ANAEROBIC DIGESTION

DELIVERING COST-EFFECTIVE BASELOAD ENERGY

Anaerobic digestion (AD) extracts more value from our organic waste (including inedible food waste, manures, wastewater) and break/cover crops than any alternative by converting organic material into:

- ultra-low carbon storable, flexible, baseload renewable gas;
- nutrient-rich biofertiliser for sustainable farming; and
- new higher value biotechnology products, such as graphene, biochemicals and bioplastics.

FRAMEWORK FOR GROWTH

ADBA

40 biomethane plants already have capacity to heat 100,000 homes or fuel 10% of UK's bus fleet

CURRENT RETURN ON INVESTMENT

DOMESTIC GAS PRODUCTION AND BASELOAD ELECTRICITY

- ✓ Biogas is baseload energy that delivers heat and electricity when we most need it, reducing the need to reinforce the grid, saving about £30/MWh.
- ✓ Over 400 AD plants are already providing enough baseload energy to replace the nuclear power plant, Wylfa, when it is decommissioned later this year.
- ✓ AD already generates almost half of the UK's renewable heat output.

COST EFFECTIVE CARBON ABATEMENT

- ✓ AD is more than just clean energy; mitigating 2.6 million tonnes of carbon from agricultural, food and human wastes.
- ✓ Biomethane as a vehicle fuel reduces carbon emissions by about a quarter and dramatically improves air quality.
- ✓ AD is vital to government efforts to decarbonise farming, heat and transport.

KEEP FARMERS FARMING

- ✓ AD generates additional revenue worth on average £150,000 to each farmer.
- ✓ AD recycles essential nutrients & organic matter back to the soil, and crops grown for AD as part of sustainable crop rotations reduce the need for pesticides/commercial fertilisers and improve food crop yields.
- ✓ AD enhances farming resilience, supporting UK food security and production.

ECONOMIC PRODUCTIVITY AND GLOBAL COMPETITIVENESS

- ✓ AD already sustains 4,000 jobs, primarily in rural areas.
- ✓ AD exports are currently estimated at £50-110 million each year, and the UK is developing innovative technology, expertise and standards to export to the world.
- ✓ The UK is notably a world leader in AD food waste technology.

MEETING RECYCLING TARGETS

- ✓ AD is an established technology for treating food waste, already converting 1.6 million tonnes each year into valuable outputs.
- ✓ Wasting food costs the average household about £470 each year.
- ✓ Councils save money by extracting heavy food from the waste stream, in many cases saving hundreds of thousands of pounds.

SUPPORT GROWTH

WHAT IS PREVENTING FURTHER GROWTH?

- » Removal of Levy Exemption Certificates (LECs) has hit AD profit margins with an £11 million bill each year.
- » Removal of pre-accreditation for FIT has halted AD growth given the calamitous impact on investor confidence.
- » Even if pre-accreditation is re-introduced, DECC aims to limit funding from 2016 to just 26MW; half that of 2015.
- » There is no commitment to extend support for biomethane and biogas heat under the RHI beyond April 2016.

WHAT DOES INDUSTRY NEED TO MEET POTENTIAL?

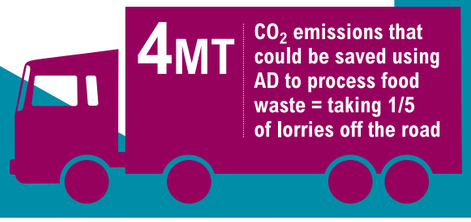
- » Stable incentive regime securing investor/operator confidence.
- » Centrally driven support for separate food waste collection schemes.
- » Support for biomethane as a transport fuel.
- » Clear recognition of AD's contribution to decarbonising farming, heat and transport.
- » More joined up policy coordination between all relevant government departments.

HOW CAN YOU SUPPORT US?

- » Come and visit us on one of your constituency days to see first-hand the extraordinary value that our industry offers.
- » Assist with facilitating a meeting with the Secretary of State for Energy & Climate Change.
- » Raise our concerns on the floor of the House.
- » Ballot for a Westminster Hall/Adjournment debate on the impact of recent government policy on a thriving green economy.

INDUSTRY POTENTIAL

- ✓ AD offers cheaper baseload energy than nuclear by the time nuclear is delivered, providing localised generation without the risks of a single large development.
- ✓ AD could meet 30% of either domestic gas or electricity demand.
- ✓ With natural gas imports from Russia and Qatar set to increase by a third over this Parliament, biogas could reduce our dependence on imported energy by 15%.



4MT CO_2 emissions that could be saved using AD to process food waste = taking 1/5 of lorries off the road

- ✓ Reduce UK's total greenhouse gas emissions by 4%
- ✓ Fuel up to 80% of the UK's HGV fleet.
- ✓ Reduce greenhouse gas abatement costs by £1.2 billion between 2016 and 2040.

1M Carbon abatement from AD is the equivalent of removing 1 million cars from our roads

- ✓ Recycling digestate helps mitigate the heavy costs attributed to soil degradation, valued at £1.4 billion by a recent government report.
- ✓ With UK dairy farms having halved to 10,000, small-scale AD could help remaining businesses survive from the on-site waste they generate.
- ✓ AD could help unlock an overall renewable on-farm energy potential that could power 1.3 million homes.

- ✓ A thriving industry could employ 35,000 people.
- ✓ The Green Investment Bank recognises AD as one of the top ten vital technologies for developing greener, smarter cities.
- ✓ The global exports and UK private sector investment opportunities are worth billions.

