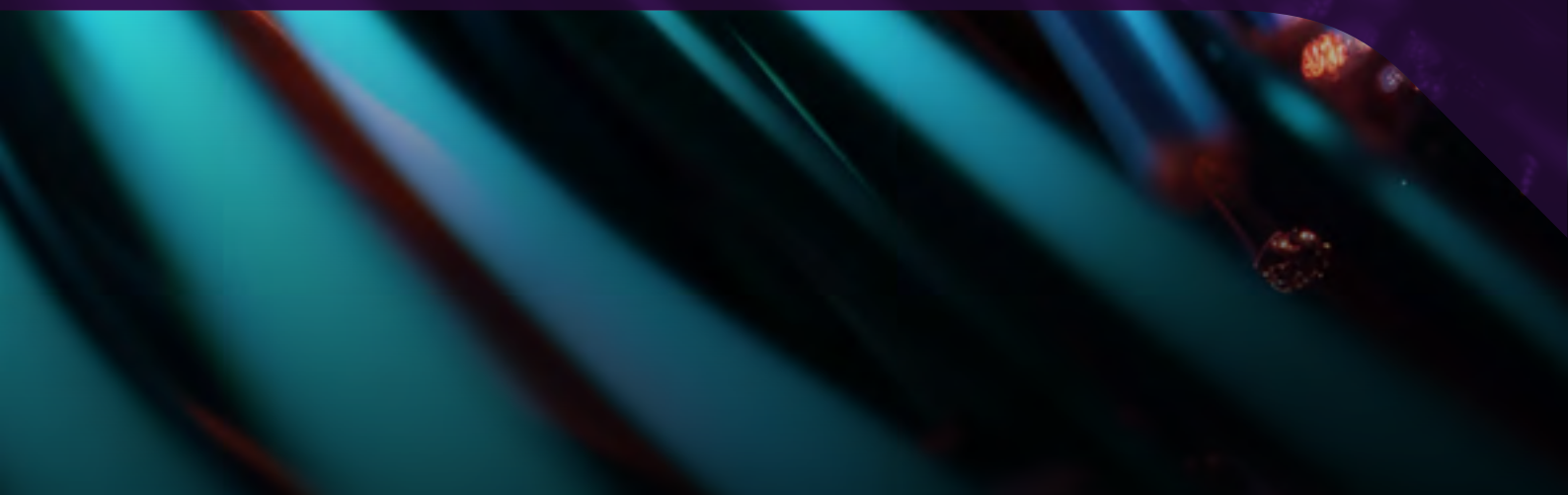
DENTONS

Dentons Global Smart Cities & Connected Communities Think Tank

Annual Report 2024

March 2025

Dentons' Global Smart Cities & Connected Communities Think Tank brings together the resources of the world's largest law firm with leaders of government, businesses, academia, innovators and stakeholders to craft cutting edge legal, economic and policy solutions to societal challenges in an era of accelerating technological change. Think Tank members work with city and community leaders to take advantage of technological developments to enable modernization and coordination of digital, physical and social infrastructure to make delivery of public, private and hybrid services more efficient, cost effective, secure, equitable and socially beneficial.



Note to our readers

Nearly seven years ago, a small group of colleagues sought to align their efforts to harness technological advancements to modernize critical community infrastructure in a cost-effective and efficient manner in order to address a host of growing and overlapping societal problems. This collaborative conversation grew into our Global Smart Cities & Connected Communities Think Tank Initiative. Now more than 750 members strong, the Think Tank has convened in person and virtually more than 50 times to take on some of the most vexing, urgent and exciting challenges associated with modernized urban living.

The starting point of our work came from alarming statistics about the coming massive surge in urban migration against a backdrop of insufficient and antiquated infrastructure, the global climate crisis, and increasing social unrest, on the one hand, and the rapidly increasing pace of technological advancements with applications that promise a more livable, sustainable, and connected future.

For most of human history, and as recently as the turn of the current century, the vast majority of people on this planet lived in small communities. 2007 marked the first time that urban populations exceeded their small, rural counterparts. Today, that number is approaching 60 percent and continues to increase,[1] and in Europe, Australia, Russia and most of the western hemisphere, this figure already surpasses 70 percent. Predictions are that by 2050, just one generation into the future, the entire planet, save the population of just a small handful of countries, will reside in urban areas.[2] We are unprepared for this shift.

In the few years that this Think Tank has been in existence, there have been dramatic changes that have impacted our cities and communities in ways we could hardly have imagined. In our early years, we talked about the impact that data centers would have on our energy infrastructure as systems became more interconnected and our daily activities become more electrified. Now that artificial intelligence (AI) has taken center stage, we are no longer just discussing the need to modernize our grid, but instead considering the hard choices that may have to be made between powering our homes and businesses and powering the massive data centers that are needed to process the information on which AI relies. AI has also changed the content and urgency in our discussions about cybersecurity privacy. But AI also has tremendous potential for improved operations and incorporation of life-enhancing technologies in cities and communities. In our first year, we discussed the essential need for community buy-in, especially where people are going to be asked to pay for infrastructure modernization initiatives. We also discussed the challenges of coming to a coherent consensus in a world where people tend to remain in their own preferred echo chambers. In the post-pandemic world where social inequities have been both exposed and magnified, where facts are viewed with skepticism, and where issues that intuitively should be nonpartisan are instead politically fraught, this phenomenon is even more acute. In the early years, we talked about mitigation measures to keep the planet within the 2°C threshold that was thought to be critical to our survival. Today, now that we have crossed that point of no return, the discussion has shifted to adaptation strategies that address health, food supplies, and the effects of extreme weather. In sum, in less than a decade, it is already a vastly different world.

1. *See* https://ourworldindata.org/urbanization based on World Bank data from the UN Population Division.
2. Id.

This year, the Think Tank continued to tackle issues of social justice and equity, as well as security, digital connectivity, energy resource and grid-related issues, but also took a deep dive into new topics, such as AI, decarbonization, hydrogen, and smart agriculture. We also took a close look at the relationship between the US federal government and state authorities on infrastructure-related matters in the wake of recent Supreme Court decisions and corporate governance trends.

Finally, we reorganized our panel structure, including the addition of new Pillars of thought leadership, to keep pace with the evolution of priorities by cities and communities. We added an infrastructure panel that looks at developments and trends in infrastructure and global best practices at a macroeconomic level. We also added a Pillar to explore the development and impact of large data centers, and one dedicated to the potential represented by AI in smart and connected cities and communities.

Our hope is that as you browse this report, you will be as inspired as we are by the challenges ahead and will continue to engage with all of us as we work through them together with an eye towards a more connected, collaborative, and sustainable future for our cities and communities.

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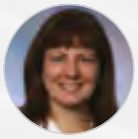

Jennifer Morrissey
Smart Cities & Connected Communities Think Tank Editorial Board
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Special thanks for their tremendous support of think tank activities over the past year to Think Tank Administrator Dorinda Graves; Contributing Editorial Advisors Barbara Tyran, Director of the Macro Grid Initiative at American Council on Renewable Energy (ACORE); Walt Duflock, Vice President of Innovation at Western Growers; Andrew Snowhite, Chief Strategy & Sustainability Officer of Snowhite Strategies; Rebecca Kennedy, Principal Corporate Counsel, Microsoft; Edward Lindsay, Partner, Dentons; Dentons law clerks Grace Charles and Matthew McDonnell; Editorial Assistant Dena Sholk; Think Tank Administrative & Logistics Support Dee McGill, Gay MacLean, Bryan Cooper and Asta Glatz.

In this volume

Pillars of Thought Leadership for a Successful Smart Cities & Connected Communities Strategy

A successful smart cities and connected communities strategy will focus simultaneously and in an integrated manner on a number of key Pillars addressing the challenges and implications of infrastructure modernization faced by city and community leaders and the people and organizations who inhabit them. Recognizing the era of accelerating change, we strive to structure our Pillars to be nimble to accommodate shifts in priorities, technologies and approaches. Pillars are re-organized or added each year to accommodate these changes and to ensure that the Think Tank remains on the cutting edge of key issues.

Infrastructure Modernization

Infrastructure modernization is the cornerstone of any smart cities initiative. This Pillar looks at key issues and challenges related to developing and maintaining critical infrastructure from a holistic and integrated perspective. This Pillar also examines best practices related to modernization, deployment and implementation of digital, physical and social infrastructure.

Government Leadership & Public Policy

Developing engagement strategies at every level of government, including identifying and building relationships with decision-makers and people empowered to implement the necessary components of a smart city, is essential to the success of a smart and connected community. This Pillar focuses on identifying and tailoring best practices for policy-makers grappling with modernizing regulations and processes to promote smart, sustainable, secure and equitable growth. Regulations need to be designed effectively so as to minimize development costs, expedite technology deployment, and achieve efficient and equitable outcomes for communities. This design can be done both proactively, in the early stages of smart city implementation, and reactively, if legal or administrative structures emerge that may present challenges at a later phase.

Energy, Electrification & Resilience

Electric grid modernization is the touchstone of an effective and comprehensive smart city strategy. Without a modern, safe, reliable and resilient grid, implementation of smart technologies is limited. The Think Tank addresses the modernization of electric infrastructure and transitioning to a multi-directional grid with advanced clean technology solutions, including a broad array of distributed energy resources, integrated demand response and efficiency measures. The Energy, Electrification & Resilience Pillar is dedicated to supporting cities and communities in collaboration with energy companies, customers, regulators and stakeholders to ensure that affordable, reliable, and sustainable power and fuel resources are provided on an equitable basis as the energy economy is reimagined.

Transportation & Mobility

When transportation and mobility infrastructure is powered by advanced technologies, cities will realize countless benefits, from reduced emissions and congestion as clean vehicle and public transport or other ride share use increases, to enhanced public safety and economic development opportunities as underserved communities are connected with employers through efficient, data-driven mass transit. Because mobility, both physical and virtual, is key to quality of life in cities and communities, this Pillar keeps abreast of the latest physical infrastructure and policy options to support technological advancements in transportation and mobility for the modern economy, including deployment of electric and autonomous vehicles, updated traffic and transit systems, and digital and virtual mobility options.

Telecommunications

Advanced telecommunications systems are layered into all physical infrastructure to support smart technologies. The Think Tank works with stakeholders to evaluate and advocate policies that promote the deployment of advanced technologies and the development of compatible firmware and hardware. A focus on facilitating multiple uses for smart infrastructure upgrades is essential to minimizing costs and ensuring that costs are appropriately shared among a broad array of beneficiaries. Equitable access to telecommunications infrastructure also has tremendous benefits in terms of mobility of communities, as daily activities and essential services increasingly take place in a virtual environment. The mission of the Telecommunications Pillar is to promote the layering of advanced telecommunications onto the modernized grid as the backbone infrastructure for a smart and connected community to ensure cost-effective, equitable and secure access to essential services.

Technology & Innovation

The Technology and Innovation Pillar aims to build bridges to connect advances coming from centers of innovation, such as national laboratories, universities and private enterprises, with cities and communities seeking feasible strategies to design and install systems to support their infrastructure needs and to explore new approaches to both recent and long-standing challenges. At times, the Think Tank will pull out specific developments or trends in technology and innovation into a separate Pillar for individual discussion and collaboration.

Security & Privacy

This Pillar aims to understand and advance the creation of systems to secure critical infrastructure in a world of ever-changing risk, and to protect privacy while allowing for deployment of advanced digital technologies, including frameworks and protocols for data gathering and use. Among other activities, the Pillar will connect thought leaders in these areas and promote educational resources and lessons learned to help cities and communities prepare for, protect against and mitigate cyber and physical disruptions to critical infrastructure systems.

Artificial Intelligence

Where the electrical grid and advanced telecom function as the backbone of a smart city, AI is rapidly becoming the brain and nerve center. AI is enabling advancements and efficiencies, as well as rapid adaptation to changing circumstances. AI has the potential to significantly improve public services, planning, mobility and emergency response, among many other things that will improve sustainability and livability in our cities and communities. At the same time, there is a lot of work to be done to build trust in the technologies and build in safeguards against abuses or unintended impacts as advancements are outpacing our ability to harness and control it.

Data Centers

Because of the need for powerful, large scale data centers to process the digital information required to operate and protect smart infrastructure, data centers have become a central component of a smart and integrated future. From AI-powered technologies employed in everything from multi-directional, self-healing power grids to sensors to transportation to algorithms to improve efficiency and manage transactions to health care and food production and beyond, data centers are the essential facilities that enable the activities that make up our daily lives. However, at present, the need for data centers exceeds current availability and lags behind development of the technologies that depend on them. This Pillar explores this challenge and also looks at the intersection of data centers, technology, power and sustainability.

Hydrogen

This Pillar focuses on the potential of hydrogen as the fuel of a smart and connected future. Hydrogen can take energy markets to the next level by coupling gas and electricity, facilitating the integration of renewable energies and efficiently driving forward the decarbonization of CO_2-intensive industries such as chemicals, petrochemicals and steel, as well as the mobility and power sectors. The mission of the Hydrogen Pillar is to learn about and track the development of hydrogen as a clean, reliable, secure and potentially affordable energy source. This Pillar also examines how the creation of clean hydrogen hubs in smart cities and communities can advance decarbonization, create jobs and utilize economies of scale to meet the growing demands of electrification.

Community Engagement & Education

Community social infrastructure is as critical as physical and digital infrastructure in any modernization initiative, but it is often given far less attention. This Pillar brings together community leaders, interest groups, businesses and residents to conduct education and outreach to ensure broad, informed public participation, understanding and buy-in to the benefits that a smart and connected community can offer, and to adapt initiatives to the diverse needs and desires of the community. This Pillar also examines educational opportunities and structures, including K-12 education programs and workforce development, which are essential for communities to benefit from massive economic transformation.

Water, Wastewater & Waste

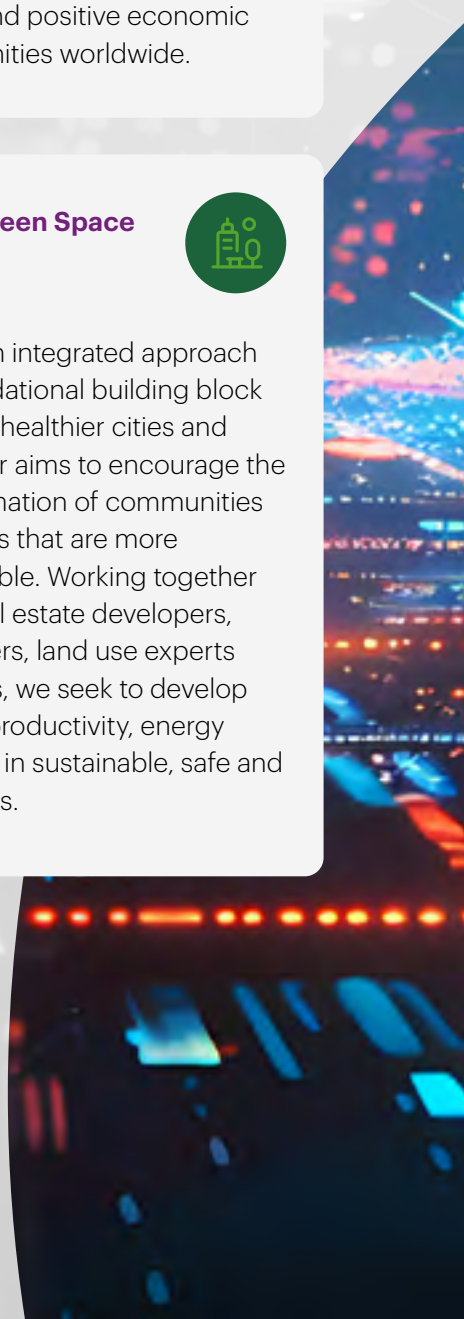
Water is essential to the well-being and functioning of any city or community. Water availability and quality are two of the greatest challenges that cities and communities will face moving into the future. Similarly, wastewater and waste are issues faced by every city and community worldwide. The Think Tank brings together technical, legal, and policy experts from government, industry, academia and NGOs who are at the forefront of water resources planning to develop new approaches to address water, wastewater, and waste issues, including exploring solutions for cities and communities to enhance the abundance and quality of water, to support education and deployment of advanced water technologies, and to mitigate the negative impacts of waste and wastewater.

Investment, Finance & Economic Development

Because of the varied benefits that will flow from smart infrastructure, modernization initiatives may exceed the scope of traditional municipal infrastructure projects, creating challenges in financing, city budgeting and planning, capacity and jurisdiction. The Think Tank explores how these challenges are being addressed in communities around the globe. This Pillar is dedicated to identifying optimum funding strategies and solutions from both existing and untapped sources of capital to accelerate the development of smart cities, and to facilitating conversations among industry thought leaders, policy makers and finance professionals on how best to achieve the expected benefits that will flow from smart cities, including improved environmental health, social justice and positive economic outcomes for communities worldwide.

Buildings, Cities & Green Space Planning

Smart buildings and an integrated approach to planning are a foundational building block of tomorrow's cleaner, healthier cities and communities. This Pillar aims to encourage the planning and transformation of communities and community spaces that are more sustainable and equitable. Working together with municipalities, real estate developers, architects and engineers, land use experts and other stakeholders, we seek to develop strategies to improve productivity, energy efficiency and livability in sustainable, safe and affordable communities.



Environment & Sustainability

This Pillar brings together leaders from cities and communities, as well as state and federal government agencies, companies, and a variety of organizations, to ensure that environmental strategies support economic opportunity while sustaining natural resources and improving quality of life. Among the many topics addressed by this Pillar are strategies to address a changing climate, including mitigation and adaptation; structural changes that may improve infrastructure while enhancing the environmental quality of cities and communities; and responses to ever-fluctuating societal priorities and demands, including how companies called on by their customers, investors and employees can lead by example in areas where governments have been slower to take action.

