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## ***NATIONAL GRID ELECTRICITY DISTRIBUTION***

***FLEXIBLE OPERATION OF WATER NETWORKS ENABLING RESPONSE SERVICES (FLOWERS)***

***D2-1. INTERIM REPORT COMMERCIAL AND REGULATORY RELATIONSHIPS***

***VERSION 2 - 16/09/2022 (G.SWANDELLS)***

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# **PROJECT FLOWERS - D2-1. INTERIM REPORT COMMERCIAL AND REGULATORY RELATIONSHIPS**

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<b>Document Control</b>	<b>Name</b>	<b>Date</b>
Authored & revised by:	Gary Swandells	26/08/2022
Reviewed by:	David Penfold Jade Kennerley	02/09/2022
Approved by:	Nick Devine	16/09/2022

<b>Revision History</b>		
<b>Date</b>	<b>Issue</b>	<b>Status</b>
15/07/2022	1	DRAFT
26/08/2022	2	FINAL

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## **2 PROJECT OVERVIEW**

The FLOWERS project will analyse the potential ability of South West Water's (SWW) network to embed energy flexibility capacity in the time difference (latency) between when Drinking Water and Waste Water are pumped and stored, and when it is used by the system. It will explore methods of delivering latency flexibility and analyse the feasibility of implementing it on SWW's systems. It will define the regulatory compliance and commercial viability requirements for the creation of a latency flexibility product which can be embedded within National Grid Electricity Distribution's (NGED) electricity network control rooms. If appropriate, a recommendations document will be produced identifying the next steps for the development of latency flexibility capacity in ED2.

## **3 DOCUMENT PURPOSE**

This document is one of several that will be published in regard to the FLOWERS Project, which is primarily a desktop-based analysis that is designed to establish the efficacy and scale of potential innovations as discussed in the previous section. The project will require the engagement of both water and electricity regulators who have responsibility over what is deemed to be permissible across much of the commercial activities that utilities undertake. The regulatory frameworks are intended to set out and manage Ofgem's responsibilities;

- working with government, industry and consumer groups to deliver a net-zero economy, at the lowest cost to consumers
- stamping out sharp and bad practice, ensuring fair treatment for all consumers, especially the vulnerable
- enabling competition and innovation, which drives down prices and results in new products and services for consumers.

The government is responsible for setting the policy for the energy sector and proposing any changes to the statutory frameworks which are then applied and monitored by Ofgem to ensure compliance and enforcement. However, the regulator does acknowledge a clear role to play in support of policy issues such as decarbonisation and where appropriate identifying important policy gaps that affect consumers. This will often reflect the identification of bad practices and following up complaints, but it can also feasibly include the identification of positive improvements that can deliver material benefits to the wider industry as well as consumers.

This specific document provides an overview of the current regulatory regime and identifies the elements of the project that present challenges to the status quo to realise benefits through a 'utilities whole-system' approach to efficiencies and tackling issues. By working together in specific areas, we expect to discover underlying efficiencies across water and electricity utilities that are technically feasible but blocked by current policies and governance structures. This novel approach will therefore assist Ofgem in the identification and investigation of opportunities when approached from a 'combined utilities' perspective

There is likely to be more than one release of this document which will be apparent through version control. The findings of the project and subsequent document will be shared with the

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regulators who have been requested to provide a stakeholder who can support the project by reviewing the outputs. If the judicial bodies can participate in the journey and offer their professional perspective on what is acceptable or in need of additional development to be taken forward.

