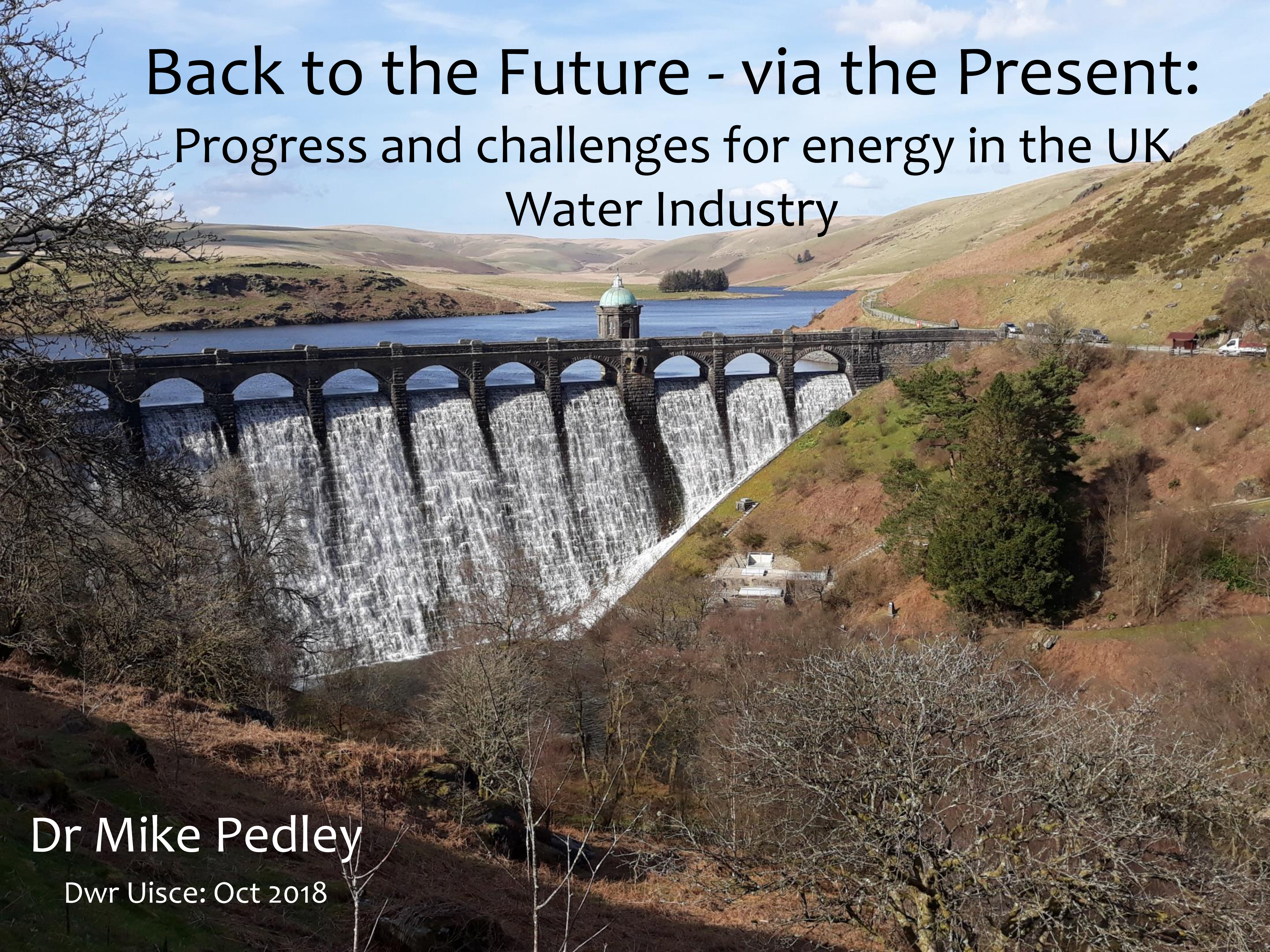
Back to the Future - via the Present:

Progress and challenges for energy in the UK Water Industry



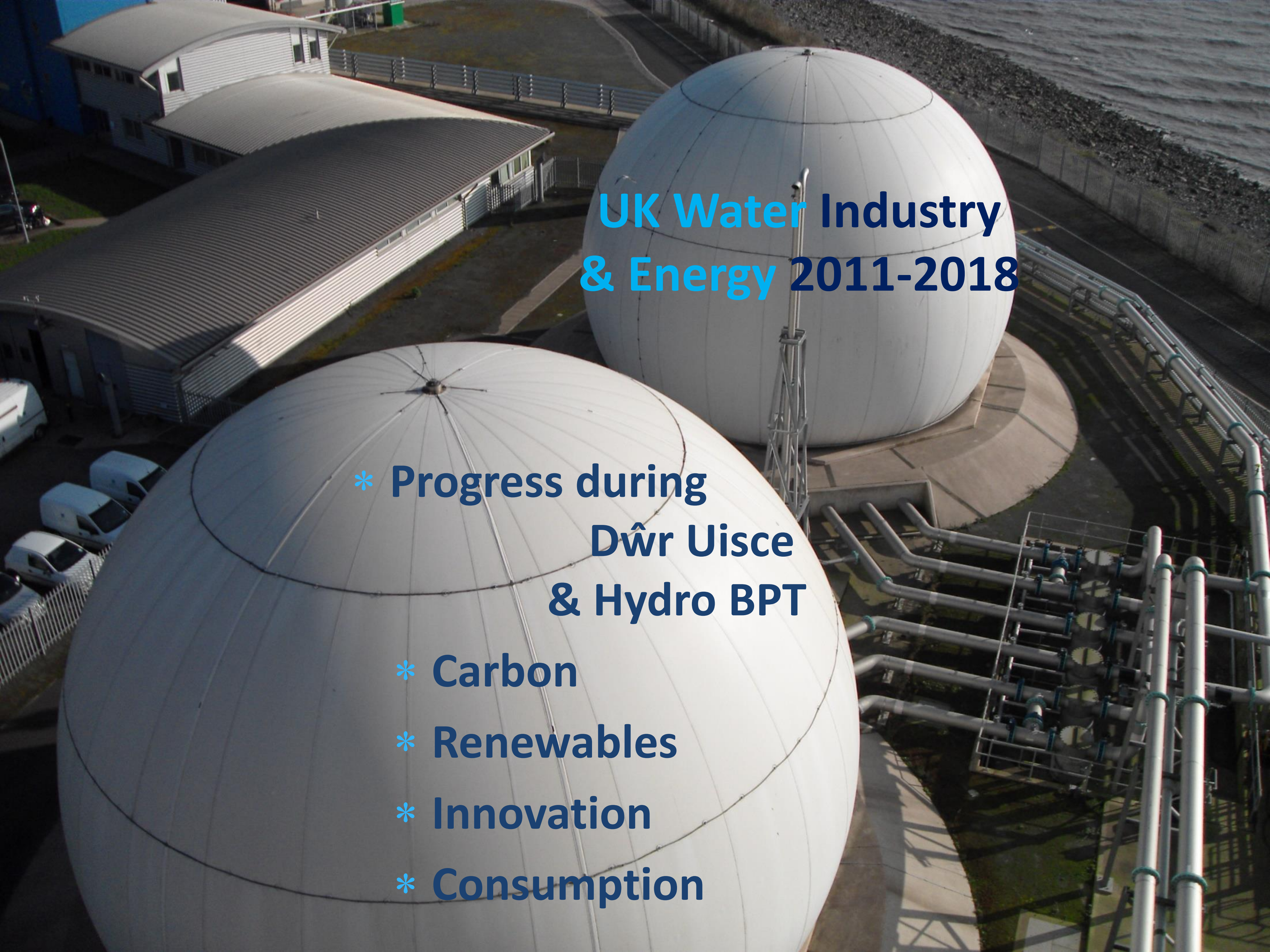
Dr Mike Pedley

Dwr Uisce: Oct 2018

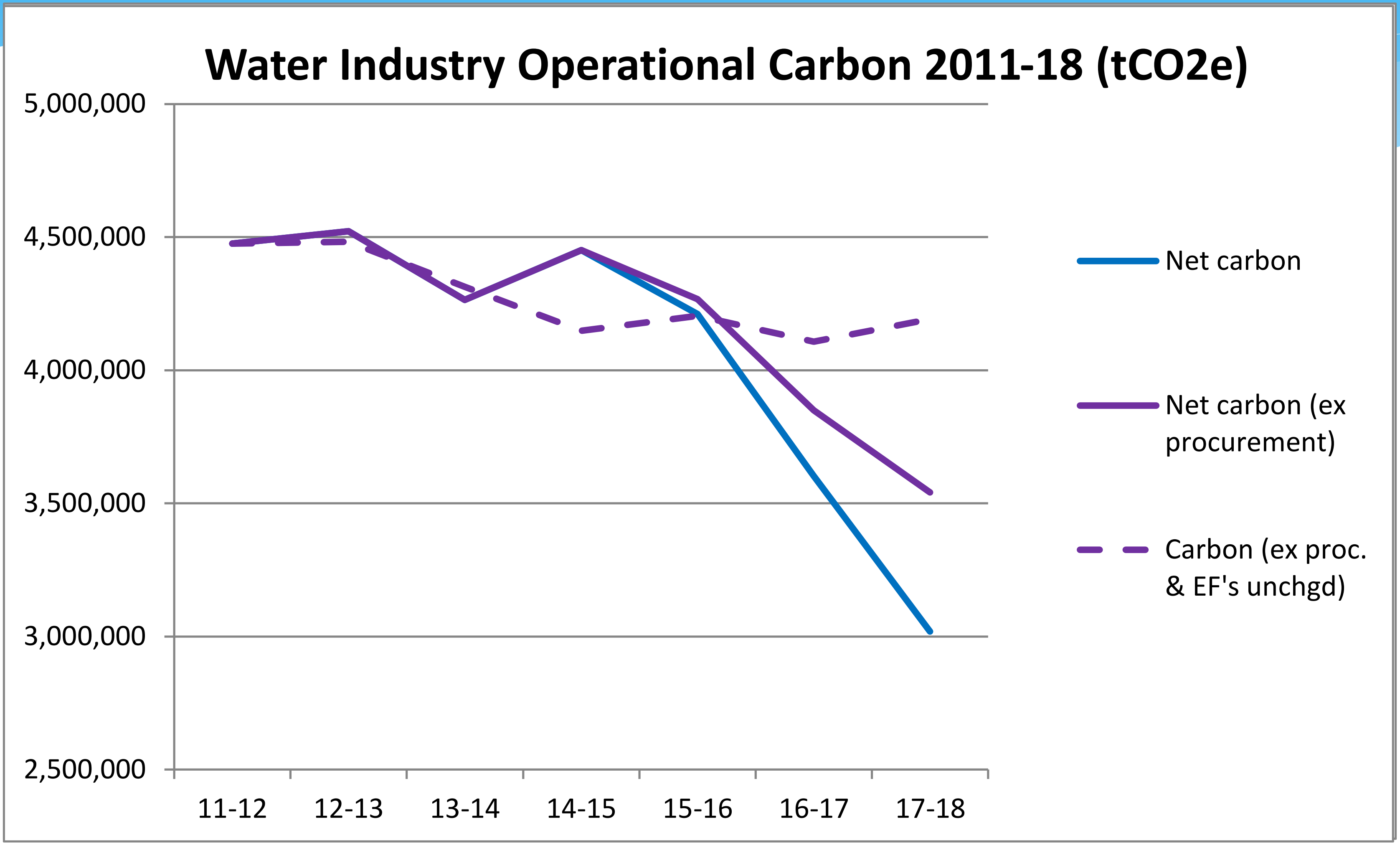
Progress and Challenges for Energy in the UK Water Industry

* **Progress 2011-18**
  (during Dwr Uisce & Hydro BPT)
  * **Carbon**
  * **Renewables**
  * **Innovation**

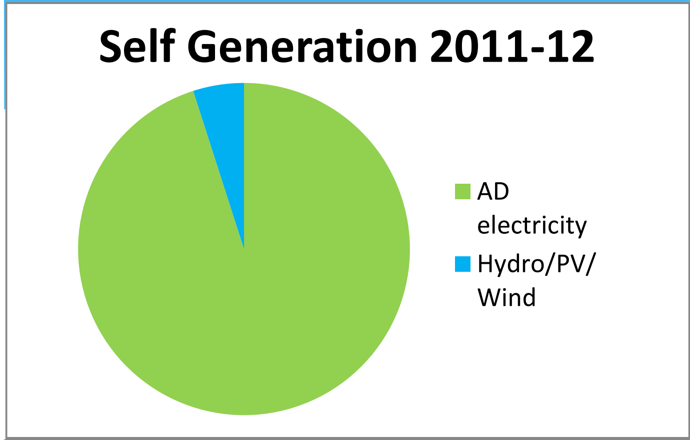
* **Challenges Ahead**
* **Where Next?**
  * **Priorities for industry's energy managers?**