NGOs & Universities

Universities, non-governmental organizations, and think tanks often serve as incubators and testing grounds for early adoption of smart technologies. Universities, in particular, are often akin to micro-cities with populations eager to embrace new technologies and with financial and physical structures that enable faster implementation of innovations. Once tested and revised, these innovations may later be deployed on a wider basis in cities and communities. The NGOs & Universities Pillar taps into these organizations to provide intellectual firepower, to nurture public trust in the development of smarter and more connected communities, and to collaborate and learn from the scale models for utilization of smart infrastructure that they are uniquely positioned to provide.

Health & Safety

This Pillar examines smart delivery of health and safety services, including by maximizing the opportunities offered by the "Internet of Things" to enhance security, safety and operational efficiencies related to healthcare and public safety. In times of disruption or crisis, a smart and connected approach allows interdependent sector and stakeholder engagement to serve the citizens and economy, both holistically and optimally, in times of crisis or uncertainty, by bringing together critical infrastructure cross-sector partners such as utilities, telecommunications, first responders and health care workers, media and government agencies, educators and social workers, and many others to devise collective responses based on lessons learned and best practices.

Culture and Engagement

This Pillar examines physical and social structures, both explicit and implicit, that impact the ability of communities to take advantage of economic and technological improvements in city and community infrastructure. The goal of leveraging technological developments to enhance physical infrastructure and improve delivery of services is to better the lives of all of the community's inhabitants. Social infrastructure is inextricably intertwined with digital and physical infrastructure. The mission of the Culture and Engagement Pillar is to explore how cities and communities are addressing systemic inequities in order to earn the confidence and social license necessary to implement an inclusive approach to infrastructure modernization projects and policies that will benefit the whole community so that equity, social justice and human rights are protected and advance in step with sweeping technological changes.

Connections & Insights

In each volume of our Annual Report, we invite Think Tank members to respond to questions about current trends related to smart cities and connected communities and to share their insights on what they think the future holds. With so much focus in the media this year on global crises and risks threatening so many aspects of our daily lives, we asked our Thought Leaders to reflect on the most promising and positive developments that have occurred or are imminently on the horizon. Here is what a few Think Tank members had to say:

Major cities across the US and around the world are working to build climate resilience into city structures. For example, the Smart Surfaces Coalition is working with 10 major US cities and several cities in India, along with local community organizations, on the targeted deployment of smart surfaces (reflective and green surfaces, rooftop solar and permeable surfaces) to combat urban heat effects and stormwater flooding, while reducing greenhouse gas emissions, in a scientifically rigorous, cost-effective and equitable manner. That effort has attracted strong support from major national and international urban planning and public health organizations and substantial federal and charitable foundation grants.

— **Simon Steel**
Partner, Dentons
General Counsel, Smart Surface Coalition
Member of the Buildings, Cities & Green Space Planning Pillar

The US has moved from an era of flat electricity demand to one of significant growth, accelerated by AI's thirst for computing power. Thankfully, we've seen a tremendous response from entrepreneurs, investors and policymakers. Scalable, data-driven solutions, from virtual power plants to energy-aware data centers, are leading the way toward more resilient and sustainable infrastructure.

— **David Gilford**
Head of Policy and Strategic Partnerships SIP
Advisor to the Urban Future Lab
Member of the Investment, Finance & Economic Development Pillar

The integration of artificial intelligence and "Internet of Things" technologies in many aspects of city infrastructure marks an important step toward urban sustainability and resilience. By harnessing real-time data, cities are optimizing public services, leading to more efficient resource use and, importantly, better management of rapidly growing populations. Some of these innovations present risks, but properly managed, they also hold the promise of a more livable urban future.

— **Dr. Fenner Steward**
Co-Chair of the NGOs & Universities Pillar
Associate Professor of Law, University of Calgary
Fellow at US School of Public Policy
Fellow at Desautels Centre for Private Enterprise and the Law

Cities are increasingly adopting smart transportation systems (e.g., Google's Green Light), which utilize technologies such as intelligent traffic signals and real-time public transit tracking to reduce congestion and improve efficiency. Complemented by air quality sensors and renewable energy sources, cities are not only modernizing but reducing their environmental footprint and improving public health along the way. These new smart city capabilities offer significant benefits, and if implemented with modernized digital policies addressing data privacy, security and equitable access, they can support a more livable and sustainable future.

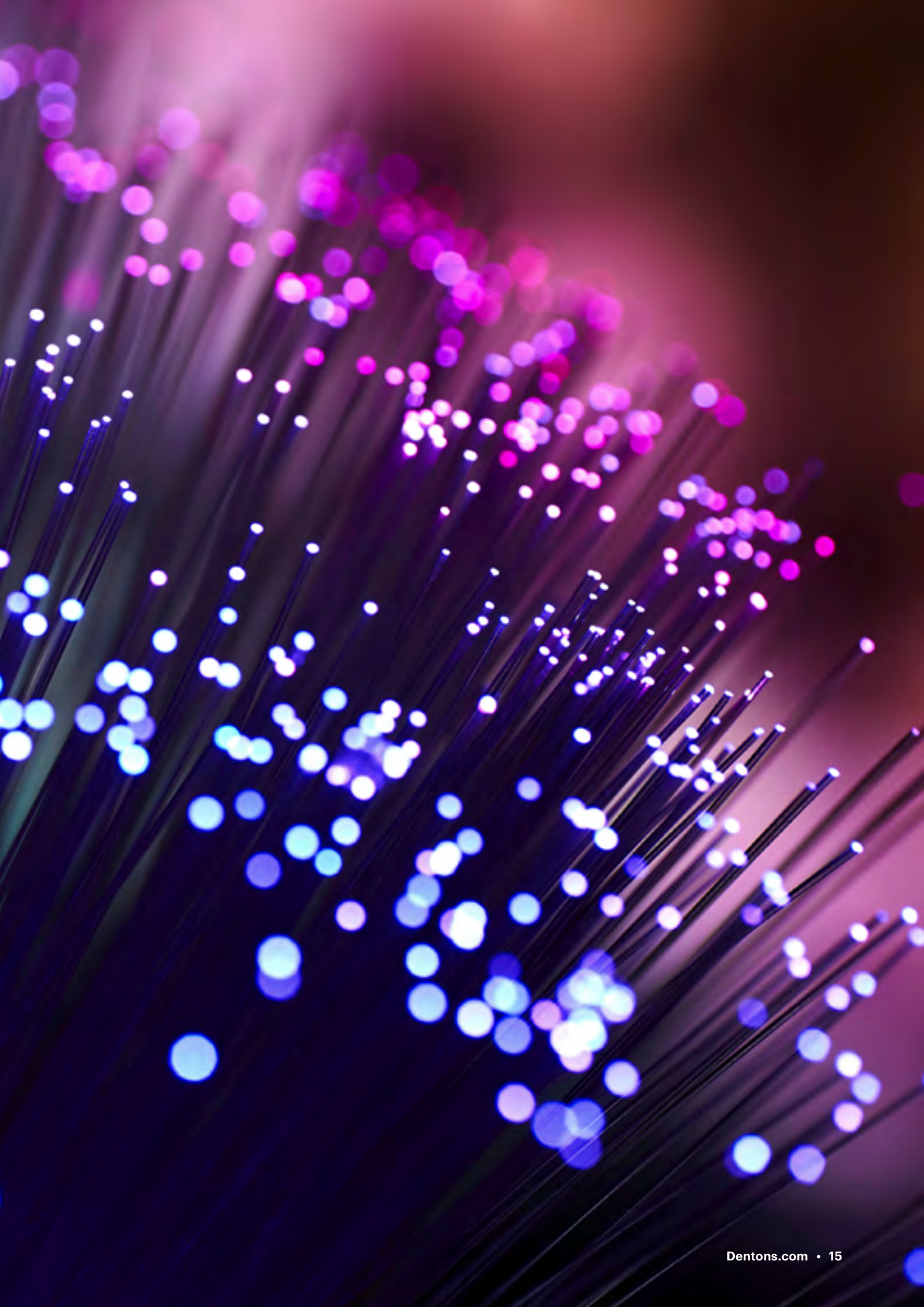
— **Kristina Podnar**
Global Digital Policy and Governance Expert
Senior Policy Director, Data & Trust Alliance
Member of the Security & Privacy Pillar
Author, *The Power of Digital Policy*

In my view, the only way smart cities can work is if there is efficient and sustainable transportation infrastructure available to people. In the last two years, we have seen significant commitment to providing that infrastructure as a fundamental component to plans for new models for living. For example, in southern Ontario, the province is now electrifying the entire rail service network and increasing significantly its service levels.

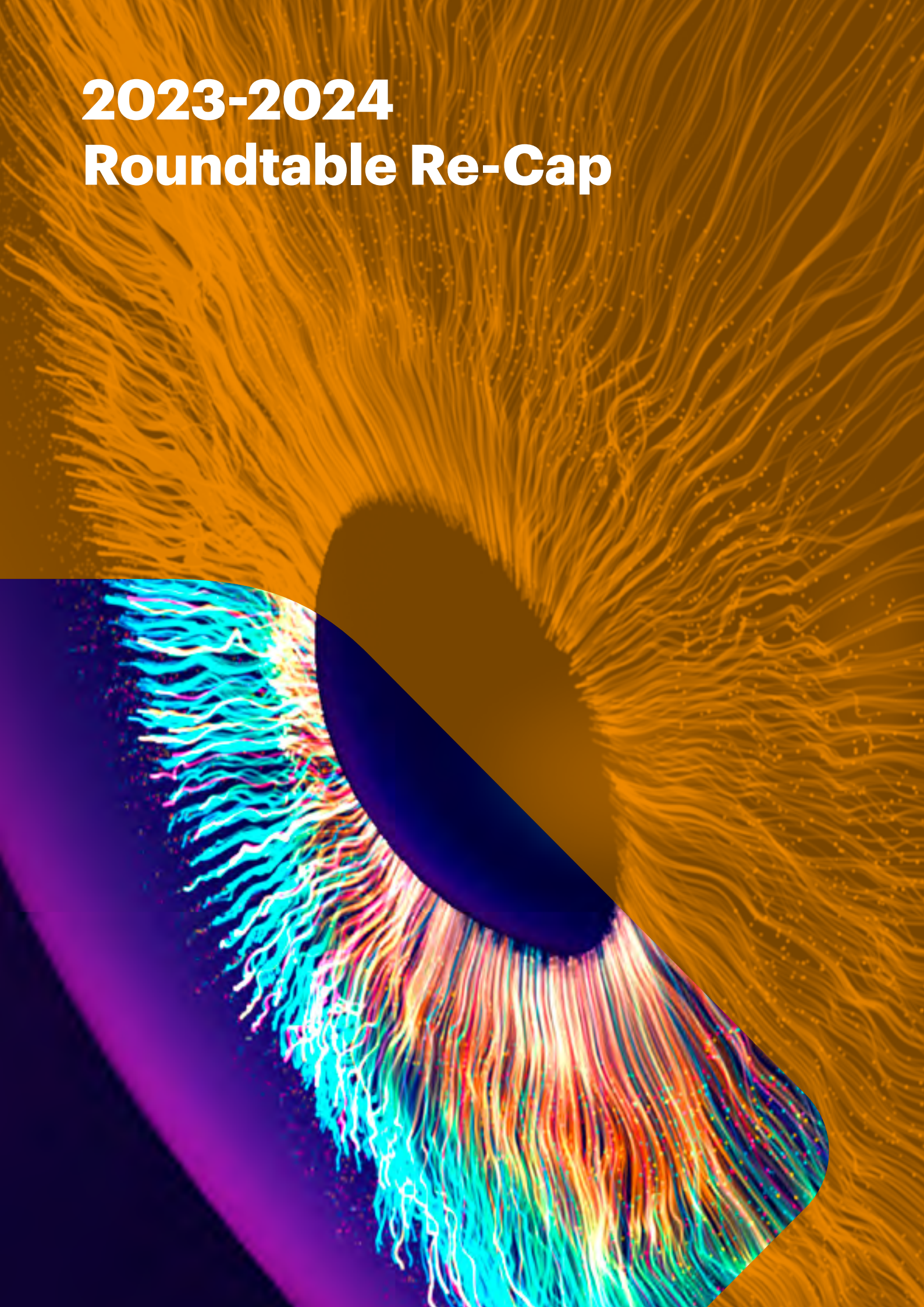
— Greg McNab
Partner, Dentons Corporate Practice
Canada Co-Chair of Dentons Mining Group

Networked energy provision in the UK has long been almost entirely organized at the national level, but there are indications that more local and municipal energy activity may now be in the cards. The Energy Act 2023 sets out a blueprint for a UK regulatory framework for heat networks (closely modelled on existing electricity and downstream gas legislation), on the assumption that economic regulation will increase confidence in and uptake of a technology / business model that remains significantly under-exploited in the UK, where individual gas boilers dominate space heating in all buildings. There is also provision for mechanisms to enable the areas that are most likely to benefit from the rollout of district heating, both locally and nationally. The Act also sets the stage for regulation of "energy smart appliances" and the "load control" signals to which they are designed to respond, with the apparent aim of using product-specific regulations and a range of technical standards to build confidence in these new technologies and so enable them to contribute to outcomes that are positive from decarbonization, security of supply and affordability points of view. Further impetus towards the increased adoption of local energy solutions may come from the new UK government's proposals for legislation to devolve more power to municipal authorities and remove obstacles to development generally, and its moves to encourage more local power generation, as well as a possible move towards zonal power pricing as part of a wider reform of electricity wholesale market arrangements in the coming years.

— Adam Brown
Counsel in the Energy Practice of Dentons' London office
Member of the Energy and Government Leadership & Public Policy Pillars



2023-2024 Roundtable Re-Cap



Our Roundtable Series over the past 12 months has included in depth discussions of trends, technologies, disruptions, and opportunities impacting infrastructure modernization initiatives in cities and communities around the country and the world. AI, cybersecurity and social justice issues all figured prominently in this year's series. The Think Tank also highlighted challenges and opportunities related to sustainability with conversations about climate, water and new topics such as smart agriculture.

Following are summaries of the discussions, along with links to the recordings and certain related materials.

September 2023

Getting To Know AI's Revolutionary Potential and Vulnerabilities

Co-hosted with the Keystone Policy Center

This discussion focused on existing and forthcoming risks, challenges, and opportunities associated with leveraging Artificial Intelligence (AI) tools in the energy sector.

Panelists included:

- Siva Sankarnarayanan, Principal Technical Leader for the Advanced Buildings and Communities Research Program at the Electric Power Research Institute (EPRI)
- Dr. Kelly Rose, Technical Director for the National Energy Technology Laboratory (NETL) Science-based Artificial Intelligence/Machine Learning Institute (SAMI)
- Todd Daubert, Partner, Federal Regulatory and Compliance practice, Dentons
- Llewellyn King, Executive Producer and Host "White House Chronicle"
- Christian Derosiers, Founder of Visceral

AI is not a single, homogenous product. It is an entire discipline of diverse machine learning (ML) tools, or Artificial Intelligence/Machine Learning (AI/ML). Supervised and unsupervised machine learning involve data aggregation techniques that reduce dimensions and clusters and allow for the rapid identification of patterns within a data set. Generative AI is part of a broader category of "deep learning," which involves the creation of text, images, or other content through generative models. Predictive AI generally encompasses a set of tools that leverage natural language processing and neural networks to identify historical patterns and generate forward-looking predictions. AI/ML tools have existed for decades and are already widely used across industries. Today, the extraordinary feature of AI/ML tools is that they are available at an enormous scale.

AI/ML applications in Smart Cities

AI/ML tools are deployed across the energy value chain, although they take on a particular definition in a Smart Cities context. Siva Sankarnarayanan, Principal Technical Leader for the Advanced Buildings and Communities Research Program at the Electric Power Research Institute (EPRI) defined AI/ML as a set of tools that have (1) an abundance of heterogenous data, (2) with a learning objective, and (3) an optimization goal. In other words, smart cities contemplating an AI/ML tool must first identify the question they want answered, the factors (and associated data) that need to be considered when solving the question, and a strategic target.

AI/ML tools are already deployed to improve numerous existing processes. At the household level, AI/ML models leverage operational data to predict proactive maintenance timetables for home HVAC systems. Utilities and governments also use AI/ML tools to predict and measure grid resilience, adaptation, and preparedness ahead of extreme weather events. In California, a large-scale IoT network of sensors—a so-called "mesh network"— is leveraged to detect smoke and wildfires to provide an early warning to utilities and aid in the strategic management of lines in areas with relatively dense vegetation.

Dr. Kelly Rose, Technical Director for the National Energy Technology Laboratory (NETL) Science-based Artificial Intelligence/Machine Learning Institute (SAMI) focused on AI-driven solutions for applied energy science, environmental and social justice, highlighted how predictive AI tools can collect data from existing sensors to predict hurricane strength, weather events, wildfires, and flooding. When deployed at scale, these AI/ML tools could potentially enable communities to appropriately prepare for extreme weather events.

AI/ML applications can also assist local governments when assessing technical challenges and planning the energy transition. To illustrate, EPRI, in partnership with the Tennessee Valley Authority (TVA) has leveraged AI tools to realize a 70 percent improvement in community-wide broadband access. AI/ML models are also being used to aggregate data on household electricity consumption, utility sales, census data, weather trends, along with cost and rate estimates to assess potential savings and demand reductions.

AI/ML tools were also used by NETL in the decade following the 2010 Deepwater Horizon oil spill to develop a suite of advanced computational tools to monitor environmental impacts in the Gulf of Mexico, and to predict and prevent future offshore oil and gas spills. The data and research insights have aided in pioneering new methods to understand subsurface dynamics, engineered components, and oceanographic and climatological systems to improve modeling and forecasting. Longer term, these AI/ML tools could be deployed to identify at-risk ecosystems, thereby informing regulators engaged in environmental maintenance and monitoring. NETL is also testing these and other AI/ML tools so they will eventually be ready for widespread commercial use. Dr. Rose notes that NETL AI/ML tools that predict oceanographic currents could be applied in the commercial shipping and transportation segment, allowing vessels to more strategically plan their routes. These same tools could be leveraged to predict, and therefore manage, migrant follows, plastic pollution movements, and other policy considerations.

