



Metropolitan Water Reclamation District of Greater Chicago

**Welcome to the November
Edition of the 2020 M&R
Seminar Series**

NOTES FOR SEMINAR ATTENDEES

- All attendees' audio lines have been muted to minimize background noise.
- A question and answer session will follow the presentation.
- Please use the Chat feature to ask a question via text to All Panelists.
- The presentation slides will be posted on the MWRD website after the seminar.
- Certificates will only be issued to participants who attend the entire presentation.

Jason Carter, P.E.

**Vice President and Water Strategy & Innovation Lead
Arcadis**

Mr. Jason Carter serves as Vice President and Water Strategy & Innovation Lead for Arcadis. With over 22 years in consulting, he assists utilities in building strategic business plans, utility-led innovation programs and effective ecosystems for sustainable implementation. He has also served as Applied Research Director and Innovation & Intellectual Property Lead for Arcadis North America.

Mr. Carter has engaged over 100 public and private partners in studying emerging issues and developing best practices in fields including treatment, system optimization, asset management, green infrastructure, and utility management. He currently serves as Principal Investigator for “The Water Research Foundation’s Project 4907 – Leading Water and Wastewater Utility Innovation.”



Joanna Brunner

**Senior Management Consultant
Innovation Program Development & Support/
Innovation Culture, Training and Engagement
Arcadis**



MS. Joanna Brunner serves as a Senior Management Consultant in the business advisory service line for the water sector of Arcadis North America. Her expertise is focused on developing sustainable strategies and effective innovation programs at water and wastewater utilities. In this role, she empowers utilities to meet current and future water sector challenges by leading more creative and agile organizations. This is achieved through her experience in leading industry research on innovation management, strategic planning, and innovation program plan.



MWRD Greater Chicago M&R Seminar Series

Leading Water and Wastewater Utility Innovation

Jason Carter, PE, Joanna Brunner, PE and Kuldip Kumar, PhD

Contributors



Jason T Carter, PE

Vice President
Water Strategy & Innovation Lead
(c) 205.253.2276
(e) jason.carter@arcadis.com



Joanna Brunner, PE

Senior Management Consultant
(c) 502.541.7406
(e) joanna.brunner@arcadis.com



Kuldip Kumar, PhD

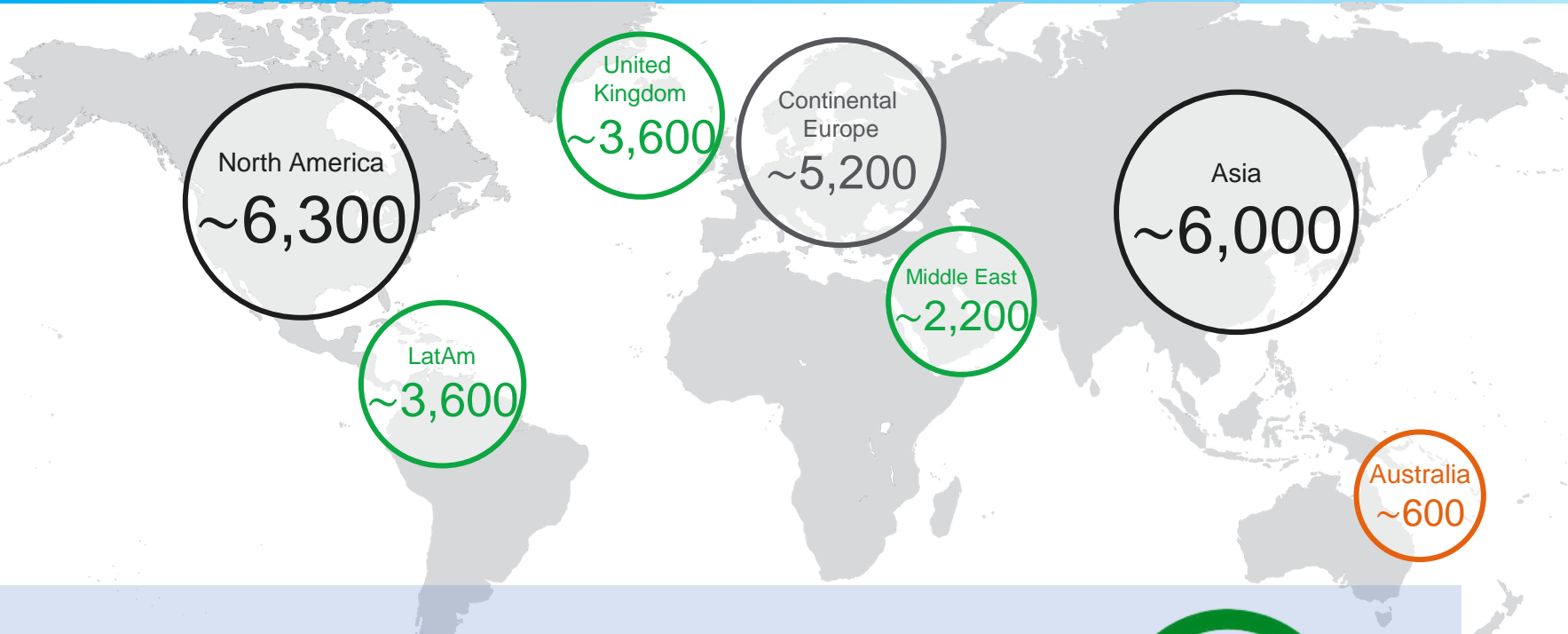
Principal Environmental Scientist
MWRDGC
(c) 708.588.3579
(e) kumark@mwrdd.org

MWRDGC Utility Partner Lead –
WRF Project 4907 Leading Water
and Wastewater Utility Innovation

Business Advisory Services is the management and digital consulting group of Arcadis Water North America.



Arcadis at a Glance



Our Business Lines:



Water



Infrastructure



Environment

Forbes | 2020

AMERICA'S BEST
MANAGEMENT
CONSULTING FIRMS

We are the leading design and consultancy firm for natural and built assets.

- 6,000** in North America
- 400+** Offices Worldwide
- 70+** Countries
- 30,000+** Projects



Water Utility Research



WRF 4642 – Fostering Innovation with Water Utilities (2017)

Based on surveys to over 400 water utility professionals and workshops with 50 utilities and private companies, developed basic **innovation management disciplines** for building a culture of innovation within utilities. Developed fourteen public and private utility case studies.



WRF 4907 – Leading Water and Wastewater Utility Innovation (2021)

Working with 76 public and private utilities to developing a roadmap for building **innovation strategies, engaging internal stakeholders** and **leveraging partnerships**. Developing an innovation planning tool and utility demonstration studies.



Opening statistics

Utilities are navigating a unique convergence of forces and trying to build sustainable and agile organizations.

91% of utility professionals believe innovation is critical to the future of their organization.

50% believe their organization effectively leverages innovation

26% of innovation partnerships were rated as effective

20% of the workforce feels opportunity to participate in innovation

Some are effectively building powerful cultures of innovation and building resilient organizations...What can we learn?



Agenda



Innovation Management as a Business Practice



MWRDGC's Innovation Environment Self-Assessment



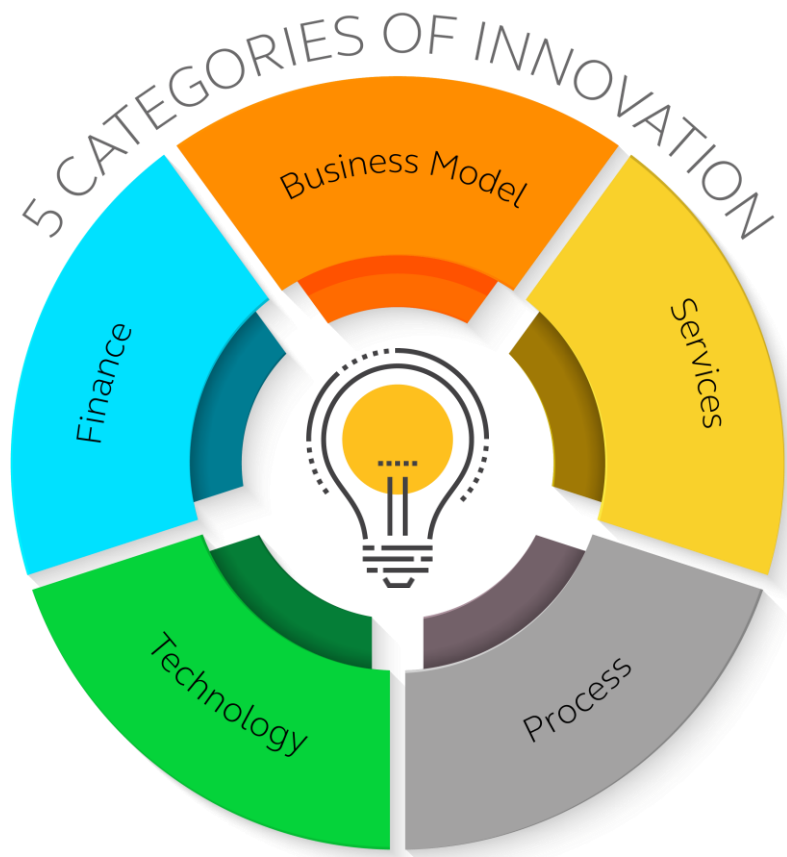
Building a Culture of Innovation



Innovation Management as a Business Practice



Terminology



1. **Innovation** - the application of new ideas resulting in increased value to our customers and/or increased productivity.
2. **Innovation management** – stewarding ideas as critical assets to develop value.
3. **Impact** – to improve organizational sustainability through **continuous improvement**, adopting **new ideas**, and positioning the **utility for future** success.

Utility executives on innovation

20 Utility Executive Interviews



- California Water Services, CA
- City of Richmond, VA
- Clean Water Services, OR
- DC Water, WDC
- Gippsland Water, AUS
- Great Lakes Water Authority, MI
- Gwinnett County DWR, GA
- Halifax Water, CAN
- Louisville MSD, KY
- Louisville Water Company, KY
- Milwaukee Metropolitan Sewerage District, WI
- Pinellas County Utilities, FL
- Queensland Urban Utilities, AUS
- SA Water, AUS
- San Jose Water, CA
- Sanepar, BRA
- Toronto Water, CAN
- Unitywater, AUS
- WSSC Water, MD
- York Region, CAN



Combat the unknown challenges of tomorrow



Do more with less



Meet community's future needs



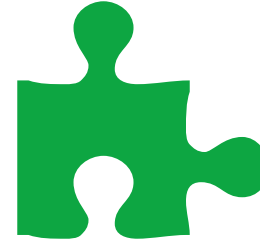
Keep pace with the industry and growing pressures

Impact of innovation



Sustainability

Energy neutrality with heat exchangers, solar panels and investigating biomass reuse.



Better Technical Solutions

Brought nutrient removal technology to US led to 20% energy reduction with a projected savings of \$400,000/yr.



Workforce Development

Collaborates regionally to address labor needs in mission critical jobs. Upskills current workforce.