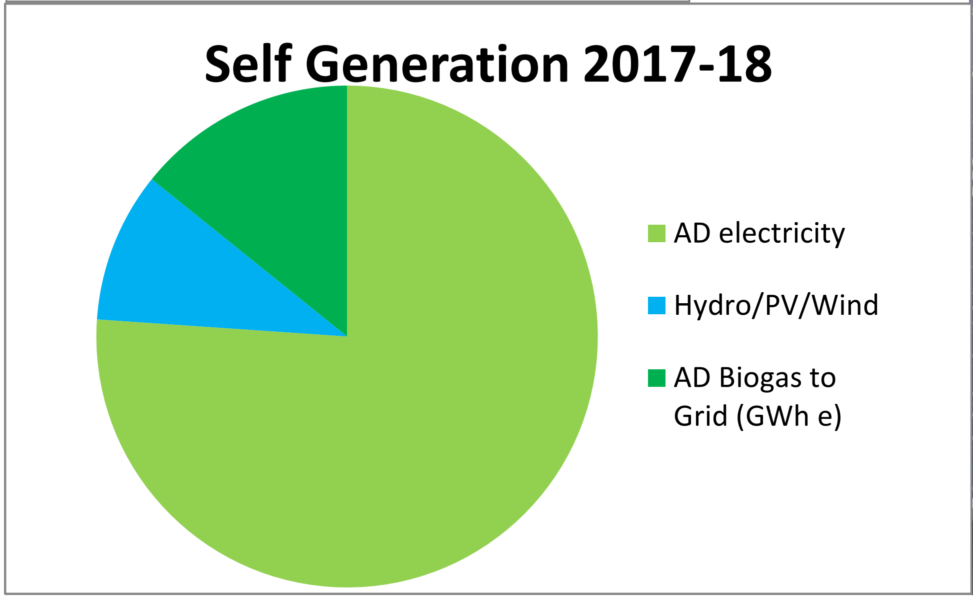

UK Water Industry
& Energy 2011-2018
* Progress during
Dŵr Uisce
& Hydro BPT
* Carbon
* Renewables
* Innovation
* Consumption

