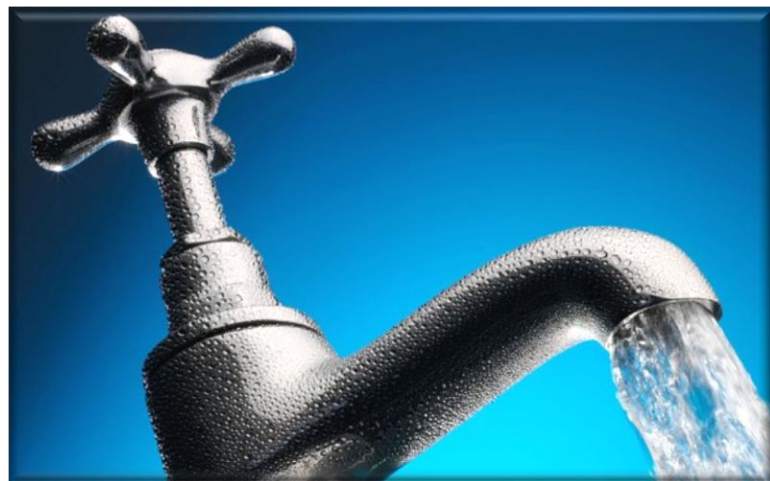
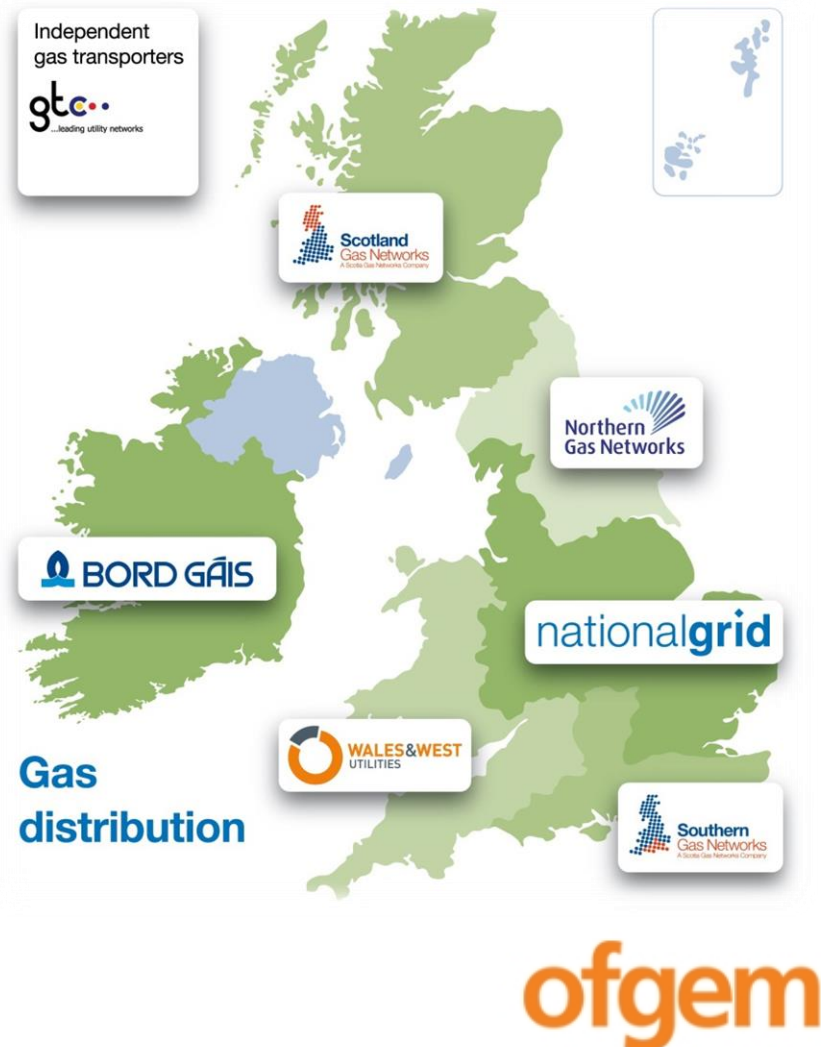