Workforce Engagement

Fosters broad collaboration, engagement and communication (over 40-60% of staff engaged).



Cost Savings

Reduced annual operating expenditures and achieved a payback time of <2 years with new algae control technology.

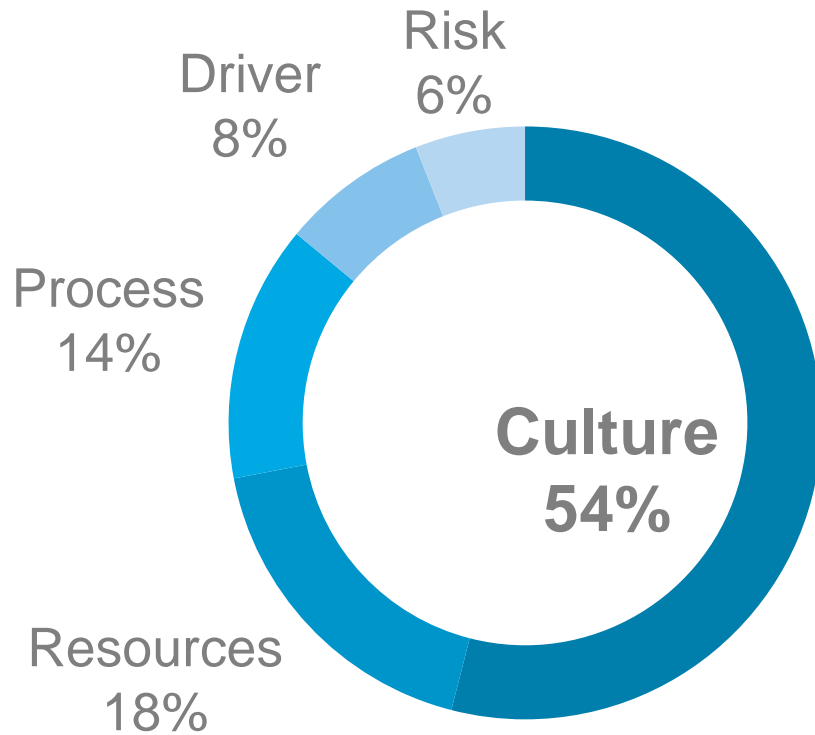


External Recognition

Named *Business Review Weekly's* Top 10 Most Innovative Companies.

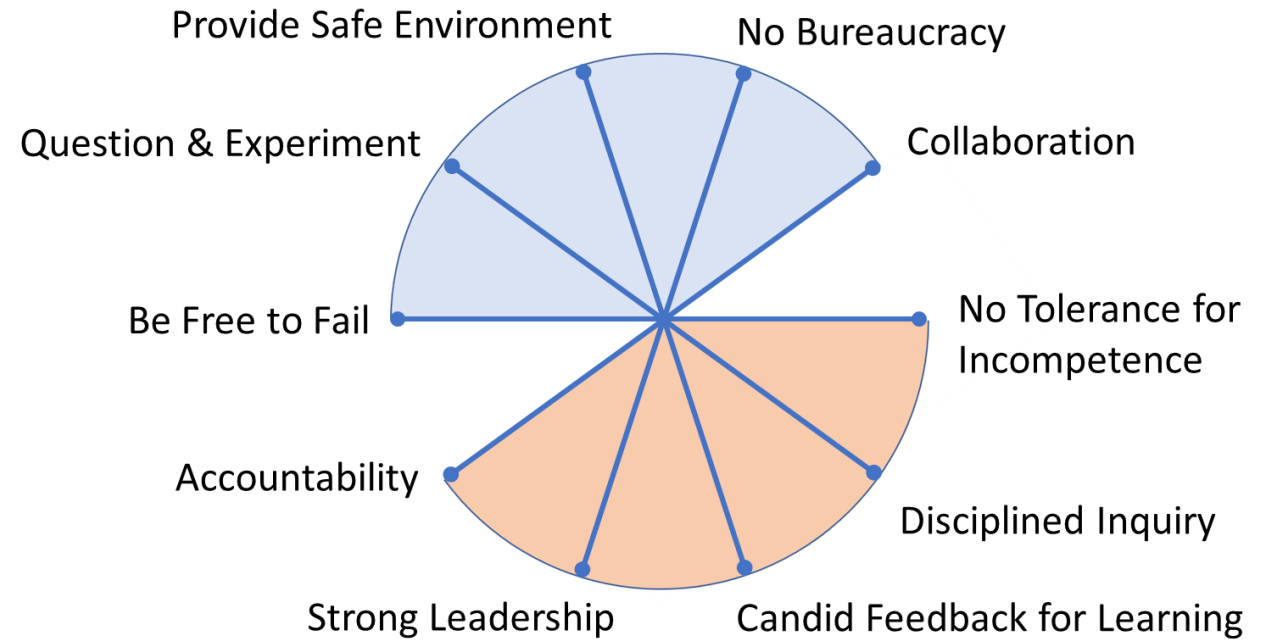
Why doesn't everyone do it?

Challenges to Launch (N=20)



(WRF Project 4642)

Balancing Act to Sustain



(Pisano 2019)

Utility innovation framework

Results-oriented. Tangible and intangible improvement aligned with leadership and organizational philosophy.

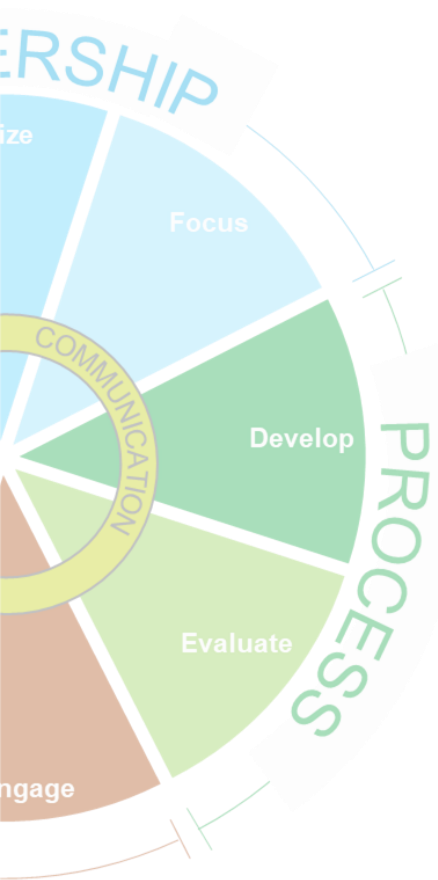


People-oriented. Ideators, mentors, adopters leading initiation and application of innovation.

Ecosystem-oriented. Environment encouraging growth and maturation of ideas.



Utility innovation framework



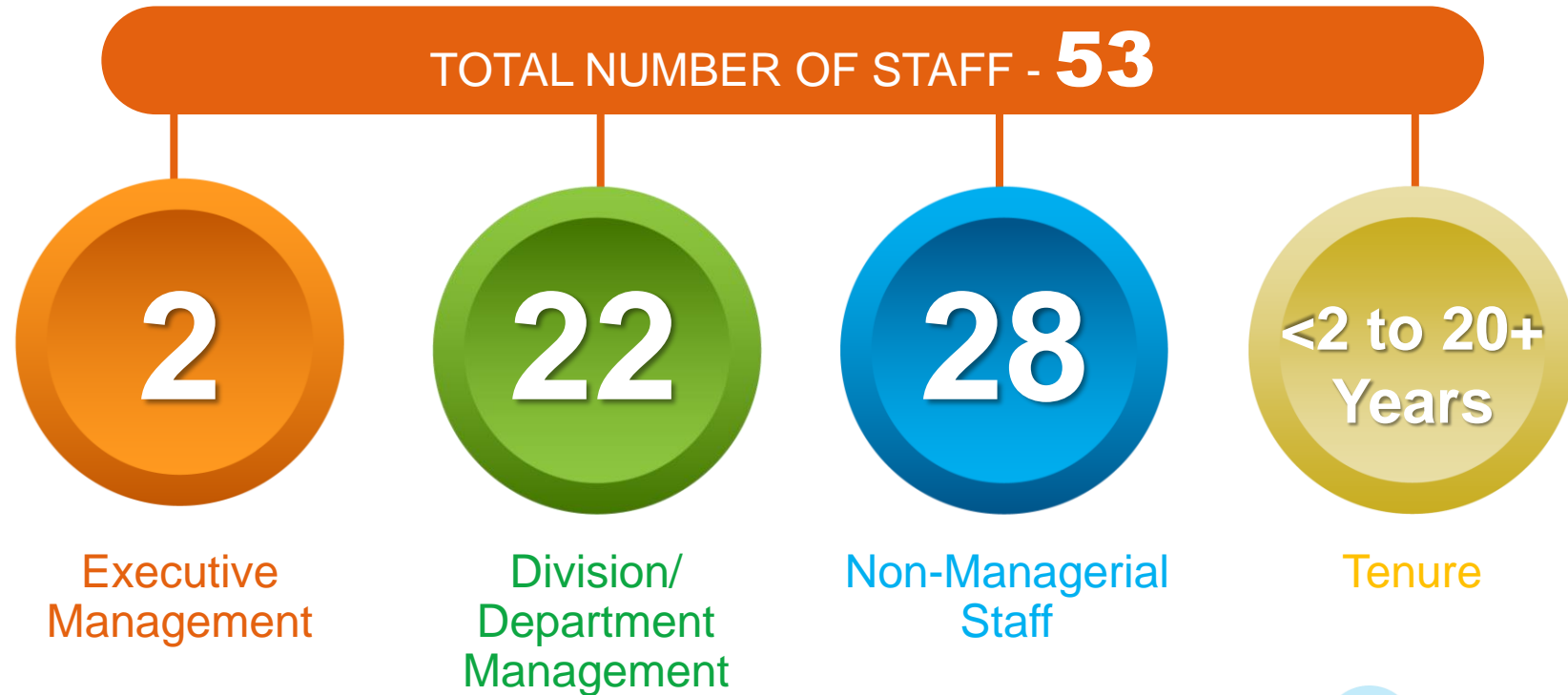
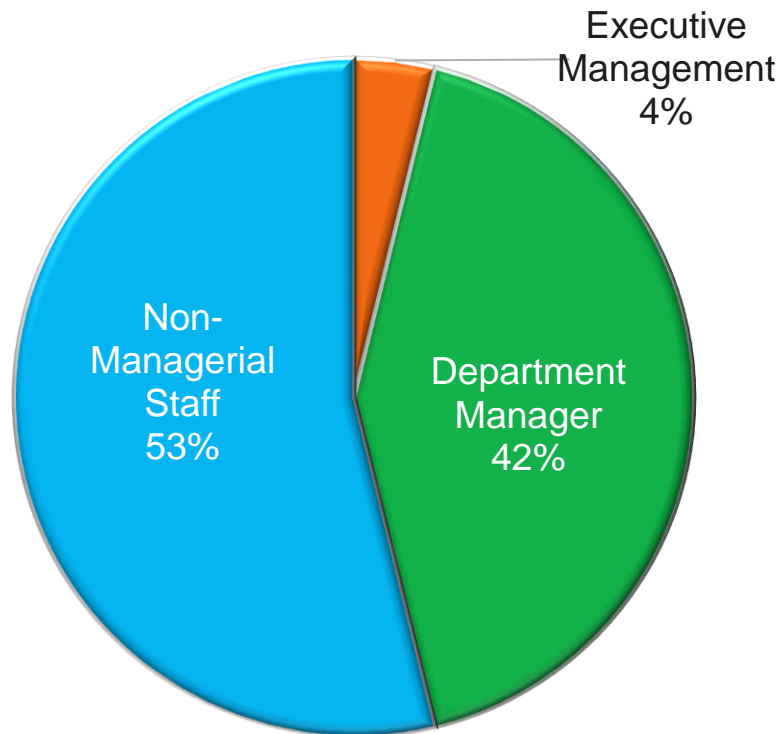
1. **Visualize** - maintain a long view that empowers and inspires innovation
2. **Focus** - define challenges that guide investment
3. **Develop** - invest resources in new ideas
4. **Evaluate** - test concepts in scaled and relevant applications
5. **Engage** - motivate, enable and reward stakeholders
6. **Reach** - utilize resources outside of the organization
7. **Communicate** - capture and convey defining success stories
8. **Evolve** - implement concepts and measure impact