Progress 2011-18: Carbon



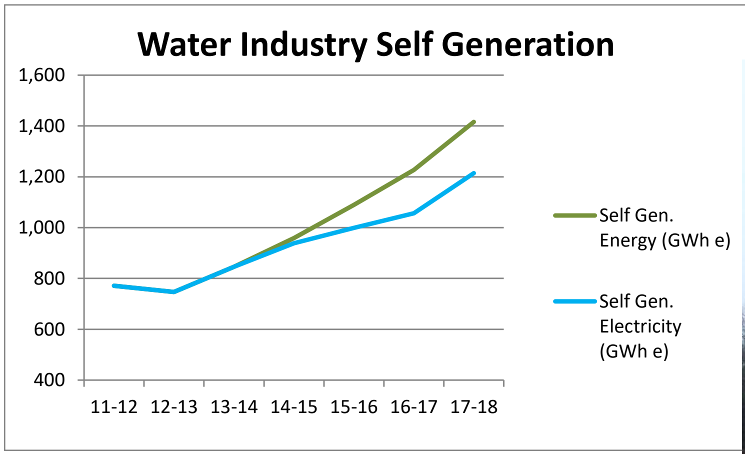
Renewable Generation: +88%

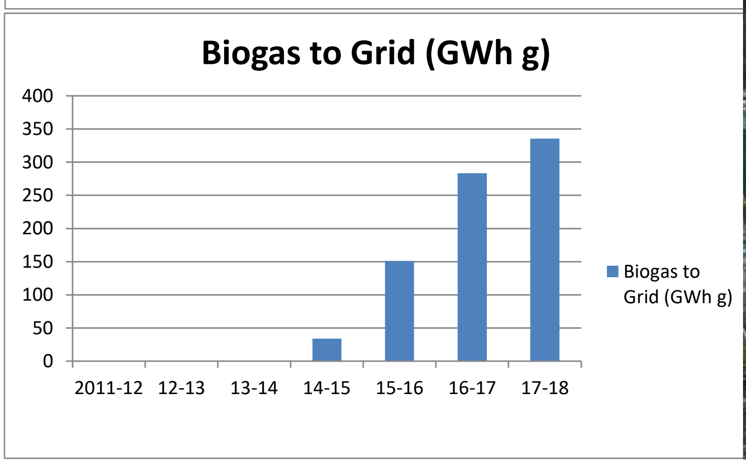




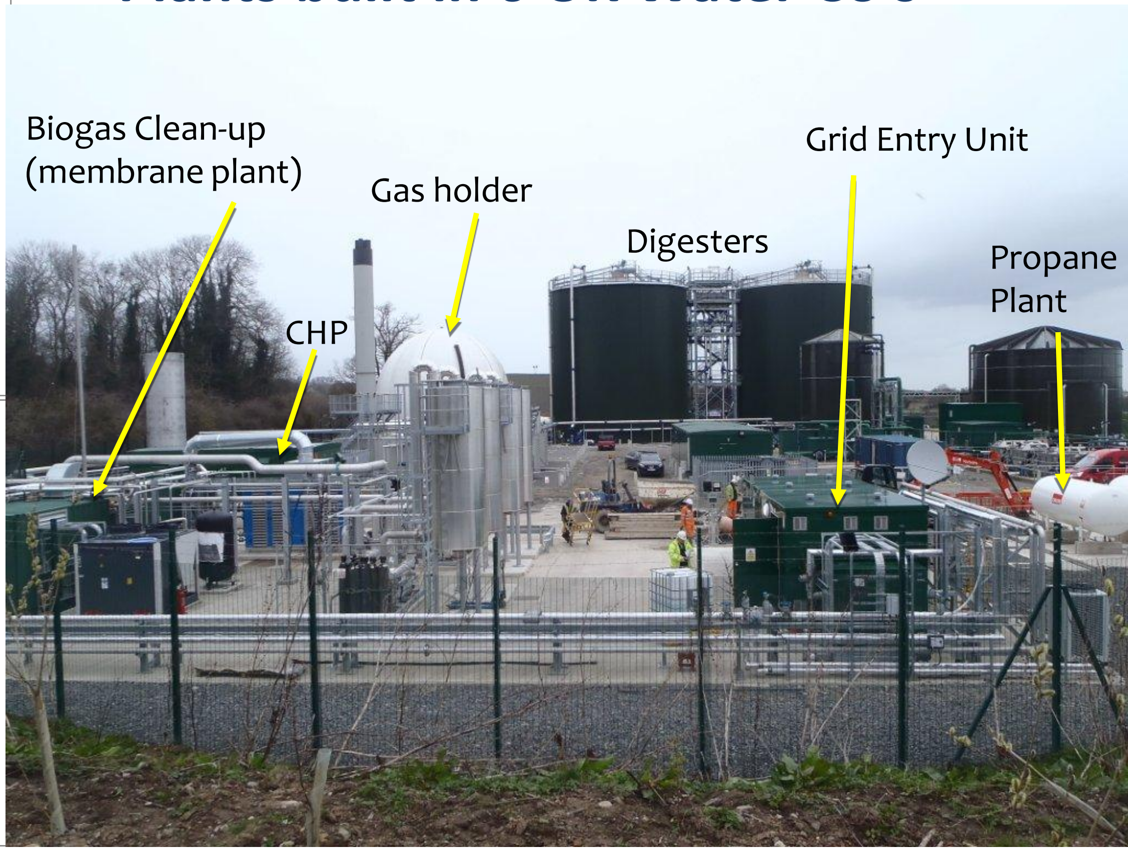
Renewable Generation: +88%

Case Study:
The rise of Biogas-to-Grid





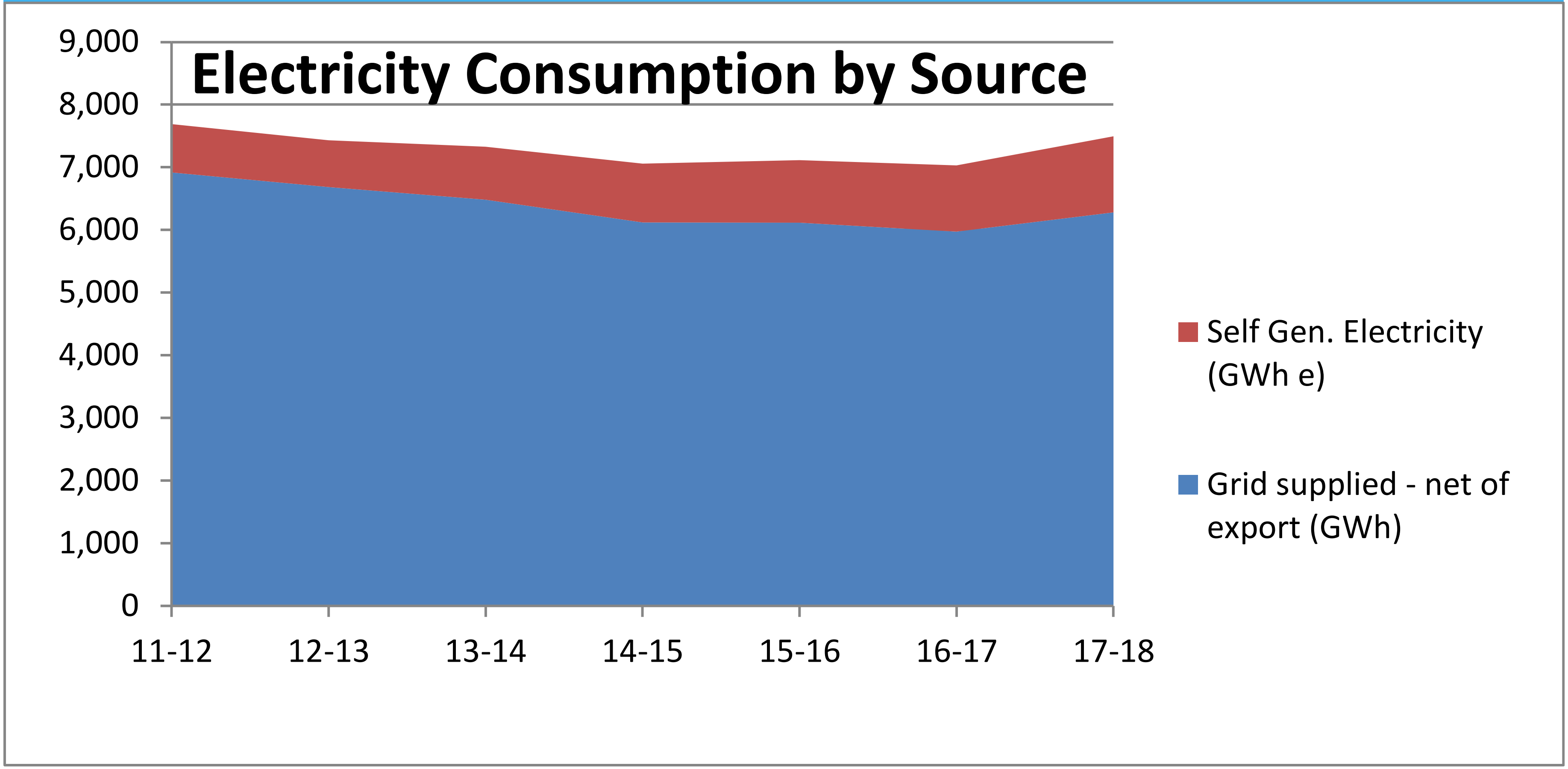
Plants built in 6 UK Water Co's



Innovation

- **Energy Innovation across the water sector (both adopted and developed)**
  - Aeration: design, control & blowers
  - Lighting
  - Anaerobic digestion optimisation;
  - Contract innovation (flex, PPA, export/import)
- **…but other challenges not yet solved…**
  - e.g. Routine PRV to hydro-generation
  - **And the Consumption Conundrum…**

The Consumption Conundrum



