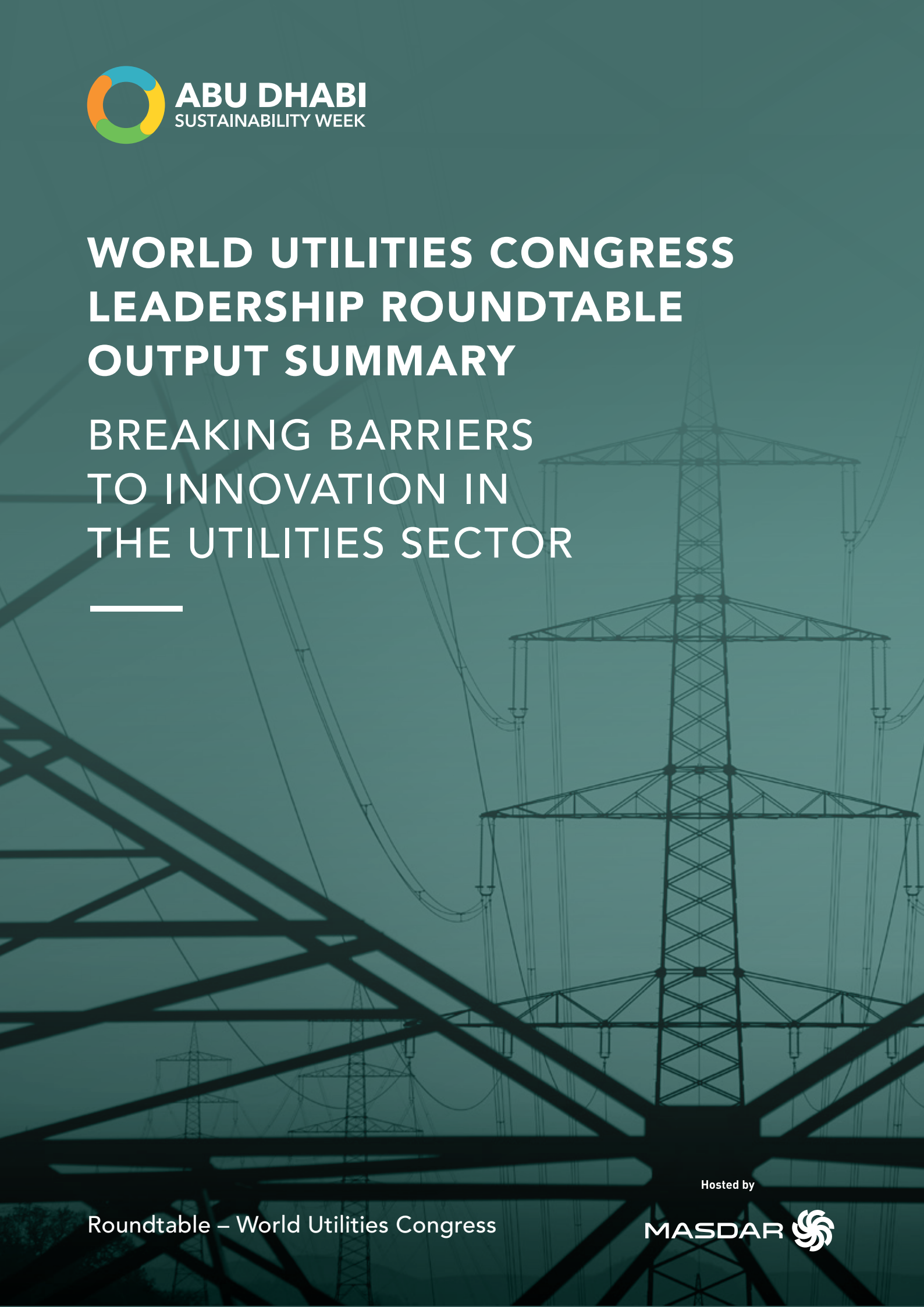
ABU DHABI
SUSTAINABILITY WEEK

WORLD UTILITIES CONGRESS LEADERSHIP ROUNDTABLE OUTPUT SUMMARY

BREAKING BARRIERS TO INNOVATION IN THE UTILITIES SECTOR



Roundtable – World Utilities Congress

Hosted by

MASDAR

Concept

Innovation is the cornerstone of the utilities sector in transition. According to the 'Future of Utilities' study by TAQA and Bloomberg, factors such as integrating renewables into the grid, evolving customer demands, and a lack of cooperation with the innovation community risk holding the sector back as the global energy system pursues 2030 goals.

The 'profound change' predicted in the Future of Utilities study can be positively shaped by innovation. This high-level, invitation-only roundtable, organized by Abu Dhabi Sustainability Week in partnership with the Technology Innovation Institute, will encourage a private discussion on the utility sector's key problems on the road to 2030 and a net zero future, fostering the pursuit of innovative solutions.

Technology can significantly enhance sector performance by improving efficiency, reliability, and sustainability. In energy generation and distribution, digitalization can optimize operations through predictive maintenance, reduce downtime and costs, and ensure a steady supply of power and water. Smart grids can balance supply and demand in real-time, integrating renewable energy sources and ensuring stable electricity delivery.