MWRDGC's Innovation Environment Self Assessment

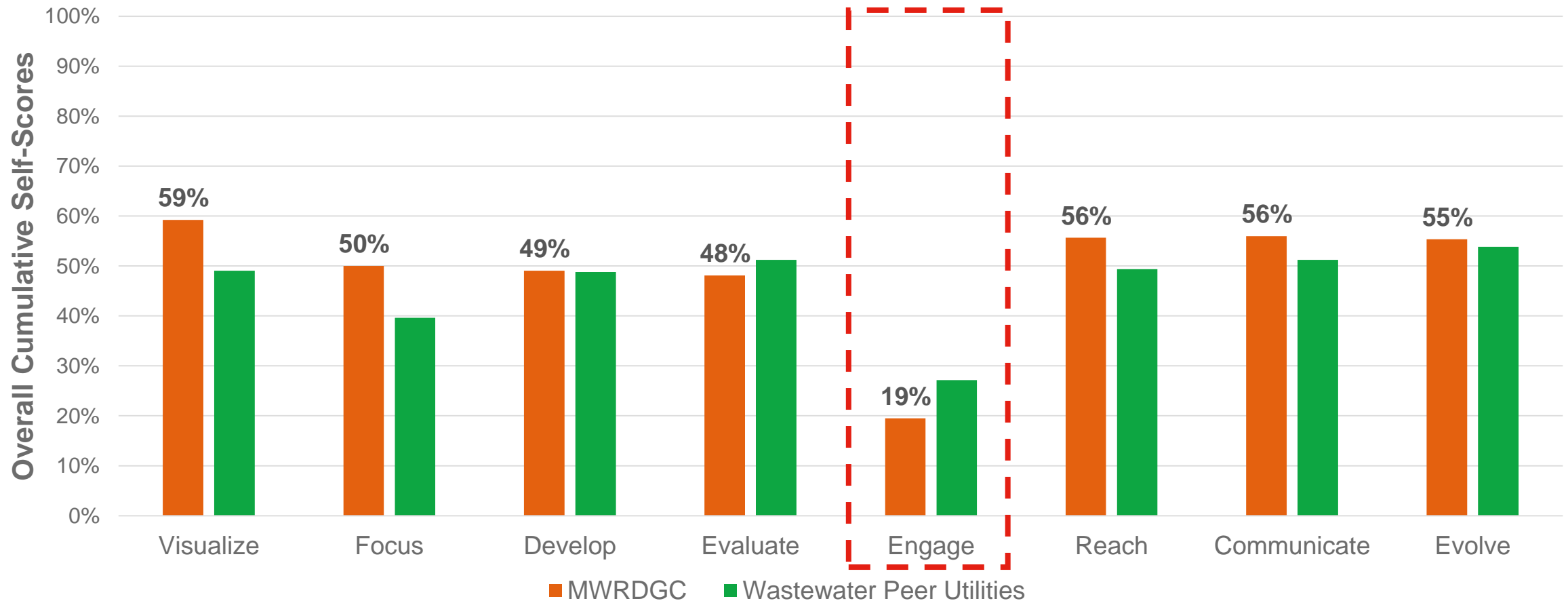


Self-assessment participation

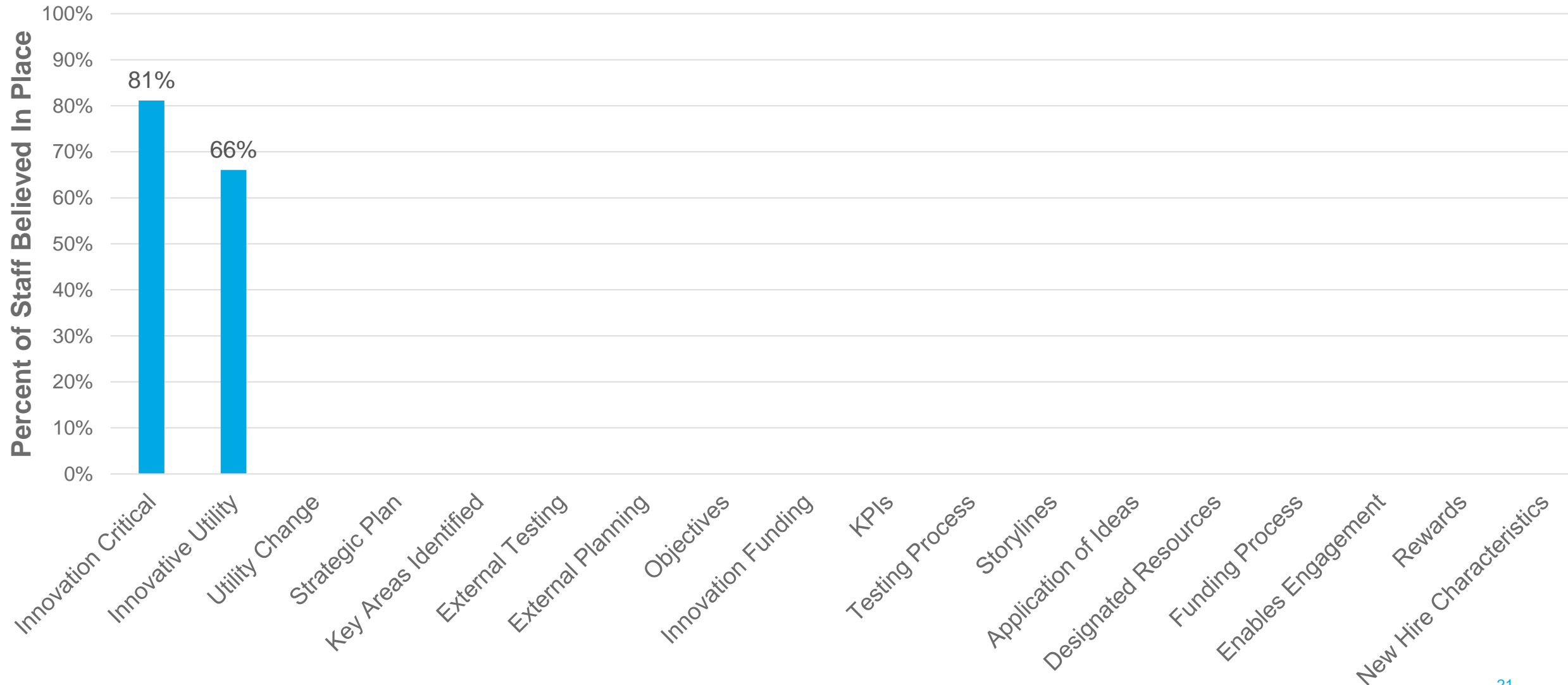


Embracing the key disciplines

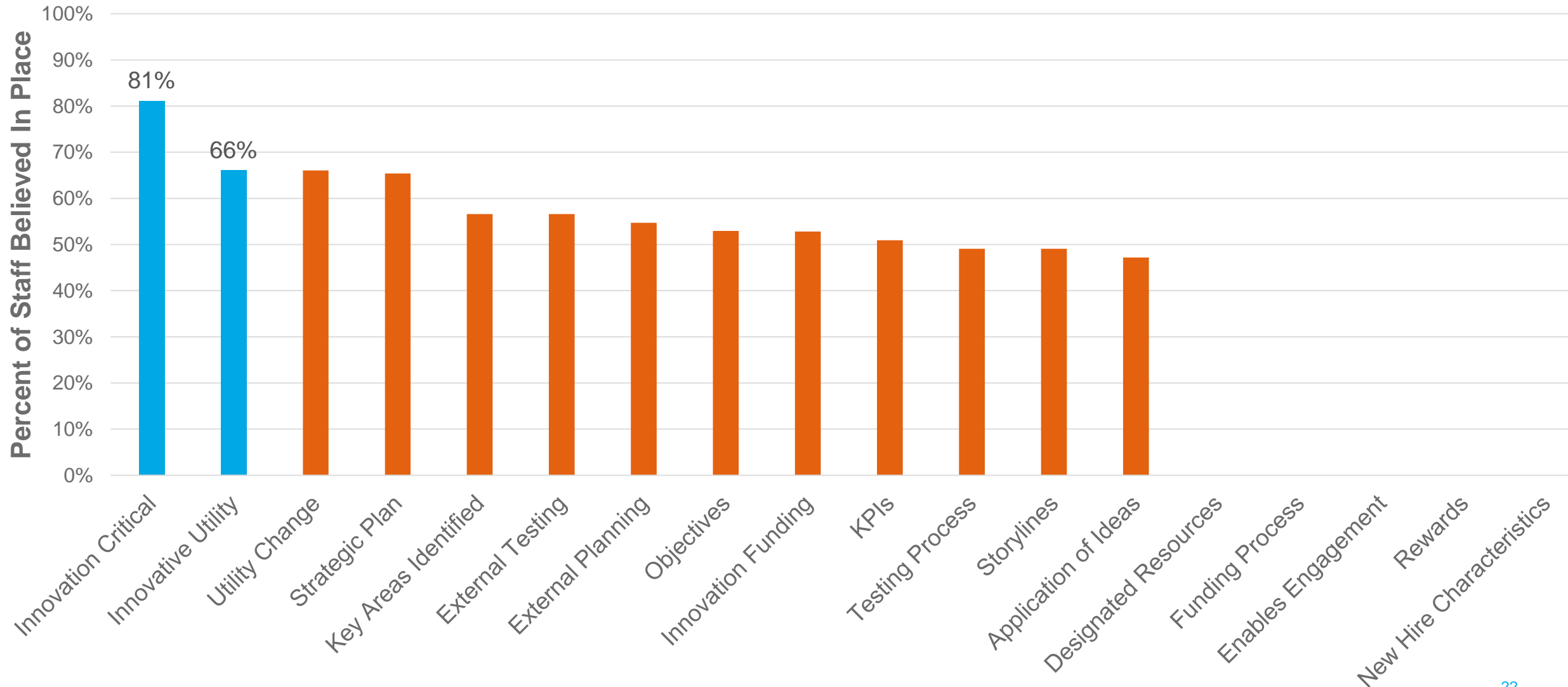
MWRDGC Utility Innovation Framework Self Assessment Results