## **4 EXECUTIVE SUMMARY**

FLOWERS is a collaborative project between electricity and water utilities which recognises that there is significant potential for energy flexibility within the water industry if it can be harnessed and made available to the electricity networks. Unfortunately, to date only a relatively small proportion of this has ever been active in commercial flexibility programmes, directly or via aggregators, to the main schemes operated by National Grid or the more recent services to support DNOs. There are several possible reasons for this, which will form part of the investigative analysis that will be a key tenet of the project. However, initial engagements have already confirmed some key barriers:

- Cost to enable compliant metering and controls to qualify flexible assets for existing flexibility programmes.
- Insufficient administrative resources to repeatedly tender assets and manage contracts for flexibility programmes.
- Potential conflicts between DSR programme rules and primary duty of assets that have flexibility potential.
- Main focus of water authorities is directed to core business and key strategic objectives such as decarbonisation, water quality and energy costs.

While the points above are not unique to the water industry, the regulated nature of the utilities and the way in which they are funded sets them apart. It is acknowledged that some of these claims could be made of gas networks, but they are not prevalent as water and electricity, which service almost every single property across the nation. While this is clearly 'out of scope' in the FLOWERS Project we recognise that there may be further potential and if successful will open up the opportunity to include gas in any future iterations of whole system investigations.

The most compelling justification for challenging some of the regulatory restrictions as part of whole system efficiency is linked to the way in which the utilities are paid for by customers. As public utilities, water and electricity networks not only service the vast majority of properties, but they are also paid for through contributions from every household and business who use their services. On this basis alone there is a compelling case to shift water utilities out of the standard competitive approach and embed their contribution to enhanced efficiency within standard operating procedures.

Project FLOWERS will carry out analysis to identify the latency that exists within the water authorities on wastewater, water treatment and clean water distribution. It will attempt to identify the benefits that the electricity network can achieve by utilising this as a tool within its smart grid tool-kit. The quid pro quo for the water industry, if it is to opt out of the payments associated with DSR programmes, must be of more strategic value. The project will therefore challenge the regulatory restrictions of both utilities to investigate the feasibility of treating the water industry favourably to help improve their energy efficiency and carbon impact so that both utilities can take a unified approach to delivering on their Net Zero commitments.

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Finally, we also recognise that with generally the same customers and infrastructure that serves the same areas, that there may be a wider range of benefits outside of activities that lead directly to the consumption or generation of electricity. Therefore, in spite of not being a core deliverable of FLOWERS we will document any additional 'whole system' approaches we uncover that have the potential to compliment Ofgem's commitment to addressing policy gaps that could help deliver;

- Financial efficiencies
- Carbon reductions
- Reduced waste
- Improvements to customer experience

## **5 PROBLEM STATEMENT**

Phase one of the FLOWERS project involves creating a forum for greater collaboration across NGED and SWW. This will facilitate discussion and collaboration between the two regulated utilities to identify a range of potential improvements that could be made.

As such, there is scope for a range of potential improvements related (but not limited) to:

- More efficient sharing of latent water company flexibility
- Better peak and load management
- Data and digitisation improvements
- Better alignment between control room operations
- Carbon monitoring and saving
- Shared EV infrastructure and facilities
- Cross-industry working and learning
- Facilitating discussions and sharing of knowledge / information

The solutions could tackle a range of shared challenges across the whole system, ranging from common sense 'quick wins' to new commercial arrangements and processes. As the project progresses, shared business processes and commercial arrangements will be agreed to facilitate future initiatives that are taken forward into the next FLOWERS phase(s). New NIA-funded initiatives would be raised to progress these, where appropriate.

By working collaboratively, the two organisations can identify solutions to be taken forward into further stages of the project, between 2023 and 2028. Regular forums and working groups will take place between NGED and SWW colleagues to identify potential improvements between the organisations' functions.

Close engagement with the energy and water regulators will support the project's thinking on options to be taken forward, and the potential requirement for derogations from existing market rules to support these. It is expected that the possible outcomes of the FLOWERS project are in line with the regulators' principles and objectives.

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## 6 APPROACH

### 6.1 REGULATORY CONSTRAINTS

Close engagement with the energy and water regulators will be important to support the project's thinking on options to be taken forward, and the potential requirement for derogations from existing market rules to support this.

