RENEWABLE ENERGY ASSOCIATION

Overview of subsidy and certification schemes for biomethane

Gaynor Hartnell,

Head of Renewable Transport Fuels

Overview

- The RHI
- The RTFO
- Interaction between the RHI and RTFO
- The Green Gas Certification Scheme
- Government's views on biomethane for transport

The Renewable Heat Incentive (RHI)

- Introduced in 2011, see - overview
- 2 schemes, domestic and **non-domestic**
- Qualifying technologies (**biomass**, G&A source heat, solar thermal, biogas combustion, **biomethane**, deep geothermal)
- Projects need to be accredited / "registered" with Ofgem
- Biomethane gets tiered tariff
- Closes to new entrants in March 2021, but biomethane plant need to commission before the end of January 2020
- Government consultation A future framework for heat in buildings: call for evidence ran from mid-March 2018 to mid-June 2018

Non-Domestic RHI tariff rates

The tariff tables below are the 2018/19 rates for the Great Britain scheme and are displayed in pence per kWhth. Please contact us, if you want to see rates prior to January 2013.

Latest tariff announcement

Show

Tariffs that apply for installations with an accreditation date on or after 22 May 2018

Hide

of eligible biomethane	Tier 3

Biomethane injection	Biomethane	On the first 40,000 MWh of eligible biomethane Tier 1	5.60
		Next 40,000 MWh of eligible biomethane Tier 2	3.29
		Remaining MWh of eligible biomethane Tier 3	2.53