AI/ML adoption requires due diligence, experimentation, and security measures

A key challenge for AI/ML use centers on data security, particularly in customer-facing applications that lack security protocols. Biometric authentication methods, such as iris-scanning, or zero knowledge proof technology, which authenticates an individual's identity based on a certain credential, are likely to become more pervasive as the use-cases for AI/ML tools expand.

Todd Daubert, Partner, Federal Regulatory and Compliance practice, Dentons, recommends organizations that are considering a new AI/ML tool vet the vendor's data-protection systems, policies, protocols and infrastructure to ensure the vendor is capable of safeguarding sensitive data and does not intentionally or unintentionally use collected data in an unexpected way. The key to risk mitigation is understanding the proposed AI tool and assessing whether it is an appropriate tool for the desired goal.

Another challenge associated with AI/ML involves the rise of "deepfakes" as emphasized by Llewellyn King, Executive Producer and Host "White House Chronicle." AI/ML tools are being used to generate images and content that is extraordinarily difficult to verify as authentic. For businesses, governments, and society as a whole, the unfettered use of AI/ML tools to generate news presents various ethical challenges, and efforts should be made to develop tools that allow verification of information.

A recording of the full discussion is found here: https://www.youtube.com/watch?v=yqqPKB60VzQ

October 2023

Smart Cities and Sustainable Agriculture

Sustainable agriculture captures the practices, approaches, technologies, and infrastructure required to support food and livestock cultivation in a manner that maximizes efficiencies and minimizes negative environmental externalities.

Guest panelists for this discussion included:

- Vartan Saravia, General Counsel (Americas & Pacific) and Corporate Secretary at HM.CLAUSE
- Jill Kutzbach Sanchez, Director, Sustainability at John Deere
- Lisa Mather, Vice President, General Counsel at Mars Wrigley
- Walt Duflock, Senior Vice President, Innovation at Western Growers

Technology maximizes efficiencies and output throughout the agricultural lifecycle

Contemporary sustainable agriculture practices start with the seed. Vartan Saravia, General Counsel (Americas & Pacific) and Corporate Secretary at HM.CLAUSE, highlighted that advances in seed engineering and breeding has shortened the generation times for foraging and yield; cultivation processes that previously took seven to eight years can now be achieved in one year. Enhancements to plant phenotypes through genetics have allowed farmers to cultivate plants with better tolerances to diseases, manage weather events and droughts, improve yield, and produce products with better taste and an enhanced nutritional profile.

Complementing advances in seed engineering, farmers are partnering with companies like John Deere to optimize seed placement and cultivation processes. Jill Kutzbach Sanchez, Director, Sustainability at John Deere, noted the company's evolution from a machinery-centric enterprise to a shepherd of technological innovations throughout the agricultural ecosystem. Data and insights collected allow farmers to allocate resources more efficiently. For example, a process called "target shooting" targets herbicide directly to weeds rather than dispersing it across an entire field. This approach saves costs, reduces run-off and conserves water resources all while preventing weeds from stealing nutrients from the soil.

Lisa Mather, Vice President, General Counsel at Mars Wrigley, discussed her company's engagement efforts with the goal of improving regenerative agriculture practices and lessening the climatic impact of suppliers' operations. For example, in sourcing almonds, Mars and its partners are investing in cover crops—crops that are planted not for their own value but to achieve other environmental goals. Almond trees are water-intensive crops. But recent experimentation illustrates that by planting cover crops alongside almond trees improves soil structure, reduces soil carbon levels, and creates pollinator habitats.

Other practices being explored include the use of compost and biochar to reduce fertilizer needs and improve soil water retention, subsurface irrigation to reduce loss through evaporation, harvesting techniques to reduce soil disturbance and dust, and whole orchard recycling to improve soil health.

Technology plays a critical role in sustainable agriculture while addressing chronic labor shortages, reports Walt Duflock, Senior Vice President, Innovation at Western Growers, which helps keep US farms in business rather than closing or moving out of the country. In California, however, water use requirements imposed by the California Sustainable Groundwater Management Act (SGMA) threaten to unwind automation efforts, compelling farmers to pull out trees before the end of their lives and plant lower-value rotational crops (*i.e.*, tomatoes) to ensure compliance. According to Duflock, SGMA has effectively forced some farmers to abandon recent efficiency and automation efforts, as farmers attempt to manage the risk and avoid regulatory penalties longer term. This dynamic underpins the importance of a cogent policy framework that takes into account the entire agricultural ecosystem, resource constraints, technological achievements, and economic considerations.

Annual Canadian Smart Cities Summit

In October 2023, Dentons' Canada Smart Cities Think Tank team hosted its 4th Annual Canadian Smart Cities Virtual Summit featuring discussions of a range of important and timely issues including municipal sponsored digital access strategies, exploring innovative ways to ensure equitable access to digital resources for all residents. They explored smart density and housing trends in the modern municipality, addressing the pressing issues of right-sizing new growth and housing affordability.

They also discussed the intricate world of technology and intellectual property considerations in smart cities, navigating the legal and technological landscapes that underpin the creation of intelligent urban environments. Additionally, they dissected the challenges and opportunities in digital data strategy, focusing on the evolving role of data in municipal governance and how it can be harnessed for better decision-making and improved services. Recordings of these discussions are found here:

https://www.dentons.com/en/about-dentons/news-events-and-awards/events/2023/october/11/dentons-4th-annual-canadian-smart-cities-summit

In addition, Arcadis Group and Dentons have developed a Smart Cities Sustainability Principles and Goals Checklist, which provides goals and guiding principles for municipalities and stakeholders to keep in mind during the planning process. The checklist is available at:

https://www.dentons.com/en/insights/guides-reports-and-whitepapers/2023/october/13/smart-cities-sustainability-principles-and-goals-checklist

GHG emissions reduction

Reducing greenhouse gas (GHG) emissions from agricultural activity is also an important aspect of sustainable agriculture. Livestock cultivation is one of the largest sources of methane emissions in agriculture, with collaborations among scientists around the world to develop technologies and techniques to manage emissions. This work is especially important in light of bans on livestock cultivation and dairy production under consideration in some locales, which might have the effect of increasing global emissions as products are imported through more carbon-intensive supply chains.

The panel also discussed the struggles associated with other decarbonization efforts in agriculture. Lack of infrastructure makes electrification difficult in rural areas. Biofuels from cover crops may be a feasible option, but costs and slim margins keep most options out of reach. Additionally, reliability concerns are front and center where grid reinforcement lags behind deployment of electric vehicles (EVs) and other new demand. A prolonged power outage during harvest can be detrimental to agriculture, where often there is an extremely narrow window – just a few hours – to produce and package certain highly perishable crops. Policy makers must balance the need to reduce emissions with the need to feed the population.

A recording of the full discussion is found here: https://www.youtube.com/watch?v=Sl4dyLE0kiU

November 2023

Emerging Issues in Transactive Energy

Co-hosted with the Keystone Policy Center

This panel discussed transactive energy, a phenomenon that generally refers to an entire system that supplies clean energy to consumers in a more integrated, bidirectional manner than the traditional, one-direction flow of power.

Guest panelists included:

- Brian Keane,
  President at SmartPower Inc. and Co-Founder & CEO at WeeGree
- Jeff Weiss,
  Co-Founder and Executive Chairman at Distributed Sun LLC
- Larisa Dobriansky,
  Chief Business & Regulatory Innovations Officer at General MicroGrids
- Morgan O'Brien,
  Founder and Executive Chairman of the Board of Anterix

Brian Keane, President at SmartPower Inc. and Co-Founder & CEO at WeeGree, explained that transactive energy is about becoming "energy smart." It is a system that is fundamentally designed to democratize energy supply and create "prosumers," whereby consumers act as both energy suppliers and buyers.

Embedded within the concept of transactive energy are virtual power plants (VPPs), which comprise of a network of suppliers—including homes, batteries, and cars—providing energy to each other.

The emergence of transactive energy is driven by several goals. First, transactive energy attempts to "do more with less," by utilizing existing infrastructure to generate electricity, somewhat alleviating the impending need for new, long-distance transmission lines. Second, transactive energy is a means to achieve decarbonization and energy efficiency goals, while promoting grid modernization, local energy resilience and cost reductions. Transactive energy systems also constitute new approaches to modernizing the grid while managing investment risk. Finally, transactive energy enables customers to become partners, actively engaged in decarbonization policy goals.

Challenges to realizing transactive energy

Realizing transactive energy systems requires upgrades to communications networks, infrastructure modernization, regulatory reform, and a systemic modification of business and consumer practices. Transactive energy systems require vast communications networks capable of processing millions of data points collected from the grid to provide real-time situational awareness so power

is on call when it is needed and capable of moving electrons in multiple directions.

The development of transactive energy systems incorporating technological advances requires that consumers be educated about the mechanics of the grid, their own energy use patterns and the economic value of various resources. Additionally, business practices and associated costs need to be reformed. Jeff Weiss, Co-Founder and Executive Chairman, Distributed Sun LLC, gave an example. Traditionally, if a new business required electricity, it would call the local utility company and establish a connection; however a transactive energy system would allow it to integrate an entire EV fleet and essentially convert its facility into a fueling station. At present, however, acting as a fueling station would require studies quantifying the costs and impacts on future electricity demand, and would take a utility several years to make the investments needed to sustainably supply power.

Regulatory reforms might also be required, especially regarding ratemaking and pricing structures. Larisa Dobriansky, Chief Business & Regulatory Innovations Officer, General MicroGrids, highlighted the need for a "comprehensive, cost-effective and efficient electricity pricing charging system where pricing charging is differentiated with sufficient granularity, geographically, and [is] technology neutral." Regulatory issues aside, there are several technological options to advance transactive energy, including the commercialization of advanced microgrid capabilities. Dobriansky emphasized that microgrids can be vital in building transactive energy retail markets. Microgrids can be networked to increase sharing capabilities and output over a vast territory.

A recording of the full discussion is found here: https://www.youtube.com/watch?v=6Adls72nFwA

December 2023

The Path to Decarbonization: COP-28 and Beyond

Co-hosted with the Keystone Policy Center

Panelists discussed accomplishments of the United Nations Climate Change Conference (COP-28) and shared their general outlooks for decarbonization efforts around the world.

Guest panelists included:

- Dr. Sue Tierney,
  Senior Advisor, The Analysis Group and Director at World Resources Institute
- Melanie Kenderdine,
  currently Secretary-designate at New Mexico Energy, Minerals, and Natural Resources Department
- Kasparas Spokas,
  Director of Insights and Integration Strategy at Clean Air Task Force
- Dr. Karl Hausker,
  Senior Fellow at World Resources Institute Climate Program

As in previous COP-28 conferences, reaching a broad-based consensus on international climate policy is challenged by the fact that the over 190 participating countries have different economies, political systems, natural resource endowments, and demographics. Each country faces a unique set of challenges with respect to energy policy across the value chain; it is nearly impossible to achieve unanimous consensus on climate change mitigation strategies and proposals to phase out fossil fuels. That said, there were several positive headwinds leading up to COP-28. Prior to the conference, 118 countries had pledged to both triple renewable energy capacity and double the rate of energy efficiency improvements by 2030. More than twenty nations had signed a declaration aiming to triple nuclear capacity by 2050. Moreover, the United States and China had agreed to collaborate on major carbon capture and storage (CCS) projects.

Dr. Sue Tierney, Senior Advisor, The Analysis Group and Director, World Resources Institute, observed, that the US entered COP-28 in a formidable leadership position with several policy accomplishments. Congress had passed the Infrastructure Investment and Jobs Act (IIJA)--also known as the Bipartisan Infrastructure Law (BIL)--in 2021, and the Inflation Reduction Act (IRA) and the CHIPS and Science Act ("CHIPS Act") in 2022. All three of these initiatives were being actively implemented in 2023. At the outset of COP-28, the Environmental Protection Agency (EPA) announced a final proposed rule for reducing methane emissions from the US oil and gas industry.[1]

Focus on methane emissions to achieve early gains

Developing economies have adopted more nuanced and varied approaches towards methane reduction. China, the world's leading greenhouse gas (GHG) emitter, recently agreed to include methane in its overall GHG targets. In developed economies, methane reduction efforts have targeted the oil and gas (O&G) sector and conventional energy systems. In the US, investments into methane-reduction technologies already led to a 13.4 percent contraction in O&G systems in 2018-21. But, as Melanie Kenderdine, currently Secretary-designate, New Mexico Energy, Minerals, and Natural Resources Department, explained, O&G constitutes a relatively small share of methane emissions. A much larger source of methane emissions in the US – about 62 percent – come from the agricultural and services (primarily landfills) sectors. Longer term, reducing methane emissions in the US and globally requires a comprehensive overhaul of agricultural and livestock cultivation.

The World Bank has already established a blueprint for methane reduction, setting up fifteen national programs to cut methane emission from rice paddies and livestock operations. In the future, governments should continue to offer incentives to businesses to invest in new technologies to advance sustainable agriculture and apply new technologies, biodigesters and other approaches to realize methane reductions while preserving jobs and economies.

1. News Release, EPA, Biden-Harris Administration Finalizes Standards to Slash Methane Pollution, Combat Climate Change, Protect Health, and Bolster American Innovation (Dec. 2, 2023), https://www.epa.gov/newsreleases/biden-harris-administration-finalizes-standards-slash-methane-pollution-combat-climate

COP-28 concluded with a largely political and humanistic agreement, as the convening parties agreed to accelerate climate mitigation efforts before the end of 2030 with the goal of limiting the global rise in temperature to 1.5°C. Other notable COP-28 outcomes include:

- The Global Renewable and Energy Efficiency Pledge, which holds that signatories will strive to triple installed renewable energy capacity to at least 11,000 GW by 2030 and double the global average annual rate of energy efficiency improvements annually through 2030. A total of 160 countries endorsed this Pledge.
- Sixty-six governments supported the Global Cooling Pledge, which seeks to reduce cooling-related emissions by 68 percent from 2022 levels by 2050.
- Fifty-two signatories endorsed the Oil and Gas Decarbonization Charter, which seeks to achieve net-zero operations by 2050, cease routine flaring by 2030, and achieve "near-zero upstream methane emissions."
- Twenty-two national governments endorsed the Declaration to Triple Nuclear Energy capacity globally by 2050.

Electrification is key to decarbonization

Meanwhile, widespread electrification of energy systems is widely considered to be the foremost pathway for decarbonization. Currently, electricity supplies 20 percent of end-use energy consumption, and studies suggest that electricity will need to provide 60 percent of end-use energy consumption by 2050 for the US to achieve its decarbonization goals. Achieving this goal requires (1) regulatory reform; (2) modernization and expansion of the US transmission network; (3) a cogent industrial policy; and (4) streamlined policy implementation across states and municipalities. Electrification also requires modernization and expansion of the national transmission network, including 360,000 transmission towers by 2030. Widespread electrification will also create massive demand for heavy and rare earth minerals — namely steel, aluminum, and copper — and the US needs to create a strategy for reliably and sustainably sourcing these critical components. Creating an industrial strategy to source critical minerals is not only important for electrification, but also for reducing emissions from industries with processes that are fundamentally unable to decarbonize.

To illustrate, 90 percent of the fuel required for glass manufacturing is natural gas. There are currently no viable technologies available to fuel the high quality process heat required for the 500-1,000°C conditions required to fabricate glass, cement, or other comparable industrials. In these industries, which are valued at over a trillion dollars annually, electricity can provide only 40 percent of the heat these processes demand.

While industry continues to explore alternatives, such as hydrogen, in the interim, CCUS can be deployed to mitigate GHG emissions from these high-heat and high-value industrial processes.

Finally, policymakers must focus on successful policy implementation. As Kasparas Spokas, Director of Insights and Integration Strategy, Clean Air Task Force, observed, many of the overarching strategies and solutions have not changed in recent years. The key challenge to decarbonization and accelerating the energy transition lies in implementation. Policymakers should give greater attention to planning and implementation, and focus less on setting targets and broad strategies.

To that end, policymakers should formulate strategies for widespread infrastructure development on a systemic-scale, rather than adopt piecemeal solutions, taking into account social, economic, and political risks as well as market uncertainties. Enhanced coordination between utilities and governments across local, state, and federal levels is also critical. Efforts to de-risk investments should also be embraced.

Successful policy implementation further demands an inclusive policy planning process that is suitable in the current social infrastructure. Dr. Tierney observed that "sticky social issues," litigation, and regulatory action can impede project development. If litigation blocks every new project, it will be nearly impossible for the US — and the world — to achieve its decarbonization goals.

A recording of the full discussion is found here: https://www.youtube.com/watch?v=hKbbU2y5jU8

On May 28, 2024, the White House released a Joint Statement of Policy and new Principles for Responsible Participation in Voluntary Carbon Markets (the Principles). The Principles outline the voluntary principles that US market participants should adhere to when engaging in the voluntary carbon market (VCM) and provide guidance on US government agencies' engagement with VCMs. It also affirms the value of carbon credits and the important role high-quality VCMs play in addressing climate change. The administration recognized the potential of VCMs to attract significant private investments to support energy transition and set out the foundational principles to ensure their proper development and growth to reach their full potential.

For an analysis of this policy development, see https://www.dentons.com/en/insights/alerts/2024/june/3/us-policy-and-principles-for-voluntary-carbon-markets-demonstrate-support

January 2024

Exploring Affordability of Energy Industry Innovations on Under-Invested Communities

A collaborative conversation with the Keystone Policy Center, AABE, and representatives of the Alliance to Save Energy and the United States Energy Association.

