Anaerobic Digestion Deployment in the United Kingdom

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Rushlights BioBriefing
Overview

• NNFCC company background
• Anaerobic digestion (AD) introduction
• Incentives for AD
• UK AD deployment
NNFCC – Who are we?

- Bio-economy consultancy based in York, originally established as a National Centre
- Expertise on the conversion of biomass to bioenergy, biofuels and biobased products
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• Bio-economy consultancy based in York, originally established as a National Centre
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• Interests in AD:
  » Involved in the development and delivery of the UK AD strategy and Action plan (2011)
  » Maintain the Official AD Portal on behalf of Defra
  » Soon to publish “Anaerobic digestion deployment in the United Kingdom” report
Anaerobic Digestion Process
AD Incentives (GB)

• Feed-in Tariffs
  » Fixed tariff for electricity generated and exported
  » Separate tariffs for small, medium and large scale
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- Renewables Obligation
  - 2 ROCs received per MWh electricity generated
  - ROCs tradable
AD Incentives (GB)

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- Renewable Heat Incentive
  - Fixed tariff for usable heat generated
  - Biomethane injection and small scale combustion currently supported
  - Medium and large scale combustion supported from April 2014
AD Incentives (NI)

- Northern Ireland Renewables Obligation
  - 4 nROCs received for small and medium scale
  - 3 nROCS received for large scale
AD Deployment in the UK

March 2014

Anaerobic digestion deployment in the United Kingdom
AD Deployment in the UK

Definitions

Plant scale

- **Small scale** refers to installations with an installed capacity of 250kWe and below.
- **Medium scale** refers to installations with an installed capacity of above 250kWe to 500kWe.
- **Large scale** refers to installations with an installed capacity of above 500kWe.
AD Deployment in the UK

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Plant type
- **Waste-fed** refers to installations where the contribution of municipal (e.g. food waste; green waste), commercial (e.g. food waste) and industrial wastes (e.g. brewery waste; animal processing wastes) towards the total feedstock requirement is greater than 50%.
- **Farm-fed** refers to installations where the contribution of farm-based feedstocks (e.g. manure; slurry; energy crops; crop wastes) towards the total feedstock requirement is greater than 50%.
AD Deployment in the UK

- 138 operational plants
  - 65 farm-fed (42 MWe)
  - 73 waste-fed (86 MWe)
AD Deployment in the UK

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  – 73 waste-fed (86 MWe)

• 342 plants under development
  – 213 farm-fed (130 MWe)
  – 129 waste-fed (249 MWe)
AD Deployment in the UK

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• 15 biomethane-to-grid (BtG) projects
  – 5 operational plants
  – 10 plants under development
AD Deployment in the UK

Future Deployment

- If all plants under development completed capacity would quadruple by 2017
- However, only around 30-50% of plants in pipeline expected to complete
- Feed-in Tariff degression to small and medium scale plants could restrict deployment even further
AD Deployment in the UK

Deployment by scale

- Large scale plants dominate in terms of capacity, while numbers similar to medium scale
- Deployment of small scale and BtG at low level
- Feed-in Tariff degression can be expected to distort the balance of plant scales even further
AD Deployment in the UK

Currently required feedstock volumes

- 1,450,000 tpa food waste
- 750,000 tpa energy crops
- 700,000 tpa other waste
- 450,000 tpa manure/slurry
- 200,000 tpa crop waste
AD Deployment in the UK

Future (theoretical) required feedstock volumes

- 5,500,000 tpa food waste
- 2,700,000 tpa energy crops
- 2,150,000 tpa other waste
- 1,800,000 tpa manure/slurry
- 450,000 tpa crop waste
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Required cropland

• Assuming an energy crop yield of 45 fresh tonnes/Ha, the UK AD industry requires 17,000 Ha of land

• If all plants under development were to complete, the UK AD industry would require 60,000 Ha of land

• Break crops often used for AD
AD Deployment in the UK

National Deployment

- Deployment currently strongest in England
- Attractive support under NIRO could see NI deployment increase over the next few years
AD Deployment in the UK

Regional Deployment

• Deployment strongest in East of England
• Deployment weakest in North East
• Broadly consistent distribution in other regions
AD Deployment in the UK

Summary and future development

• Development pipeline strong
• Considerable challenges ahead for the farm-scale AD sector
• RHI could become a more stable form of support in the future and result in further BtG deployment
Celebrating 10 years of Bioeconomy development

NNFCC is a UK based consultancy with expertise on the conversion of biomass to bioenergy, biofuels and biobased products.

We help industry solve complex business challenges and provide vital evidence for policy makers.