Ofgem are likely the most important regulator to the FLOWERS project, as this is an energy and NIA funded project. It is expected that the Ofwat is likely to have less direct involvement but will be engaged with during the project.

### 6.2 REGULATORY OBJECTIVES AND CONTEXT

Regulatory objectives are different for electricity and water, however the principle of best outcomes for the consumer is common, as are the mechanisms to achieving this (e.g. price controls for natural monopolies and competition where possible).

Other stakeholders in/adjacent to the regulatory space that may be engaged with include:

- The UK Regulators Network – an existing mechanism to foster cross-regulator and industry working, bringing to together regulators from utility, financial, transport and housing sectors
- BEIS – in its role in providing oversight to the energy sector
- The Environment Agency (EA)
- Low Carbon Contracts Company (LCCC) – with have a role in administering the Contract for Difference (CfD) programme
- Citizen's Advice
- Energy Networks Association (ENA)

Figure 1 - Ofgem objectives

To protect consumers' interests now and in the future by working to deliver a greener, fairer energy system, by:

- Working with government, industry and consumer groups to deliver a net-zero economy, at the lowest cost to consumers
- Stamping out bad practice, ensuring fair treatment for all consumers, especially the vulnerable
- Enabling competition and innovation

<https://www.ofgem.gov.uk/about-us/our-role-and-responsibilities>

Figure 2 - Ofwat objectives

Carry out work as an economic regulator in the way that will best:

- further the consumer objective to protect the interests of consumers, wherever appropriate by promoting effective competition
- secure that water companies (meaning water and sewerage undertakers) properly carry out their statutory functions
- secure that water companies can (in particular through securing reasonable returns on their capital) finance the proper carrying out of their statutory functions

<https://www.ofwat.gov.uk/about-us/our-duties/>

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## **6.3 APPROACH TO REGULATORY ENGAGEMENT**

Phase 1 of the project will see close engagement with the regulator at early stages to get informal feedback on potential proposals. This will be focused on the Ofgem innovation team in the first instance (and other colleagues as appropriate, e.g. at Elexon, BEIS).

As part of phase 1, we could 'soft test' a long list of potential FLOWERS interventions with the energy regulator that could be taken by taken forward in future phases of the project.

This process will allow the project to establish principles for regulatory approval, and/or requirements to seek derogation from the existing market rules. It will also allow the regulator's position and thinking to be reflected into the design of the FLOWERS interventions.

To prepare for this regulatory engagement, we will consider the costs and benefits of potential changes, and the impact on stakeholders in the market when developing proposals under the FLOWERS project. These will be generated in FLOWERS forums/workgroups and captured in the risk logs to support engagement with the regulator.

In order to ensure that the proposal receives regulatory support, our regulatory engagement should include:

- **Demonstrating the benefit to consumers** – i.e. demonstrating and quantifying the benefits which will be passed onto consumers
- **Establishing the precedent for the FLOWERS intervention** – i.e. showing where there are similar approaches used in other parts of the market
- **Having a Plan B** – i.e. showing that alternative arrangements could be used

A key risk to this engagement is therefore likely to be related to not securing sufficient time with, or feedback from, the regulator during the course of the project.

## **6.4 IMPACTS ON STAKEHOLDERS**

A key concern for regulators will be the impact of changes on stakeholders, markets and the end consumer.

Stakeholders in the market have different priorities as set out in the table below. These stakeholders may be impacted in different ways depending on the specific options taken forward for further work in future FLOWERS phases.