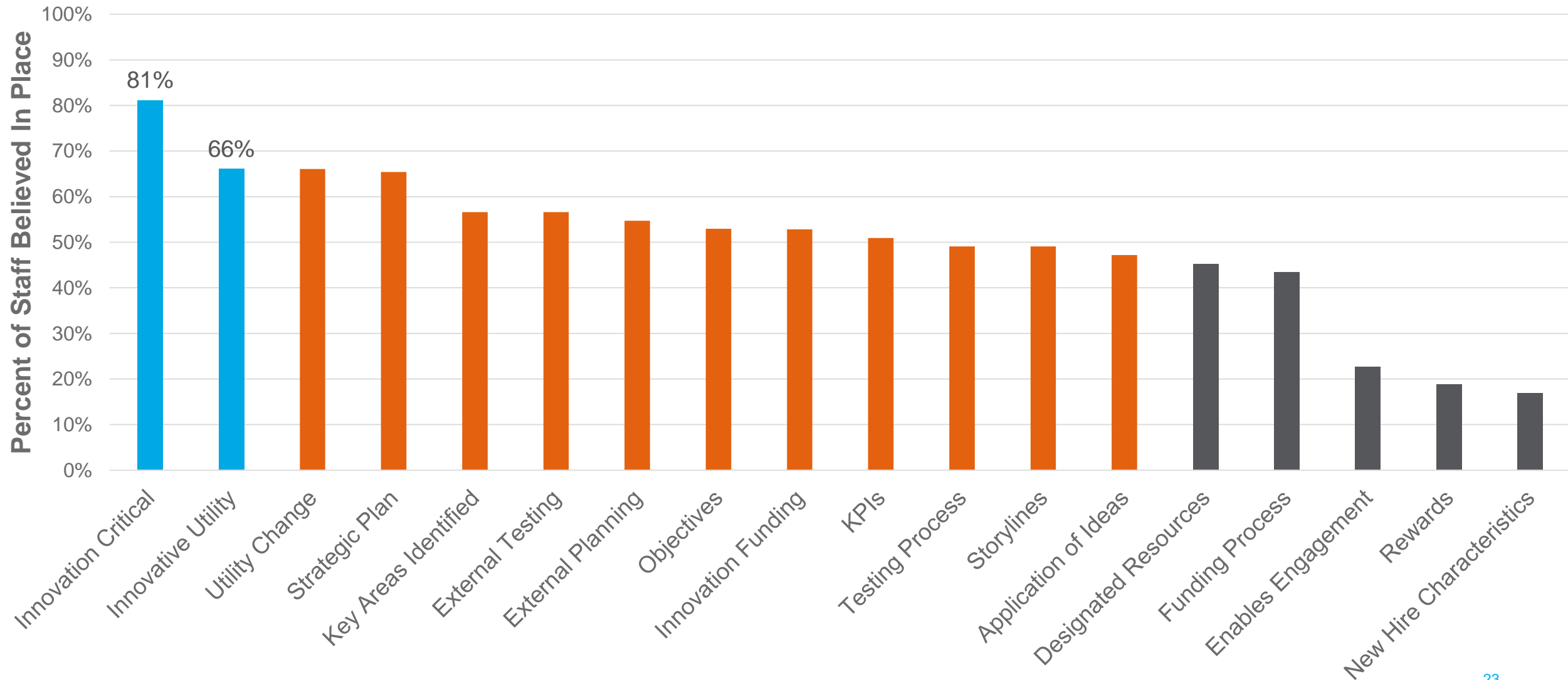
Survey results by question



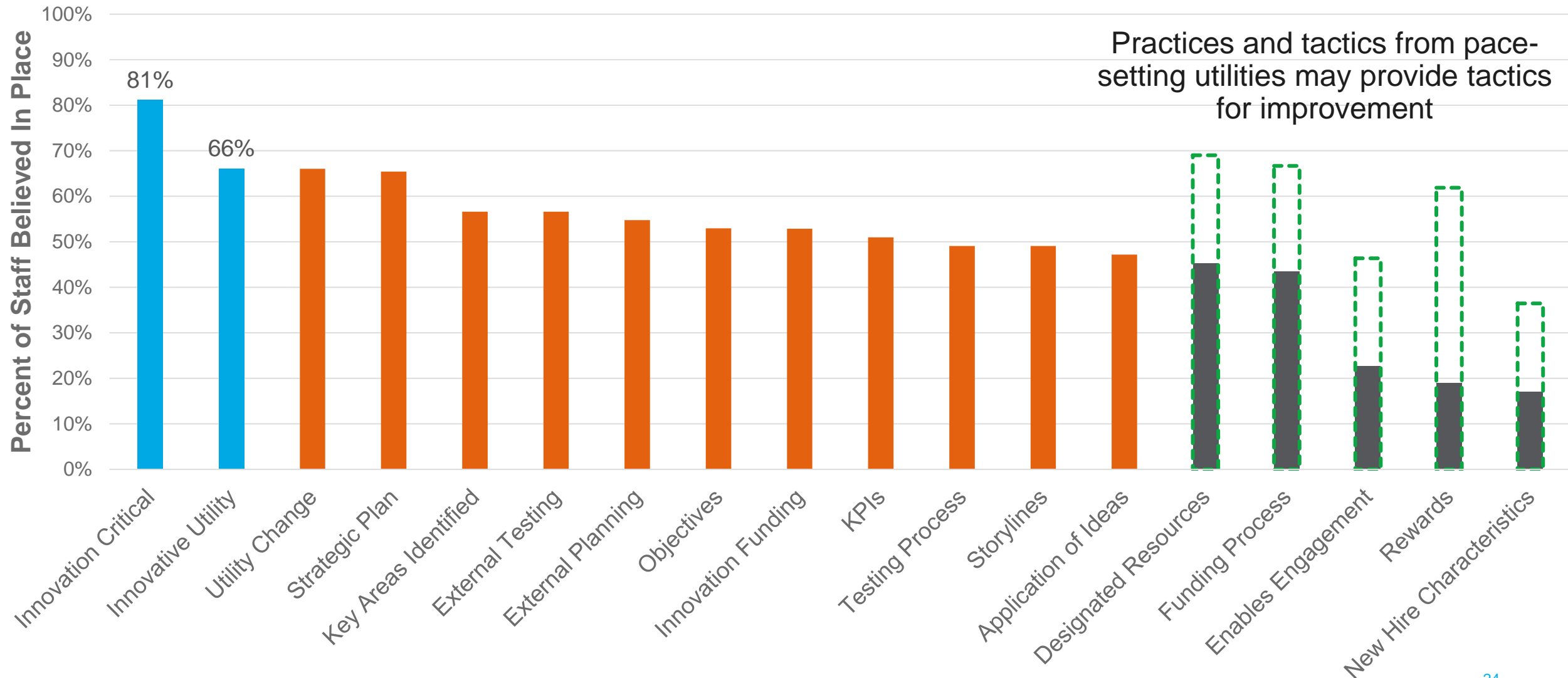
Survey results by question

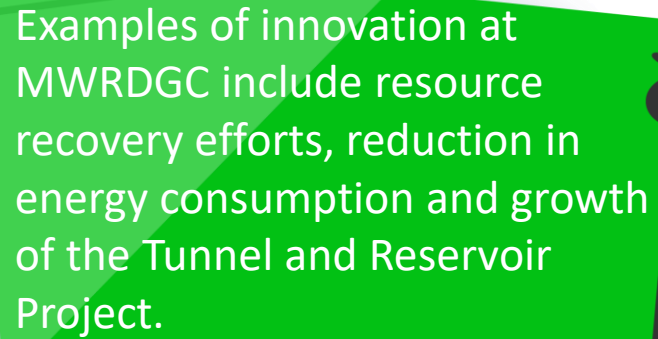


Survey results by question

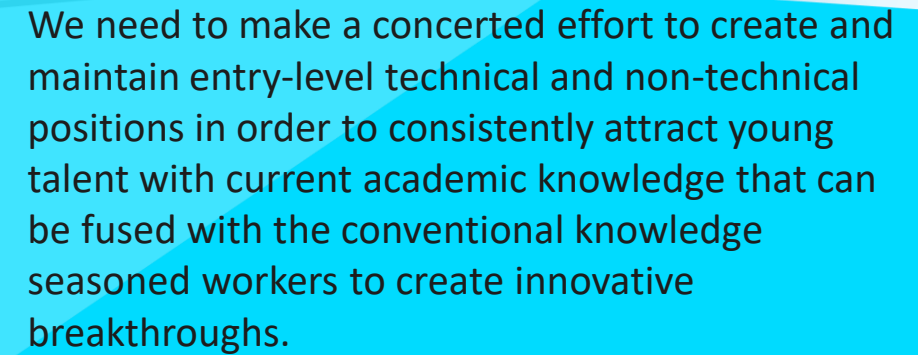


Comparison with pace setters







Examples of innovation at MWRDGC include resource recovery efforts, reduction in energy consumption and growth of the Tunnel and Reservoir Project.



We need to make a concerted effort to create and maintain entry-level technical and non-technical positions in order to consistently attract young talent with current academic knowledge that can be fused with the conventional knowledge seasoned workers to create innovative breakthroughs.



Creating conditions in an organization that allow for innovative thinking is important, but not everything that causes change is innovation, nor does every little problem demand an "innovative" solution. Diluting the understanding of true innovation can stifle its emergence.

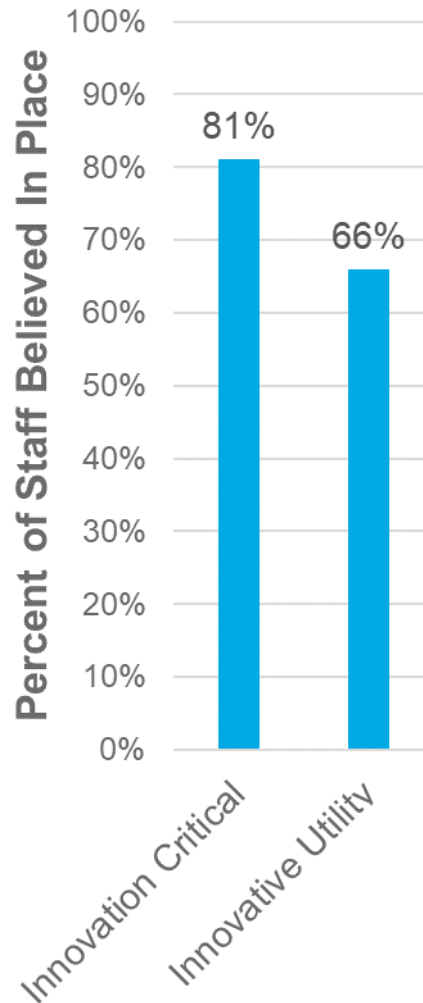


We need to create support for innovation across the organization including Operations and Engineering.