United Kingdom Utility Market Overview

Matthew Izzard
(UKSTT Past Chairman)





- Sourced from over 45% imported (60% by 2050), North Sea, Bio Mass, Private Networks)
- Gas taken from high pressure transmission system (National Grid) and distributed nationally through low pressure networks.
- 275,000k of low pressure gas pipes - Ductile Iron, Cast Iron, Steel, Polyethylene.
- Eight Gas Distribution Networks (GDNs) covering geographical areas and some Independent Gas Transporters (IGTs)
- Regulated under license by OFGEM – independent regulator who ensure commitments are met to retain license.
- New technology (innovation) can be funded separately by a GDN or applied for through OFGEM. Once approved by one GDN technology is available to all.

Gas: Trenchless Technology Application

- 80% of UK Gas Installation is now Trenchless Technology



Impact Moling



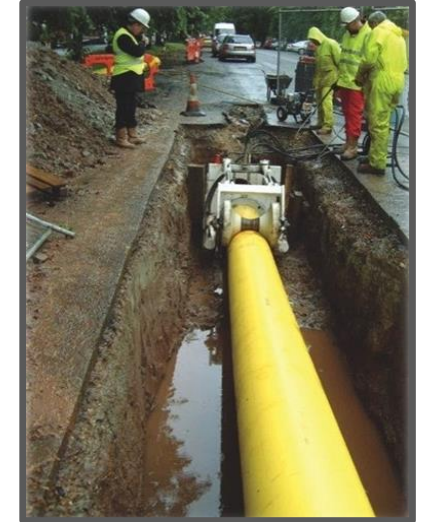
Directional Drilling



Cleaning



Robotic Repair



Insertion



Pipe Pushing



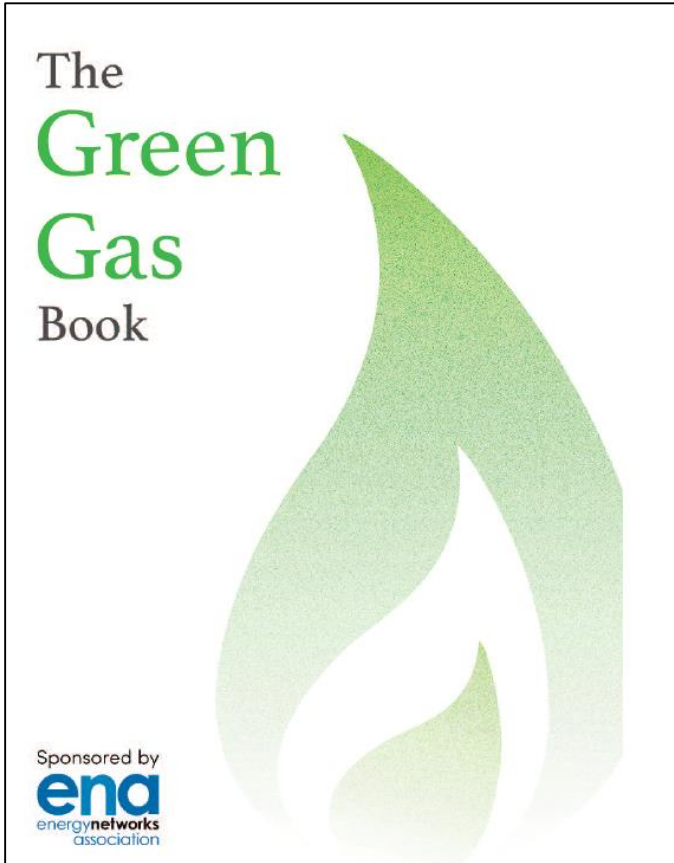
Vacuum Excavation



Pipe Bursting