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Stakeholder	Key role(s)	Priorities
DNOs	<p>Owners and operators of distribution networks</p> <p>Responsible for procuring DNO flexibility via market based mechanisms</p> <p>Manage the distribution network connections process</p>	<p>Ensuring safe and reliable operation of distribution networks</p> <p>Meeting price control objectives</p> <p>Reducing costs for flexibility</p> <p>Meeting net zero objectives</p> <p>Consumer protection</p> <p>Process improvements</p>
Water Companies	<p>Deliver water and sewerage services</p> <p>Environment and low carbon objectives</p>	<p>Meet business plan and price control objectives</p> <p>Meeting net zero objectives</p> <p>Manage capital costs</p> <p>Consumer protection</p> <p>Process improvements</p>
Ofgem	<b>Energy Regulator for regulated and competitive markets</b>	<b>Protecting customers, including vulnerable customers, achieving net zero and promoting markets</b>
Ofwat	<p>Water Regulator</p> <p>Determines water price controls and approves business plans</p>	<p>Water company efficiency, lower costs for the consumer</p> <p>Water companies reach net zero by 2030 by reducing usage and installing renewable energy</p>
Flexibility providers	Generators or demand side response capacity that can provide flexibility services	Maximising received revenue for flexibility services
Prospective network users	Generators or demand customers that wish to connect to the distribution system	Quick connection to the network, low connection costs
Aggregators	Parties that coordinate generators and demand side response capacity and act as a route to market for their flexibility	<p>Maximising received revenue for flexibility services</p> <p>Ability for third party aggregators to access services</p>
Energy suppliers	Sell electricity to customers, including water companies	Ability to hedge customer positions, earn a retail margin
Vulnerable customers	End beneficiaries of the water and electricity systems, may require additional support	Low utility bills and security of supplies, access to services
Retail customers	End beneficiaries of the water and electricity systems, pay use of system charges	Low utility bills and security of supplies

## 6.5 ARGUMENTS FOR AND AGAINST

### 6.5.1 Benefits of the potential FLOWERS outcomes

Benefit	Beneficiary
Saves consumers money through greater efficiencies leading to lower end user bills	Consumers

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Better processes and communication related to vulnerable customers	Consumers
Supports need for industries to work together, using a collaborative approach / multi-vector	Whole system
Knowledge sharing and learning between the industries	Whole system
Potential for closer control operations	Water companies and DNOs
Enables greater levels of headroom for renewable connections, supporting Water Companies' net zero objectives	Water companies
Greater resilience for water companies and network companies	Water companies and DNOs
Greater ability to reduce and monitor carbon	Water companies, whole system

### **6.5.2 Potential concerns about FLOWERS approach**

Potential concern	Concern raised from	Response / mitigation
Competition within other DSO flexibility markets could be distorted, and/or value reduced with potentially less usage of existing flexibility available for other participants	Other flexibility providers, aggregators, Ofgem, DNOs	DNOs have a duty to investigate the most efficient methods of managing the network and TOTEX reduction. Any alternatives to flexibility procurement could be argued to have a distorting impact. As the water industry is a vital utility used by almost everyone Nationwide, the widespread benefits to everyone outweigh the limited impact experienced by just a few.
Allowing Water Companies to connect new capacity early could be deemed unfair to privately owned assets if they are already in a connection queue	Other generators, Ofgem	As the water industry is a vital utility used by almost everyone Nationwide, the widespread benefits to everyone outweigh the limited impact experienced by just a few.
FLOWERS flexibility could counter-act ESO balancing services or preclude balancing services participation	ESO, Ofgem, aggregators	The underlying principles for ESO & DSO Flexibility are not well aligned and conflicts can be encountered. This is being reviewed under Open Networks Primacy rules (P5) and FLOWERS Project will ensure that any outputs are incorporated where relevant and feasible.
Provision of FLOWERS flexibility would not be in line with competition / market-based provision of services where possible	Ofgem, other flexibility providers, aggregators, DNOs	Principle of non-market based flexibility has been established by ANM. Additionally, the presence of capacity from a water company may also help achieve the minimum flexibility capacity that a DNO requires to consider flexibility as a viable option and trigger flexibility procurement over conventional reinforcement.
There could be a mismatch between water company and DNO requirements at times, potentially increasing DNO costs or exacerbating DNO network capacity issues.	DNOs	Water companies processes largely take place arbitrarily, meaning the status quo will often be the worst case scenario. Increased communication, analysis and understanding of the