While the energy transition presents numerous financial, infrastructure, and policy challenges, these issues are exaggerated in lower-income, marginalized communities with less-developed infrastructure due to decades of under-investment. Closing the energy access gap and accelerating energy investments in underserved, marginalized communities requires robust private-public partnerships, extensive stakeholder engagement, an intimate understanding of affordability considerations, and the targeted implementation of new technologies. Also, affordability issues remains one of the foremost challenges to modernizing energy systems in underserved communities. But affordability is relative; defining affordable energy costs requires an assessment of both the cost of production and the share of energy expenses in household budgets, especially benchmarked against other essentials.

Panelists for this discussion included:

- Paula Glover,
  President of the Alliance to Save Energy
- Vicky Bailey,
  Executive Chairman at United States Energy Association
- Paula Gold-Williams,
  current Co-Chair of the Board at the Keystone Policy Center and former CEO of CPS Energy

Paula Glover, President of the Alliance to Save Energy, highlighted that there are several basic steps consumers can take to mitigate utility bills and improve energy efficiency, including weatherization improvements, adjustments to thermostats, and opting for smart household appliances, HVAC systems, and, potentially, electric vehicles (EVs), and, if available, smart meters.

At the municipal and state level, delivering affordability is challenged by the fact that utilities are simultaneously modernizing the energy system while trying to "leapfrog" communities that have historically received lower levels of investment. Utilities cannot introduce battery storage, solar projects, and other innovative technologies without confronting high up-front costs (i.e., capital expenditures). Vicky Bailey, Executive Chairman, United States Energy Association, emphasized that these investment challenges are often exacerbated by a lack of access to financing, regulatory concerns, limited infrastructure, and sometimes issues accessing the technology itself. From the perspective of the utility company, providing reliable energy at a rate that is both affordable to customers and is sufficient to generate a reasonable rate of return remains a constant concern.

Overcoming affordability issues requires a multi-pronged approach. First, community engagement – whether directly between the utility and customers or through public-private partnerships – is critical to project implementation. While utilities are naturally focused on the balance sheet, project success requires addressing misconceptions and building trust among skeptical community members. It is important that members of the community, especially members of underserved communities, do not feel that they receive a disproportionately small share of the project benefits. This skepticism requires utilities and local governments to go the extra mile to explain new programs and pursue community-based educational and vocational partnerships.

Partnerships are critical to technological implementation, but also provide avenues for community feedback to facilitate decision-making, reduce regulatory lag and aid utilities in navigating ethical dilemmas in implementing projects.

Historical under-investment in underserved communities has created a situation that demands specialized policy support, technical solutions, and financing to accelerate the energy transition in these communities. Policymakers should consider a deployment strategy that accelerates deployment of new technologies in underserved communities to close the gap in legacy infrastructure, allowing all communities to participate in the energy transition at generally the same time.

Paula Gold-Williams, current Co-Chair of the Board, Keystone Policy Center and former CEO of CPS Energy, highlighted the need for nuanced investigation into how certain technologies can best be adapted to fit the needs of specific communities and customer bases – encompassing reliability, local weather patterns, efficiency and conservation, and so forth.

Panelists also discussed specific projects that are overcoming these challenges, and how the incorporation of AI might help to address affordability as well as operational efficiency. One key to success is an integrated approach that prioritizes both energy access and other goals such as pollution reduction or reliability improvements.

A recording of the full discussion is found here: https://www.youtube.com/watch?v=CNQvtGvnw78

February 2024

Getting to Know AI's Revolutionary Potential and Vulnerabilities — Part II

Co-hosted with the Keystone Policy Center

In part two of Dentons Smart Cities Think Tank Virtual Roundtable on "Getting to Know AI's Revolutionary Potential and Vulnerabilities," panelists reflecting a range of industries examined the opportunities, challenges and risks associated with AI tools.

The panel for this discussion included:

- Llewellyn King,
  Executive Producer and Host of "White House Chronicle" and frequent contributor to InsideSources, Forbes and SiriusXM Radio Energy Central
- David Derigiotis,
  Chief Insurance Officer at Embroker
- Allison Jetton,
  Partner, Dentons Venture Technology Group
- Omar Hatamleh, PhD,
  Chief Advisor, Artificial Intelligence & Innovation at NASA

The discussion opened with the need to validate the authenticity of interactions, data, and tools to safeguard consumer data and corporate systems. Llewellyn King, Executive Producer and Host of "White House Chronicle" and frequent contributor to InsideSources, Forbes and SiriusXM Radio Energy Central reflected on the power of AI to transform the way most humans live. Because AI tools generate information that blurs the line between truth and fiction, and challenge the human capacity to be disingenuous, we need to carefully consider the ramifications when this information becomes a data source from which AI tools draw. Key questions we should be asking include how can we certify the veracity of data and is our understanding of truth being adulterated?

David Derigiotis, Chief Insurance Officer, Embroker, gave an example of how technology has advanced. He played a purported "recording" of King's remarks that was an eerily authentic version of King's voice, marketing a new Bitcoin product and soliciting money offers. While Derigiotis' "deepfake" of King did not accurately capture King's remarks, this exercise shows how easy it is for anyone to clone an audio sample, manipulate voice data, and generate a product that is so lifelike that it could very well be mistaken as authentic.

Robust and layered defense systems are needed, especially in the business context. In addition to educating employees, cybersecurity infrastructure that targets spoof emails and "business email compromise" attacks needs to be upgraded to field risks from highly-believable AI-generated interactions. Using multiple authentication methods, and involving multiple individuals throughout an organization, to verify the authenticity and legitimacy of a transaction is key.

Allison Jetton, Venture Technology Group Partner at Dentons, further underpinned the need of secondary defense measures to combat various AI threats, including social engineering and voice codes. AI tools can create additional risks. For example, AI tools can "hallucinate," and effectively make up data or information.

Relatedly, the regulatory treatment of personal data remains an ongoing concern. While privacy laws have traditionally lagged behind emerging technologies, longer term, lawmakers will need to update guidance to protect consumer data.

Omar Hatamleh, PhD, Chief Advisor, Artificial Intelligence & Innovation, NASA, noted that AI tools have the power to transform nearly every aspect of daily life. In healthcare, for example, predictive AI tools are being developed that can leverage an individual's genetic history, blood type, and risk factors, and predict a disease well before it materializes. Successfully deploying these tools means that individuals will likely live longer lives, creating an entirely separate set of social, economic, and ethical questions. A more immediate question is the nature of care and the role of doctors given the powers of AI in this space. Over the near term, doctors and specialists will likely leverage these tools to help them do their jobs better and faster. Across sectors, it is likely that more resources will be devoted towards governing AI tools that replace human jobs in completing manual and repetitive tasks than AI tools totally displacing human work.

At the same time, data indicates that most consumers are uncomfortable with how data is collected and used. Another problem is ethical, centering on bias in data as AI tools learn from

whatever information is fed to them, reflecting common stereotypes and biases.

A recording of the full discussion is found here: https://www.youtube.com/watch?v=0-2Xit4Ucco

As the legal and regulatory landscape governing the testing and deployment of autonomous vehicles (AVs) across the globe continues to evolve, stakeholders face a complicated array of laws, policies and regulatory schemes that can vary greatly across the world, and sometimes even within a single county. Regulators in 2023 focused heavily on safety, while critical questions remain around issues of liability. Data privacy, cybersecurity and the responsible deployment of artificial intelligence also emerged as significant concerns amongst regulators and lawmakers, reflecting the data-intensive nature of AV operations. These debates underscore the ongoing complexity between innovation and accountability in this space. The narrative around AV law and regulation in 2023 was also interwoven with broader public policy ambitions, from alleviating urban congestion and cutting emissions to enhancing mobility for those who need it most. Regulations are starting to mirror these larger societal goals, nudging AVs to integrate more seamlessly with public transportation systems and urban planning efforts. This is all occurring in an environment of cooperative regulatory efforts and public-private initiatives to underscore the collective journey toward a future where innovation, safety and the public good converge on the roads all across the world.

Dentons annual Global Guide to Autonomous Vehicles, just released in June, takes a deep dive into this tapestry by summarizing the key AV related regulatory and legal developments from several countries around the world. The guide is found at https://www.dentons.com/en/insights/guides-reports-and-whitepapers/2024/may/29/global-guide-to-autonomous-vehicles-2024

March 2024

The Power of Broadband Infrastructure to Enable Smart Cities

Co-hosted with Wireless Broadband Alliance's Connected Communities Forum

Panelists representing municipal governments and private-sector partners shared their experiences developing connectivity networks and best practices associated with bridging the digital divide in underserved or unserved communities. Among other things, panelists highlighted (1) the need to treat digital connectivity as a utility service, given the central role of internet in education, healthcare, municipal services and energy operations; and (2) the importance of broad-based stakeholder collaboration in the form of public-private partnerships and inter-departmental coordination at the municipal level, to realize connectivity infrastructure at cost and scale.

The panel included:

- Rob Schwartz,
  President and CEO at Anterix
- Michael Sherwood,
  CIO of the City of Las Vegas
- David Wilkins,
  Head of Smart City at Westminster City Council in London
- Erin Spears,
  Chief Of Staff & Counsel for the City Council Utilities Regulatory Office in New Orleans
- Al Jenkins,
  Board Advisor at the Wireless Broadband Alliance-Connected Communities Forum

Value of private LTE networks

Rob Schwartz, President and CEO, Anterix, discussed modern communications system as the backbone of the electric grid of the future and the benefits that private LTE networks can offer to a more connected and secure future. Private LTE networks offer three major advantages: scale, security and speed. On scale and speed, private LTE networks allow distributed energy resources (DERs), electric vehicles (EVs), sensors, smart meters, voltage regulators, and batteries in a given service area to communicate with each other and with the utility in real time, helping manage load and enhance operational efficiency. Additional benefits include support for resilience during extreme weather events or wildfires and critical cybersecurity safeguards. High value assets are located on a separate airgap disconnected to the threat vectors that could be targeted by malfeasants.

Michael Sherwood, CIO of the City of Las Vegas, discussed benefits that private broadband networks can offer municipalities for social services, such as ensuring access to education and healthcare. In 2020-21, as COVID-induced lockdowns strained Las Vegas's connectivity infrastructure, the City

of Las Vegas realized the need for reliable internet so students could reliably log onto online learning platforms. Michael noted how the municipality and public school system worked together to launch an education-first, private network. The network was not open-access, but fit-for-purpose.

David Wilkins, Head of Smart City, Westminster City Council in London described efforts to strengthen digital infrastructure and improve public services. They have prioritized mapping and data collection in order to understand regional gaps in mobile phone service and capacity constraints. They also have used mapping and sensors in connection with sanitation services to measure download and upload signals around the city, and have leveraged existing assets such as lamp posts to attach small cells to improve capacity bottlenecks, all in efforts to improve digital inclusion.

As Erin Spears, Chief Of Staff & Counsel for the City Council Utilities Regulatory Office in New Orleans talked about challenges at the municipal level where there often is a lack of regulatory or enforcement power to change fee structures or erect infrastructure or otherwise compel providers to ensure equitable access. Often internet access is not considered an essential utility the way electric power or telephone connections are.

Al Jenkins, Board Advisor, Wireless Broadband Alliance-Connected Communities Forum, has worked extensively on mapping broadband connectivity across the US and formulating grant proposals to direct investment to communities in need. He described steps taken by New York City to close the digital divide by analyzing access in non-affluent zip codes and then creating broadband opportunity zones with attractive investment conditions. Among other things, the city reduced franchise fees and tariff fees and granted broadband developers more accessibility to street light poles and wood utility poles.

Data obtained from mapping and data collection can be used to entice public-private partnerships or to secure state and federal grants which often require the identification of underserved populations.

A recording of the full discussion is found here: https://www.youtube.com/watch?v=Aqln6u04IdU

April 2024

How Cyber Innovation is Disrupting the Energy Sector and Critical Infrastructure

Panelists shared their perspectives on the areas in need of greatest protection from cybersecurity threats. Shanna Ramirez, Chief Legal & Ethics Officer, General Counsel & Board Secretary at CPS Energy said that while CPS Energy is focused on all of its infrastructure, the protection of substations is an acute problem. Karen Wayland, CEO, GridWise Alliance, identified three of the biggest challenges for the transmission grid: (1) the additional demand from distributed energy resources; (2) interconnection backlogs; and (3) hackers (and criminals). Allison Jetton, a Partner in Dentons Venture Technology group, recognized the important role that government plays in mitigating cybersecurity challenges in the private sector. Todd Daubert, a Partner in Dentons Federal Regulatory/ Compliance practice, stressed the importance of not just planning for a cybersecurity threat but assuming that one will arise.

Panelists included:

- Shanna Ramirez,
  Chief Legal & Ethics Officer, General Counsel & Board Secretary at CPS Energy
- Karen Wayland,
  CEO at GridWise Alliance
- Allison Jetton,
  Partner, Dentons Venture Technology Group
- Todd D. Daubert,
  Federal Regulatory/Compliance partner at Dentons

A number of themes emerged during the discussion. First was the importance of the "human"

factor, both in terms of bad actors and employees unwittingly allowing a threat to enter a system. Allison Jetton commented that the human link is always the weakest, but it can be mitigated by phishing training and a better understanding of the consequences of actions. Todd Daubert mentioned that many breaches accompany emotional reactions to domestic situations having nothing to do with the workplace. He added that dual measures such as two-step or two-party verification can go a long way to mitigating this problem.

The second theme was the interconnected nature of all infrastructure and its dependence on the power sector. Karen Wayland offered that responsibility for advancing resilience is not just in the provenance of the utility; it should extend to communities as well to have plans in place to ensure that vital services such as healthcare and communications can continue in the event of a cyber attack. More time to think about building community resilience and thinking about the problem more holistically is needed.

Third, government and other regulatory bodies play a key role in partnering with utilities and other critical infrastructure against outside threats. Shanna Ramirez discussed a recent directive from the Transportation Security Administration (TSA) to all entities responsible for gas supply and transport in the wake of the Colonial Pipeline incident. She applauded the new standards as a "true win" for compliance efforts and an example where an extremely practical government regulation is working to create another layer of defense from human behavior. Karen Wayland pointed out that in light of recent geopolitical events, many bad actors are now state entities, which brings a strong national security component into this area, and the federal government has a duty to help protect against such attacks as well. Allison Jetton agreed that standards are important in moving the mark and pointed to the National Cyber-informed Engineering Strategy as an example of a security-informed standard reinforce protections as well as the National Association of Regulatory Utility Commissioners' new cybersecurity baseline standards for distributed energy resources.

Shanna Ramirez commented on the unique operational exposure of electric utilities; the disruption of operations is not related to financial gain or access to data but the devastating impact of a lapse in power. Therefore, it is important to separate and prioritize operational technology systems from informational technology systems, which are less likely to be threatened. She added that it is not good to have the best tools alone, there needs to be an investment in people as well, to analyze the data and implement appropriate solutions. Karen Wayland discussed the critical role and potential vulnerability of substations and the need to find ways for the federal government to help protect them from a national security standpoint.

With respect to Artificial Intelligence, Allison Jetton commented that it is helpful to look at where the DOE is directing its funding for specific projects in cybersecurity through the Office of Cybersecurity Energy Security and Emergency Response. She recommended having controls in place that provide visibility when something is not right in workplace operations. Shana Ramirez recommended that utilities and other energy providers at a minimum, should review data governance policy and keep an up-to-date asset inventory, as well as train employyes on what to do with company data, and keep attorneys in the loop.

Shanna Ramirez warned of the looming scale of cyberattacks with the weaponization of artificial intelligence. With the explosion of data centers and sharp in crease in load demand at a time of retirement for many generation resources for efficiency and environmental resources - planning utilites are facing a threat of operational disruptions at a scale never seen before.

A recording of the full discussion is found here: https://www.youtube.com/watch?v=OEiD_QNVD2g

This past spring, the US Cybersecurity and Infrastructure Security Agency ("CISA") issued a proposed rule to require companies operating in US critical infrastructure sectors to promptly report certain cyber incidents and ransomware attacks. Prior to the final rule, the agency encourages covered entities to voluntarily report incidents of the nature covered by the proposed rule with an aim to mitigating harm and preventing other organizations from becoming victims of similar incidents.

A description of the requirements and its implications is discussed here: https://www.dentons.com/en/insights/alerts/2024/may/9/cisas-proposed-wide-sweeping-cyber-incident-reporting-requirements

May 2024

Navigating Climate Reporting and Building Sustainability: Risks and Opportunities

Recent rules from the SEC, California, and the European Union (EU) emphasize mandatory climate reporting. While the SEC rules are being contested in US courts and are currently stayed or paused, the EU is moving ahead with its Corporate Sustainability Reporting Directive (CSRD) rules. Companies must be transparent about managing climate-related issues and risks in corporate reporting. This discussion explored strategies for navigating competing interests, compliance practices, and seizing opportunities related to climate change and energy transition.

The discussion was moderated by Gail Lione, senior counsel at Dentons and founding co-chair of the Firm's US ESG Advisory Team and a member of the Global ESG Steering Group. Panel guests included:

- Ken Bockhorst,
  Chairman and CEO of Badger Meter, Inc., and Board Member of Mirion Technologies , both listed on the NYSE
- Carolyn Campbell,
  COO and Managing Partner of Emerging Capital Partners, and Board Member of Burger King South Africa and Eranove SA
- Suzanne Folsom,
  Board Member of Ecore International and Encyclopedia Britannica, and former General Counsel of US Steel and Philipp Morris and counsel at the World Bank
- Sam Olens,
  Partner in Dentons' Public Policy practice and a member of the firm's State Attorneys General group, and former Attorney General for the state of Georgia
- Walter Van Dorn,
  former SEC Special Counsel

The discussion opened with an overview of SEC climate disclosure rules that were adopted this year after an extended two-year rulemaking process. The rules have not yet gone into effect because they have been stayed or paused following a number of legal challenges in US courts. The EU, however, is moving ahead with a corporate sustainability directive and California has also enacted climate disclosure rules. Most companies are not taking climate disclosure lightly, even with US rules paused. Nearly 95 percent of S&P 500 and Fortune 500 companies publish ESG reports that are curated for markets and stakeholders, and board and company management are grappling with increased pressure and scrutiny.

