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Technology Sustainability

- What is technology sustainability?
- Why you should care about sustainability
- How sustainability can help increase citizens' quality of life
- COVID-19 impact on sustainability
- Innovations shaping the sustainability agenda
- Government role in sustainability

JOINT COUNCILS' EXECUTIVE MONTHLY REPORT

Developed by the Research Committee

February 2023

Images: iStock

1. What is technology sustainability?

- Sustainable technology refers to innovations that respect natural resources and promote economic and social growth. Its purpose is to significantly decrease environmental and ecological threats and create sustainable products.

  Sustainability in technology can be classified in three ways: Substitution, Prevention, and Efficiency.

- **Substitution** involves the use of biodegradable materials and renewable resources in production. Sustainable technology should aim to reduce reliance on non-renewable resources and shift towards more environmentally-friendly alternatives.

  For example, this could involve replacing plastic packaging with biodegradable alternatives or using renewable energy sources like solar or wind power.

- **Prevention** involves designing technology that prevents environmental degradation or contamination through its use or production. Sustainable technology should aim to minimize the negative impacts on the environment by reducing waste and emissions.

  For instance, designing products that have a longer lifespan or using manufacturing methods that produce fewer greenhouse gas emissions.

- **Efficiency** encompasses designing technology that is efficient in terms of its use of energy and resources. Sustainable technology should aim to reduce energy consumption and waste by improving the efficiency of processes and products.

  As an example, this involves using energy-efficient LED lighting or designing products that require less energy to operate.

Why Is This Report Important?

Sustainable living and development present a significant challenge in today's world. Environmental dangers such as depletion of natural resources, pollution, deforestation, e-waste generation, poor air and water quality, and ozone layer depletion present a significant challenge. For example, the United States projects to emit 4,807 million metric tons of carbon dioxide by 2050 if no action is taken, a concern for both businesses and individuals.

Businesses and individuals respond to climate change by using sustainable technology, such as renewable energy sources like solar and wind power and energy-efficient lighting, appliances, and vehicles. They also use green building materials and practices to decrease energy consumption, water waste, and pollution.

Individuals can make a difference by reducing energy consumption with energy-efficient appliances, using public transportation or carpooling, and reducing waste through recycling or composting. Small actions can produce significant results in reducing environmental impact.

What is Covered in this Executive Report?

This report includes the following:

- What is technology sustainability?
- Why you should care about sustainability
- How disruptive innovations help sustain our planet
- COVID-19 impact on sustainability
- Innovations shaping the sustainability agenda
- Government role: example of the UK

Sources: Rubicon

2. Why you should care about sustainability

Sustainability is becoming increasingly important in the technology industry due to its impact on the environment. The Information and Communications Technology (ICT) sector alone contributes to about 1.4 percent of total global carbon emissions. Whether you are a producer or consumer of technology, it is important to consider the impact it has on the environment.

Adopting a sustainability strategy can be beneficial for technology operations. Efficiency initiatives are closely tied to sustainability and can lead to innovative research and development. By optimizing processes such as cooling systems, power usage, and water usage, businesses can meet sustainability goals while also improving their operations.

The impact of sustainability is also felt by employees. A 2019 Forrester survey showed that close to half of respondents were concerned about the impact of climate change on society. Implementing sustainability initiatives can motivate employees and foster a culture of innovation and positivity.

In addition to its internal benefits, sustainability is also good for business. Companies with a focus on sustainability have been shown to have better financial results compared to their peers, even during the COVID-19 pandemic. Sustainability initiatives can lead to cost savings and can be a tangible source of revenue. With increasing customer, employee, and government awareness of sustainability, it is becoming increasingly important for businesses to adopt a clear sustainability strategy.

Lastly, investing in sustainability is also important for the future of the citizens. Technology has the power to solve many of the problems it creates, and opportunities for sustainable practices are abundant. By focusing on sustainability, all actors can make a positive impact on the environment and ensure their future success.

Sources: Forbes, The Guardian

3. How sustainability can help increase citizens’ quality of life

The role of technology in maintaining our planet's sustainability is crucial. Innovations in clean transportation, smart cities, and renewable energy lead to improved resource management and decrease dependence on fossil fuels. However, overcoming engineering difficulties related to performance, compatibility, and security is vital in providing solutions that reduce emissions, decrease waste, and prevent pollution.

Ensuring Safety And Performance In Electric Vehicles

- The growth of electric vehicles is being driven by government incentives and regulations globally, with a forecasted growth rate of over 21% annually from 2019 to 2030. One challenge in the EV industry is managing interoperability between vehicle manufacturers and charger suppliers. To address this, organizations like CharIN are working to create a global standard for EV charging to ensure accessibility and affordability for end users.

- Another challenge for manufacturers is the development of high-voltage, high-power batteries which come with additional costs and risks. Early incorporation of testing in the EV product development life cycle is crucial for safe and efficient manufacturing. This testing helps to identify and address potential issues early, ensuring the final product meets safety and performance standards.