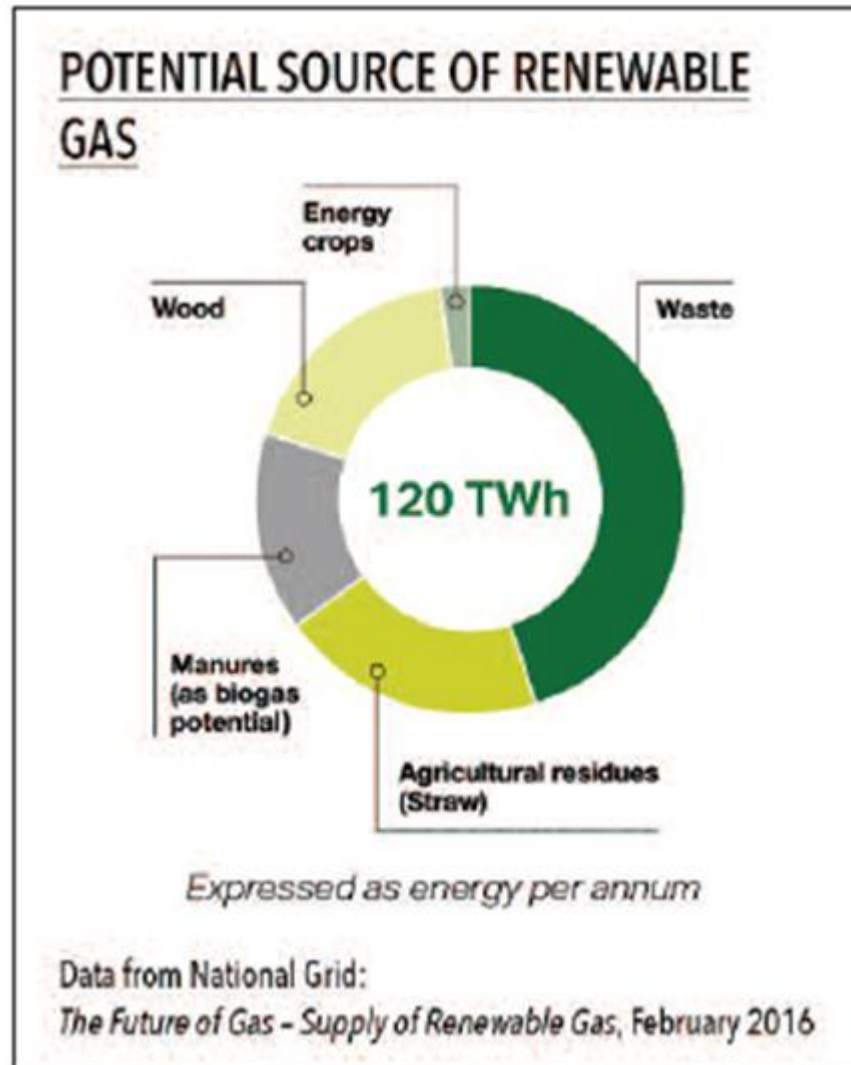


Coring

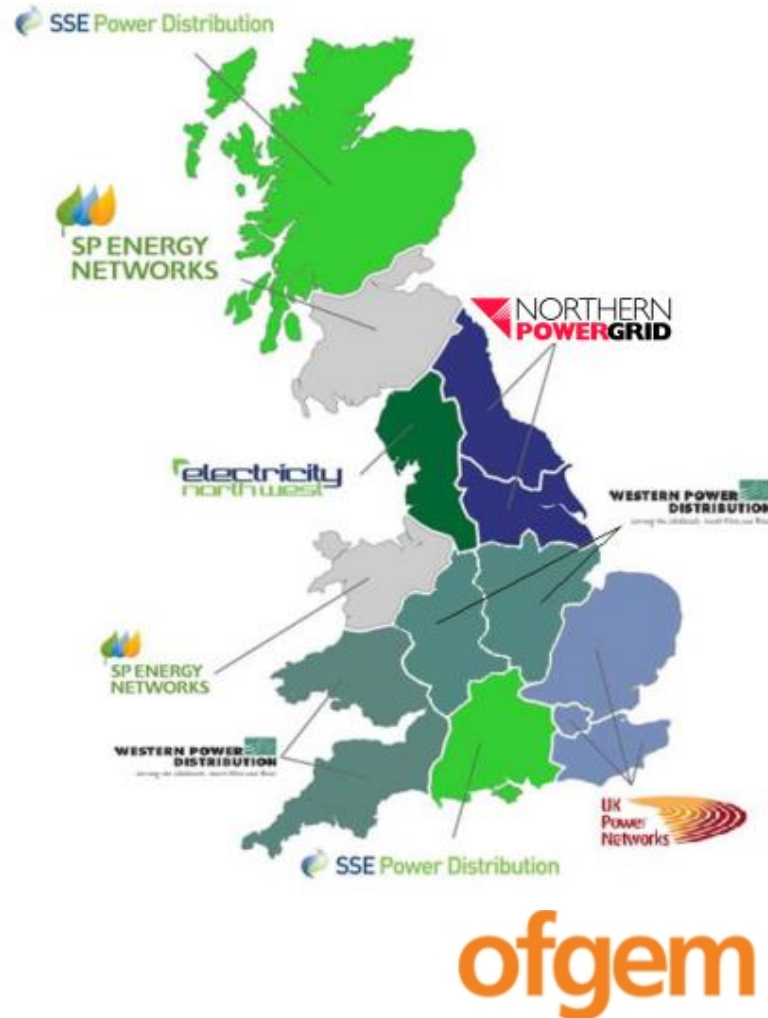


- The first commercial use of gas in the world – UK over 200 years ago.
- Gas accounts for 50% of non-transport primary energy needs – for power generation + heat.
- Gas accounts for 40% of the UK's Green House Gas emissions.
- To meet 2050 GHG (Paris Agreement) target government policy in 2010 was to switch from gas to an all electric solution for heat.
- Hydrogen + other initiatives – gas industry is potentially the solution.

Through the 'Iron Mains Replacement Programme' approx. 100,000km of the low pressure gas mains have been replaced with new polyethylene mains in recent years – Programme due for completion by 2032



- To meet peak heat demand would require 30 nuclear power stations
- 85% of UK homes are heated by gas
- Ideal way forward is to make gas “Green”
 - Biomethane
 - Biopropane
 - Hydrogen
- National Grid target to hit 30% - 50% of domestic gas demand to be ‘green gas’
- Anyone can sell bio-gas into National Grid network
 - Flare off gas: sewage plants