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		limitations and opportunities is likely to yield sufficient benefits to merit progressing.
Any new assets that are permitted under any aspect of derogation or rules that aren't applicable to other Flex Providers could result in the reduction of revenues if liquidity is achieved and competition drives down participation rates.	Ofgem, other flexibility providers, aggregators	FLOWERS would propose that enduring restrictions would be placed on any assets that are given preferential terms to connect to the distribution network. A commercial covenant would be required to bind them to a suitable term that demonstrates repayment of any 'benefit in kind'

### **6.6 SUMMARY OF FEASIBLE INITIATIVES**

The opportunities identified during the workshops and control room surveillance have been classified into one of 5 groups.

- **Low hanging fruit** – opportunities that are achievable, feasible and have clear benefits.
- **More challenging** – opportunities that require some further investigation. It may be concluded these are too limited or risky, or are possible but require internal SWW investment (for which FLOWERS outcomes may support the business case).
- **Worthwhile with focus** – opportunities where focus needs constraining to identify the mutual electricity and water network benefits.
- **Energy management/efficiency** – opportunities that align with energy management rather than flexibility.
- **Out of scope** – opportunities which relate to other projects but could be of interest.

#### **6.6.1 Low Hanging Fruit**

<b>Initiative</b>	<b>Detail</b>
1. DWS & WWS - 3 to 4 hours turndown/switch off of pumps	<ul style="list-style-type: none"> <li>• Currently being manually implemented as 'DUOS' turn down between 17:00 and 19:00.</li> <li>• Review timings to assess if would be more beneficial to do this when the local network has over demand issues.</li> </ul>
2. WWS - Increasing and reducing aeration blowers for biological treatment	<ul style="list-style-type: none"> <li>• Smart aeration control that can hold off or ramp up with updated Fluxton system</li> </ul>
3. DWS & WWS - Produce pumping profile based on a model that creates a schedule for control room.	<ul style="list-style-type: none"> <li>• Provide a forecasted pumping schedule that reflects the fill levels and treatment volumes that would be needed based on next day known factors.</li> <li>• Factors could be weather, population change, energy price signal, energy over generation</li> </ul>

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Initiative	Detail
	(ANM), energy over demand, Demand Side Response and weekend pre pumping.
4. DWS - Drinking water reservoir pre-filling	<ul style="list-style-type: none"> <li>• Pre-fill reservoirs when too much local generation is impacting the electricity network or SWW own generation is high.</li> <li>• Operation curves for impounding reservoirs and borehole water pumping</li> <li>• Onsite energy generation forecast information tool for control room</li> </ul>
5. Onsite Hydro & CHP generation	<ul style="list-style-type: none"> <li>• Develop a better understanding of when this generation should be used or programmed</li> </ul>
6. WWS - Re-Profiling levels of storage	<ul style="list-style-type: none"> <li>• Hold off or pre-pump at new SFA style pump stations, Sewerage Pump Stations (SPS) and Sewerage Pump Station Terminals (SPST).</li> </ul>
7. DWS & WWS - Review all set points are as needed for current demand and operating as expected	<ul style="list-style-type: none"> <li>• Total review of all set points as implemented onsite to ensure no creep has happened since original implementation.</li> </ul>

