



Creating the Space to Innovate: Action Plan & Recommendations



**CREATING the SPACE
to INNOVATE**

In Partnership With:



Contents

1	Program Overview	3
2	Action Plan & Recommendations.....	4
2.1	Digestion Enhancement.....	4
2.2	Water Reuse	5
2.3	Renewable Products	5
2.4	Nutrient Management.....	6
2.5	Improved Risk Sharing and Institutional Barriers.....	7

1 Program Overview

The Leaders Innovation Forum for Technology (LIFT) seeks opportunities to promote the adoption of innovative technologies and practices. The Water Environment Federation (WEF) and The Water Research Foundation (WRF) recognize that there is a complex landscape that can either encourage or discourage innovation, including for example: leadership, culture, procurement practices, regulatory programs and policies, and others.

Policy and regulatory domains substantially control the type of and pace of the adoption of innovative technologies and practices. To enable innovation, one must explore the barriers and flexibilities at the implementing mechanism level and devise specific approaches that will provide certainty and defensibility for the operator and reasonable assurance for regulatory bodies that compliance can be discerned, verified, and enforced if not met. Examining the broader regulatory context to explore such areas as state-to-state reciprocity, technology acceptance, and technology procurement can help to ensure the sector is well prepared to embrace new technologies efficiently and without undue uncertainty.

Creating the Space to Innovate is a WEF driven program of LIFT that focuses on creating the regulatory space to help foster technology and approaches to innovation in the water sector. This program considers ways in which its regulatory activities can reduce barriers to, or encourage incentives for, technology and innovation.

Five technology implementation scenarios have initially been chosen to focus on because they are most likely to be affected by barriers, flexibility needs, and regulatory incentives.

- Digestion Enhancements
- Water Reuse
- Renewable Products
- Nutrient Management
- Improved Risk Sharing and Institutional Barriers

The action plans for each topic are provided in the following section.

2 Action Plan & Recommendations

Recommended action plans have been developed to identify the next steps needed to support innovative technology adoption through enhancement of the regulatory/policy landscape. The action plans will be carried out through the WEF Government Affairs Committee's Regulatory Subcommittee. For more information on the five topics, please see the appendices document.

2.1 Digestion Enhancement

Utilities face a highly complex web of people and policy issues when considering a co-digestion venture. There are specific rules and policy areas that could be subject to re-interpretation or clarification, particularly related to organic waste feedstock pH, Renewable Fuel Standard and RIN, and RCRA waste characterization. However, given the complex and interactive nature of the people and policy issues challenging co-digestion implementation (as well as the potentially unique aspects of individual operating contexts and state/local requirements), utilities lack the knowledge and expertise to navigate the complex process efficiently. There are four key areas that stand out:

- Business Case
- Regulatory Barriers
- State and Regional Planning
- Governance and Utility Management

To advance relative to these areas, a *Co-Digestion Guidance Document* could be developed which addresses the critical issues listed above and gives utilities practical and structured guidance. It would present the methodology to develop a holistic *business case*, including risk analysis, sustainable return on investment, identification and valuation of benefits, financial analysis, and life cycle assessment. WRF has already completed several projects related to the business case for co-digestion. These include project OWSO5R07, *Co-Digestion of Organic Waste Products with Wastewater Solids: Final Report with Economic Model*, and project OWSO11C10a, *Reframing the Economics of Combined Heat and Power Projects: Creating a Better Business Case Through Holistic Benefit and Cost Analysis*. WRF also started a project in 2017 on *Food Waste Co-Digestion at Wastewater Resource Recovery Facilities: Business Case Analysis* (project ENER19C17).

The components of a successful *communication strategy* would focus on ways to engage and target the different stakeholders, including business partners, elected officials, the media, the community at large, and regulators. Guidance on, and examples of, creating a collaborative working environment would be included.