 - Land fill gas



- Generated from green energy, gas, coal and nuclear power stations.
- 14 Public Electricity Supply Areas, run by 6 companies - Distribution Network Operators (DNOs).
- 482,000k of power cables in the UK – Overground & Underground
- Regulated under license by OFGEM – independent regulator who ensure commitments are met to retain license.
- New technology (innovation) can be funded separately by a DNO or applied for through OFGEM. Once approved by one DNO technology is available to all.

Electricity: Trenchless Technology Application



Impact Moling



Directional Drilling



Keyhole



Cable Pushing



Cable Pulling



Cable Detection / Location



Vacuum Excavation



Cable Exchange

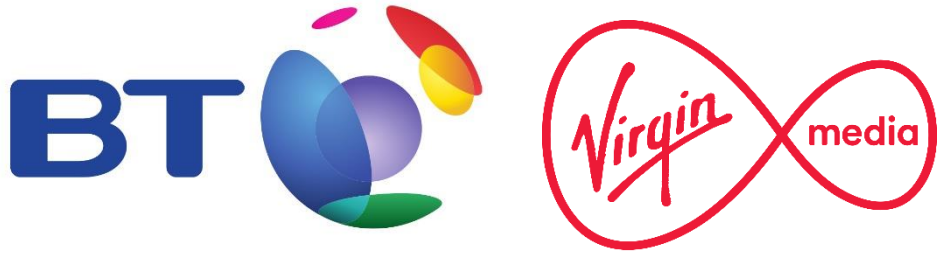


Coring



- Set to be largest growth utility industry
 - EV Charge Points
 - Solar Energy
 - Wind Farms
- Undergrounding projects
- Reduction in carbon emissions
- Projected population growth and demand
- Introduction of Smart Metering
- Decentralising energy – but more investment needed.