### 6.6.2 More challenging

Initiative	Detail
1. WWS - Timing of UV treatment usage	<ul style="list-style-type: none"> <li>• Determine if UV treatment can be modularised with reduced flows.</li> </ul>
2. WWS & DWS - Pump size increase and/or mismatch check verses volume requirements	<ul style="list-style-type: none"> <li>• Review the benefit of increasing the pump sizes to enable quicker movement of the required volume of water. Thus shortening the operational hours.</li> <li>• Wrongly sized pumps or mismatched pumps could be driving increased energy usage.</li> </ul>
3. WWS - Changing usage of infiltration pumping based on forecasting	<ul style="list-style-type: none"> <li>• Profile the usage of increased pumping based on tidal flows to enable pre pumping.</li> </ul>
4. DWS & WWS - Energy performance reporting, achievements sharing and Maintenance Management Information	<ul style="list-style-type: none"> <li>• Development of site based energy reporting scorecards and targets.</li> <li>• Roll out of energy sub-metering to enable measurement of usage.</li> </ul>

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Initiative	Detail
	<ul style="list-style-type: none"> <li>MI - Aid identification of above baseline energy usage to inform maintenance requirements</li> </ul>
5. WWS - Adjusting timing of grit removal paddle operation	<ul style="list-style-type: none"> <li>Modularise the paddles kWh usage based on flow rates.</li> </ul>

### 6.6.3 Worthwhile with focus

Initiative	Detail
1. DWS - Pump Variable Speed Drives	<ul style="list-style-type: none"> <li>Identify where VSDs would be beneficial based on demand profile.</li> </ul>
2. WWS - Sea water infiltration pumping.	<ul style="list-style-type: none"> <li>The amount of sea water infiltration is greatly impacting pumping energy usage.</li> <li>This has been identified as a consequence of low maintenance of components used to restrict sea water infiltration.</li> </ul>
3. WWS - Storm Tanks usage to hold off treatment works	<ul style="list-style-type: none"> <li>Use storm tanks to reduce flows to the treatment works when weather forecast is clearly zero rain</li> <li>Would need a review of the EA permit and potential liaison with EA</li> </ul>

### 6.6.4 Energy Management/Efficiency

Initiative	Detail
1. DWS - Pump Variable Speed Drives	<ul style="list-style-type: none"> <li>Identify where VSD's would be beneficial based on demand profile.</li> </ul>
2. WWS - LED lighting for UV treatment	<ul style="list-style-type: none"> <li>Review the available LED technology to ascertain replacement of current fluorescent tubes reduction of total energy usage</li> </ul>
3. WWS & DWS Reducing energy usage with refurbished pumps	<ul style="list-style-type: none"> <li>Compare the energy usage to identify energy benefit of pump refurbishment.</li> </ul>
4. WWS - Ceramic filtration systems to reduce energy usage	<ul style="list-style-type: none"> <li>New design of filtration system as installed at Mayflower WTW could enable modulation of the filtration.</li> <li>Energy kWh savings to be understood which could lead to re-classification of this item.</li> </ul>

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Initiative	Detail
5. WWS & DWS - Power factor correction	<ul style="list-style-type: none"> <li>Ensuring a power factor as close as possible to one could reduce energy costs.</li> </ul>

### 6.6.5 Out of Scope

Initiative	Detail
1. Operational link between NGED and SWW Control rooms to avoid outages	<ul style="list-style-type: none"> <li>A number of SWW pump outages have a causality attributed to NGED network switching - a "heads up" communication between the Control Rooms could be good to try and avoid these.</li> </ul>
2. Review Water Treatment Works Reliability Tracker for info on NGED impacts on SWW systems	<ul style="list-style-type: none"> <li>Unclear if this drives increased energy usage.</li> </ul>
3. Anaerobic Digestion and Ammonia licence Condition.	<ul style="list-style-type: none"> <li>Assess the energy balance of running the AD and CHPs where the treatment site has an Ammonia licence condition</li> <li>There is potential, where this condition exists, the kWh needed to treat the Ammonia outweighs the kWh generated by the biogas CHP</li> </ul>

## **7 POTENTIAL OUTCOMES**

One potential outcome of the collaboration between NGED and SWW could be a new type of flexibility service, to be used in addition to existing DNO flexibility services. In this case, there may be specific regulatory considerations.