-3% (2011-2018)

⇒Broadly static

The Consumption Conundrum

£m's (>£100m) spent on energy efficiency

- Network control
- Aeration
- Digestion optimisation
- Lighting
- & more

>£5bn /year asset investment

=> higher standards

⇒ using more energy

Increasingly variable weather events

- **What is the new "Normal"?**
- **How to reduce energy whilst improving service?**

Future Challenges

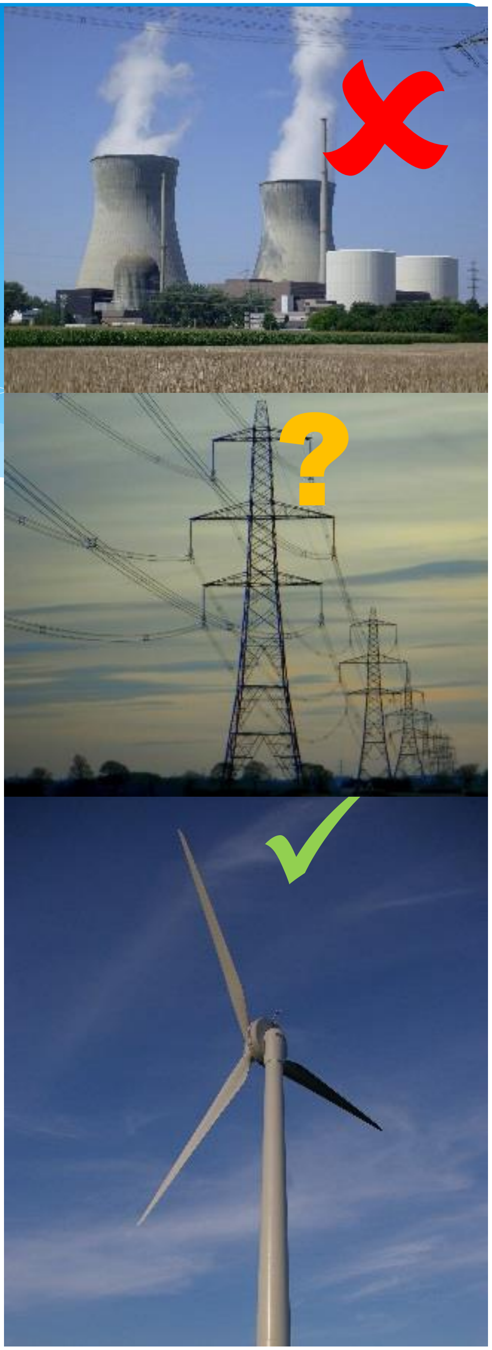
- **A Stressed Network**
  - **Less ‘baseload’ generation more ‘intermittent’**
    => A network unsuited for the “new generation”

    => Network resilience issues

    => Increasing costs for DNO to maintain and operate

    => Charging methodology reviews
    (e.g. >capacity charging)