Prices are in pence per KWh

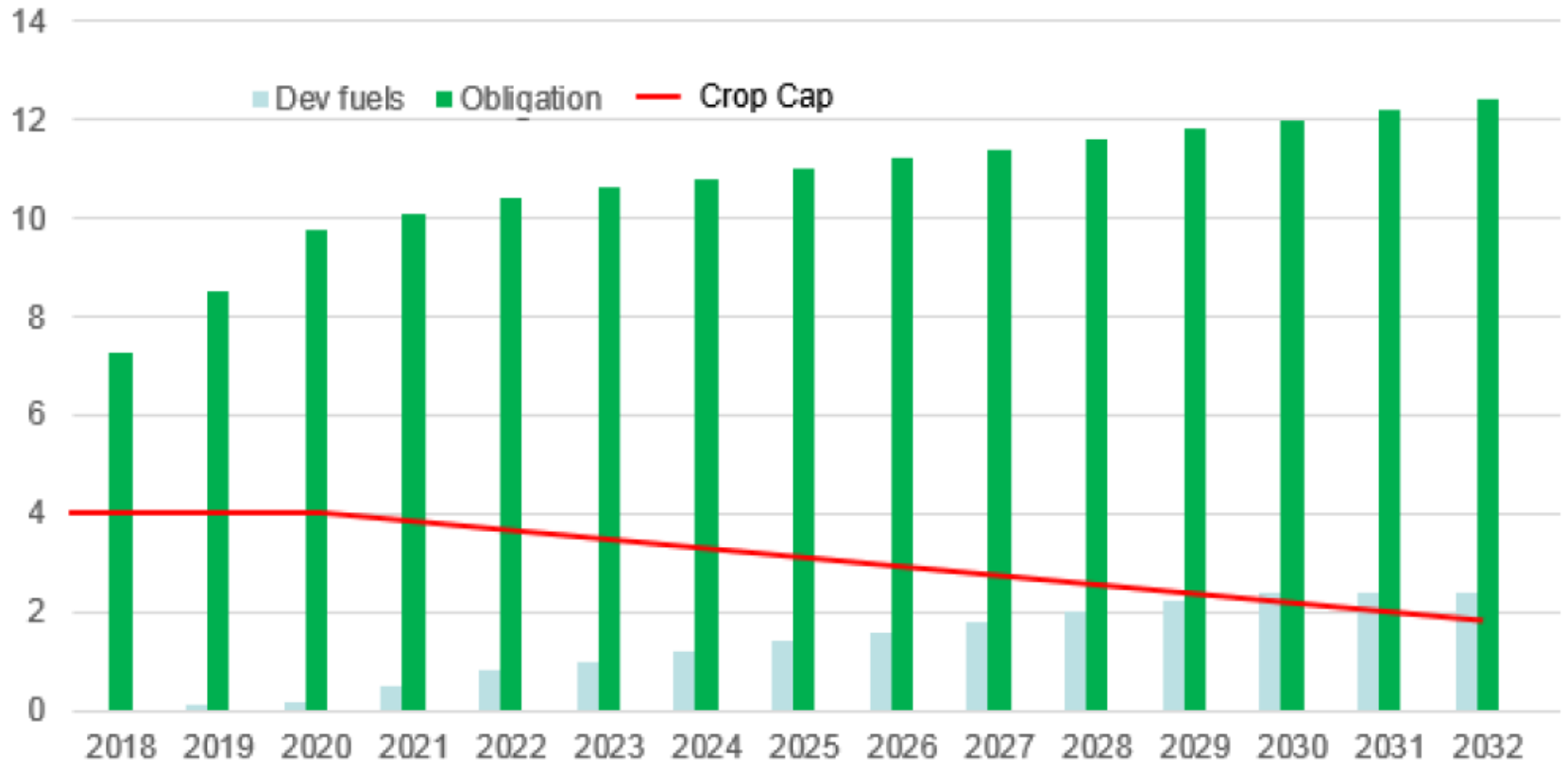
AD Deployment in the UK

	Plant numbers	Capacity	Biogas to grid
2011	71 (39 waste fed)	95.3MWe	6 plants
2018 In development	473 (144 waste fed) 326 (100 waste fed)	392.7 MWe	80 plants 47 plants

The Bioeconomy Consultants
NNFCC

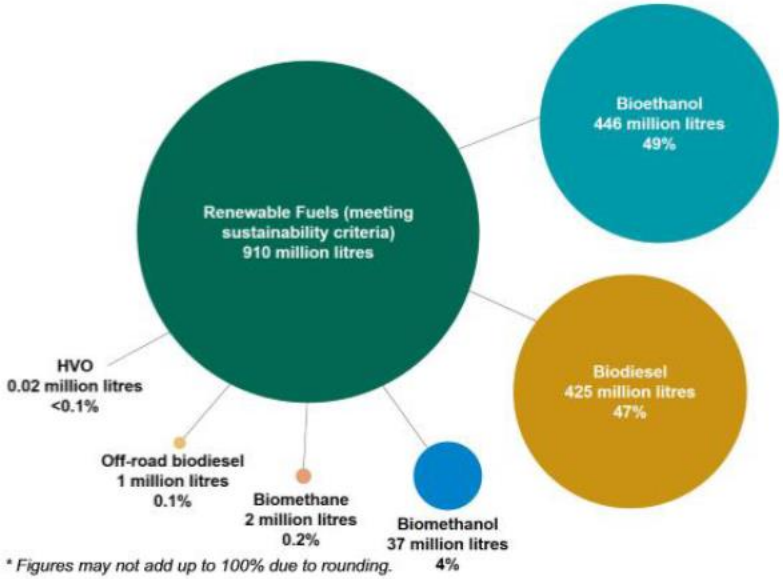
RHI vs RTFO

RHI	RTFO
Closes to new entrants 2020	Upward trajectory to 2032, no end date
Fixed tariff payment	Value of RTFC varies (and not influenced by biomethane)
If plant accredited, applies to all gas injected into the grid	Only applies to gas demonstrated to have been used in transport
Attractive tariff for first 40GWh injected	Attractive for all biomethane (if produced from wastes / residues)


14
12
10
8
6
4
2
0
Dev fuels
Obligation
Crop Cap
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032

RTFC *Theoretical* Value

- Spread between mineral based oil and biofuel prices
- Buyout capped at 30p/certificate (80p for Advanced), hence max reward for waste biomethane = 8.2ppkwh
- Focus on waste-based biodiesel



** Figures may not add up to 100% due to rounding.*

Energy Census Price Assessments

4pm London, 31 Aug 2018 — Methodology

	pence/certificate	+/-
RTFCw Year 11	17.20	-0.10
RTFCc Year 11	17.20	-0.10
RTFC Year 10	16.60	+0.10

	Outright $/mt	Spread to ULSD $/mt	Spread to ULSD pence/litre
UCOME	1040.75	351.00	23.91
FAME 0	894.75	205.00	13.96
RME	973.75	284.00	19.34
ULSD	680.25		