The approach, to be tested between South West Water (SWW) and National Grid Electricity Distribution (NGED) and developed throughout the course of 2022, could involve:

- Assessing the latent upwards and downwards flexibility within the water system and suitability for this to meet DNO system balancing needs
- Developing of commercial arrangements to realise this flexibility
- Allowing water companies to connect greater volumes of renewable generation with freed-up headroom, either front of meter or behind the meter

The high level design of the FLOWERS service will be developed during the project, and as part of the wider LFA2 workstream. It is likely that the specific design of the FLOWERS service may impact the approach to regulatory engagement, likelihood of regulatory support, and/or requirement for a regulatory derogation. The design will therefore reflect the key aspects of commercial, legal and technical parameters that would be necessary to establish operating principles on which a detailed design could be based.

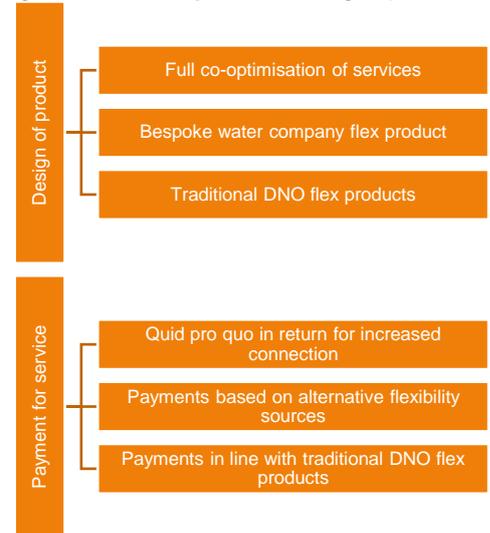
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High level ways that the product could differ include:

- The design of the service specifications – i.e. how ‘bespoke’ the service is for water company flexibility. Options could include:
  - **Full co-optimisation of water company services on an up-to-date basis** – where product specifications and requirements are not fixed in advance, but instead vary based on up-to-date capabilities of the water companies and DNO requirements.
  - **Bespoke water company DNO flex product** – where product specifications are pre-defined and designed in a way that allows water companies to participate
  - **Traditional DNO flexibility** – where a new FLOWERS product is not defined, but instead the traditional DNO local flexibility products are used
- Payment for the service – i.e. how the service is paid for, or whether it is offered as quid pro quo in exchange for increased headroom. Options could include:
  - **Quid pro quo in return for increased connection** – where DNOs do not pay for availability or utilisation of the product, but instead water companies receive the ability to connect greater levels of renewable generation
  - **Payments based on alternative flexibility sources** – where payments for the FLOWERS service are based on the cost of the DNOs alternative flexibility, which could be traditional DNO flexibility and Active Network Management (ANM) flexibility
  - **Payments in line with traditional DNO flex product** – where payments are the same as traditional DNO flexibility products, both in terms of structure and level

Figure 1 - Flexibility service design options



### 7.1 ALTERNATIVE MECHANISMS FOR REALISING WATER COMPANY FLEXIBILITY

A key consideration from regulators will be whether there are other mechanisms that could realise the flexibility from water companies, and/or whether the FLOWERS approach could impact other areas of the market.

Other ways that water company flexibility could be realised include:

- **Traditional DNO flexibility services** – four flexibility services contracted for by DNOs, which assets compete for, to provide upwards flexibility in return for availability, arming or utilisation payments
- **Emerging DSO flexibility services** – new flexibility services being developed as part of innovation trials and local initiatives, such as Intra-flex, which assets compete for in return for payments
- **ESO balancing services** – assets provide a range of centrally-procured upwards and downwards services to address national balancing needs. Assets usually compete to provide services in return for payments, however some services are mandatory or have limited scope for competition

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- **Wholesale market / imbalance price signals** – Assets with portfolios respond to ex-ante price signals in the wholesale market or ex-post imbalance prices, to avoid or capture high or low prices. Payments are on a total portfolio, rather than asset specific, basis.
- **Active Network Management** – assets agree to lower levels of firmness when agreeing a connection with a DNO, giving the DNO the ability to control its output to manage

There are a number of differences between these and the potential FLOWERS flexibility service as outlined below.

