

Reaching Out with a Digital Helping ‘Handprint’ to Decarbonize Every Sector

“*The future has arrived—it’s just not evenly distributed yet,*” observed writer William Gibson, whose observation was cited during the Environmental Law Institute’s November 17 webinar, “Digital Solutions to Climate and Water Challenges,” the first in a series that will serve to continue exploring the dynamic intersection of policy and cutting-edge technologies begun in 2019 with ELI’s inaugural GreenTech conference in Seattle.

Although unevenly distributed now, technologies critical for decarbonizing the U.S. economy could be deployed much faster if federal and state policymakers adopted policies supporting the wider use of information communication technology (ICT) applications that are already boosting the sustainability of sectors as diverse as energy, manufacturing, transportation, buildings, water treatment, agriculture, and others, the webinar’s experts concurred.

Moderator Steve Harper, Intel’s Global Director for Environment and Energy Policy, framed the discussion using two key concepts: the environmental “footprint,” defined as a sector’s additions to climate change, water scarcity, and other problematic effects, and the “handprint,” or help digital ICT can provide to every other sector in subtracting from their footprints as the world heads toward net zero. As an electricity consumer, ICT has a “footprint,” but the sector also has a much larger potential “handprint,” though it is often missed because ICT’s contribution is “horizontal,” affecting all sectors, and therefore is “easy to miss,” Harper said.

But that blind spot may not exist much longer with the formation of the Digital Climate Alliance (DCA) whose members include Schneider Electric, Trane Technologies, and Johnson Controls, not typically regarded as ICT companies but allies nonetheless because they are extensive users of tech in their sustainability solutions. While public policy is a key enabler of ICT markets and applications, there is “no silver bullet,” Harper said. He then introduced the other webinar participants.

Speaker Brad Townsend, the Managing Director for Strategic Initiatives at the Center for Climate and Energy Solutions (C2ES), began by describing a 2019 C2ES report, *Getting to Zero: A U.S. Climate Agenda*, that details steps needed in transportation, oil and gas, manufacturing, mining, high-tech, buildings, and other sectors to achieve carbon neutrality. “Digitalization” was recommended as a key cross-sectoral need, Townsend said. He highlighted specific “handprint” examples, such as ICT’s enabling improved renewables integration onto a “smart grid,” 3D printing in manufacturing, and Measurement Reporting, and Verification technologies for digital supply chain management, enabling more precise identification of low-carbon products.

Policy measures are needed because financial, technical, regulatory, and other barriers exist, Townsend said. For example, rural areas lack broadband, electric vehicle recharging infrastructure is deficient, and cost recovery rules for utilities are biased toward new capital investments rather than operational improvements. He offered examples of critical policies, including the need for Congress and the Department of Energy to prioritize Research, Development, Demonstration and Deployment efforts that enable systems-based efficiency

through digital technologies and for federal, state, and local governments to “lead the way” by requiring the procurement of digital solutions and communicating successes.

Speaker Anna Pavlova, a Strategic Adviser with Coefficient, which founded the DCA, noted that the World Economic Forum estimates ICT could cut carbon emissions 15 percent by 2030. ICT has enabled a previously one-directional siloed energy sector to connect the disparate parts into one integrated and interactive ecosystem, she said. Amid such megatrends as decarbonization and electrification, ICT is shifting business models toward “services,” such as “cooling” rather than selling consumer goods, and “soon we’re going to have carbon removal as a service,” she suggested. With machine learning as the next phase in digitalization, both products and a whole building’s HVAC operations can be optimized, she said. Emerging now are such ICT developments as “digital twins” of buildings’ operations, “transactive systems” that can verify emission reductions are real and calculate the amount of carbon “embodied” in a building’s materials, and “Julia computing,” a machine learning system that “can optimize just about anything” and is a compulsory tool for anyone in sustainability today.

Like Townsend, Pavlova called for policies to accelerate ICT deployment, which is lagging in key sectors, including a “woefully unprepared” manufacturing sector that DOE could bring into the digital age. But fundamentally, policy must begin by adopting decarbonization as the overarching goal and then identify the tools to support that goal, she said.

Speaker Nanette Lockwood, the Global Director for Climate Policy at Trane Technologies, described her company’s Gigaton Challenge aimed at reducing its own and customers’ emissions by a billion metric tons by 2030. In closely examining electricity use, Trane developed a calculator to better understand the impacts of its products and its customers’ emissions. Trane realized that there is a big difference between the average emissions generally used to measure carbon footprints and marginal emissions rates, which represent the change in overall emissions tied to electricity use. To enable the accurate calculation of buildings’ emissions, state public utility commissions and the Federal Energy Regulatory Commission should require utilities and wholesale market operators to provide real-time emissions and pricing data to end use customers so buildings can optimize emission reductions by matching their electricity consumption with renewable sources.

The final speaker, Will Sarni, Founder and CEO of the Water Foundry who shared Gibson’s quote, presented a Water Strategy Maturity Model that maps where clients in the private water sector are on a “maturity curve.” Early maturity encompasses “compliance and water efficiency” goals. But as companies mature further, they adopt risk management to ensure a license to operate, making *ad hoc* innovative investments and embracing water stewardship, with watershed-level actions, value chain management, and stakeholder engagement. Now, however, water strategy aimed at business growth is driving the digital transformation of the deeply maturing water sector, Sarni said, citing real-time water quality and quantity digital monitoring technologies and naming various companies engaged in the transformative “handprint” approaches to delivering diverse water-related sustainability values. Clearly, the future is fast becoming more widely distributed.