Private Community Networks



- Only British Telecom and Virgin Media had license to install network in UK.
- All other broadband providers rent asset space from network owners.
- PCN can build onto network.
- Private companies regulated on delivery and performance by OFCOM.
- Connections either cable / optic or microwave.
- Copper cable or fibre optic, some in ducts, often laid at shallow depths.

Fibre Optic: Trenchless Technology Application

- 30% Customer 'take up' improved by installation factors.



Trenching



Impact Moling



'Stitching'



Keyhole



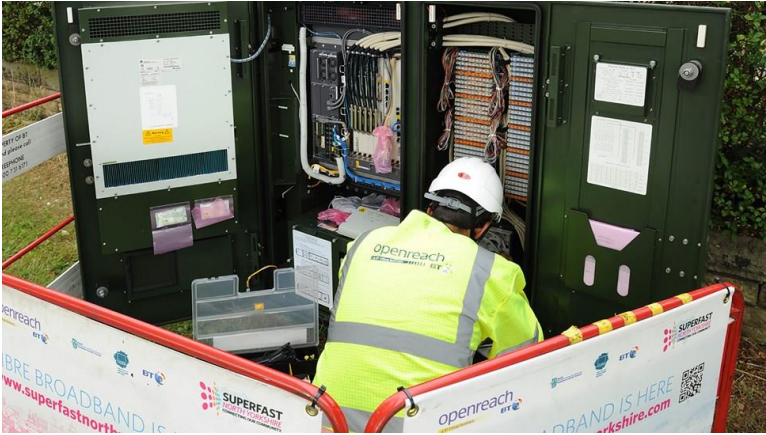
Cable Pulling



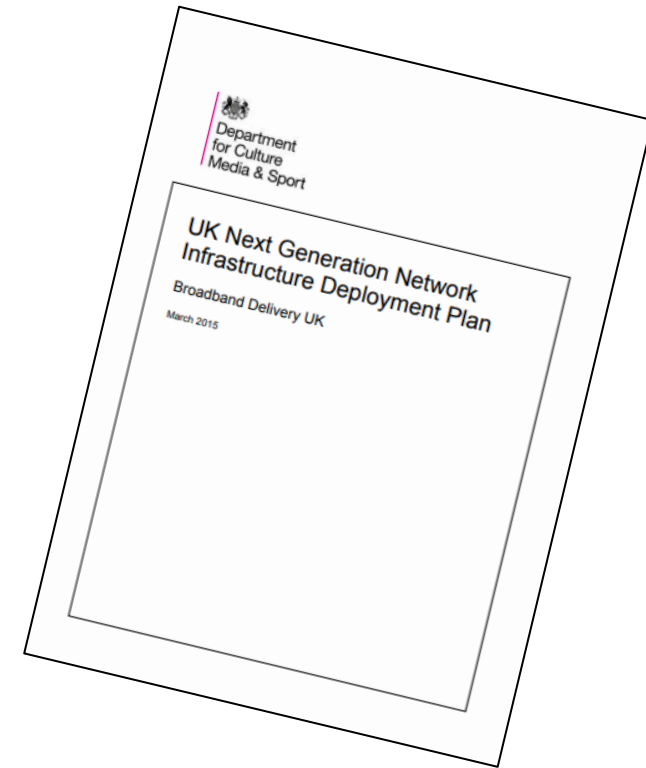
Micro-Trenching with Vacuum Excavation



Directional Drilling



- Government target to provide 100% coverage in the UK by 2020 as part of Broadband Delivery UK (BDUK).
- Upgrade on existing system from copper cable to fibre optic.
- 'Google Cities' identified around Europe.
- Private Networks being encouraged.
- Microwave networks developing.