The SEC rules for the first time adopt clear "line item" disclosure requirements regarding the impact of climate change on public companies' businesses. These include identifying specific risk factors, material impacts of climate change on business, and description of activities to mitigate and adapt to those impacts. How costs related to climate change are handled must be incorporated into the financial statements, not just narratives. These must reflect both Scope I and Scope II emissions. The SEC rules do not require disclosures regarding Scope III emissions, however EU and California rules do cover indirect emissions.

Sam Olens discussed the role that State AGs are playing in environmental litigation and how some companies have reacted. The panelists agreed that savvy companies will try to develop cordial and productive relationships with the AGs in the states where they operate, and stressed that this must be done before there is a problem. Too often, communications are unnecessarily litigious in nature.

The panelists described various processes within the organizations they lead. While approaches will vary depending on the circumstances of each company, a pragmatic approach with identification of specific short term goals and follow-up is preferable to setting long-range goals that are easily forgotten as short term initiatives and emergencies take precedence. The best-positioned companies are those that have been working on training and internal processes to get ahead of new rules, and that set reasonable goals. As a practical matter, it is not something that can happen overnight.

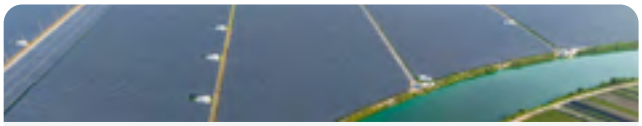
Among other things, companies should consider what role the legal department will play. The rules potentially will have a significant impact on potential liability of the board. Each company will develop a structure that works for its particular circumstances (company, size, industry, location, other competing priorities). Regardless of the structure selected, it is important that board agendas and minutes reflect robust conversations.

The panel also talked about how climate disclosures impact efforts to hire and retain talent, how to ensure that employees understand the need to balance climate goals with the business needs of the company, and strategies for benchmarking progress and setting priorities so as to better allocate resources and integrate climate strategies into day to day operations.

The challenge of managing supply chains was discussed. Even though the SEC rules do not reach Scope III emissions, EU rules do. Private companies often must be educated as to the requirements of the various regimes if they want to continue to supply the large public companies. Larger companies may be able to help the small supplier to gather information needed to comply. While some may resist initially, in the long run, it may represent an opportunity for smaller companies going forward.

Among the other points emphasized by the panelists, companies should be honest in reporting and avoid greenwashing. Reporting is not necessarily negative. Successes can also be touted as long as they are true. Company leaders should be conscious of multiple ways in which information is reported out to investors – written and oral. Reports should be reviewed for accuracy and consistency, and companies should decide when to speak and on what issues, and who is authorized to speak on behalf of the company.

A link to the webinar is found here: https://www.youtube.com/watch?v=wMlpevEmUQg&t=4s



In 2023, the Think Tank hosted a discussion of the importance of defining corporate purpose and culture and instilling that purpose and culture at all levels in an organization.
See discussion entitled To Speak or Not to Speak: How Companies Can Navigate Challenging Social and Political Issues, available at https://www.youtube.com/watch?v=2PsogdvuZ-s&t=11s.
For an example of the potential risks of failure to establish and communicate a clear corporate purpose and culture within a company, see Max Carr Howard's article: https://www.law360.com/corporate/articles/1844629/boeing-saga-underscores-need-for-ethical-corporate-culture

July 2024

Supreme Court Overturns Chevron Doctrine: Implications for Energy and Climate Policy and Beyond

In perhaps the most consequential legal decision affecting federal regulatory law in some time, the Supreme Court, in a 6-3 decision, has overruled the long-standing "Chevron doctrine," giving federal agencies less discretion under the Administration Procedure Act (APA) to interpret statutory law. Our panelists discussed how this decision reshapes the administrative law landscape, including what it means for energy and climate policy, the impact of the decision on the role of states, and limitations of the decision.

Guest panelists included:

- Ben Grumbles,
  Executive Director at The Environmental Council of the States (ECOS)
- Robert W. Gee,
  President at Gee Strategies Group LLC
- Sam Olens,
  Partner, Public Policy practice at Dentons and Former Attorney General of Georgia
- Simon Steel,
  Partner, Federal Regulatory practice at Dentons

The discussion opened with some background on *Chevron* and *Loper* by Simon Steel. The *Loper* decision, by a vote of 6-3, overrules the unanimous 1984 decision that cemented the *Chevron* doctrine. Under *Chevron*, a court first had to determine whether a statute was ambiguous, and if so, it then deferred to a reasonable agency interpretation of the ambiguity. *Loper*, however, says it is up to the court, and not the agency, to interpret the ambiguity. *Loper* only applies to questions of law. *Loper* does not affect cases involving agency discretion under the arbitrary and capricious standard, matters of fact under the substantial evidence standard, or matters of procedure. Importantly, there are limitations to *Loper*. Congress retains the ability to write broad statutes giving discretion to agencies, but it must be clear about its intent. Agencies are still subject to the arbitrary and capricious standard, and agency interpretation is not irrelevant. In the absence of *Chevron*, the standard announced in the 1940s era *Skidmore* decision applies, *i.e.*, courts should consider the agency's interpretation. Further, stare decisis is still relevant. Notably, the opinion leaves untouched another older doctrine that accords deference to an agency's interpretation of its own regulations. The future of this doctrine remains to be seen.

Loper and related judicial developments

With respect to *Chevron, Corner Post* and *Jarkesy*, Simon Steel cautioned that the impacts of these decisions will depend heavily on the agency in question. Clint Vince, who moderated the discussion, pointed out that there will likely be a gap between what Congress should do in telling the regulatory agencies what to do, and what they will be able to do – and potentially there will be a lot of turbulence in this gap. Ben Grumbles described the decisions as efforts "to recalibrate and reduce the administrative state." In addition to these decisions, the Supreme Court's increased used of its "shadow docket" authority to stay federal rules pending review in lower courts adds to the reining in of federal regulatory authority by the Court.

Bob Gee remarked that the Loper decision has created a lot of uncertainty that could prompt litigation, including test cases to identify the limits of the decision. A lot of research is being done on the potential impact on prior decisions, while close scrutiny will be drawn to pending and future agency actions and regulations to ensure adherence to the intent expressed in textual statutory language and legislative history. Meanwhile, there will be a more immediate impact on the financial community. Uncertainty creates regulatory risk, which increases the cost of capital for regulated companies and creates a climate of uncertainty among investors who invest in assets that are not regulated but which benefit from strong and clear regulation. It also will draw scrutiny of rating agencies and analysts (equity and debt).

Impact on energy industry and climate law

Bob Gee also spoke on the potential impact of *Loper* on Department of Energy (DOE) activities, noting that there may be implications for DOE's role in establishing energy efficiency standards and in issuing liquefied natural gas (LNG) export licenses. The body of law governing DOE's authority to establish energy efficiency standards for consumer appliances and commercial and industrial equipment is well-settled; however, the standards typically draw a degree of controversy and congressional scrutiny. DOE will need to ensure that decisions are grounded on reasonable interpretation of the law and supported by a solid factual record. In the area of LNG licensing, while DOE's role is limited, its public interest findings will have to be carefully crafted to withstand challenge.

Sam Olens commented that while the Biden administration's regulations will come under fire, "the sky is not falling." It is important to remember that the *Loper* decision can — and will — limit regulatory authority under Democratic as well as Republican administrations. Olens and Gee discussed how, at the federal level, agencies have seen the writing on the wall for several years now, and have already been trying to craft regulations and adjudicative decisions that will survive scrutiny in absence of *Chevron*. The process will be messy for a while, especially where Congressional intent likely included *Chevron*,

even if not expressly stated. As for states filling the gaps, state commissions are probably not going to act on their own, but will wait for state legislatures to take action first. Also, a lot of states have sunset laws so they have to revisit regulations every several years. Regular revisions build modernization into the regulatory structure and mitigate the risk that newly enacted state legislation will be overturned. There are very few instances of sunset provisions in federal law.

Ben Grumbles pointed out that despite all of the rhetoric in response to *Loper*, the two part *Chevron* test is difficult to parse, and the court's opinion glossed over the reasonableness portion of part two of the test. Also, despite statements that the doctrine of *stare decisis* still holds, it clearly is not understood or applied in the same manner, and the high court is already directing lower courts to revisit pending cases in light of *Loper*. As for the effect on environmental law, 90 percent is implemented by the states. *Loper* does not apply to state action, and many states have rejected or distanced themselves from deference to interpretations of ambiguity. At the federal level, Congress is going to have to weigh in. Requiring Congress to "do its job" is entirely reasonable. The question is whether politically it will be able to do so. Also, Congress presumably has enacted laws with *Chevron* in mind, and has intentionally left it to agencies to fill in technical areas with their specialized expertise, especially in areas like environmental law. What this dynamic will mean going forward is uncertain.

Meanwhile, states will continue to craft their own approaches, informed by federal decisions, and in some instances, are able to do things entirely unavailable at the federal level (*e.g.*, the Regional Greenhouse Gas Initiative (RGGI) in the northeast). At the federal level, we may see a slow-down in the pace of regulation for a while. As a general rule, states support the idea of federal science-based technical regulations, national standards and neighborhood solutions that are ultimately implemented by states, but for the time being, national standards are going to be scrutinized.

A recording of this discussion is found at: https://www.youtube.com/watch?v=MhRWhzS4ITQ

Please refer to the special report below for discussion of potential implications of *Loper Bright* on a variety of administrative agency actions.

August 2024

Hydrogen Markets and the Clean Energy Transition

Co-hosted with the Keystone Policy Center

Thanks to modern advances in technology, the growing demand for energy worldwide, and a new level of awareness about how our actions impact the planet, the benefit of hydrogen as an energy transition fuel is generating a lot of excitement in the energy industry and beyond. This panel discussed hydrogen's emergence as a key player in the transition to net-zero emissions, with applications in decarbonizing industries, mobility, and power generation.

Guest panelists included:

- Alex Kizer, Senior Vice President and Chief Operating Officer at Energy Futures Initiative Foundation
- Noah Feingold, Director, Energy Transition Consulting Team at S&P Global
- Leia Guccione, Managing Director, US Program at Rocky Mountain Institute
- Emma Hand, Partner, Energy practice at Dentons

The role of hydrogen markets in the clean energy transition

The role of hydrogen as an energy transition fuel is generating a great deal of excitement in the energy industry and beyond. Its applications in decarbonizing industry, power generation and mobility seem endless, but the challenge is unleashing the full potential of hydrogen at market scale. This roundtable, which was moderated by Clint Vince Partner, Energy practice, Dentons, and co-sponsored by the Keystone Policy Center, examines how demand markets are being developed to ensure that the clean hydrogen market can be a reality.

The H_2DI initiative

Alex Kizer , Senior Vice President and Chief Operating Officer, Energy Futures Initiative Foundation described the Hydrogen Demand Initiative (H_2DI), which is an effort to create hydrogen markets across the Regional Clean Hydrogen Hubs Program. The 2021 Bipartisan Infrastructure Law provided US$1 billion for demand support for the Clean Hydrogen Hubs. Under this authority, the US Department of Energy (DOE) selected the H_2DI team, which is comprised of the Energy Futures Initiative Foundation, Dentons LLP, the Rocky Mountain Institute (RMI) and S&P Global, to develop demand markets for the clean hydrogen produced in the regional hubs. H_2DI was created in early 2024 and since that time, the team has created a 501(c)(3) structure to run the auction for a demand market for the regional hubs. Emma Hand, partner, Energy practice, Dentons described some of the next steps in the process, including: completion of the design phase (projected for the fall of 2024); terms and conditions of the auction (by late 2024); legal documents; corporate structure; model contracts, market rules, checks and balances and eligibility criteria.

Why hydrogen?

In response to the question of 'Why Hydrogen?', Leia Guccione, Managing Director, RMI discussed the unparalleled potential of hydrogen for decarbonization, particularly with respect to the industrial sector. She pointed to certain commodities, such as ammonia, which is a critical component of fertilizer. Ammonia currently is sourced from grey hydrogen or hydrogen sourced with natural gas. Harnessing the power of clean hydrogen to make ammonia would be an elegant solution for this market. Guccione cautioned, however, that because clean hydrogen is in its infancy stage, it is necessary to harness technology support, policy initiatives and business model innovations to advance its development. She added that she has observed a healthy diversity of parties, a "mix of incumbents and insurgents" which is exactly what's needed to grow a nascent industry, both domestically and globally.

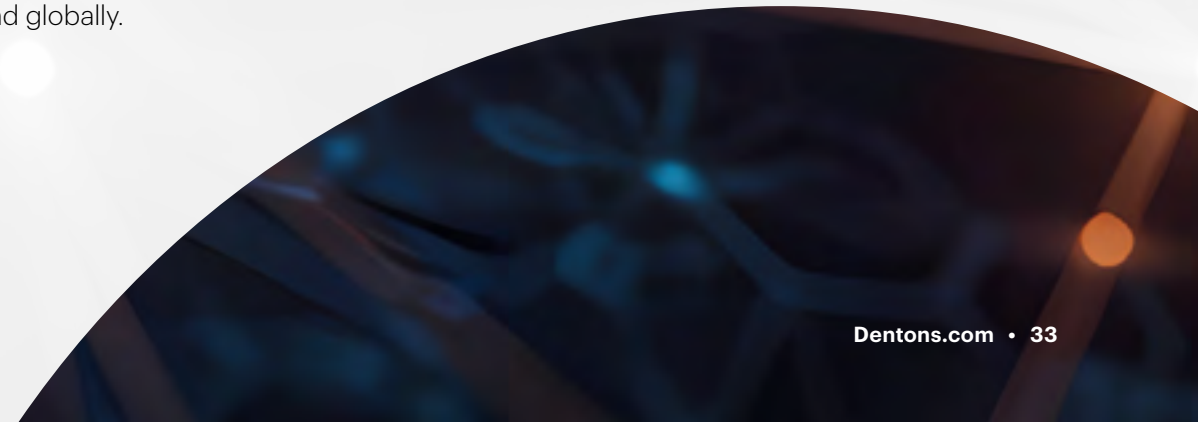
Innovative structure

Emma Hand discussed the unique structure of the DOE's role in the H_2DI partnership. DOE is drawing for the first time on "other transactions" (OT) authority," which is less rigid than traditional government contracts authority. The panelists agreed that the OT structure works well with the auction-driven process of creating hydrogen demand markets and allows deployment to be done on a much faster track than the traditional government contract model. Moderator Clint Vince pointed out that the OT/auction-driven model could apply to other industries, and Emma Hand agreed that if the model works, it could create a new model for any kind of technology market the government wants to accelerate.

Recipe for a robust hydrogen market

Noah Feingold, Director-Energy Transition Consulting Team, S&P Global remarked that the key to a robust hydrogen market is flexibility and responsiveness in terms of having different types of suppliers and purchasers that can take varying levels of hydrogen at different times. He pointed out that the various end-users of hydrogen have different perspectives and needs. For instance, a regulated utility is most concerned about proving whether a type of energy is in the interest of its customer base. A multinational corporation with a large fleet like Amazon may have other concerns. Feingold added that stackability of financial incentives also can help ensure a strong market. Finally, creating a more transparent hydrogen market by shifting away from traditional bilateral contracts will help transform and advance the hydrogen market.

A recording of this discussion is found at: https://www.youtube.com/watch?v=n0HkEQjAbPI



Special Report

The Supreme Court, Policy and Regulatory Uncertainty: The Effect of the *Loper Bright* Decision on a Smart and Connected Future in the US

In a trio of Supreme Court rulings this last term, the Court has signaled its intention to crack down on the amount of authority and discretion that federal agencies have enjoyed over the last several decades, and to assert the power of the federal judiciary in a manner that will have significant ramifications for regulation by just about every federal agency. In *Loper Bright Enterprises v. Raimondo* (Loper), the Court ruled that in cases governed by the Administrative Procedures Act (APA) courts must exercise their independent judgment in deciding whether an agency has acted within its statutory authority, expressly overruling the longstanding Chevron doctrine that required courts to defer to an agency's permissible interpretation of a statute if the statute's language is ambiguous. In *Securities and Exchange Commission v. Jarkesy* (Jarkesy), the Court significantly limited the ability of agencies to try certain types of cases in-house by holding that when the SEC seeks civil penalties against a defendant for securities fraud, the Seventh Amendment entitles the defendant to a jury trial. And in *Corner Post v. Federal Reserve* (Corner Post), the Court held that in APA cases, petitioners have six years from when they are injured by an agency action – not just six years from the agency ruling itself – to petition for judicial review. Many years of congressional gridlock have left the courts to fill policy-voids by default. Some interpret the decisions, especially Loper, as a significant blow to federal agency authority, and likely portend a substantial increase in administrative law litigation, as well as judicial involvement in federal policy and regulatory decision-making. Others advise more caution, noting (likely correctly) that while agency rules and court decisions that have specifically relied on the Chevron doctrine are vulnerable, the predictions about the long-term effects of this case might be overstated given that Chevron applied only to an agency's interpretation of a statue enabling an action where the statutory language is ambiguous. We asked a panel of legal practitioners of various expertise to share with the Think Tank their initial reactions on what these decisions mean in terms of their own practice areas, and the future of smart and connected communities.