158 on-farm plants provide local power for 203,000 homes

- ✓ By recycling all inedible food waste through AD, the industry could produce over 9TWh per year alone by 2025 – enough green gas to heat half of the households in London.
- ✓ Recycling food waste reduces fertiliser imports by 10%.
- ✓ Separate food waste collections are essential to meet the UK's recycling targets.

40% of the 15 million tonnes of UK food waste is lost to landfill

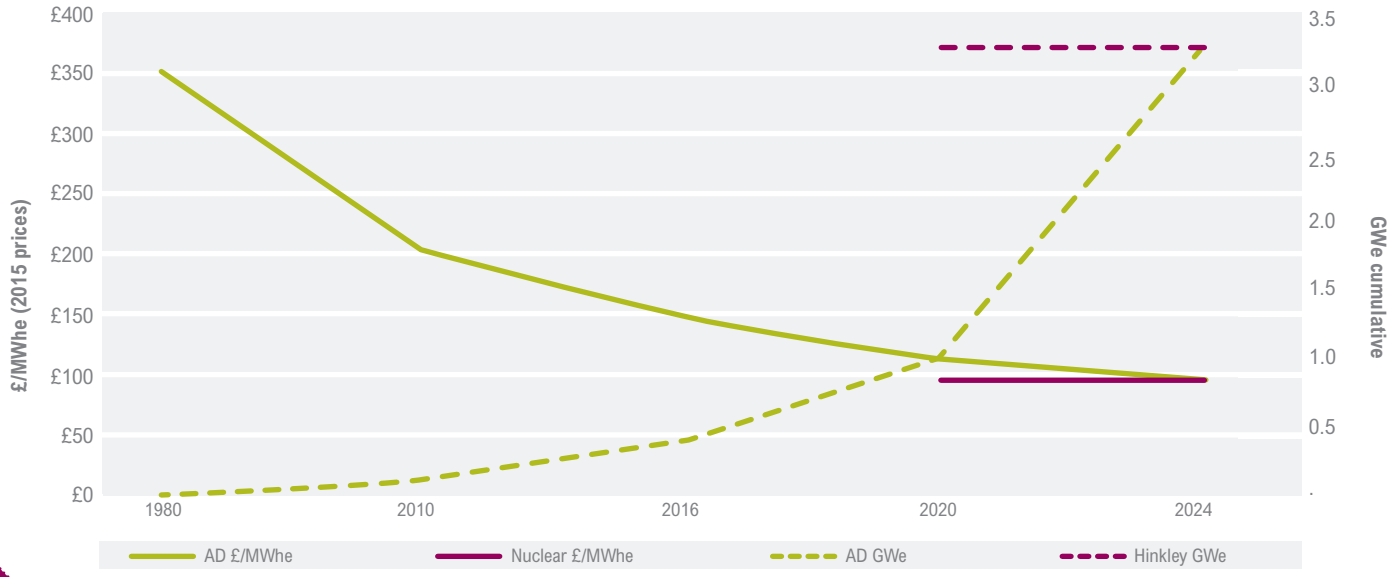
HOW COMPETITIVE IS AD?

WHEN ENERGY OUTPUT IS CONSIDERED IN ISOLATION?

We can improve energy security now through AD. The industry is ready to deploy new capacity in time for winter 2016.

AD is on the path to becoming the most cost-effective form of low-carbon baseload power. The graph below shows how, as more AD capacity is built, the cost falls so that by 2024 AD will cost less than new nuclear by the time Hinkley Point C is delivered, providing localised generation without the risk of a single large development.

COST OF GENERATING BASELOAD ELECTRICITY As more AD capacity is built, the cost falls. In 2024 it becomes cheaper than nuclear



As the cost per MWh of biogas energy (depicted by the green line) drops below the 35-year price guarantee for Hinkley Point C (denoted by the red line), AD's electrical capacity (green dotted line) will increase to match Hinkley's capacity generation (as illustrated by the red dotted line). This graph is illustrated for the period leading up to 2024 by which Hinkley was expected to have been delivered – by diversifying this capacity across the country AD also reduces the risk of delays.

WHEN ITS NON-ENERGY BENEFITS ARE TAKEN INTO ACCOUNT?

As outlined in the below grid, when taking AD's carbon abatement contribution into account alongside the value derived from baseload energy generation, AD offers exceptional value for money compared to renewable and non-renewable alternatives – and that's before assessing the technology's contribution to rural communities, food security and resource management.

	AD	SOLAR	OFFSHORE WIND	NEW NUCLEAR (from 2024?)	NEW GAS (from 2017?)
Cost of electricity generated £/ MWhe	£125	£68	£131	£95	£77
Value as a baseload technology (£/ MWhe)	-£30	N/A	N/A	-£30	-£30
Economic value of avoided fossil emissions	-£32	-£32	-£32	-£32	N/A
Economic value of non-energy carbon reduction (average £/ MWhe)	-£32	N/A	N/A	N/A	N/A
TOTAL COST OF ELECTRICITY GENERATED £/ MWHE	**£32**	**£36**	**£100**	**£34**	**£47**
Contributions to other government priorities:					
Supports recycling targets	✓				
Digestate benefits soil	✓				
Supports farming - diversification, income stability	✓	✓			
Rural jobs	✓	✓			
Low risk of unexpected capacity outages	✓	✓	✓		
Localised energy generation	✓	✓			
Technology costs falling over time	✓	✓	✓		
Reduced farm/ countryside odour	✓				