Self-assessment takeaways

Recommended Priority Areas



- 45% Designated **resources** (e.g., time, funding) to invest in innovation
- 43% **Process to request** and secure resources to develop an idea
- 23% Process that **enables engagement** of internal workforce in innovation
- 19% **Rewards and recognition** that encourage participation in innovation
- 17% Innovation as a characteristic in **new hires and advancement**



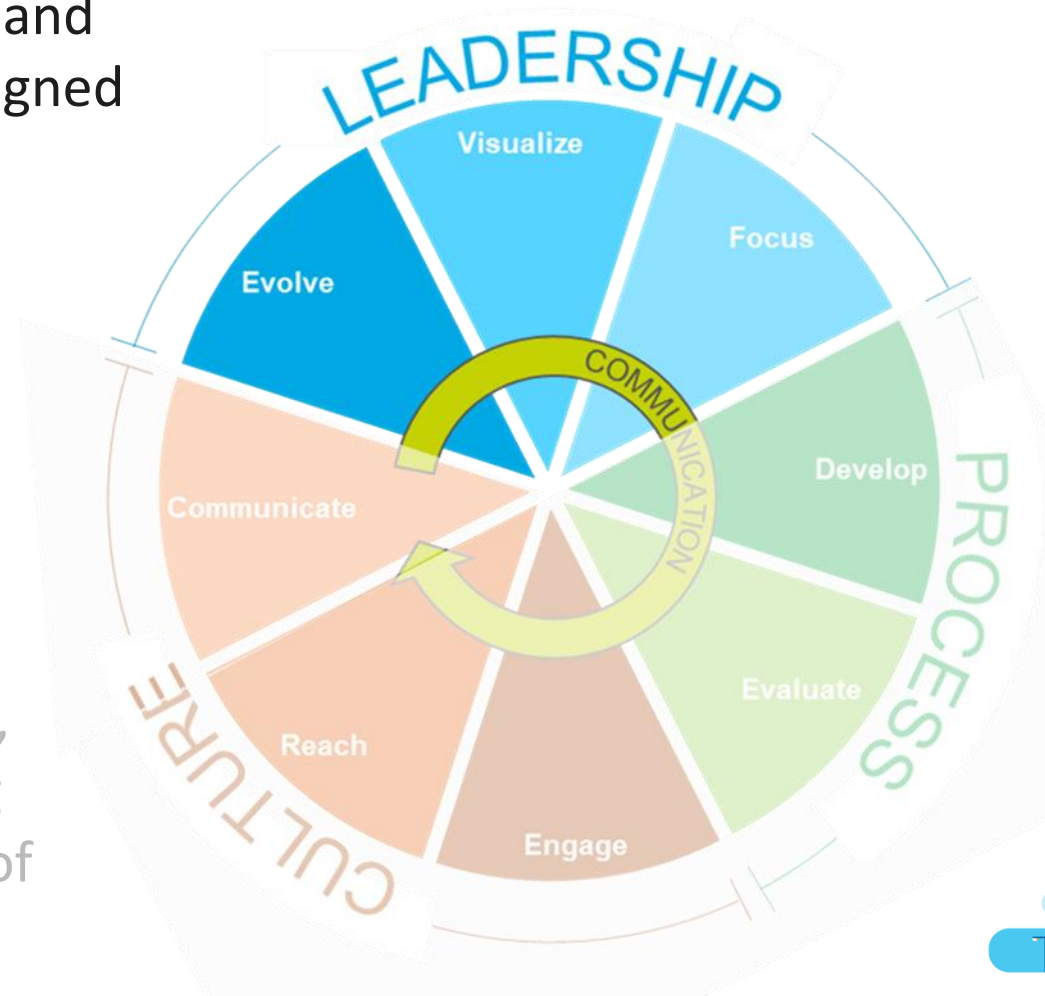
Building a Culture of Innovation



Utility innovation framework

Results-oriented. Tangible and intangible improvement aligned with leadership and organizational philosophy.

People-oriented. Ideators, mentors, adopters leading initiation and application of innovation.



Ecosystem-oriented. Environment encouraging growth and maturation of ideas.



Set your innovation aspirations



Queensland Urban Utilities

Building a collaborative culture where everyone is engaged in innovation and building the utility of the future.

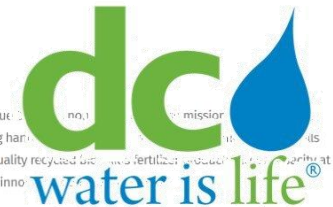
DC Water

Capturing and commercializing ideas to create non-rate payer revenue.

Blue Drop



Stoddert Elementary School Garden, grown with Bloom.



Launched by DC Water in 2016, Blue Drop is a mission to improve water efficiency and reduce water loss for DC Water and its ratepayers. Working hand-in-hand with Bloom®, a Class A, Exceptional Quality recycled bio-based fertilizer produced and packaged at DC Water facilities; and DC Water Innovation, Blue Drop helps generate revenue at DC Water facilities; and DC Water Innovation.

The small, nimble company manages market research, marketing, sales, client relationships and project management so DC Water personnel can focus on their core areas of expertise. Blue Drop can also invest non-ratepayer funds in future revenue-generating projects. The revenue and cost savings Blue Drop generates helps DC Water to slow the growth of rates and mitigate the impact of that growth on ratepayers.

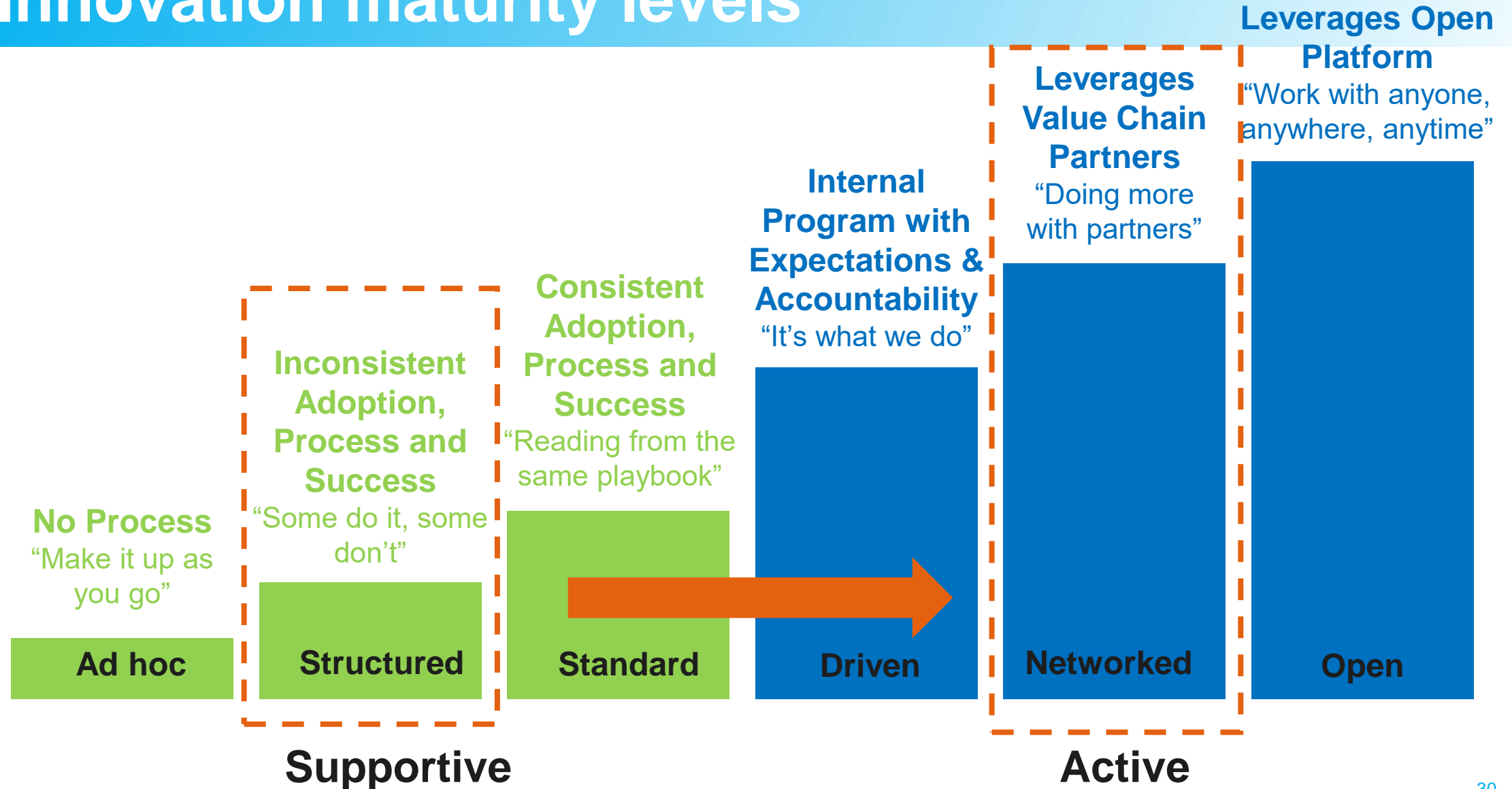


MWRD Denver

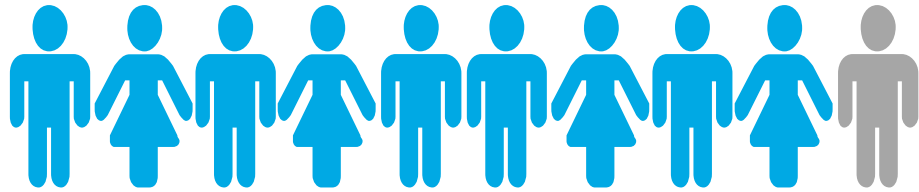
Engaging emerging challenges as key initiatives and leveraging technology and ideas for a more effective capital program.



Innovation maturity levels



Culture starts with leadership



Over 90% of utility employees believe that innovation is critical to the future of their organization.



Less than 40% say their organization has described urgency or shown a vision for innovation.



Only 30% have identified key challenges or opportunities that need to be explored.

Build an innovation strategy



Water Research Foundation | ARCADIS | Design & Consultancy for natural and built assets | Mott MacDonald

- Long-term program activities (over 18 mos.)

Appendix – This section provides simple resources to the innovation leader and innovation team members for submitting and developing ideas.