Litigation, Uncertainty, and Judicial Policy-Makers

Clint Vince
Chair of Dentons' US Energy practice and co-chair of the Dentons Global Transportation and Infrastructure sector for the US Region

The dismantling of the forty-year-old "Chevron Doctrine" and other recent decisions are sweeping in application to federal administrative agencies and will impact everything from the clean energy transition, the implementation of environmental policies, health care, education, student loans, and beyond. The Court has signaled its intention to dramatically restrict the amount of authority that federal agencies have been accorded over the past four decades in implementing federal statutes and to transfer a hefty chunk of that authority to the judiciary. Reasonable people may differ as to the extent of change and disruption that will occur going forward; however, there almost certainly will be what Justice Jackson described as a veritable "tsunami" of litigation as affected stakeholders representing differing ideologies turn to the courts to lobby for their views, causing riptides of uncertainty throughout federal agencies and forcing busy federal judges to substitute their judgement over experienced agency regulators on issues that at times require extensive expertise on highly technical and scientific subjects. The one thing that is certain is that we are in for a turbulent sea change in terms of federal administrative agency regulation

and it remains to be seen how State Governments will react.

For further analysis of the potential impact on the energy sector, please visit: https://www.dentons.com/en/insights/alerts/2024/july/2/the-supreme-court-has-just-dismantled-traditional-energy

Increased Litigation of Environmental Regulation Expected

Bob Schuda
Partner at Dentons and co-chair of the Environment and Sustainability Pillar of the Dentons Global Smart Cities & Connected Communities Initiative and Think Tank

The recent US Supreme Court decisions in *Jarkesy*, *Loper*, and *Corner Post* impact the authority of federal environmental agencies to issue regulations, conduct administrative environmental reviews, enforce environmental law, and issue administrative and civil penalties. While no agency action or policy was automatically repealed other than those at issue in the specific cases, many environmental rules and regulations are now susceptible to additional challenge. For example, US Environmental Protection Agency (EPA) efforts to reduce greenhouse gas emissions from cars and trucks may be challenged because they target "mobile sources" rather than "stationary sources," and the Clean Air Act is arguably ambiguous regarding "mobile sources." EPA regulations on per- and polyfluoroalkyl substances known as PFAS may also be subject to challenge, based, for example, on ambiguity whether they pose a "substantial danger" to human health or the environment, subjecting them to regulation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). While impact on the EPA is most obvious, many other federal agencies administer or enforce some form of environmental law, including the National Oceanographic and Atmospheric Administration, the US Fish and Wildlife Service, the US Department of Agriculture, and the United States Coast Guard, among others.

Telecome Sector may be Less Vulnerable

Todd Daubert
Partner and chair of Dentons' Communications and Technology sectors, and leader of the US Privacy and Cybersecurity team

In contrast to many other industries, telecommunications regulations tend to be less about government versus industry and more about industry versus industry, so the overruling of *Chevron* may impact the telecommunications and technology industry differently. The relevant statutes use broad language and principles that the relevant agencies have been forced to interpret and apply over the years. For example, since Congress last updated the primary federal telecommunications statute, the Communications Act of 1934 (the "Act"), in 1996 when the focus was voice services, the Federal Communications Commission (FCC) has continually updated its interpretations to reflect the increasing focus on fixed and wireless broadband services. Interpretations that impose obligations or result in the reallocations of resources like Spectrum are more likely to be challenged by the "disadvantaged" industry sectors, although the outcome of these challenges may not be as predictable as the challengers would hope. By contrast, interpretations that lead to funding, like the various broadband funding programs, are less likely to be challenged since delay does not tend to favor any industry sector.

Health Care Regulation Implications

Janice Ziegler
Partner, Dentons Life Sciences and Health Care sector

In the healthcare space, the Supreme Court's decision in *Loper Bright* means that future challenges to agency regulations will take place upon a much different terrain. From a practical perspective, the decision will likely have a number of important implications. First, as with other agency actions, there will be more legal challenges brought against US Department of Health and Human Services' (HHS) regulations. Courts in different areas

of the country may reach differing conclusions regarding HHS regulations, leading to increased inconsistency across federal health care programs. This will likely create more uncertainty for key stakeholders, including providers and suppliers, who must determine how to comply with regulations under challenge. HHS will have less flexibility to create new programs or impose new substantive program requirements where statutory obligations are unclear, leaving important operational gaps. At the same time, industry participants will have greater incentives to challenge reimbursement and other rules, which often have complicated statutory formulas subject to potentially differing interpretations. In the past, courts have generally deferred to Centers for Medicare & Medicaid Services' (CMS) interpretations, but post-*Loper* providers and suppliers can assert more favorable legal interpretations to enhance reimbursement.

By way of example, the US government made payments between October 2000 and September 2009 to two state-operated Michigan hospitals totaling US$196 million that it later asserted should be returned because the hospitals were not eligible for Medicaid payment. On August 2, 2024, Michigan sued HHS in federal district court in the District of Columbia asserting that the government is not entitled to recover because the government's interpretation of relevant rules isn't entitled to deference in light of the *Loper* decision.

As a result, HHS will be more cautious in developing and implementing its regulatory agenda, working to create legally defensible regulations that minimize the chances of legal challenge and reversal, likely leading to fewer regulations, more slowly promulgated.

New Tool to Challenge IRS Interpretations

Jason Walton
Partner, Dentons Tax practice

The departure by the US Supreme Court from the long-standing *Chevron* precedent calling for deference to federal agencies on statutory interpretation means that, in some circumstances, courts will be free to interpret Treasury Regulations using their own judgement rather than deferring to the Internal Revenue Service (IRS). The *Loper* decision gives taxpayers a new tool to challenge IRS interpretations of Treasury regulations that they view as unfavorable or restrictive. One area where we might expect to see this tested is in connection with the issuance of final regulations on renewable energy tax credits under the Inflation Reduction Act, which the IRS is just beginning to do. Those regulations could be more easily challenged by taxpayers who seek different interpretations than what the IRS directs.

For insight on the interplay of *Chevron* and IRS rules, please visit: https://www.ustaxdisputes.com/after-chevron-uniform-tax-law-interpretation-not-guaranteed/ and https://www.dentons.com/en/insights/articles/2023/may/11/tax-implications-of-chevron-challenge

Labor and Employment Rules may be Susceptible to Increased Attacks

Kate Erdel
Partner, Litigation & Dispute Resolution and Employment & Labor practices

In the labor and employment context, agencies such as the US Department of Labor, the Occupational Safety and Health Administration, the Federal Trade Commission (FTC) and the Equal Employment Opportunity Commission have heavily relied on and regularly invoked the *Chevron* doctrine. In light of the Supreme Court's decision overruling *Chevron*, some employment issues to watch include the FTC's authority in banning non-compete clauses, rules and regulations related to minimum salary thresholds and overtime pay, and rules and regulations regarding accommodations for pregnant workers, among others. For more details on these and others, see a recent article by Dentons lawyers Kate Erdel and Shaina Bloom at https://www.dentons.com/en/insights/articles/2024/july/3/us-supreme-court-overrules-chevron-doctrine-implications-for-employers

Financial Disclosures and Fines are in the Judicial Crosshairs

Deborah H. Renner
Partner, Litigation & Dispute Resolution & Financial Services practice

Even before *Loper Bright* was decided, regulators in the financial sector were seeing challenges to their rulemaking authority, as well as their enforcement authority. For example, in March 2024, the Securities and Exchange Commission (SEC) adopted new rules mandating certain climate-related disclosures by public companies in their annual reports and registration statements. The SEC believed that because climate-related risks can have financial consequences, it was within its authority in adopting the rules. But others disagreed, leading to several cases being filed against the SEC for overstepping its authority. Enter *Loper*, which expands the judiciary's power to review administrative rulemaking, and which may signal the defeat of the SEC's climate-related rules. Meanwhile, only a day before *Loper* was decided, the US Supreme Court decided *SEC v. Jarkesy*, which held that the Seventh Amendment entitles a defendant to a jury trial when the SEC seeks civil penalties for alleged securities fraud. The ruling not only curtails the enforcement authority of the SEC, but also impacts the enforcement authority of the Financial Industry Regulatory Authority (FINRA), a self regulatory organization overseen by the SEC, whose authority is already being tested in the courts. *Loper* and *Jarkesy* upend long-held assumptions about the authority of federal agencies and will likely lead to a greater cabining of regulatory authority.

For more detailed analyses, visit Dentons Post-Chevron administrative law resource center at https://www.dentons.com/en/insights/articles/2024/july/10/chevron-deference-resource-center

Smart Cities & Connected Communities Thought Leadership

Navigating the tides of sustained infrastructure investment in the US

By Clint Vince, Jennifer Morrissey, Dena Sholk and Alissa Carbonara

It is no secret that US infrastructure has faced decades of underinvestment, notwithstanding that state and local governments across the US spend about half a trillion dollars annually on transportation and water infrastructure.[1] According to the American Society of Civil Engineers ("ASCE"), the investment gap over ten years between projected expenditures for infrastructure and the amount of necessary expenditures to appropriately address our aging infrastructure is nearly US$2.6 trillion.[2] The ASCE also estimates that by 2039, continued underinvestment in America's infrastructure will cost US$10 trillion in GDP.[3]

The passage of the Bipartisan Infrastructure Law (BIL), the Inflation Reduction Act (IRA), and the CHIPS and Science Act ("CHIPS Act") in 2021-22 cleared the way for massive investment in US infrastructure. The US$1.25 billion in anticipated federal spending has catalyzed interest in investment across infrastructure sectors. In the clean energy sector, by the first quarter of 2024, private companies announced US$649 billion in planned investments in clean energy infrastructure[4] (with clean energy and transportation investments reportedly topping US$71 billion in that quarter[5]), while the federal government had announced US$442.6 billion in funding for clean energy investments under the BIL and IRA.

Implementing projects, however, is faced with numerous challenges. States are the most significant beneficiaries under the infrastructure laws, but must work out priorities with local input, and, in some cases, overhaul capital spending plans.[6] Implementation is also taking place against a backdrop of administrative, workforce and coordination challenges.

For example, the US Department of Transportation has cited problems in recruiting, developing, and managing a workforce that complies with the requisite certifications,[7] as well as lack of experience in large scale coordination with other federal agencies.[8] Other challenges include cost and supply issues (materials and labor) in the construction sector and tight municipal finances,[9] layered against a backdrop of unease about the overall direction of the economy, to name a few.

In the energy sector, an added challenge is a regulatory scheme that was designed for an era that no longer exists, and that is incompatible with the pace of modern technological advancements and investment cycles. In this sector, a legislative fix to fundamental jurisdictional barriers erected by an outdated system of energy federalism will be needed to take full advantage of available funding to accommodate the on-going energy transition. In sum, federal funding has been announced, but significant challenges remain to getting projects funded and completed.

A case study: Infrastructure Investment and the Energy Transition

The energy transition stands to be both a major driver and beneficiary of funding from the infrastructure laws. While the political tides ebb and flow between a fossil fuel-based energy system and a lower-emitting one powered by renewables, battery storage, and hydrogen, the

1. https://www.pewtrusts.org/en/research-and-analysis/articles/2023/02/03/state-and-local-governments-face-persistent-infrastructure-investment-challenges; https://www.sifma.org/resources/submissions/funding-and-financing-options-to-bolster-american-infrastructure/
2. https://www.sifma.org/resources/submissions/funding-and-financing-options-to-bolster-american-infrastructure/
3. https://www.sifma.org/resources/submissions/funding-and-financing-options-to-bolster-american-infrastructure/
4. https://www.whitehouse.gov/invest/?utm_source=invest.gov
5. https://rhg.com/research/clean-investment-monitor-q1-2024-update/
6. https://www.brookings.edu/articles/the-start-of-americas-infrastructure-decade-how-macroeconomic-factors-may-shape-local-strategies/
7. https://www.oig.dot.gov/sites/default/files/OIG%20Correspondence%20-%20Challenges%20Facing%20DOT%20in%20Implementing%20IIJA.pdf
8. https://www.oig.dot.gov/sites/default/files/OIG%20Correspondence%20-%20Challenges%20Facing%20DOT%20in%20Implementing%20IIJA.pdf
9. https://www.brookings.edu/articles/the-start-of-americas-infrastructure-decade-how-macroeconomic-factors-may-shape-local-strategies/

sector is nevertheless undergoing fundamental transformation in its role as the backbone of the modern economic ecosystem. Consumer and shareholder pressures, together with a variety of government policies, have prompted most major energy companies, utilities, and manufacturers to incorporate decarbonization, energy-efficiency, or other "green" goals into their respective long-term strategies. Because this trend coincides with the electrification of most industries, it will continue even if the political tide in Washington eases environmental regulations.

The BIL, IRA, and CHIPS Act have further propelled these tailwinds. The BIL and IRA have authorized the Department of Energy (DOE) to greenlight over US$110 billion in funding for 90 Clean Energy Infrastructure Programs across six categories: clean energy demonstrations; federal, state, community & tribal infrastructure; grid infrastructure; loan programs; manufacturing & supply chains; and Research & Development (R&D). Similarly, the BIL and IRA earmarked US$5 billion in federal funding for the Department of Transportation to erect a national network of 500,000 electric vehicle (EV) chargers by 2030. Meanwhile, through 2027, the CHIPS Act authorizes about US$52 billion to advance US semiconductor manufacturing and microchip development, nearly US$170 billion to support quantum computing and Artificial Intelligence (AI), and US$1.5 billion for R&D in advance wireless technologies.

We are still in the early stages, but these funds are already being directed towards workforce development, particularly programs to help students of color, women, and underrepresented groups pursue clean energy careers; the development of entirely new industries; and modernization of the electric grid through the creation of "connected communities of grid-interactive efficient buildings," or "transactive energy systems," to name a few.

Workforce development, as flagged above, will be a recurring theme throughout every infrastructure sector. In the energy sector, this encompasses both new and traditional energy resources as skills of traditional energy workers may be transferrable to other areas such as the water sector, critical minerals extraction or construction. Regarding new industries, the US DOE has awarded several billion dollars to seven regional clean hydrogen hubs to manufacture and develop markets for clean hydrogen. Grid modernization will have many shapes, large and small. The transactive energy systems are peer-to-peer networks delivering energy to one another (*e.g.*, buildings), allowing the suppliers to take advantage of advanced telecommunications, AI technology, and the multidirectional flows from rooftop solar, EV batteries, and other smart or distributed resources to "do more with less."

However, in order to realize the full investment potential of these federal funds, much work remains to be done. First and foremost, improved supply chains and streamlined regulations are needed to sustain development.

Availability of key inputs will drive the direction of the flow of dollars. Currently, supply constraints for critical minerals are increasing as global demand rises for lithium and graphite (vital components for EV batteries), and as other components of clean energy technologies (polysilicon used in solar panels, neodymium used to make permanent magnets in EVs and wind turbines, and battery-grade nickel and cobalt) become less available due to shortages or geopolitical obstacles. The BIL allocates US$3 billion to advance domestic battery production, but without availability of raw materials, these funds may struggle to reach their targeted use.

As for regulatory reforms, infrastructure projects are faced with a complicated and often outdated web of rules, permitting requirements, and fluctuating political and social demands that extend timelines and drive up costs. In the power sector, for example, the existing regulatory construct was devised nearly a century ago in the context of the vertically-integrated monopoly utility provider sending electrons in one direction to end users. Regulations must be updated to allow for DER integration and more dynamic load management practices. Additionally, rules applicable to siting, construction, permitting, ratemaking, and transportation need to streamlined among the various federal, state and local entities with authority over projects, both to minimize delays and reduce costs.

Another major disruptor on the regulatory front comes in the form of the Supreme Court's recent decision ending judicial deference to federal agencies' interpretations of their own enabling statutes. This change not only impacts investor confidence in agency decisions approving infrastructure projects, but also invites an onslaught of litigation from entities of all ideologies. As long

as Congress remains gridlocked, the development of coherent regulation that is needed to enhance infrastructure modernization will be impeded, states will take on an outsized role in innovation regulation, and the clean energy transition likely will be slowed, at least in the short term.

Nevertheless, despite these and other fundamental challenges, reports for 2024 indicate that investment in the energy transition is strong and growing, with clean energy, clean vehicles, building electrification and carbon management technologies drawing the lion's share. This optimism is good news because both urban migration and technological change are outpacing our ability to meet the exigencies that these trends create.

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America's Decaying Water System And How Smart Technology Can Help Fix It

By Edward H. Lindsey, Jr.

On May 31, 2024, the City of Atlanta suffered a major series of water main breaks cutting off available water for several days that left thousands of residents without water, closed down most of its downtown commercial district, silenced its tourist attractions in its usually vibrant convention and tourism area, and sent hospitals scrambling to redirect high risk patients to other facilities. And while the national focus was on Atlanta's woes, local officials around the country know that at any moment, they are likely to be next.

According to a 2023 Utah State University Study, there are over 260,000 reported water main breaks on average per year. The principle cause? Old water mains that have outlived their time. Thirty three percent of US and Canadian water mains are over fifty years old and many are 100 years old or more. Water systems are losing on average 11 percent of their water due to leaks.

The American Society of Civil Engineers ("ASCE") in its periodic review of America's infrastructure has echoed the university study. In 2021, it gave America's water system infrastructure a C-. It reported that we suffer under a water main break on average every 2 minutes resulting in approximately 6 billion gallons of treated drinkable water lost each day.

The scope of how to fix the problem is daunting. There are approximately 2.2 to 2.3 million miles of water mains in the US and Canada. These pipes are generally underground, invisible to the millions of consumers relying upon them for a reliable water source daily.

In fairness, some progress has been made in recent years to address the problem. ASCE's 2021 rating was an improvement to the D rating it gave 2017, and the massive US$1 trillion infrastructure bill passed in 2021 includes US$185 billion devoted to water system upgrades for over 4,000 communities throughout the United States. Aging cast iron and asbestos cement pipes are slowly being replaced by PVC, steel, or ductile iron pipes (although experts differ on which of these is a better replacement in the long run). Still, as reported by Utah State University's study, this is only a fraction of what is needed to bring our water systems up to grade.

So what do we do while we struggle to find the resources and then the manpower to aggressively upgrade the water systems operating – and decaying -- literally under our feet? One thing we cannot do is sit back and play Russian Roulette waiting for the next water main break in our communities. In times of natural and manmade disasters and wars, frontline medical personnel are forced to engage in triage – allocating limited resources to those who need it most. The same approach must be taken to our vital water supply network.