UKSTT The Water Network



ofwat



- 390,000km of water mains & 362,000km of sewers
- 12 Water & Sewerage companies.
- 19 Water only companies.
- Regulated under license by OFWAT
- Water companies operational activities account for 0.7% of UK's GHG emissions
- Operate in 5 year Asset Management Cycles (AMP) to hit targets for funding and Customer
- Innovation developed separately – similar approval process for each company.

Water: Trenchless Technology Application



Impact Moling



Directional Drilling



Cleaning



Robotic Repair



Insertion



Patch Repair



Vacuum Excavation

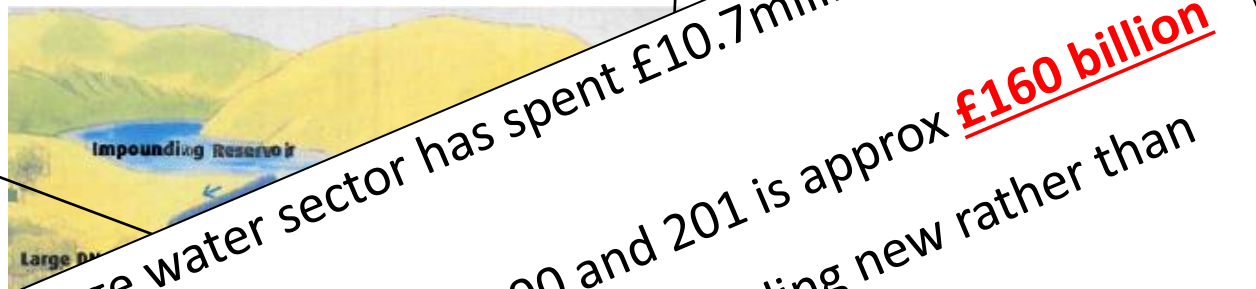


Pipe Bursting



Lining

Improve water treatment works process



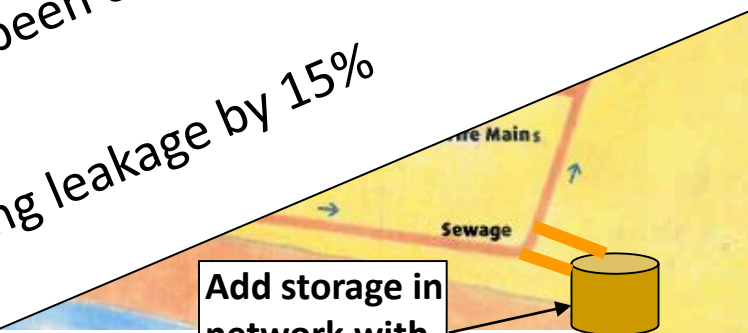
New houses built with new pumped water supply

On average water sector has spent £10.7million per day since privatisation
 Total invested between 1990 and 201 is approx **£160 billion**
 The focus of spend has been on building new rather than maintaining old assets
 AMP7 targets reducing leakage by 15%

Improve and extend wastewater treatment works

New sewer system for additional flows

Add storage in network with pumped returns to reduce spills



390,000km of water mains & 362,000km of sewers

Cost of replacing water mains £100Billion

Cost of replacing sewer system £400 - £600Billion

Total capital spend 1990 – 2019 = £160Billion

At current replacement levels:

200 years to replace the UK's water mains

800 – 1200 years to replace the UK's sewerage system

The European Water Network Potential:

Country:	Type:	Amount: km	Water Loss Rate:	% Renewal Rate:	km/a
Austria	Sewage	96,200	11%	1,25	1,200
	Water	76,700		2	1,500
France	Sewage	400,000		0,7	2,800
	Water	1,050,000	20%	0,6	6,300
Germany	Sewage	575,800		0,8	4,600
	Water	530,000	6.5%	0,8	2,700
Italy	Sewage	164,500		0,75	1,250
	Water	337,500	37%	0,75	2,500
Netherlands	Sewage	130,000		1	1,300
	Water	119,146	7%	1	1,200
Spain	Sewage	105,000		0,6	630
	Water	160,000		0,8	1,280
Switzerland	Sewage	50,000	11%	1 -2	750
	Water	59,000		1 -2	880
United Kingdom	Sewage	390,000	22%	0,5	1,615
	Water	362,000		0,1	3,475

Projects and contracts may be:

- Scoped by utility company
- Scoped by contractor
- Scoped by Design Consultancy
- Scoped by Joint Venture

Projects and contracts may be:

- Set Price
- Profit Share / Loaded
- Bonus & Penalty Claused
- Out of scope Process Agreement



Specification of Technique (Designer / Consultant):

- Based on knowledge
- Area of expertise
- Failure Risk
- Technical Delivery Competence
- Time
- Independence

Specification of Technique (End Client):

- Installation Cost
- Installation Life & Performance
- Liability & Risk
- Customer Impact
- Environmental Impact

Contractors: Registration & Contract Process

Regulated Approval System



Approved Contractors

Bethell Utility Services Ltd - MURS Accredited	+
Blyth Utilities Ltd	+
Integrated Utility Services - MURS ACCREDITED	+
Clancy Doowra - MURS ACCREDITED	+
Infrastructure Gateway - MURS Accredited	+
Multi Utility UK - MURS Accredited	+
Blu-3 (UK) Ltd - MURS Accredited	+
Future Energy Group Ltd - MURS Accredited	+
Energetics, Design and Build - MURS Accredited	+
IQA Group - MURS ACCREDITED	+
TriConnex Ltd - MURS Accredited	+
Harlaxton Engineering Services Ltd - MURS Accredited	+
GTC	+
Fulcrum - MURS Accredited	+
Mulholland Contracts Ltd - MURS Accredited	+
Nicol of Skene Ltd - MURS Accredited	+
DaCI Utilities Engineering Consultancy Ltd - MURS Accredited	+
Advance Construction (Scotland) Ltd - MURS Accredited	+
Bermus Construction Services Ltd - MURS Accredited	+
Matrix Networks Ltd - MURS Accredited	+
Phoenix Utilities Ltd	+
PN Daly Ltd - MURS ACCREDITED	+
Aptus Utilities - MURS ACCREDITED	+
Connect It Utility Services - MURS Accredited	+
Key Utility Solutions Ltd - MURS Accredited	+
J Murphy and Sons Ltd - MURS Accredited	+
Megson Utilities Limited	+
FES Support Services Ltd - MURS Accredited	+

Tender Announcement

Duration / Project
Scope of Works - Clauses
Selection Process - Timescale
Selection Criteria – Transparency



Tender Evaluation



Contract Approval / Award



Contract Start



Ongoing Management

Joint Venture:

- Term Design, Profit Share



Balfour Beatty
Utility Solutions

Barhale

MMB

Grontmij

MWH

love every drop
anglianwater

SKANSKA

Tier 1: Project Management



MORRISON
Utility Services

Tier 2: Assigned Delivery

– Line Work, Special Projects

- Mapping & Location
- HDD
- Lining
- Vacuum Excavation
- Skilled Labour
- Specialist Plant Hire

Specialist Contractors:



Pipe Ramming



Micro Tunnelling



Auger Boring / Pipe Jacking



Asset Location



- ✓ Formed in 1993, not for profit organisation.
- ✓ To promote and educate on Trenchless Technology in an impartial manner.
- ✓ Made up of consultants, academics, manufactures, contracting companies, hire companies, authorities and utility companies.



UKSTT Patrons:





Natural resources are conserved & the impact on the environment is less due reduced need for quarried materials.



In 2017 Wessex Water saved transporting over 107,000 tonnes of material through using trenchless technology – enough to fill the USS Nimitz!





UKSTT Thank You!



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