- Assessment,
 - Self-Initiated
 - Assessed
 - Storyline
 - Challenge
- Resources
 - Idea
 - Business Model
 - List of Resources
 - Description
 - Rewards
 - Non-Financial
 - Intellectual Property

Innovation Strategy Outline

- Foreword from Executive Leadership** – This section prioritizes innovation within the utility culture and begins to shape culture by building on history.
 - Urgency for and commitment to Innovation
 - Storyline of past innovation that has led to tangible results (optional)
- Expectation/Aspirations** – This section provides stakeholder with a more detailed foundation for the program, key program pieces and direction for development.
 - Vision for program (drive and direction)
 - Aspirations for innovation culture
 - Impact
 - Capability
 - Engagement
 - Current and emerging challenges/market opportunities (high level roadmap)
 - Primary elements of Innovation Program with brief descriptions
 - Partnerships
 - Stakeholder engagement
- Strategic Framework** – This section serves as a guide to the innovation leader for planning and management of the program.
 - Program mission
 - Specific Innovation goals, objectives and metrics
 - Resources allocation (based on program budget)
 - Leadership and management
 - Supply chain/partner network
 - External partnership engagement opportunities
 - Intellectual property statement
 - Communication plan overview
 - Strategy revision process
- Program Elements** – This section serves as a guide to potential partners – both internal and external.
 - Challenge statement(s)
 - Idea development process (e.g., submission, evaluation, phase gate, outcomes)
 - Idea Value profile (e.g., desired value dimensions for evaluation)
 - Development process resources (i.e. people, tools, templates, space)
 - Protecting creative capital (e.g., innovation team guidance for managing intellectual property)
- Implementation Plan Overview** – This section provides a detailed roadmap and milestones for launching the program and assessing progress.
 - Near-term program activities (<6 mos.) with champions and milestones, including:
 - Program reporting dashboard
 - Idea/Focus area capture
 - Early external partner engagement
 - Success metrics
 - Intermediate-term program activities (6 to 18 mos.)

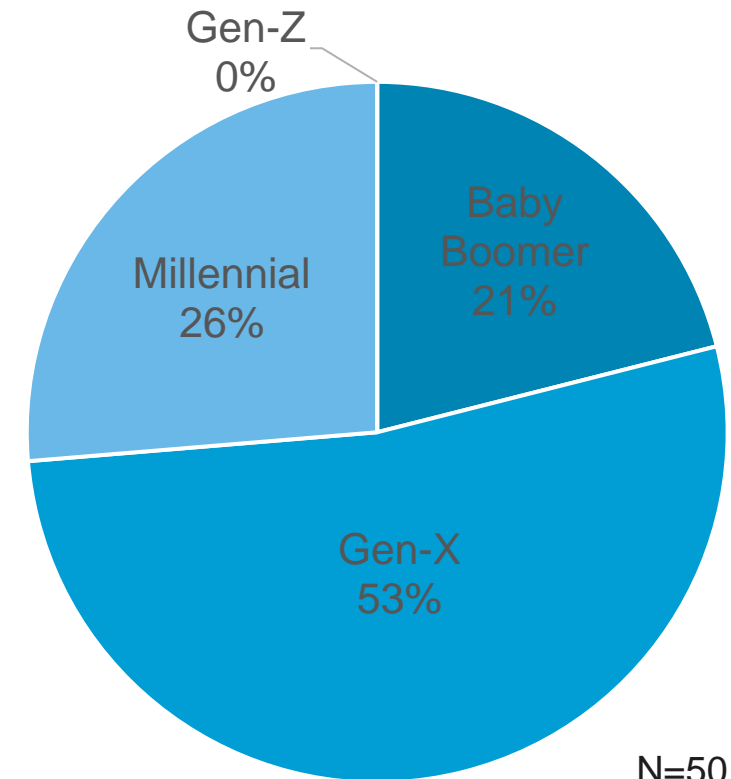
WRF 4907 Leading Water and Wastewater Utility Innovation

4

An innovation strategy is a map that provides direction, pathways, and tracking.

Establish innovation leadership

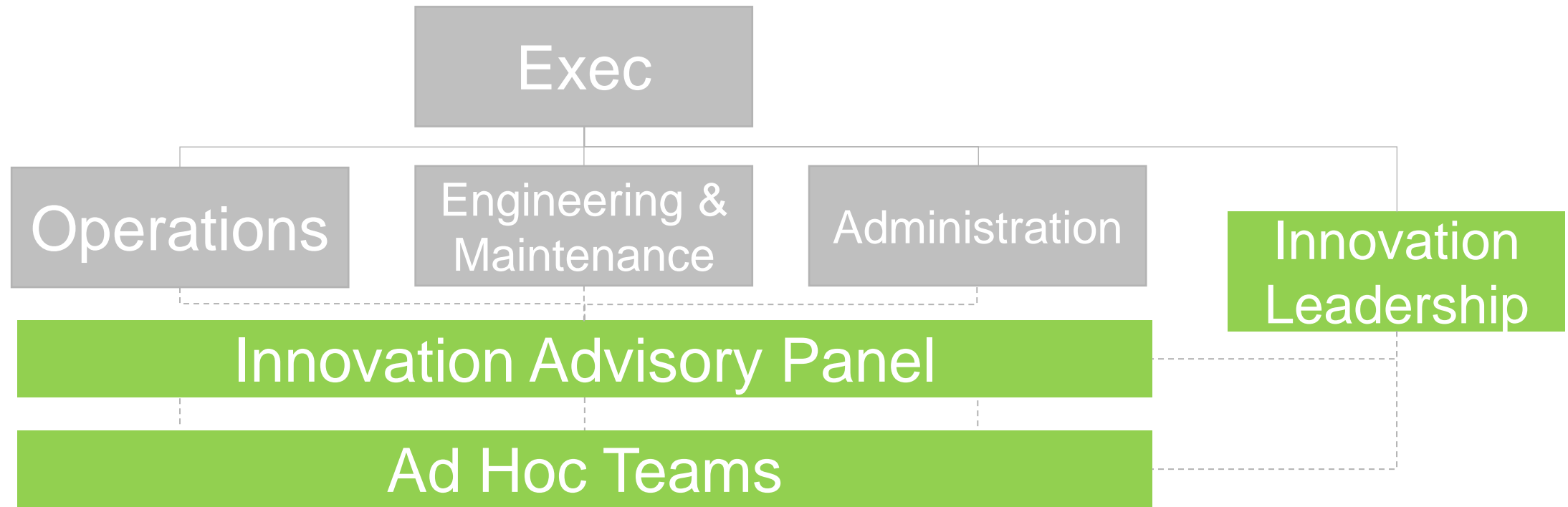
- 83% with over 10 years of water sector experience
- 76% recruited from within the organization
- 53% had Master's Degree or Doctorate
- 33% were female
- 10% had formal innovation training
- None had innovation management degrees
- Average current time in role 3.3 years



N=50

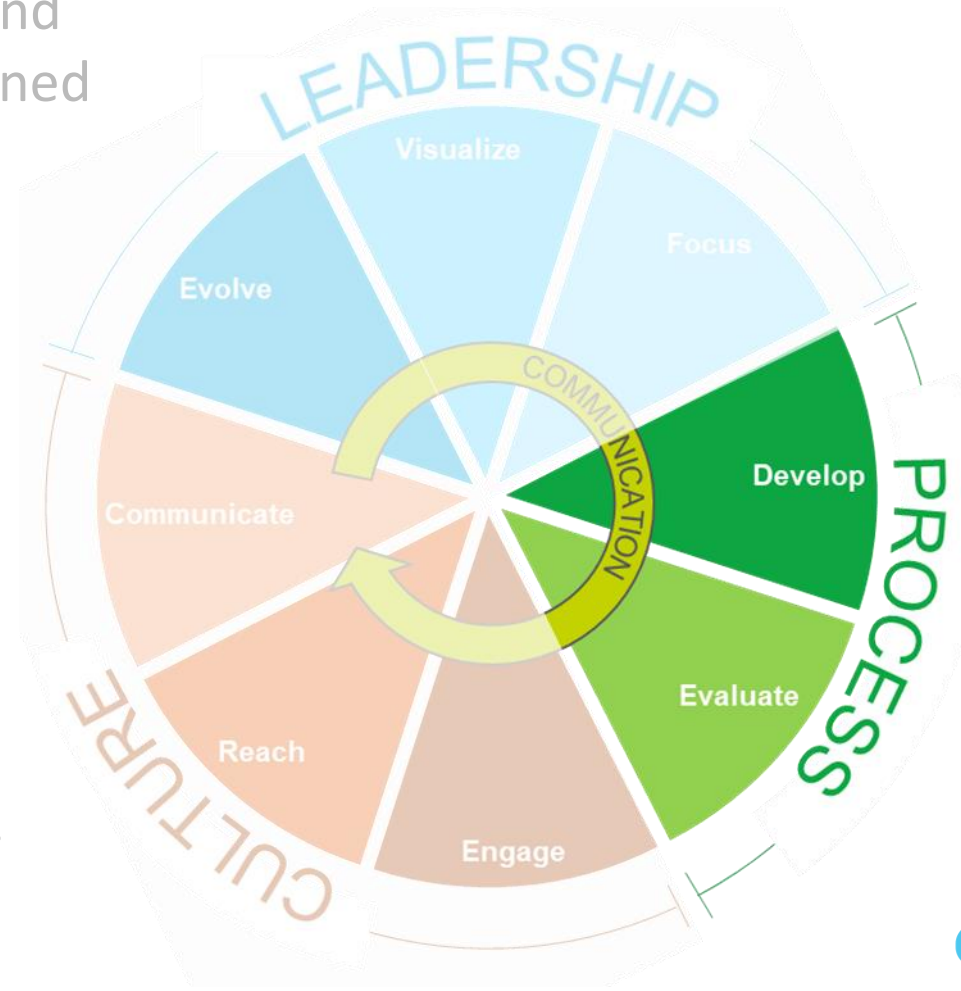


Create opportunity for collaboration



Utility innovation framework

Results-oriented. Tangible and intangible improvement aligned with leadership and organizational philosophy.



People-oriented. Ideators, mentors, adopters leading initiation and application of innovation.

Ecosystem-oriented. Environment encouraging growth and maturation of ideas.



Build idea infrastructure

Capture

Horizon-scanning, recruiting idea submission, evaluating operations to identify concepts.

Screen

Sorting ideas that are aligned with organizational goal and focus areas.

Develop

Generating creative dialog to combine and refine ideas for prototyping and testing.

Evaluate

Testing ideas in increasingly relevant settings and evaluating for impact and alignment.