FX USD/GBP 0.7697

RTFC-RHI spread (waste based biomethane) *	pence/kWh	pence/litre
RTFCw Year 11	1.70	6.31

* 3 pence/kWh RHI

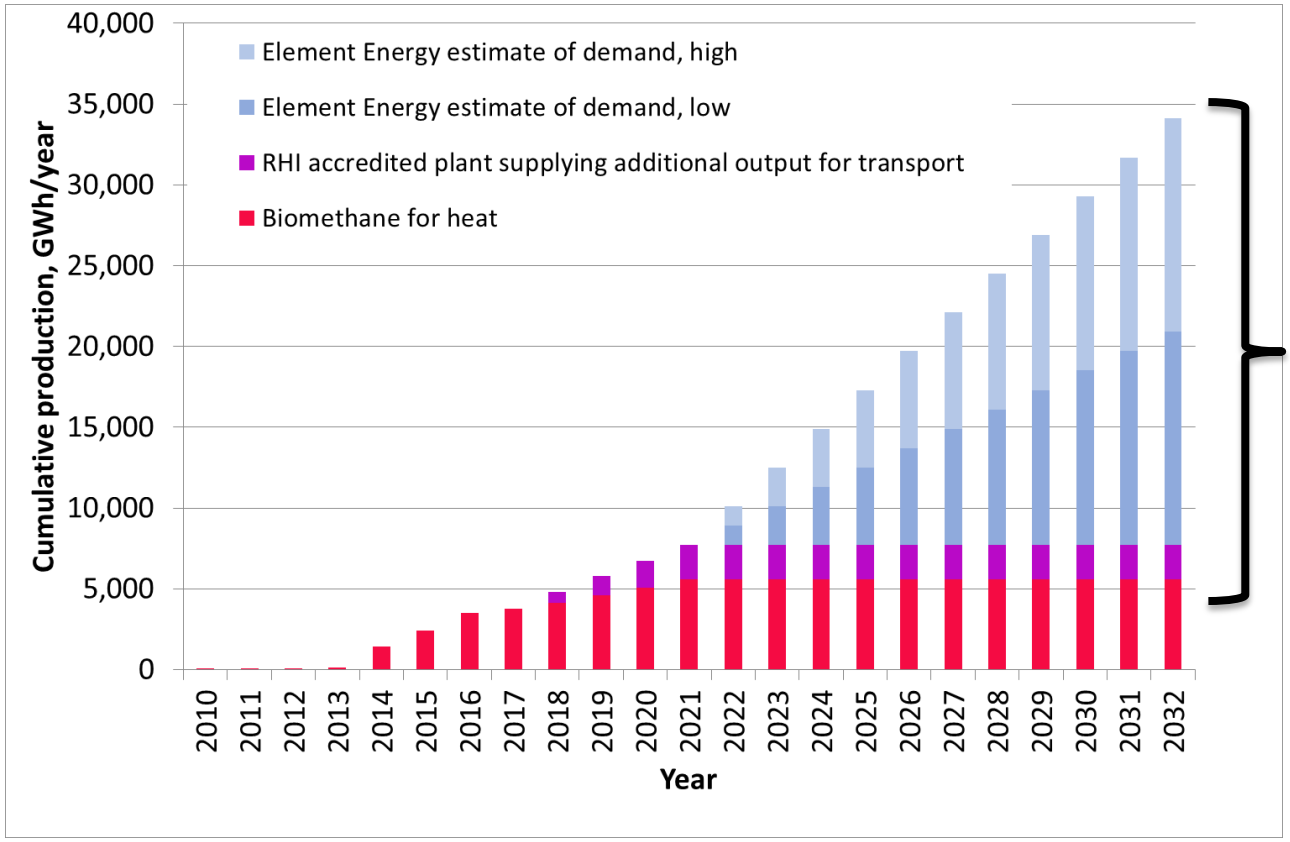
energy CENSUS

REA lobbying

- Meetings with DfT, BEIS, CCC, LowCVP
- Messages
  - Huge interest in biomethane for transport
  - Allow existing plants to send tier 2 gas to transport, and earn RTFCs – paper explaining benefits
  - This would free up some existing unutilised capacity
  - When RHI comes to a close RTFO will be the only driver for new deployment
  - Let's get biomethane plants built and be pragmatic about the policy incentives available
  - Our only ask – that HM Treasury does not prematurely end fuel duty differential