AI has the potential to enhance customer service through chatbots and virtual assistants handling inquiries, processing payments, and providing usage insights. Predictive analytics can identify non-payment patterns and help design strategies to minimize revenue loss.

A key barrier to utilities embracing innovative technologies stems from the challenges in maintaining awareness and understanding of new potential solutions, as well as a low willingness to take on the technological risks associated with putting unproven technology into their critical infrastructure. Overcoming these hurdles will require increased collaboration with stakeholders across the value chain through knowledge sharing and investment.

Introduction

Decarbonizing the utilities sector is crucial to driving the global energy transition, as it provides essential services – such as electricity and water – that both consumers and industries rely on for their daily operations. Without a clean and sustainable utilities infrastructure, individual sectors will be unable to achieve meaningful decarbonization. To reach this goal, substantial innovation is required, including advancements in renewable energy integration, energy storage solutions, smart grids and water management technologies, ensuring the sector's transformation into a low-carbon, reliable foundation for the future.

According to the Future of Utilities study by TAQA and Bloomberg, the utility sector must prioritize innovation to navigate evolving trends and embrace the transition ahead. At the World Utilities Congress 2024, Abu Dhabi Sustainability Week and the Technology Innovation Institute convened leading international energy experts to discuss innovation. The event brought together C-level industry executives and policymakers for an invite-only conversation focused on the latest trends impacting the utilities market. By fostering open dialogue among influential decision-makers, this roundtable session aimed to collectively address the challenges facing the sector and explore forward-thinking solutions.

This report summarizes the key takeaways and insights from the roundtable. They serve as a roadmap for where the sector should focus its efforts to propel companies and customers through the energy transition to a more sustainable future.

Innovation: Risky and Vital

One roundtable participant stated, "There is a new reality. We all know that innovation was a good-to-have in the past in the sector. Today, it's become a crucial part of the sector."

Utilities companies are often seen as resistant to change. However, participants highlighted that in many ways, this reputation is undeserved. The sector has made major shifts in less than a decade, from gas to electric, from thermal cogeneration to membrane-based desalination.

There was consensus, however, among the gathered experts, that as a whole the sector is risk-averse – by necessity.

One contributor put it simply and clearly: "For anybody who is involved in utilities, the thing you cannot risk is the availability of providing power – that infrastructure always has to work."

With communities and countries depending on utility companies to keep homes warm, lights on and water running, there is no room for error.

This puts utilities between a rock and a hard place: implementing any new technology to progress decarbonization must be balanced with safeguarding customers' immediate and vital needs.

The progress the sector can make through innovation is immense, however. From floating offshore wind projects in Scotland and floating solar in Indonesia, to erecting windfarms in the most remote desert regions, participants provided striking examples from across the globe, showcasing the power of next-generation energy systems – supplying communities with vital power while contributing to global decarbonization goals.

So what can be done to help minimize risk and encourage innovation? While participants had a range of opinions, they all circled back to one key theme: collaboration.

No innovation without collaboration

Collaboration emerged from the high-level discussion as the key challenge and most promising opportunity as the sector transitions to cleaner energy systems.

One contributor illustrated this point, saying "We have conducted a study last year to identify the challenges that we have in the sector, and one of the challenges was on innovation." Another speaker added, "What has been playing against the innovation uptake in the sector has been mainly collaboration ... we don't collaborate with each other within utilities, but also with the technology players."

Experts highlighted the difficulties in coordinating among parties, slow response times and a lack of knowledge sharing. One technology leader highlighted how a lack of partnership with other companies within the technology sector acts as a narrow bottleneck, slowing progress:

"When we work with utilities, the majority of them ask, 'we have to do a pilot with you.' As if they cannot learn from each other, every one of them wanted to have a pilot ... these technologies that we're talking about have been commercially deployed for quite a few years. We can do better collectively as an industry." He concluded with a call to action: "I will put that challenge on the table for everyone who has responsibility for your grid: be bold and reach out to other utilities who have had commercial deployment experience. Encourage your staff to be more progressive in that regard. Encourage sharing the results of pilot scale testing across the utilities sector, so that we can avoid repeated testing programs and speed up new technology adoption across the sector."

Other participants echoed the need for a culture that was more willing to share risk and collaborate on progress. One emphasized the need for multiple partnerships across sectors. He urged the room not to wait for industry giants to make moves to innovation, but consistently be working in conjunction to share knowledge, resources and wins.

Speakers also gave examples of what can be achieved through effective partnerships across the board: investing in state-of-the-art infrastructure, enabling innovation through research and development, establishing neutral and/or shared pilot scale testing facilities, working with government to craft policy and regulation, and securing new forms of energy. One participant highlighted how initially, government policy only permitted 5% use of an area for renewable energy projects, but through education and partnership on the potential, this was expanded to 20%.