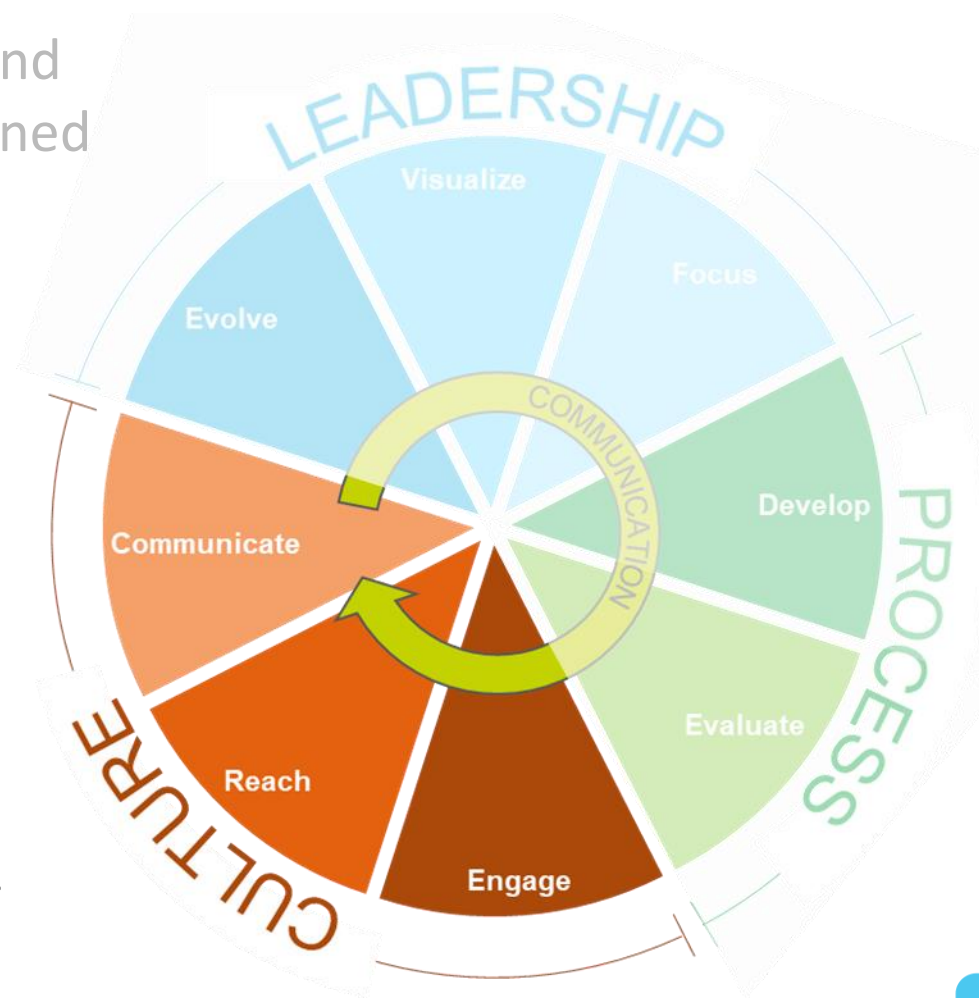
Deploy

Adopt into daily use and measure impact.



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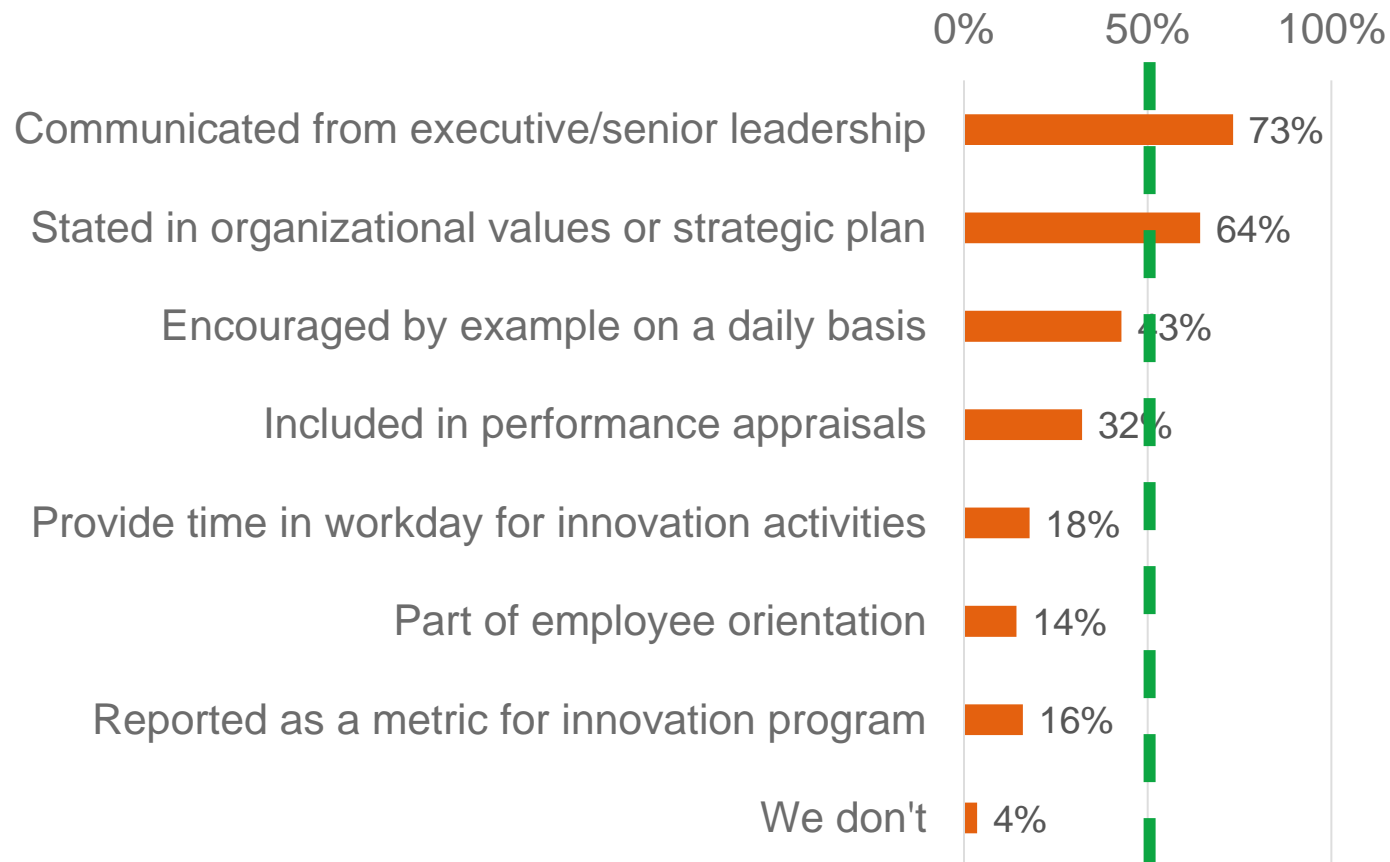
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Empower your workforce

Percent of Utilities Reporting Practice (N=56)



Only 2 in 10 feel empowered to participate in innovation

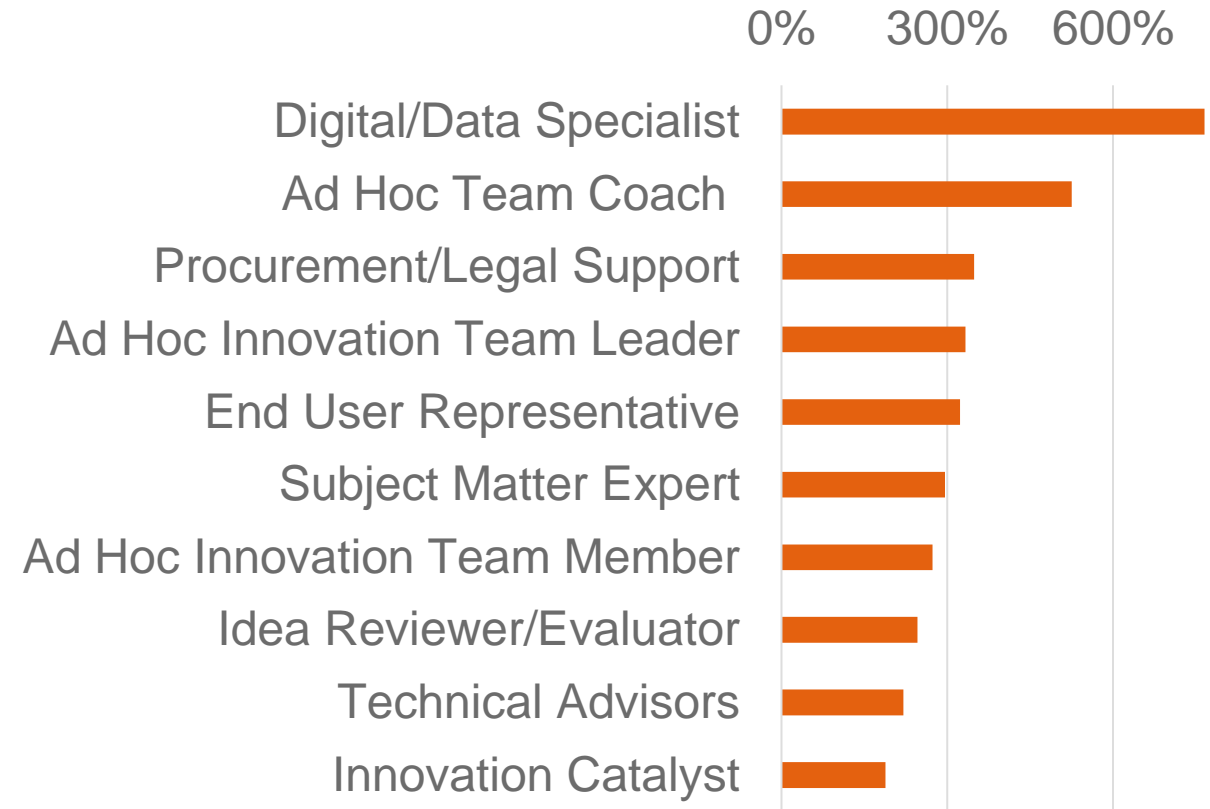


Create opportunities for participation

Common Innovation Roles

1. Innovation leader
2. Innovation committee member
3. Technical advisor
4. Idea team member
5. Champion

Relative Growth Projection (N=56)



Equip your workforce

WRF 4907 Stakeholder Engagement Survey (N=56)