Demand for RTFO-approved Renewable Methane From the HGV Sector

- Analysis carried out by Element Energy on behalf of Cadent has identified a low – high potential of 12 – 24 TWh of gas fuel demand by 2035 from HGVs >18 tons
- According to Element Energy's analysis, 12 – 24 TWh of gas fuel demand would require 75 – 145 large public access gas refuelling stations



The RTFO will be the only policy driver for this additional renewable gas

The Renewable Transport Fuel Obligation

and how to participate in it – reaching out to new players

REA Conference – 4th Sept 2018

Eversheds Sutherland, Birmingham

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RENEWABLE TRANSPORT FUELS

Claiming RTFCs - RHI-accredited biomethane projects

Proving RHI is not claimed

Department for Transport

- Not allowed to claim RHI and RTFCs
- Evidence may involve:

Screen shots from the producers OFGEM RHI applications

Self declaration

Green gas certificate- will indicate whether the gas received RHI

Click here for slides from GGCS

Mass balancing, the Green Gas Certification Scheme and the RTFO

September 2018

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Government views (historical)

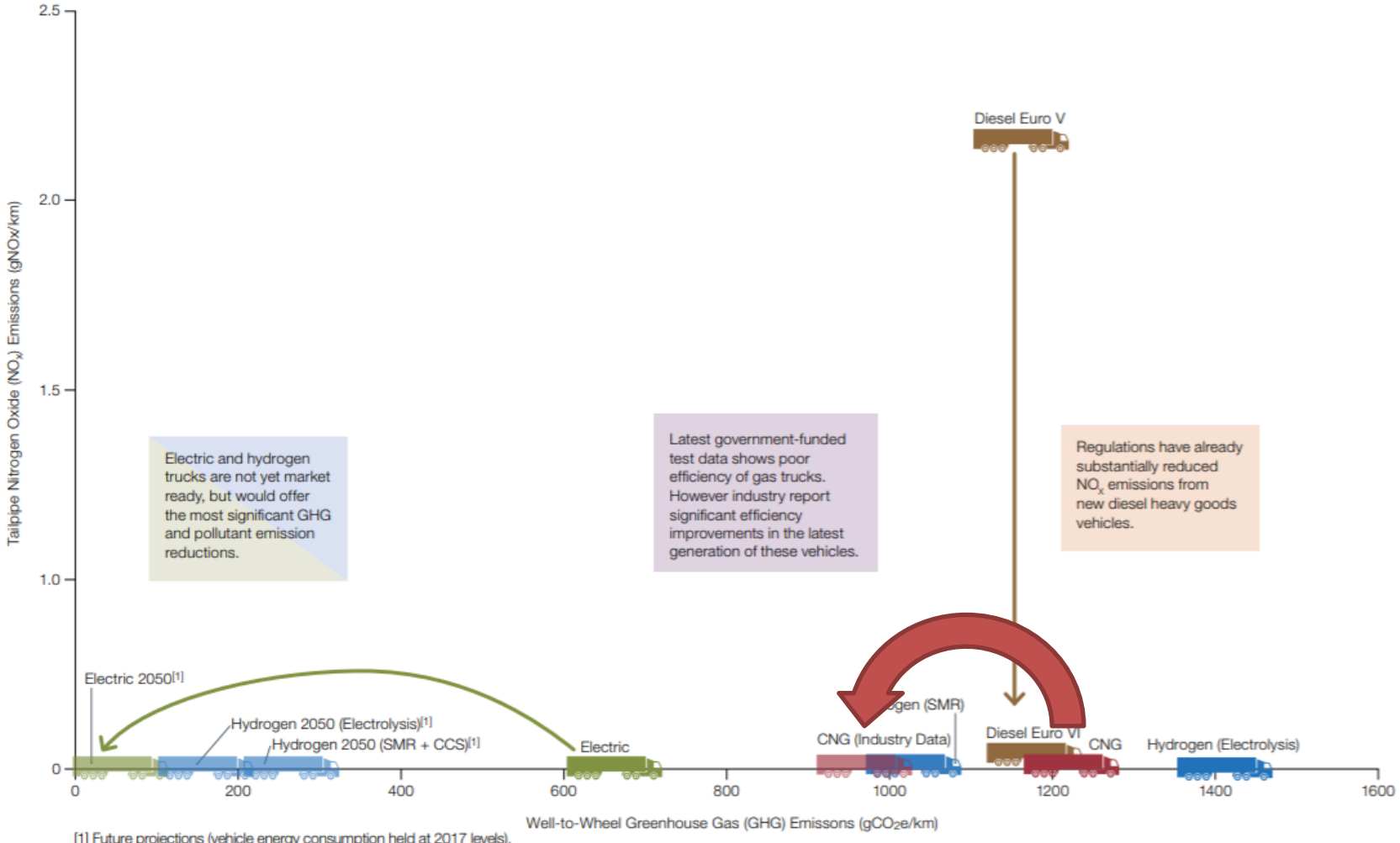
- Autumn Statement 2013 to maintain the duty differential for LNG, CNG and biomethane until 2024 (to be reviewed in 2018)