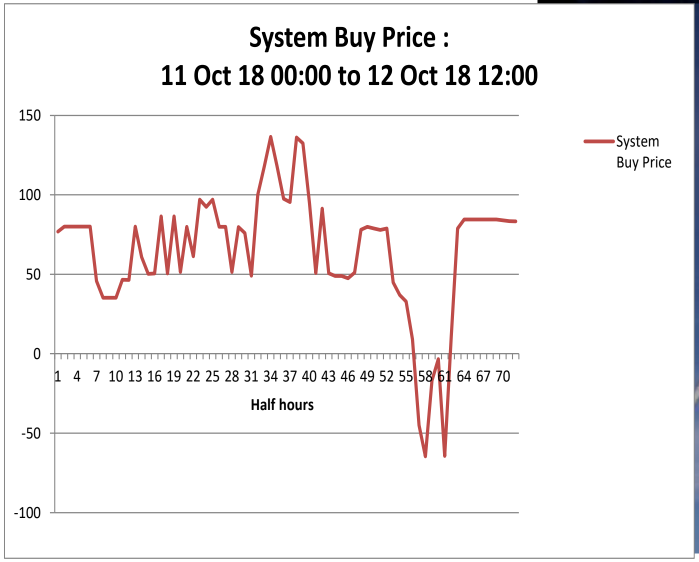
    => Higher cost for companies
    (to generate or consume)



Future Challenges

- Policy Changes
  - T&D charging
  - Renewables subsidies
    - FiTs (& CFD), RHI (heat & gas), Transport (fuel, EV support)

- Volatile Energy prices
  - Up/downward pressures
  - More ‘real time’ charging
  - Possible 15 min settlement



Future Challenges

- **Falling Bills**
  - -4% from 2020-2025
- **"Go green"** (self-imposed) **targets** e.g.
  - North'ian carbon neutral by 2027
  - Welsh energy neutral by 2050

	Change in bills £		
Water and wastewater companies' proposals			
Anglian Water		<1%	▲
Dŵr Cymru		5.0%	▼
Hafren Dyfrdwy		2.2%	▲
Northumbrian Water	Water	12%	▼
	Wastewater	14%	▼
Severn Trent Water		5.0%	▼
South West Water	South West area	11%	▼
	Bournemouth area	9%	▼
Southern Water		>3%	▼
Thames Water		no change	►
United Utilities		10.5%	▼
Wessex Water		4%	▼
Yorkshire Water		3.5%	▲

Where next: priorities for the energy manager?

- **Flexibility & resilience**
  - "Nimble" assets
  - Alternative supplies / suppliers (private networks)
  - Resilience to network disruption
  - Storage & Off-grid options?

= £

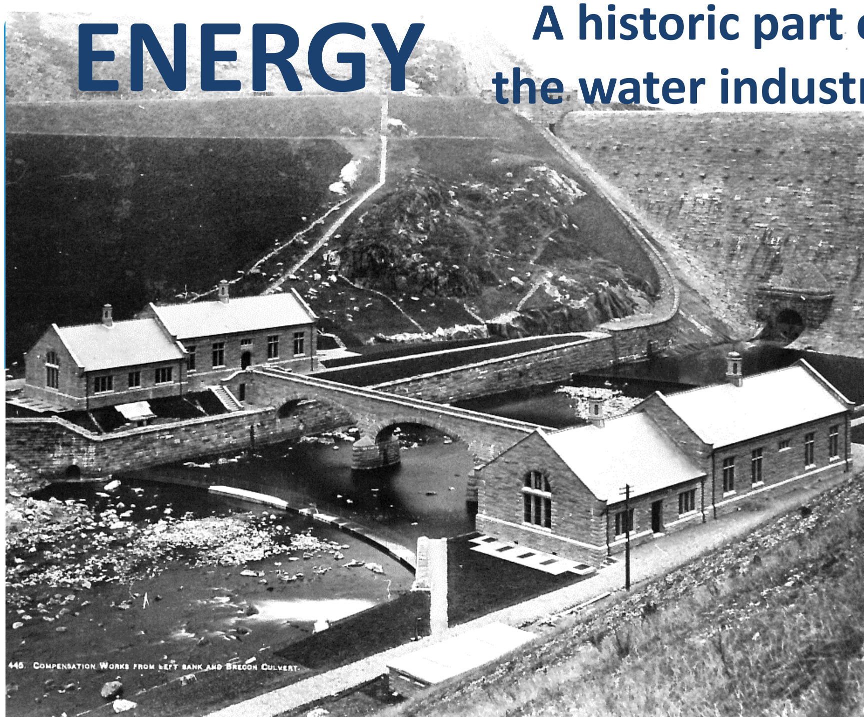
- **Controlled consumption**
  - Energy considered early in design / 'option-eering'
  - Understanding the true impact of new investment