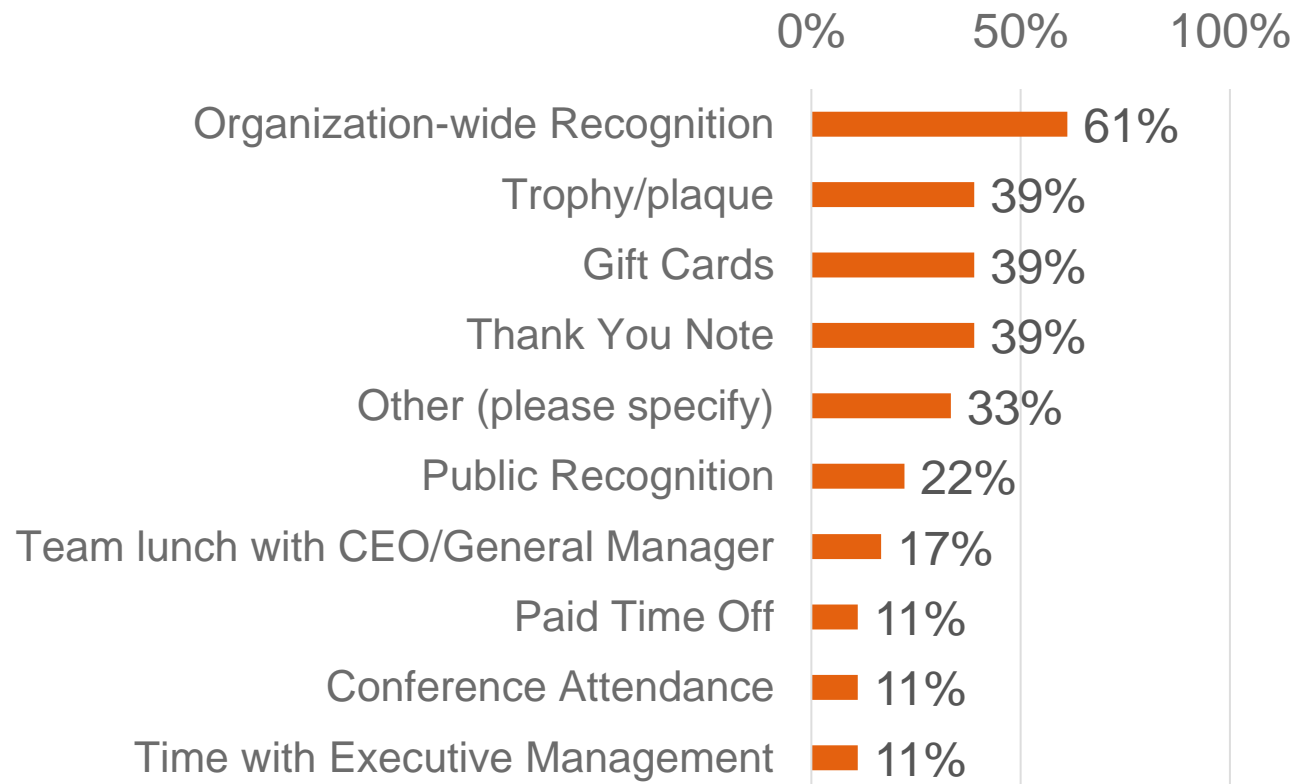
54% of utilities provide staff training and guidance resources to encourage staff engagement.



Recognize your workforce

WRF 4907 Stakeholder Engagement Survey (N=47)

Percent of Utilities with Programs



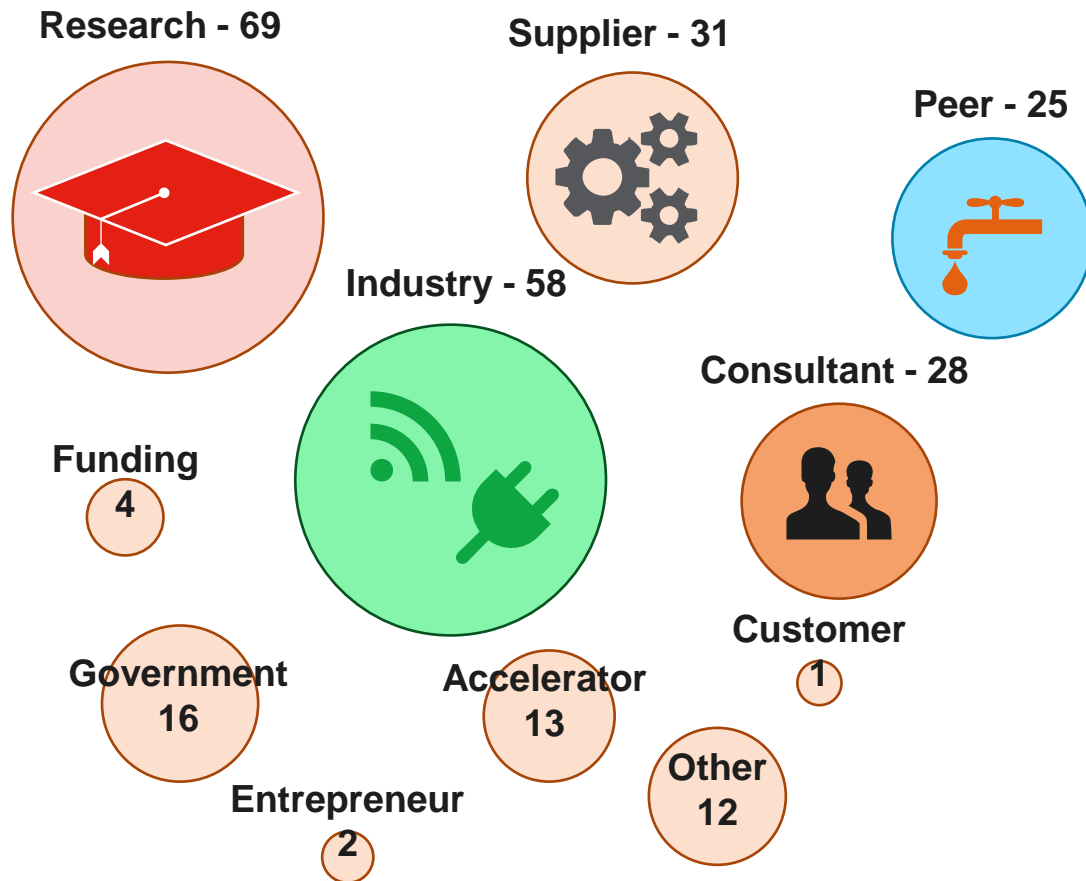
38% of utilities have general reward and recognition programs. **Only 17% specifically recognize innovation.**



Narrow and improve partnerships

WRF 4907 Ecosystem Mapping and Evaluation (N=25)

Number of Partners by Organization



Surveyed utilities maintained an average of **12 partners for innovation** with some over 70 partners.

Only 26% of partnerships were perceived as being effective.

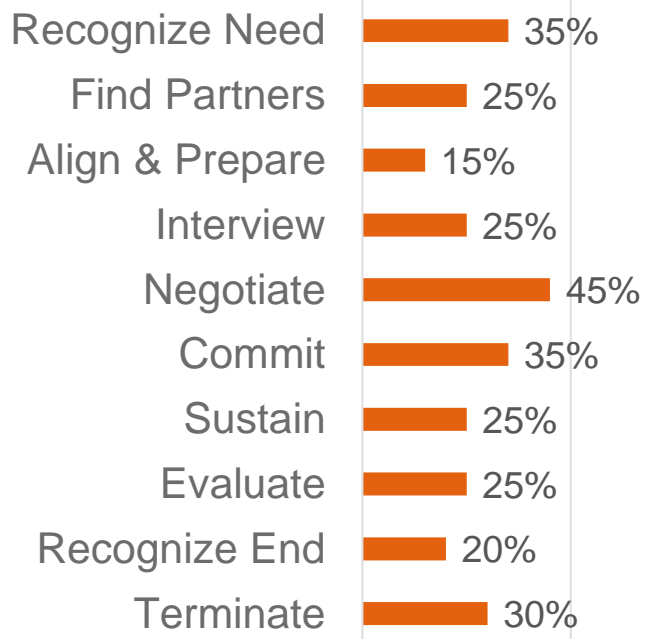


Narrow and improve partnerships

WRF 4907 Ecosystem Mapping and Evaluation (N=20)

Percent of Utilities Self-Scored as Effective in Best Practices

0% 50% 100%



Value Exchange



Complementarity provides a motive for alliance formation as it yields a higher return than the sum of returns if it were used independently

Process



Compatibility in partners' organizational structure and routines reduces uncertainty about intentions, interests and competences

Culture

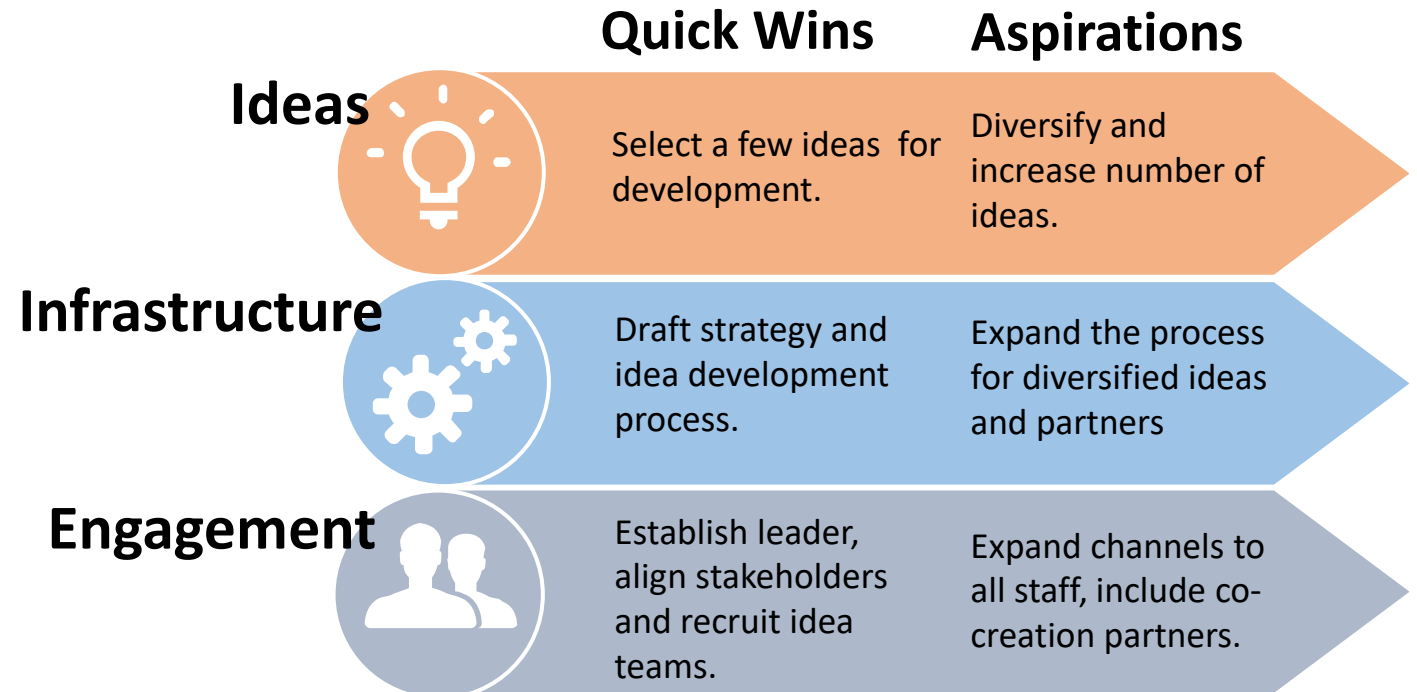


Good fit stimulates joint sense-making, misfit undermines the quality of work relationships

Launch plans – strategic, small then scale...

Finding a Starting Point

- Strategic Planning
- Organizational Assessments
- Digital Initiatives
- Asset Management Planning
- Capital Program Planning



Key Takeaways

- Innovation management provides a pathway to sustainability and organizational agility.
- Innovation management is not one-size-fits all and should be tailored to need.
- Innovation strategies must address core themes of Leadership, Process and Culture (WRF Utility Innovation Framework).
- Workforce engagement through empowerment, roles, training and recognition are foundational for a culture of innovation.
- Beginning with a clear value proposition will lead to better partnerships.
- Think “*strategic, small and then scale*” when launching innovation.





Jason T Carter, PE

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(e) jason.carter@arcadis.com



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