Fuel Duty rates

Type of fuel	Rate
Petrol, diesel, biodiesel and bioethanol	**57.95 pence** per litre
Liquefied petroleum gas (LPG)	**31.61 pence** per kg
Natural gas used as fuel in vehicles, for example biogas	**24.70 pence** per kg
'Fuel oil' burned in a furnace or used for heating	**10.70 pence** per litre

DfT happy to support if emissions performance was as industry suggested. See Fig page 125 Road to Zero (July 2018)

Figure A5: Estimated greenhouse gas (GHG) and nitrogen oxides (NO_x) emissions for a 44 tonne HGV on a 'long haul' duty cycle (average speed 79 km/h)



LowCVP Jan 2017


Department for Transport

LowCVP Low Carbon Vehicle Partnership

Connect Collaborate Influence

Emissions Testing of Gas-Powered Commercial Vehicles

The results of tests to measure the greenhouse gas and air pollutant emission performance of various gas-powered HGVs, on behalf of Department for Transport.

Prepared by Low Carbon Vehicle Partnership

January 2017

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Reviewed by: Andy Eastlake CEng FIMechE
Managing Director

GHG Results Summary

For the dedicated natural gas vehicles, the GHG results are somewhat mixed. When comparing with a substantially higher-powered diesel vehicle (Dedi02), overall savings of 4-8% were measured, but in more like-for-like tests (Dedi01 and Dedi03), **the savings were, at best, 5% and, at worst, the dedicated gas vehicle's emissions were some 15% higher** than the diesel comparator. These results suggest that there are quite high efficiency losses under some operating conditions in moving from a compression ignition, conventional diesel engine to a spark-ignition one of similar power output.

Recent emission

I can only give you the results verbally – but you'll see them when the LEFT testing is complete and results published…..

Aim – To inform DfT Environment Strateg

Low Carbon Vehicle Partnership

Connect
Collaborate
Influence

- Road to Zero commitment -

18. Undertaking further emissions testing of the latest natural gas HGVs to gather evidence that will inform decisions on future government policy and support for natural gas as a potential near-term, lower emission fuel for HGVs.

- Gas (Methane) has been identified as a potential opportunity to reduce the carbon and AQ impact of HGVs
- Testing in 2016 identified concerns over Methane Slip and emission performance of Retrofit Dual Fuel Gas HGVs but potential carbon benefits delivered by OEM dedicated Gas HGVs, with no significant AQ detriment.
- A call for further testing on the latest generation of Gas HGVs was recommended and supported by industry.

Natural gas

There is growing interest in the use of natural gas in HGVs because of its potential to reduce both greenhouse gas and air pollutant emissions compared to diesel HGVs. Natural gas vehicles can also provide other benefits, such as quieter operation, that may make them more suitable for certain tasks such as night operation.

Government is working with industry, through OLEV's Low Emissions Freight and Logistics Trial (LEFT), to test the latest gas trucks to assess their emissions compared to diesel alternatives. Where data is available in time, it will also inform the government's review of duty rates for alternative fuels, ahead of Budget 2018.

Thank you

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