Potential benefits for the energy sector include digital applications that could generate US$80 billion in annual savings for the power generation and distribution sector, or about 5% of its total costs.

5G Impact on the Energy Sector

Key challenges faced by the energy and electric utility industry include increasing energy demand by developing countries; growing levels of electrification; utilization of renewable energy creating significant demand side pressures; increasing operational complexity due to the integration of new energy sources; a shift from the traditional utility business model towards a new decentralized model; Environmental, Social, Governance (ESG) performance reporting and regulatory pressures; energy wastage; competitive pressures from global markets; outdated extraction, generation and distribution plants and processes; increased risk of natural disasters due to climate change; and physical and cyber attacks.

5G will enable innovative applications that could optimize energy extraction and distribution while also addressing the additional complexities introduced by decentralized grids with multiple energy sources. These digital 5G solutions include AR/VR-enabled diagnostics and worker training; smart grids that leverage AI and predictive analytics to automatically react to changes in power demand; smart meters that provide real-time data on consumption and generation; remote drone surveillance to manage security; supervisory control and data acquisition (SCADA) systems that proactively detect infrastructure faults; and digital workforce management with seamless real-time collaboration.

These 5G solutions will enable accurate demand predictions and supply adjustments from distributed grids; reduce peak energy demand; optimize energy extraction and distribution operations; reduce downtime through improved diagnostics and maintenance; cut operational expenditures; enhance worker training and safety; streamline end-to-end logistics; reduce electricity theft and wastage along the supply chain; help standardize regulatory compliance through digitization; and improve physical and cyber security

The International Energy Agency (IEA) estimates that the overall savings from digitally enabled measures could reach approximately US$80 billion per year from 2016 to 2040 for the power generation and distribution sector alone, or about 5% of its total costs.

Policy recommendations

- Support the reskilling of the energy sector workforce for the digital economy through training programs designed for the sector and its subsectors (power generation, distribution, oil & gas extraction and distribution).
- Recognize that digital innovation is a foundational component to addressing the many and diverse challenges facing the energy sector. Cultivate digital innovation in the sector by supporting collaborations between the sector, technologies providers, and research institutions to address these challenges.
- Measure, track, and report on the deployment of 5G solutions to demonstrate the quantitative linkages between 5G use and the sector's performance.

Deetken Insight was commissioned by TELUS to complete a comprehensive review of published research about 5G and its potential socio-economic impacts, with a particular focus on Canada. To download the full report, *The Socio-Economic Impacts of 5G*, visit [insert link to website.]