Maximizing The Power Of Solar Energy

- The renewable energy market has seen growth due to increased accessibility and affordability of alternative energy sources. The solar energy market is expected to increase at a 20.5% compound annual growth rate from 2019 to 2026, reaching a value of $223.3 billion by 2026. Traditional energy companies are diversifying into solar and other renewable energy sources to conserve natural resources and reduce greenhouse gas emissions.

- Despite the average solar panel operating at less than 19% efficiency, research and development engineers are working to improve efficiency and output. The efficiency and reliability of solar power are being improved with innovative technologies. These advancements are contributing to the growth of the renewable energy market and the reduction of the negative impact on the environment.

Reducing Resource Consumption With 5G-Enabled IoT

- 5G technology offers fast data speeds, low latency, and increased connectivity that will be crucial in addressing environmental challenges. 5G technology will help conserve natural resources by enabling the Internet of Things (IoT) network in various sectors.

- In smart cities, 5G will allow for automated monitoring and management of utility systems, reducing traffic congestion and pollution and conserving energy. In smart agriculture, 5G will enable precise application of water, fertilizers, and pesticides, reducing water use. In smart buildings and homes, 5G-enabled sensors will react to environmental conditions and occupancy, reducing energy consumption from lighting, heating, and cooling. The implementation of 5G technology in these sectors will significantly contribute to reducing the negative impact on the environment.

Building A Better Planet With Technology Innovations

- In the coming years, companies across industries will prioritize environmental issues by designing, testing, and manufacturing technologies that support these concerns. This will result in hardware and software solutions that conserve natural resources, reduce carbon emissions, and minimize reliance on fossil fuels.

- To support these efforts, companies will form partnerships with industry leaders and invest in technologies such as electric vehicles, 5G-enabled IoT, solar energy, and others. This will help create a foundation for a more sustainable future, as companies work towards reducing their impact on the environment and promoting sustainable practices. These initiatives will play a key role in shaping the future and addressing the pressing environmental challenges facing the world today.

Sources: Forbes

4. COVID-19 impact on sustainability

The importance of environmental, social, and governance (ESG) practices is rising among tech companies. A 2020 KPMG Technology Industry Innovation Survey of 800 global tech leaders showed that 86% of organizations believe in the need for more sustainability regulation, but only 26% having incorporated ESG into their planning. 34% said climate change affects their investments and funding, driven by COVID-19, regulation, and investor expectations. There is growing evidence that companies' responses to COVID-19 and overall performance are increasingly evaluated through an ESG lens, beyond just financial results.

Importance of ESG in technology industry: With technology becoming an integral part of people's lives, tech companies are expected to consider their impact on society positively or negatively. ESG has become a crucial aspect for technology companies and is no longer just a cosmetic reporting. Investors, customers and bankers are demanding improved ESG practices from tech companies and want them to be accountable for their business practices.

ESG evaluation by research firms: Companies are evaluated and rated by various indices and research firms that provide ESG ratings and reports for investors. Investors take into account the ESG rating of an acquisition target when evaluating a potential transaction.

Customer demand for ESG improvement: Customers now demand not only quality products and services at competitive prices, but also improved ESG performance from technology companies. Social media can circulate negative stories about ESG failures or undesirable business practices, causing severe reputational damage before companies can respond.

Responsibility of corporations: Corporations have a responsibility to be good corporate citizens and are widely recognized by investors, customers, regulators, employees and corporate leaders. They have the resources to make a bigger impact and need to embrace ESG practices in the long-term.

Environmental and social changes: Environmental and social changes are continuously altering the business landscape. Unexpected events such as COVID-19, climate change, and cyber breaches cause high losses for businesses. Adaptive capacity to environmental and social risks will help companies to compete and thrive better.

ESG as part of digital transformation strategy: Companies are becoming more focused on driving sustainable practices and are prioritizing investment in technology improvements to reduce their energy use, carbon footprint, and waste levels. Integrating ESG initiatives into their digital transformation strategy is a purpose-led and innovative approach to business.

Sources: KPMG

5. Innovations shaping the sustainability agenda

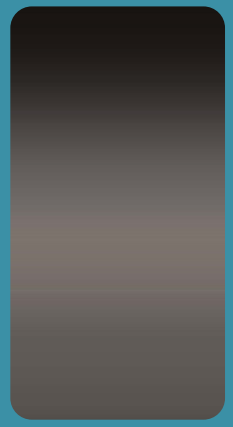
There is a rise in the adoption of electric buses in cities, particularly in China, which will encourage European cities to follow suit. The electric buses have a lower total cost of ownership compared to diesel buses, and they reduce local air pollutants.

Adoption of battery electric commercial vehicles is expected to surpass that of personal electric vehicles in some markets by 2030. The total cost of ownership is expected to be on par with diesel trucks, and charging stations every 80 to 100 km will be sufficient for early adoption.

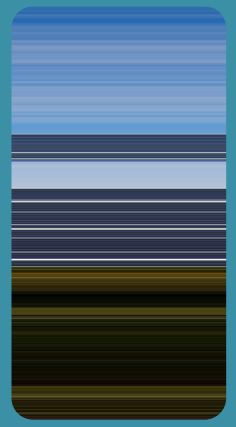
The market for lithium and cobalt batteries has expanded and prices have dropped, leading to a wider use for batteries as energy storage solutions. Utilities will need to change to accommodate the trend, such as moving to a fixed fee for access to the grid.