The guidance needs to include a *Regulatory Analysis Framework* with the purpose of evaluating the rules applicable to the addition of food waste to Water Resource Recovery Facility (WRRF) processes and helping utility managers be better consumers of information by giving them a better understanding of the regulatory landscape. It would identify rules by jurisdiction (local, state, federal) and sector (solid waste, energy (gas and electric), wastewater, and air). Impediments created by regulations would be identified, with analysis of how different states/regions differ. Implementation case studies would be presented, with emphasis on permitting (NPDES, RCRA, etc.) and agreements such as consent decrees and administrative orders.

The suggested next steps include WEF developing a position statement in support of co-digestion, and initiating a project to develop a Regulatory Analysis Framework and Co-Digestion Guidance Document.

2.2 Water Reuse

Despite its increasing consideration and implementation, there are several long-standing constraints to the development of non-potable, and – particularly - potable reuse water, including cost, public acceptance, institutional coordination, and regulatory approval. Regulatory, financial, and governance structures have put water into separately managed silos for drinking water, wastewater, and stormwater. These stovepipes have been reinforced at every level of government— from the federal to local level. There currently are no federal regulations specifically governing reuse, and there are also no federal legal prohibitions against this practice.

In order to combat the many challenges pertaining to water reuse, the proposed action plan includes the following areas:

- Gaining wider acceptance of potable reuse water
- Regulatory guidance and flexibility
- Institutional coordination
- Pilots, research, and funding
- Operator training and certification

The major next steps include increasing outreach and education to improve public acceptance, work with EPA to develop a reuse support statement, encourage permitting flexibility with administrative orders and integrated planning to allow utilities time and space to innovate, encourage the adoption of drinking water into the integrated planning framework, detect and eliminate impediments to funding reuse projects (such as separate funding for drinking water, wastewater, and agricultural projects), and expand water reuse operator training.

2.3 Renewable Products

The paradigm of wastewater treatment has shifted significantly in the past decade. Previously seen as having the primary function of disposal of waste material, municipal and industrial wastewater treatment facilities are increasingly now seen as entities with opportunity to recover the resources embedded in those waste streams for beneficial reuse. However, wastewater treatment derived renewable products currently reside in a regulatory context that suppresses market acceptance and creates uncertainty that deters innovation.

The need exists for a general policy framework that addresses renewable products from WRRFs, including, but not only focused on, nutrients. There is anticipation and encouragement for more reclaimed products and processes to emerge. It will be very helpful if they do not need to be addressed on a case-by-case basis each time. It would be a very powerful market signal to research and technology developers, as well as private investment/funding, if there was a reasonably well-known path to “allowance” of new, reclaimed products.

To better support renewable product innovation and improve the Return on Investment utilities will derive from pursuing the production of such products, there is a need to define a policy

framework that 1) allows for an efficient means to demonstrate a product is “safe for intended use,” and 2) supports removing the “derived from sewage sludge” designation. There are three potential options for defining such a policy framework.

- Improve the current EPA case-by-case review approach
- Make a “surgical adjustment” to the existing 503 Rule to redefine “biosolids”
- Establish a “504” rule that creates a category of “renewable products” that are “derived from the wastewater treatment process,” allowing for both a separate regulatory designation and separate regulatory requirement

Pursuing one, or a combination of these options, can address the current federal regulatory policy challenges faced by products derived from wastewater treatment processes. In addition to these actions, there is also a need to address the state-by-state approval process.

To advance these revisions to both the federal and state policy approach for renewable products derived from wastewater treatment operations, several actions are suggested.

1. Conduct an independent legal review of EPA’s current policy position on the applicability of 503 to products derived from wastewater treatment processes. The end goal for this effort will be a revised legal interpretation from EPA that creates a more streamlined relationship of CWA applicability to wastewater treatment-derived products.
2. If a sufficiently strong legal basis for revising EPA’s current interpretation does not emerge, a subject matter experts workshop should be held to strengthen the case. The workshop topics would include:
 - a. Identify the data requirements and testing methods that can act as the basis for 1) demonstrating a product is derived from a wastewater treatment process; and 2) will be safe for intended use.
 - b. Identify the component parts of a Safe for Intended Use Plan.
 - c. To the extent needed after the legal review conducted under item 1, characterization of the specific 503 changes needed or the specific text for a new 504 rule that will support an alternative regulatory and policy framework for wastewater treatment-derived products.
3. Increase overall social acceptance of renewable products