- **Cost not Carbon?**

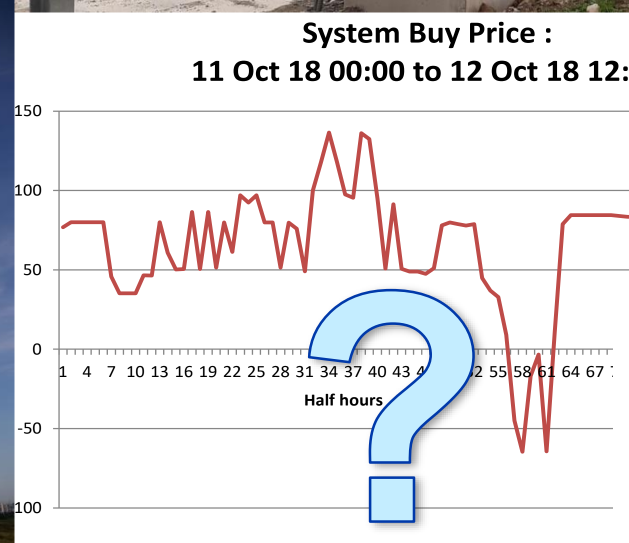
Poor service costs more than a high energy bill

ENERGY

A historic part of the water industry



Innovating for Energy Efficiency



Ofwat

PR19

A leading player in renewable self generation

Ready for Future Challenges

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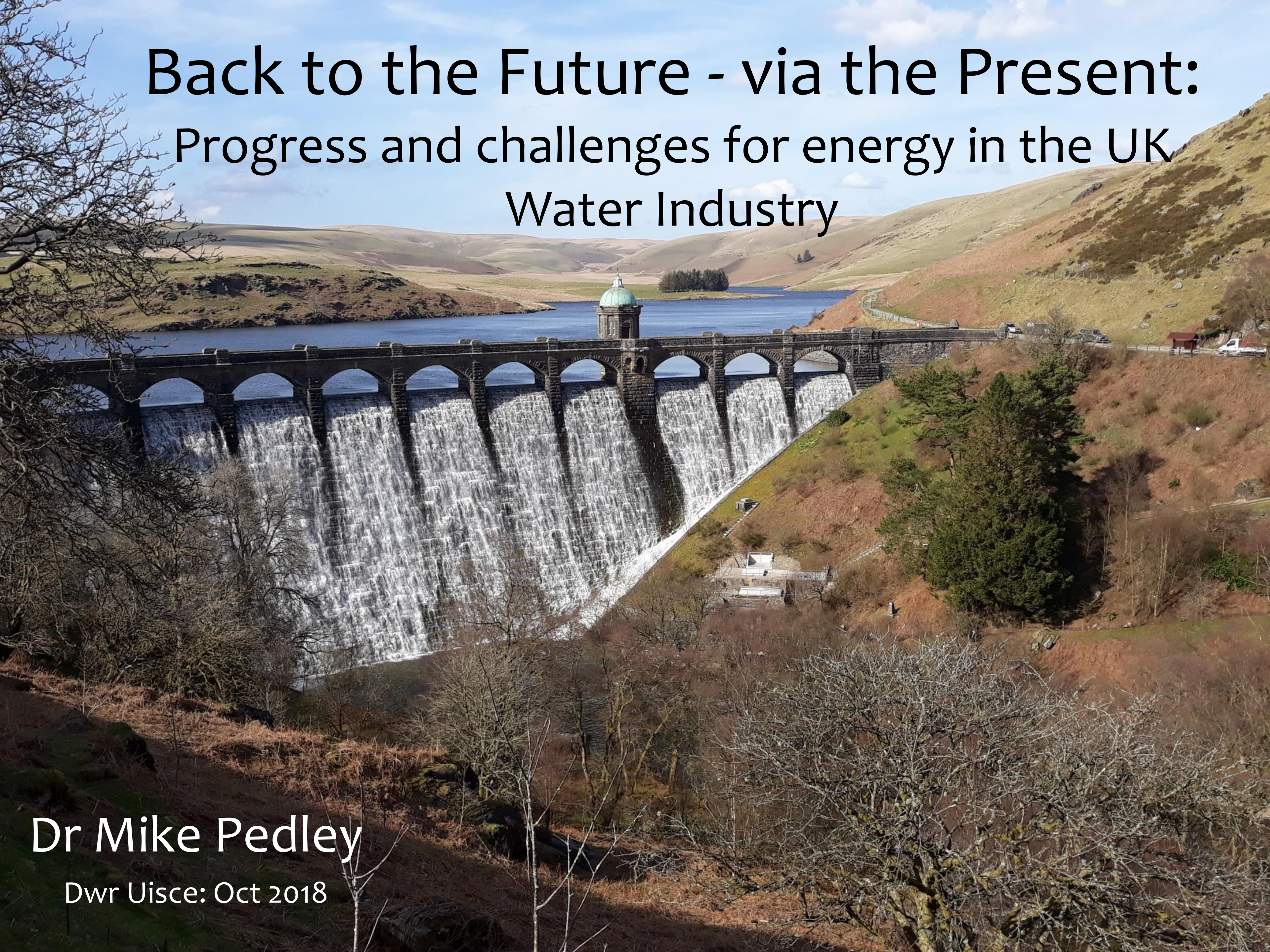

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