Digital technologies have been available to monitor water systems and report potential water main breaks before they happen – allowing limited resources to be focused on areas of greatest need. However, the use of these technologies is far from universal among water utilities, according to the Utah State University study. These technologies include: Smart Metering (wireless devises measuring water usage and communicating that information to the water utility – 65 percent usage); Pressure Management (regulates water pressure to ensure efficient and sustainable distribution – 34 percent usage); System Modeling (simulation that uses mathematical formulas, algorithms, and physical data to analyze how a water system is behaving under different conditions – 17 percent usage); and Pressure Monitoring (uses physical attributes and pressure equations to simulate the flow of water through a pipe network – 15 percent usage).

In addition, the rapid development of AI can further help water utilities discover and prevent water leaks even faster. "Machine Learning" utilizes artificial intelligence to collect the raw data collected by the existing digital monitors and through a series of algorithms detect water patterns and problems more quickly to repair water mains more quickly and efficiently. At present, however, according to Utah State University's study, only 6 percent of water utilities are utilizing this technology.

The task of stabilizing and upgrading America's water system becomes even more pressing in light of studies showing the rapidly increasing water scarcity by 2050. According to the World Meteorological Association, two-thirds of the world population will feel the impact of climate-related water shortages by that time and Americans will not be immune. Therefore, it is incumbent on us not to waste this vital resource that we capture, purify, and seek to make available to our population. In the long run this will mean upgrading our decaying water pipe network. In the short run, we will need to utilize the existing and emerging technologies available to us to hold and protect what we capture.

The ancient Chinese proverb holds that the best time to plant a tree was twenty years ago. The second best is now. So it is with stabilizing our nation's water system through technology while we upgrade it to face the challenges ahead.

About the author

Ed Lindsey is a Partner in Dentons' Public Policy practice and serves as the head of the Firm's Georgia State Government Affairs team. He has more than 32 years of legal, political and leadership experience, including 10 years as a Georgia state representative and three terms as the House Majority Whip, He also served on the House Appropriations, Judiciary, Education, Ways and Means, and Rules Committees. He has enjoyed a successful and varied legal career spanning a broad range of issues ranging from education regulation, health care, infrastructure, and transportation issues, among others.

The Inflation Reduction Act's Future After the 2024 Election

By Linda Willard

The Inflation Reduction Act (IRA) represents the most significant investment Congress has ever made in addressing climate change, but there is concern among its supporters that a Republican administration and Congress would weaken or repeal it. With high energy prices, Congressional Republicans and former President Donald Trump are sharply criticizing the IRA, pledging to repeal the climate law. Trump's opponent Vice President Kamala Harris strongly supports the IRA.

Notwithstanding the grand promises of the campaign trail, history teaches us that even if Republicans win both the White House and Congress in November, the prospects of repealing the IRA will be much tougher in practice given the bill's economic impacts, particularly in conservative districts and states. In some ways, the debate over the future of the IRA bears some resemblance to the Affordable Care Act (ACA), also known as "ObamaCare," another landmark, albeit controversial, bill passed by a Democratic Congress during Barack Obama's first term. Republicans pledged to repeal the ACA during successive elections, but when they finally controlled both the White House and Congress after the 2016 elections, their efforts to undo the legislative centerpiece of the Obama Presidency fell short.

The Passage of the Inflation Reduction Act

The IRA provides nearly US$370 billion in investments in clean energy. In contrast to other climate change proposals, such as cap-and-trade and clean energy standards legislation that take a punitive approach, the IRA takes an incentive-based approach by offering tax credits and other incentives for clean energy deployment and the reshoring of domestic manufacturing. The IRA provides long-term extensions of the electricity Production Tax Credit (PTC) and Investment Tax Credit (ITC) and makes the PTC and ITC technology neutral after 2024. The IRA also establishes new PTCs for nuclear energy and clean hydrogen and expands an existing carbon capture tax credit (the "Section 45Q" credit). There are additional incentives to encourage clean energy manufacturing. Non-taxable entities, such as states, tribes and municipalities, are now able to avail themselves of the PTC, ITC and other tax credits by electing to receive a direct payment for clean energy projects.

For consumers, the law provides significant tax incentives and rebates for purchases of electric vehicles and energy efficient technologies (*e.g.*, heat pumps, solar panels, electric vehicles). In addition to the tax incentives, the IRA establishes other clean energy programs, such as the Environmental Protection Agency's (EPA) Greenhouse Gas (GHG) Reduction Fund, to address climate change, and it expands the Department of Energy's (DOE) loan authority.

The IRA was a partisan bill from its inception, as the votes in both the House and Senate fell sharply along party lines, similar to how things stood with the ACA in 2009 and 2010, when Congressional Democrats were unable to build support for a more expansive overhaul of the health care industry. Similarly with the IRA, President Biden and Congressional Democrats were unable to advance aggressive climate change policies, such as a Clean Energy Standard, but passed legislation that extended and expanded a variety of tax incentives that some Republicans have supported through the years. With both the ACA and IRA, Congressional Republicans — despite prior support for portions of these bills — unanimously opposed these two measures.

Democrats and arguments in favor of the IRA

The IRA, along with the Infrastructure Investment and Jobs Act, which passed in 2021, represent the cornerstones of the Biden-Harris Administration's clean energy agenda. Since its passage, Democrats have argued that the IRA responsibly addresses climate change, creates millions of good-paying jobs, and re-shores supply chains. The IRA, according to the Rhodium Group, is projected to reduce economy-wide GHG emissions 32-42 percent below 2005 levels by 2030, representing

a 7-10 percentage point improvement compared to a world without it. As of August 16, 2024, non-partisan advocacy group E2 tallied 334 new clean-energy projects during the IRA's lifetime, with private investments of US$126 billion across 40 states and an estimated 109,278 new jobs.

Treasury Secretary Janet Yellen, in a speech at a North Carolina community college on September 5, warned that repeal of the IRA would have a devastating impact on the economy of states, particularly the more rural, Republican-leaning states. She stated, "[P]rematurely repealing energy tax credits, particularly those which were used to justify investments that already broke ground, would undermine private investments and stop development that is already ongoing....[A] full repeal would create a worst-case scenario where we would have spent billions of taxpayer dollars and received next to nothing in return.[1]"

Republicans and arguments against clean energy measures in the IRA

Republican criticism of the IRA is focused on a variety of issues. First, Republicans contend that the IRA's clean energy measures, along with other Biden administration policies, are driving up energy costs by artificially promoting renewables at the expense of more traditional fossil fuel resources. Second, Republicans are concerned that the IRA, through incentivizing additional renewable penetration, is undermining grid reliability. Third, Republicans assert that the IRA is contributing to US dependence on China and other hostile nations for critical minerals necessary for electric vehicles and other clean energy sources. Fourth, some Republicans contend that tax incentives, such as the PTC and ITC, distort the market and force the phase-out of baseload sources of power, such as natural gas and coal. Finally, some Republicans continue to claim to be skeptical regarding the human contribution to climate change.

Since the start of the 118th Congress, House Republicans have made several attempts to repeal various clean energy provisions of the IRA. Members of the small but outspoken wing of the House Republican party known as the Freedom Caucus have advocated to repeal the IRA in its entirety as part of the debt ceiling discussions. In April, House Republicans voted 217-215 in favor of a debt ceiling bill that would repeal most of the clean energy provisions of the IRA. The controversial "Limit, Save, and Grow Act" did retain, however, some clean energy provisions from the IRA. Republican members from agricultural-intensive states fought to protect the biofuels, sustainable aviation fuels, and clean fuels tax incentive, and Republicans from oil and gas-rich states advocated to retain the Section 45Q carbon capture credit. H.R. 1, the Lower Energy Costs Act, which passed the House in March, would claw back the US$27 billion tied to the EPA Greenhouse Gas Reduction Fund and would repeal the IRA's fees on methane emissions from the oil and natural gas sector as well as a set of programs that provide rebates and training for energy-efficient appliances.

Former President Donald Trump and his running mate Senator JD Vance have repeatedly criticized the IRA, referring to it as the "Green New Deal," but there has been no clear indication that a second Trump administration would seek to repeal the IRA's key tax credits. The biggest threat to the IRA in a Trump Administration would not be full repeal but a potential reduction in credit levels or years to accommodate the extension of the Trump era tax cuts, which are set to expire after 2025.

Challenges to Repealing the IRA: Post-2024 Election Outlook

Although not one Republican voted for the IRA, more than half of the projects that will benefit from the bill's tax credits and incentives are in predominantly Republican states, according to a study by the Rocky Mountain Institute. Several Republican governors, such as Gov.

1. https://home.treasury.gov/news/press-releases/jy2561

Brian Kemp (R-GA), are leveraging the IRA, along with state incentives to attract clean energy and manufacturing plants in their states. There may be push-back from these states if Republicans seriously try to undermine the IRA's incentives.

The greatest threat to the IRA is a scenario in which Trump wins the White House and Republicans take both the Senate and House in November. There would be tremendous pressure to extend the Trump-era tax credits, which would come at a cost, making the US$370 billion of credits and incentives in the IRA vulnerable to repeal in order to at least partially pay for those tax cuts. Short of outright repeal, Republicans could seek the repeal of the IRA's more politically vulnerable provisions such as the efficiency standards, methane fee, GHG reduction fund and potentially the clean electricity PTC.

There are some measures that are politically "safer" than others, like the PTCs for biofuels, clean hydrogen, carbon capture, and nuclear energy. If the ACA is any indication, however, Republicans are unlikely to be successful in repealing the IRA, and any changes to the law will be relatively minor. Since the passage of the ACA, Republicans have voted more than 60 times to repeal the measure, but even with Republicans in control of the Congress and the Presidency, Republicans were unsuccessful in their efforts.

Looking forward to 2025, there will likely continue to be a great deal of rhetoric about the IRA and clean energy with the swearing in of a new President and members of Congress, regardless of who wins. Republicans will likely continue to tout the ways in which their energy policies, in contrast to the IRA, will provide abundant, reliable and affordable energy for American families. Democrats, on the other hand, will likely discuss how the IRA will meaningfully address climate change without sacrificing affordability or reliability. The IRA and clean energy policy on its own will not drive the ultimate results of the election, but it will be important to the context of climate and energy policy going forward.

About the author

Linda Willard is Counsel in Dentons' US Energy practice where she concentrates on energy, environmental, and infrastructure policy. She previously served as Counsel to the US Senate Committee on Environment and Public Works. Linda also is the Executive Director for the Dentons Smart Cities & Connected Communities Think Tank.

Maritime: The Next Sustainable Mobility Revolution

By Andrew Snowhite

The mobility revolution has primarily taken place on our roadways and in the skies; however, there is massive opportunity for it to positively impact our ocean and waterways too. This is reflected in potential business innovations, job creation, lower carbon emissions, less pollution, and enhanced human health.

Why? Maritime trade accounts for almost 90 percent of global goods and is projected to triple by 2050. In the United States, ships move almost 70 percent of the country's international freight trade. Over 40 percent of the world's population lives within 100km of a coastline, a percentage that will continue to grow. And most megacities are located on the coast. Simply put, the future of transportation isn't anchored beneath, but upon the waves.

Innovative companies and cities already are testing and implementing new strategies and technologies to meet market needs and a booming population, while also aiding in the race toward net zero.

This is also true for the world's new coastal cities, where it is imperative that sustainable maritime strategies and infrastructure are included from inception. Perhaps the most ambitious example of the energy transition and maritime mobility is NEOM, in Saudi Arabia. The US$500 billion coastal project covers an area over 25,000 km2 and aims to be the smart and sustainable economic region of the future, driven by clean energy (more on NEOM below).

Following are highlights of the key trends being explored and implemented in the marketplace.

The Energy Transition

Like most industries, maritime mobility is being affected broadly by the energy transition. This is happening in the form of organizational net zero commitments, reactions to new or potential regulations, shifting risk models, novel sources of capital, and entrepreneurial disruptors.

Industry leaders recognize the impact. Maritime shipping is responsible for about 3 percent of global greenhouse gas emissions each year, at least on par if not higher than airlines. That's in addition to various other harmful emissions produced like sulfur and nitrogen oxides (9 percent and 18 percent, respectively). Consequently, in 2018 the International Maritime Organization set the goal to cut greenhouse gas emissions by 50 percent by 2050, relative to a 2008 baseline.

Two of the most exciting and promising aspects of the energy transition are electrification and green hydrogen.

Similar to cars, all-electric or hybrid engines can power ships while producing lower or zero emissions. However, this requires large scale batteries as well as widespread charging infrastructure, especially for long haul voyages. Already, in Norway, the all-electric ferry Basto Electric is running multiple electrified ships across Oslo Fjord, the country's busiest crossing. The Washington State Ferries, which operates the largest ferry system in the United States, is in the process of transitioning to an emission-free fleet through a hybrid electric system (building new vessels, converting old vessels, and electrifying terminals).

Green hydrogen, or hydrogen fuel that is produced using renewable energy, is extremely exciting due to its potential industrial scalability and cost-effectiveness. Like electrified ships, it will require new infrastructure and either new engines or retrofitted vessels. Incremental steps are being taken as well, such as Hyundai Motors designing small yachts fully powered by their hydrogen fuels cells. On a larger scale, MSC Cruises is starting to partially integrate hydrogen-fuels into their Explora Journeys branded cruise shops, as is Viking Cruises.

And it's not only the fuel that a ship is using while at sail that needs to be considered, but the time it's docked and the associated infrastructure and operations. The Port of Miami has committed to adding additional shore power hookups for cruise ships to utilize while docked, instead of relying on traditional diesel generators for power. It will be the first port on the east coast to allow multiple ships to plug in simultaneously. On the other side of North America, the Port of Vancouver offers up to a 75 percent discount on harbor dues for shipping lines that use shore power. To their south, the Port of Long Beach already is powering 17 percent of its cargo-handling equipment electrically (the largest fleet in the United States), on its way to a 100

percent emissions-free goal by 2030. And the Port of Los Angeles is utilizing hydrogen-powered fuel cell electric vehicles, and has multiple hydrogen fueling stations, as part of its Clean Air Action Plan.

These types of programs will be accelerated across America as ports are primed to receive billions of dollars in incentives and investments due to recently enacted legislation. The Inflation Reduction Act includes US$3 billion to reduce air pollution and advance zero-emissions technology in ports, which is in addition to the US$17 billion in the Infrastructure Investment and Jobs Act for upgrading ports and crucial waterways.

Greenfield Coastal Cities

The incredibly ambitious NEOM project (mentioned earlier) endeavors to integrate clean maritime mobility at scale via the NEOM Green Hydrogen Company. It plans to do so by capitalizing on the country's low-cost hydrogen resources and renewable capacity (specifically wind and solar). Not only is it preparing to begin producing green hydrogen at scale from 100 percent renewable sources by 2026, but also it will be based in a floating city called Oxagon that features a port and logistics network for global distribution (more on Oxagon below).

Technology Facilitated Innovations

Many of the technology innovations impacting other industries are being adapted to maritime mobility as well, resulting in increased efficiency, lower environmental impacts, job creation, and new business models.

Artificial intelligence (AI) is facilitating route planning, driving dynamic pricing, and powering autonomous vehicles. Automated planning at ports streamlines loading and offloading, reduces the risk of human error, and speeds up scheduling and rescheduling. In 2022, a fully autonomous ship developed by IBM called The Mayflower crossed the Atlantic. And it is not only big tech that's innovating. For example, the Hong Kong startup Clearbot is developing AI-powered electric and self-driving boats for pollution recovery, surveillance, and cargo delivery.

Another startup that's received considerable attention is The Ocean Cleanup. Its mission is to tackle marine pollution using technology that captures plastics, which costs the world an estimated US$6-19 billion per year. Not only is it capturing plastic, but through a partnership with Kia, it also plans to provide plastic that will be used in the car company's production process. Other car companies are employing similar circular economy strategies. Both BMW and Ford have announced plans to use recycled fishing nets in future EVs (BMW's NEUE KLASSE EVs and the Ford Bronco Sport). Other startups are tackling plastic pollution from the source, such as ENSO that is developing tires for EVs that reduce tire plastic pollution and reduce carbon emissions (ENSO won CoMotion's 2021 L.A. New Mobility Challenge).

A variety of other new mobility technologies are being adapted to marine transport as well. Similar to bicycle or scooter micromobility sharing companies, PADL is a Florida platform that facilitates self-service paddleboard and kayak rentals. And for the NetJets crowd, U-Boat Worx offers shared ownership for personal submarines!

Floating Cities and Residences

Humans have long dreamt of living at sea, or even under the sea. Aside from a few underwater hotels and restaurants, we remain far away from permanent underwater dwellings. However, the idea of building fixed or mobile houses or developments at sea, is starting to become a reality.

This includes the progression from cruise ships as short-term vacation dwellings to offering permanent residences, like the MV Narrative that's set to launch in 2025. Billing itself as "the world's first environmentally sustainable private residence ship," it is slated to have 547 private residences and an estimated US$1.5 billion in sales. The idea of houseboats is being reimagined as it relates to climate change and resiliency too. In 2019, London-based architect Wojciech Morsztyn designed an award winning ocean-home concept called Ocean Community, a "future mobility vision to deal with rising sea levels."

And as noted earlier, Oxagon at NEOM is envisioned as a fully automated next-generation port. Upon completion it would be the largest floating structure in the world, powered by clean energy and housing almost 100,000 people.

Looking Forward

The maritime mobility revolution has massive potential for positive environmental and economic impact. Decarbonizing ships and ports significantly contributes to local and global net zero commitments, while also improving human health (including the 40 million Americans that live within three miles of a port). The development and implementation of new technologies coupled with widescale retrofitting will create a wide variety of jobs. And new funding will drive innovation and investment in smart and sustainable developments and operations.

Keep your eyes on the sky...but don't forget the waves.