Table 1 - Comparison of FLOWERS flexibility with other flexibility products

	Flexibility service provided	Payment received for flexibility	Accessible by	Other considerations
<b>FLOWERS</b>	Upwards and downwards flexibility on a site specific basis, depending on up-to-date water company flexibility	NA – likely offered on a 'quid pro quo' basis	Water companies with latent flexibility	Service may free up headroom for additional renewable generation connection Service is designed specifically for Water company flexibility depending on site specific and temporal abilities. Water companies could respond to less conventional, localised signals. For example, low carbon intensity due to high renewable generation within local area.
<b>Traditional CMZ flexibility</b>	Upwards flexibility on a site specific or locational basis	Availability, arming or utilisation payments	Flexibility providers in DNO target areas	Potential to include downwards flexibility in future
<b>Emerging DSO/local flexibility</b>	Upwards flexibility on a site specific or locational basis	Availability, arming or utilisation payments	Flexibility providers in innovation target areas	Potential to include downwards flexibility in future
<b>ESO balancing services</b>	Range of upwards and downwards flexibility services to the ESO	Availability, arming or utilisation payments	Different balancing service and flexibility providers, depending on the service	Centrally procured products to address national balancing needs Distribution assets may face a disadvantage compared to transmission assets for ESO balancing services <sup>1</sup>
<b>Wholesale market / imbalance price signals</b>	Upwards and downwards flexibility on a Trading Party basis	Avoided or captured prices	Wholesale market participants on a Trading Party (i.e. portfolio level) basis	Does not support distribution level balancing

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<sup>1</sup> This is because they are subject to 'skip rates' (i.e. being overlooked in the control room) or the Aggregator Impact Matrix (the process which de-rates distribution connected assets to account for local constraints). However the ESO and industry have been working towards lowering barriers to entry

## **PROJECT FLOWERS - D2-1. INTERIM REPORT COMMERCIAL AND REGULATORY RELATIONSHIPS**

<b>Active Network Management (ANM)</b>	Curtailment of generating assets close to real time	NA – no payments for ANM actions (although ANM provisions could allow quicker/cheaper connections)	Distribution connected generators	Service may allow cheaper or faster network connections
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Therefore, the FLOWERS approach may offer a number of benefits compared to other flexibility products:

- FLOWERS flexibility is water company capability led, rather than led by the design of the products, which should lead to optimal usage of available flexibility, both in term of Water Companies general abilities, and up-to-date/temporal abilities
- FLOWERS flexibility could be offered for a lower price compared to other flexibility products, reducing overall flexibility costs for DNOs and costs for end-users more generally
- Water Companies would not face the same barriers to entry compared to other flexibility products. This is important given the size of water companies demand and importance of multi-vector alignment for the net zero transition.

### **7.2 AREAS OF THE MARKET THAT COULD BE IMPACTED**

Water companies providing their flexibility via the FLOWERS approach could impact or distort other areas of the market. Areas that could be impacted include:

- **Markets for flexibility as outlined above** – where water companies' FLOWERS flexibility could be seen a substitute or distortion to these markets.
- **Active Network Management** – where DNOs could use FLOWERS flexibility as an alternative to ANM should be generally recognised as a benefit.
- **The existing DNO connection and queue management process** – where assets pay connection charges to connect to the system, potentially with ANM conditions. FLOWERS could give water companies another route to connecting generating assets compared to the traditional connection route.
- **The DNO connection process, with Ofgem Access Significant Code Review (SCR) minded-to change** – If Ofgem's minded to position is implemented, assets could have alternative connection options, which could vary based on firmness or time (e.g. peak or off-peak).