Finally, when considering collaboration, energy companies should remember the importance of customers. Respondents to TAQA and Bloomberg's Future of Utilities study reported customer relationships as one of the top net-zero enablers. Though customers are often considered end-users, separate from the sector, participants noted the successes to be found in collaborating with clients to maximize impact. Energy providers can be at the forefront of greater change by empowering, encouraging and supporting customers to shift to more sustainable behavior. Partnering with them can be mutually beneficial – helping test new technologies, reduce emissions and de-risk changing systems.

The Need for Speed

Leaders attending the roundtable discussion also aligned on the need for the utilities sector to move at a faster pace, accelerating the adoption of innovation and driving the energy transition.

Participants agreed that technology development and innovation offer great opportunities, if the utilities sector can position themselves to adopt and integrate new solutions. As one speaker observed, "The great news is that developing the solutions is generally much faster than utilities' time to adopt them."

Contributors pointed out that this isn't a problem unique to utilities: key partners face a similar challenge. One speaker summed it up: "We are slow. Regulators are slow. Finance is slow." This was seen as a key barrier to innovation, with participants urging, "We need to move faster and manage the risks more effectively and appropriately."

Discussing strategies for quickening the pace, participants emphasized the importance of expedient decision making, with one speaker explaining, "A quick 'no' is far better than three months of 'maybe." This speed was seen as especially critical for early-stage technology companies working with utilities.

The Path Forward

To accelerate the transition to a sustainable future, the utilities sector must secure investment and nurture talent. Most important of all, leaders must prioritize collaboration to capitalize on innovative solutions and technologies.

Utilities, technology companies, researchers and policymakers should work together to identify challenges, develop solutions and navigate regulatory frameworks. Cross-sectoral partnerships are not optional; they will be vital to secure long-term investments in research and development, test pilot projects, implement infrastructure upgrades and find ways to de-risk the adoption of new technologies.

The roundtable ended with a formidable to-do list – but not an impossible one. Like all of us, the utilities sector stands at a crossroads: we either collaborate meaningfully today, throwing the weight of our shared knowledge, expertise and resources behind solving a deepening climate crisis, or have our future decided for us by a warming world.

Case Study:
UAE Wind Program

The UAE Wind Program is a pioneering initiative to diversify the United Arab Emirates, energy mix and achieve its 2050 net-zero emission goals.

Funded by the Abu Dhabi government and developed by Masdar, the project spans Sir Bani Yas Island, Delma Island, Al Sila, and Al Halah, with a total wind energy capacity of 103.5 MW and 14 MWp of solar power.

The project marks the introduction of large-scale wind power in a region traditionally dependent on solar energy, enhancing energy security and sustainability.

The UAE's energy sector has recently seen significant investments in solar power but the need for a diversified energy portfolio has become clear, especially with the global shift toward renewables. Wind power, once considered unfeasible due to low wind speeds in the UAE, is now becoming a viable option.

The UAE Wind Project reduces CO2 emissions by 120,000 tons annually, equivalent to removing over 26,000 gasoline cars. It also decreases SO2 emissions by 525 tons and NOx by 450 tons per year, improving air quality and public health.

The project created over 1,000 jobs and continues to provide employment for local engineers and technicians. It also offered substantial training, enhancing the region's technical expertise in renewable energy, which benefits the local workforce.

Case Study:
Taweelah Reverse Osmosis (RO) Independent Water Plant

Taweelah RO is the world's largest reverse osmosis desalination project with on-site solar generation. Thermal desalination techniques have been the primary method for water production in the Middle East since the 1960s, however this is energy intensive.

Reverse osmosis – a process that forces seawater through semi-permeable membranes to remove salt – has emerged as the most cost effective and energy-efficient solution for water production in the Gulf.

Taweelah RO combines the energy-efficiency of reverse osmosis with renewable energy to meet the water requirements of Abu Dhabi and support the decarbonization of the energy sector in line with the UAE Net Zero by 2050 strategic initiative.

Partners

ABU DHABI SUSTAINABILITY WEEK

Abu Dhabi Sustainability Week (ADSW) is a global initiative championed by the UAE and its clean energy powerhouse, Masdar, to accelerate sustainable development and advance economic, social, and environmental progress. Established in 2008, ADSW provides a global platform for all who have a stake in the future of our planet.

ADSW brings together leaders from across governments, the private sector, and civil society to discuss and engage in bold climate action and innovations that will ensure a sustainable world for future generations.

MASDAR

Masdar (Abu Dhabi Future Energy Company) is one of the world's fastest-growing renewable energy companies. As a global clean energy pioneer, Masdar is advancing the development and deployment of solar, wind, geothermal, battery storage and green hydrogen technologies to accelerate the energy transition and help the world meet its net-zero ambitions. Established in 2006, Masdar has developed and invested in projects in over 40 countries with a combined capacity of over 20 gigawatts (GW), providing affordable clean energy access to those who need it most and helping to power a more sustainable future.

Masdar is jointly owned by TAQA, ADNOC, and Mubadala, and is targeting a renewable energy portfolio capacity of 100GW by 2030 while aiming to be a leading producer of green hydrogen by the same year.

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