About the author

Andrew Snowhite, the Chief Strategy & Sustainability Officer of Snowhite Strategies, has 20 years of global experience fostering business growth through innovating scalable green and blue initiatives across the built environment, real-estate, and consulting sectors. He shapes material risks into strategic ESG opportunities, scales multistakeholder programs through partnerships, and leverages environmental assets to strengthen brands.

This article was previously published in CoMotion News, https://comotionnews.com/2023/03/05/the-next-sustainable-mobility-revolution-maritime/

The EV Race, and a "Soft Landing"

By Matthew McDonnell and Rebecca Kennedy

In the US, the EV revolution is now the EV race.[1] The federal government and several state legislatures have enacted a significant amount of Electric Vehicle ("EV") related legislation in the hope that various regulations and incentives will expedite wider deployment of EVs. All new cars sold in California starting in 2035 must be zero emission vehicles.[2] The EPA's proposed emissions standards, which were finalized in March of this year, are aimed at ensuring that by 2032, 67 percent of new light-duty vehicles and 25 percent of new heavy-duty trucks sold are electric.[3] Illinois' Electric Vehicle Charging Act, a "Right to Charge" law, requires that newly constructed single-family residences and renovated multi-unit residential buildings have at least one EV capable parking space.[4] Other states have or will soon follow suit, which will prompt many developers and property owners to quickly invest in EV capability and equipment. On the federal level, the Biden Administration's Inflation Reduction Act provides major incentives and funding for the decarbonization of the American transportation industry.[5]

The EV race could not come at a better time for climate. A typical passenger vehicle in the United States emits roughly 4.6 metric tons of carbon dioxide per year[6], atmospheric carbon dioxide reaches new highs every year,[7] and the transportation industry has held the largest share of direct greenhouse gas emissions in the United States since 2021.[8] The EV race could mean cleaner air overall for many cities, as well as economic stimulation and job creation across the United States.[9]

Whether the EV race comes at a good time for the majority of Americans is uncertain. Moody's Analytics Chief Economist, Mark Zandi predicts that the US economy will experience a "soft landing" in 2024, with inflation moderation, declining interest rates and

1. The EV revolution refers to the technological revolution that has led to development of electric vehicles, while the EV race is intended to refer to push for policy reforms, legislation and regulations designed to increase EV ownership, utilization, and infrastructure
2. Cars and Light Trucks are going Zero – Frequently Asked Questions, California Air Resources Board, (2023), https://ww2.arb.ca.gov/resources/documents/cars-and-light-trucks-are-going-zero-frequently-asked-questions
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6. Tailpipe Greenhouse Gas Emissions from a Typical Passenger Vehicle, United States Environmental Protection Agency, https://www.epa.gov/greenvehicles/tailpipe-greenhouse-gas-emissions-typical-passenger-vehicle
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8. Sources of Greenhouse Gas Emissions, United States Environmental Protection Agency, https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions
9. But see ee David Ferris, Energy Wire, LA Deaths Increase in an all-EV future –study, (Jun. 10, 2024) https://subscriber.politicopro.com/article/eenews/2024/06/10/la-deaths-increase-in-an-all-ev-future-study-00161530 (citing a recent study that large scale EV usage might worsen air quality for disadvantaged communities in certain parts of Los Angeles, due to geography and the increase in other pollutants associated with EVs

wage growth.[10] Economic growth may not be quite as strong, but spending continues to grow, as does savings among middle to high income households.[11] Overall, real wages are increasing and purchasing power is improving, but asset prices are up. What this "soft landing" means for the fast-paced EV race is that wary consumers, reluctant to purchase expensive EVs during an economic slowdown,[12] are likely to continue to exercise caution. *Car and Driver* magazine reports that the cheapest new EV on the market in the US, the Nissan Leaf, starts at US$29,280.[13] By contrast, the cheapest new car in the US market, the Nissan Versa, starts at US$17,405.[14] Cheaper EVs from China might provide an affordable alternative for American consumers, however, Chinese EVs are now subject to a 100 percent tariff rate to protect American manufacturers.[15] Even with the tax credits provided under the Inflation Reduction Act for both new and used EV purchases,[16] the decision to make the switch to an EV may come at a cost that is out of reach for many. J.D. Power estimates that, depending on what equipment is already installed where you live, EV purchasers should be prepared to spend US$1,200 to US$2,500 to install EV charging capabilities.[17] The availability of public EV charging stations within a reasonable distance from the owner's home or place of work varies widely. Some areas boast a myriad of EV charging locations at places of work, schools, shopping malls or even local grocery stores, while numerous communities across the country have minimal access to EV charging stations.

This situation poses significant challenges for underserved communities that could greatly benefit from more readily accessible electric transportation. Environmental Protection Agency research shows that air pollutants play a significant role in premature deaths and various other health complications in underserved socio-economic communities in the United States.[18] Additionally, people of color and underserved communities more often live in close proximity to major industrial sources of air pollution, which increases the risks of related health complications in these communities.[19] However, "charging deserts," i.e., areas with little to no public charging station access within a reasonable distance, commonly occur in low income and underserved communities,[20] and often follow racial patterns as well as socio-economic patterns. For example, in Chicago, as of 2018, public EV charging stations were most commonly found on the city's North Side; home to more affluent and mostly Caucasian communities,[21] while 60 percent of Chicago's other communities at that time, mostly on

10. From Slowcession to Soft Landing, Risk Management Association, (Feb. 28, 2024), https://www.rmahq.org/blogs/2024/from-slowcession-to-soft-landing/?gmssopc=1
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16. The Inflation Reduction Act of 2022, United States Internal Revenue Service, https://www.irs.gov/inflation-reduction-act-of-2022
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the South Side and West Side, lacked public EV charging capabilities entirely.[22] Therefore, the populations that could most benefit from broad deployment of EVs not only are those with the least economic means to afford an EV, but also have the most limited access to electric vehicle infrastructure. Increased funding and legislative incentives can aid in making the transition, but these inducements still might not be enough.

As an alternative, many Americans are now calling for clean public transportation, rather than increased support for the electrification of personal passenger vehicles. Given the pace at which EV legislation is being passed, along with the impending "soft landing," investment in clean public transportation may be the most equitable and viable solution in the short term. One way to better incentivize electric public transportation might be to shift IRA funding away from personal EVs, and instead direct it toward the public transit system. By investing in electric public transit, all citizens would have equal access to its benefits without having to front the hefty investment in a personal EV. A focus on public transportation could streamline the manner in which EV tax credits and related incentives currently operate, which requires significant economic investment from both private citizens and the federal government. The transportation industry's evolution will more equitably improve all communities if it does not depend on a community's socio-economic profile.

Whether the EV race will continue to charge forward at the same pace we have seen to date, even as we slog through the "soft landing," is uncertain. Even setting aside the heated political debate over the future of EV tax credits, the need for significant upfront investment makes the EV race an expensive undertaking for both the Federal Government and consumers and is riddled with an economic determinism that all but ensures that disadvantaged communities who most need and would most benefit from the EV race will be left behind unless there are changes to how the race is run.

About the authors

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22. Audrey Henderson, In Chicago, 'Charging Deserts' Part of Racial Divide on Electric Vehicles, Energy News Network, (December 14, 2020), https://energynews.us/2020/12/14/in-chicago-another-roadblock-for-would-be-ev-drivers-charging-deserts/

Smart Agriculture: Biologicals and management of pests and disease – avoiding fiascos

By Walt Duflock

Emphasizing the importance of global connectivity for agritech innovators and their supporters, the Western Growers gather each year with New Zealand-based AgriFoodTech consultancy Wharf 42 to take on issues associated with modernization of global agriculture. Among other things, they examine changing regulatory, technological and consumer environments, and discuss responses to a rapidly-evolving global macroeconomic environment. Among other issues, the group grappled with calls for "less chemicals, more biologicals" in the management of food production. The 2024 Salinas Biological Summit brought together experts, technologists, innovators, and government officials from the global agricultural sector to discuss the shifting mix of chemistry and biological solutions that are currently in play and where things appear to be going in the future. This year's event focused on one key question – *what is the state of play in agricultural inputs to manage pests and disease, and where do we need to invest and make progress for the space to continue to grow?*

The topic is more important than ever for several reasons. First, venture capital for the innovators has seen a huge drop in recent years – from US$53 billion in 2021 to US$16 billion in 2023. This reduced investment means more startups will struggle for badly needed capital to fund R&D and product rollouts for biological solutions, which are highly capital-intensive.

Second, from the hundreds of conversations I've had with growers over the past year, it is clear that there is concern among growers (the eventual customer of these products, whether through direct or channel sales) about past efforts to sell solutions in the biological space. This is not surprising given the history of over-promise and hype of some products and technologies that did not meet reality. As a result, many growers view product promotions with skepticism, and are now requiring that biological solutions both prove a positive impact AND show the grower how that positive impact improves the economics of their operation.

Third, the way that most startups will demonstrate positive impacts is through field trials and case studies. Field trials are required for three stages: (1) does it work (at all?) and in what crops and conditions; (2) does it work at scale (repeatedly performing as expected, and what range of outcomes; and (3) the most important – when the grower tries it on production acreage, what is the result for their economics against a recognized baseline that they worked to develop with the startup / innovator.? Currently the industry at large is not doing a great job of delivering test results across all 3 stages that are transparent and scaling to what is needed, *i.e.*, thousands of tests per year.

Western Growers and its partners are focused on all 3 of these key areas. For capital, we work with our venture investor partners to help them conduct the appropriate due diligence to identify snake oil salesmen from legitimate operators. This is a tough process, especially because entrepreneurs can be very persuasive. We work together to identify projects that are worthy of funding. To address grower skepticism, Western Growers is working with our grower members and automation startups on case studies that delve deep into operational integration and grower economics. We published our first effort on Carbon Robotics earlier this quarter and the response from the market (both growers and startups) has been overwhelmingly positive. We have more automation case studies in the queue and we are on track to get similar efforts in biologicals out later this year. The space Western Growers is focused on is bio-controls, or biological solutions that can complement or reduce the usage of chemical inputs, especially those that are under pressure from regulators and large buyer specifications.

The pre-cursor to the case study is often a lengthy set of field trials and iterations. For this, Western Growers is collaborating with our partners at the University of California Agriculture and Natural Resources to get all 3 phases of testing scaled up. For phase 1, we plan on using and sharing more data on the land grant acreage, the community college acreage, and any other acreage that can be used that is under University control in coordination with Co-Op Extension resources. Once the solution is proven to work, this same group of collaborators can help test whether it works at scale, including testing in different soil types with different agronomic and water quality conditions to determine if results are consistent. If a solution is proven to work in multiple conditions, that solution has earned the right to test on production acreage to confirm grower economics. The key here is that growers can do the work on land that is outside of their current operations but exhibits similar conditions, which means that they do not need to commit any resources to testing within their operations or subject it to unnecessary risk. The goal is to develop a transparent set of activity metrics in terms of all 3 phases on the way to successful phase 3 tests that are case study worthy.

The effort to incorporate scale into key parts of the biologicals segment is a key strategic effort for Western Growers and our partners. Growers are under massive pressure to use fewer chemicals, and in some cases, chemistry-based solutions are being restricted or banned. Our efforts to develop next generation biological solutions faster and help them commercialize can help reduce some of the pressure that growers are facing.

For more information on the testing program, please feel free to contact innovation@wga.com and to view test results and case studies at https://www.platform10.ag/ and https://www.wga.com/innovation/case-studies/

About the author

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Student Note: Urban Parks: Who Benefits?

By Grace Charles

The myriad of benefits that urban green spaces offer city dwellers is often juxtaposed with a stark reality: their uneven distribution and restricted accessibility creates a troubling inequity, leaving certain communities without access to the valuable health advantages that these green sanctuaries provide.

"Urban green spaces" refers to areas within cities that are characterized by natural elements, and generally includes public parks, forests, gardens, and other vegetated areas.[1] Such green spaces support natural ecosystems, mitigate air pollution, improve water quality, promote healthy outdoor activities, and, for some metropolitan residents, are their first and only contact with nature.[2] In addition to vital mental, physical, and environmental health benefits, they also provide respite from heavily populated areas and foster social cohesion among city dwellers.[3] Some studies report reduced crime and vandalism where vacant lots and buildings are replaced with green spaces.[4] The importance of urban green spaces gained significant recognition by city governments in the early 20th century, largely due to rapid industrialization and population growth which subsequently led to increasing public health issues.[5]

It's no secret, however, that urban green space inequity has been and remains a persistent issue in cities across the US. A substantial body of research over the last twenty years has found strong ties between affluence and race, and access to urban green spaces. A 2019 study[6] of 10 US cities found that higher income and academic achievement are strongly correlated with access to green spaces. Recent studies have also shown that urban minority groups have access to fewer parks and fewer acres of park per person.[7] The parks that these groups have ready access to tend to be lower quality parks, with less concentrated vegetation and minimal upkeep by the city.[8]

Why is there such a disparity in urban park accessibility? While there is no one answer, it is likely the result of a combination of factors, such as historical disinvestment, racially discriminatory land use and development patterns, structural racism as it relates to resource depletion, park planning and funding, and gentrification.[9] City governments decide the location, structure, and landscape architecture of parks, but have increasingly relied on funding from state nonprofit organizations, state agencies and the federal government in financing such parks, rather than on tax-based funding. These less-local, often privatized organizations, make planning and investment decisions based on their own priorities, which may disproportionately favor affluent and whiter neighborhoods within cities where their donors tend to reside.

One of the biggest points of contention with urban green space equity is the use of urban parks by homeless city dwellers, a demographic that relies on urban green space and public city parks more than housed people do. Cities often regulate urban green spaces in a way that compounds disparities in city park accessibility by restricting the hours parks are opened and building defensive architecture within the parks. A 2018 survey of 100 of the largest cities in the country reported that the majority of parks close from dusk until dawn, and several others close at 11 p.m.[10] There are few exceptions, however, including Central Park, which closes at 1 a.m., and

1. https://www.mdpi.com/1660-4601/18/16/8420
2. https://www.mdpi.com/1660-4601/18/16/8420; https://www.upi.com/Science_News/2019/01/17/Study-Access-to-urban-green-spaces-favor-the-rich-educated/7741547742967/
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4. Lee, Jordan and Horsley, Value of urban green spaces in promoting healthy living and wellbeing: prospects for planning, Risk Management and Healthcare Policy (2015), available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4556255/
5. https://www.sciencedirect.com/science/article/abs/pii/S0195925514000754?via%3Dihub
6. https://www.sciencedirect.com/science/article/abs/pii/S0169204618307710#preview-section-snippets
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9. https://www.fs.usda.gov/research/treesearch/57094
10. https://www.bloomberg.com/news/articles/2019-06-14/why-do-parks-close-at-night

the National Mall, which is open at all hours.[11] Major US cities have ordinances and regulations in place that close public parks overnight and impose civil penalties and, in some cases, even imprisonment or other city enforcement actions against those who remain in parks outside of the permissible hours.[12] This year's Supreme Court decision upholding an Oregon ban on sleeping outside is sure to have ripple effects that will further disadvantage these communities. These pervasive regulations specifically impact homeless people, as many cities often do not have beds or space available in their homeless shelters due to overcrowding. As such, many homeless people do not have a safe or more comfortable place to sleep than on concrete city streets, and even this option is facing challenges as cities and communities struggle to deal with increasing homeless populations in recent years. The recent Supreme Court decision upholding an Oregon city's effort to curb homeless occupation of public property by banning camping on public property is sure to have ripple effects that will further exacerbate the problem in many communities.[13]

Some cities with large homeless populations use defensive or "hostile" architecture in their parks and public spaces to deter homeless individuals from sleeping on benches or using certain areas for shelter. For example, New York and Philadelphia implemented bench dividers on benches in Bryant Park and Rittenhouse Square, respectively, to prevent people from lying down on them.[14] Other examples include spikes on window ledges or other flat surfaces, rocky pavement, sprinklers, or slanted benches at bus stops, to name a few.

The controversy between urban park access and homeless city dwellers' use such green space may be, at its core, rooted in the conflicting ideologies of the use of nature for leisure versus the use of nature for survival. Cities often plan, build, and regulate the quality of and access to public parks in a way that makes it more difficult for homeless people to sleep and survive, but easier for higher income residents (often non-minority groups) to access it during the day. And cities likely do so because of the persistent view that the use of nature for survival inherently devalues its use for middle and upper-class leisure.[15] This dichotomy is clearly laden with deeply complex and intricate issues, such as the race, socioeconomic status, and the values society oftentimes inadvertently accords to certain groups of people. Recognizing this heart of the matter is a first step in addressing the inequities. According to the World Resources Institute, actions taken to remedy green space inequity will not only benefit disadvantaged communities, but will also have economic, health and safety benefits for the broader community.[16]

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11. https://www.bloomberg.com/news/articles/2019-06-14/why-do-parks-close-at-night
12. *See, e.g.*, https://www.nycgovparks.org/rules/section-1-03 (fines of up to US$200 and one night in jail for violation of park hours)
13. City of Grants Pass, Oregon v. Johnson, Case No. 23-175 (2024)
14. https://billypenn.com/2022/08/03/rittenhouse-square-benches-hostile-architecture-philadelphia-homeless/
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16. https://www.wri.org/insights/green-space-underestimated-tool-create-more-equal-cities

Engage with the Think Tank

Upcoming discussions

Over the next year, the Think Tank will take up topics including:

- What the proliferation of data centers means for the power sector
- Hot topics in transportation infrastructure
- Reliability and critical infrastructure
- Urban planning and equitable access to housing
- Climate adaptation: programs and technologies for a sustainable future in cities and communities
- Tribal microgrid projects
- Private sector and university smart city pilots

Think Tank members are invited to propose topics for discussion and to submit short articles and thought pieces on any topic related to infrastructure modernization and smart and connected cities and communities for inclusion in Think Tank reports. We also invite members to share work published elsewhere or events that might be of interest to other members. Please reach out to any of our Think Tank leaders to share your topic ideas.

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