2.4 Nutrient Management

According to the EPA, nutrient pollution remains one of the greatest challenges to our Nation’s water quality and presents a growing threat to public health and local economies - contributing to toxic harmful algal blooms, contamination of drinking water sources, and costly impacts on recreation, tourism and fisheries. There is a need to pursue a strategy for the management of nutrients at WRRFs that considers issues such as energy and chemical use, and recognizes the larger watershed context that these facilities operate in.

An effective strategy to improve the nutrient-related water quality benefits of the investments made by the water sector has two pillars. The first is to seek to design and develop an integrated package of permitting tools that allows utilities to optimize their individual, in-plant investments as derived from and measured by water quality impact. The second pillar supports broader optimization (through flexibility of where and when any individual actor invests) of investments across an entire watershed (or sub-watershed) when the mix of nutrient sources creates an opportunity to take advantage of variations in cost effectiveness related to

obtaining equivalent water quality benefits. Some of the permitting needs/approaches support both pillars.

Facility focused suggestions include a stepwise approach to nutrient reduction that encourages innovation, allows trial and error, eliminates the need for ultra-conservative designs, and focuses more on water quality-based outcomes. Additionally, with NPDES permits being the key implementing mechanism at the facility level, permitting strategies were discussed, mainly related to writing permits in a way that allows flexibility for the utility while still achieving the desired water quality. This will allow facilities to be more innovative when reducing nutrient levels.

In the broader watershed context, utilities want to participate in a process that more equitably and effectively shares the responsibility for nutrient management. The watershed-based approach and the Integrated Planning Framework do provide the structure for a successful process, but they need to be better understood, simplified, expanded, and possibly modified to accommodate the unique nature of nutrient management.

The next major steps include developing EPA approved guidance to NPDES permit writers to recognize and avoid expression of permit limits in ways that drive ultra-conservative design, enhance ambient monitoring and data collection in lieu of more plant data and restrictions, and enable and expand watershed-based permitting and integrated planning ability for nutrients.

2.5 Improved Risk Sharing and Institutional Barriers

As a sector substantially driven by regulatory compliance, the wastewater sector has a general reluctance to adopt technologies and practices that lack a proven track record of performance and reliability, including both compliance and financial risk. Additionally, regulators at the regional and state level have little guidance and incentive to be flexible with regulations.

For compliance risk, there may be an opportunity to create a national policy approach similar to EPA's Integrated Planning. An integrated planning approach offers a voluntary opportunity for a municipality to propose to meet multiple CWA requirements by identifying efficiencies from separate wastewater and stormwater programs and sequencing investments so that the highest priority projects come first. A similar policy focused on WRRFs could enable consistency from EPA regional offices and lay out clear expectations for use of existing CWA and SDWA flexibility.

For financial risk, consideration could be given to various aspects of insurance and funding approaches. These include:

- Developing a federal guarantee program for municipalities that move forward with innovation
- Developing an insurance program whereby a technology that does not perform as intended can be remedied or replaced
- Developing a more robust warranty model, which includes externalities and ancillary risks
- Establishing a Water Innovation Fund to support the demonstration and deployment of cost saving innovative technologies via a national test bed network (for more information, please see the LIFT report on *Innovating a Better Water Future*)
- Involving venture capitalists, public/private partnerships, and other non-traditional (in this sector) funding approaches

While progress is being made to promote innovation in this sector, an overall challenging context for innovation remains. This situation signals a need to step back and discuss the ingredients of both a near-term and longer-term strategy to create an “innovation safe space” for the sector, as well as an “innovation culture” in the longer term. Discussions reflected the recognition that current knowledge, science, treatment processes/applications, and instrumentation have substantially evolved and improved since the inception of the CWA, creating opportunities for rethinking the way we regulate clean water efforts.