment is needed and buses are more expensive
- Biogas buses can make a huge contribution towards providing clean, de-carbonised public transport. Electric can be a solution, but is not the ‘silver bullet’, even if it is London’s preference.
- CO_2 reduction is a global issue and buses are part of the solution, but the cost cannot be borne by the operator alone – it needs Government support.

Other Air Quality Improvements

- Clean Air Zone due in Nottingham in 2020 – very little time for us to comply!
- All Euro III / IV ‘big’ buses to be replaced with new Euro VI double decks
- 180 Euro V diesel buses will require exhaust retrofit systems to achieve Euro VI equivalent NOx
- By 2020 the operational fleet will then be Euro VI or Euro V + retrofit

Buses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Free Wi-Fi
427
Your frequent City bus network

Buses


USB Power on Board
Free Wi-Fi
Up to every 10 mins
Nottingham City Transport
YP17 UGK

Infrastructure

Thank You

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