Innovations are being made in the development of long-term energy storage solutions using technologies such as molten salt and low-cost thermal batteries. If successful, long-term energy storage could reduce the cost of power significantly.

The plastics industry has an opportunity to adopt a circular business model to reduce waste, with a recycling-based profit pool estimated at $55 billion by the next decade. One process is pyrolysis, which converts plastic waste back into liquid feedstock.



LED lights are expected to achieve 84% market share by 2030 and reduce energy consumption by 40%, resulting in $26 billion in savings.



Renewable energy is becoming cheaper and more accessible, particularly in areas without access to electricity, such as sub-Saharan Africa and the Caribbean. Innovative financing plans can help bring affordable solar home systems to communities without a reliable grid connection.

Carbon capture and storage is being developed to reduce carbon emissions from industrial processes, with advancements in the use of solvents and regenerable sorbents.

The trend towards digitalization and data-driven decision-making is transforming industries and leading to more efficient and effective processes. However, there is also a growing concern for data privacy and security.

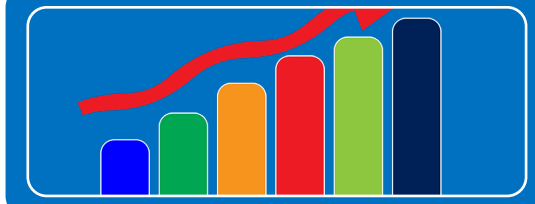
Sources: McKinsey

5. Government role in sustainability

Background. Many governmental organizations, such as the UK's Coal Authority, are dedicated to environmental, economic and social sustainability, which is its core purpose. The Coal Authority's role is to resolve the negative effects of mining such as water pollution and land instability, while also considering the impacts of its operations on the environment, economy, and society. The Authority, as its counterparts, is committed to sustainable resolution of mining impacts for the protection of the public, environment and stimulation of economic growth in former mining areas.

Examples of sustainable technology and innovation are available for public use: public and electric transport, LED light technology, solar power, carbon capture and storage technologies, and self-sufficient and LEED buildings and construction methods. The adoption and widespread use of sustainable technology and innovation are crucial for mitigating the adverse effects of climate change and achieving a more sustainable future for all. Governments, businesses, and individuals have a responsibility to prioritize and invest in these technologies to promote a more sustainable and resilient world.

Achieving Objectives. To achieve its sustainability goals, governments often set core sustainability objectives to focus on over the next five years. They endorse the sustainability policies and strategies to ensure sustainability is integrated into all areas of departmental operations. The departments are embedding sustainability into their organization, implementing a sustainable procurement policy, developing departmental action plans, and reviewing their sustainability plan annually to align with internal and external priorities.



Measuring Progress. Governmental departments and actors review their sustainability performance regularly and reports to its board and the public through its annual report. For instance, a department can redefine its key performance indicators to measure and report its progress on priority areas. It can involve all its staff in the departmental sustainability plan, communicate with its supply chain, and encourage the sharing of new sustainability ideas. Many governmental actors have developed a sustainability webpage with resources for staff, and they communicate with them through various means such as blogs, articles, and campaigns.

Long-term objectives. Various governmental actors are committed to resolving the impacts of their operations in a sustainable manner, with a focus on economic, environmental and social sustainability. Their sustainability goals may be aligned with the wider strategic sustainability goals and the Paris Agreement on climate change. The departments may be taking various steps to achieve its sustainability goals, including embedding sustainability into its operations, developing departmental action plans, and measuring progress regularly. They may be involving all its staff, communicating with its supply chain, and encouraging the sharing of new sustainability ideas to successfully deliver its sustainability plan.

Sources: Gov.uk

For Further Reading

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- Preuss, Lutz. "Buying into our future: sustainability initiatives in local government procurement." Business Strategy and the Environment 16, no. 5 (2007): 354-365.

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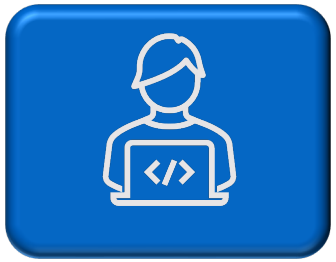
Trends in the Daily Newsletter

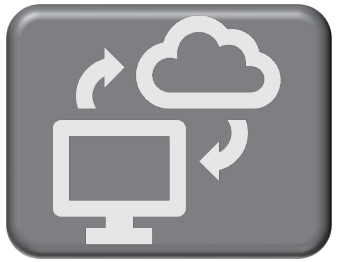
The Digital Trust and Cybersecurity symposium on Jan. 25 was attended by representatives from every province and territory, save Alberta, and took place roughly six months after the inaugural meeting in Quebec.

"Since June, we have been working together to build solutions that can scale and that can work together. We have seen real progress," a spokesperson for B.C.'s Ministry of Citizens' Services wrote in an email to CTV News Tuesday. "The symposium recognized that governments must take the lead to ensure that personal information is protected in the digital world."



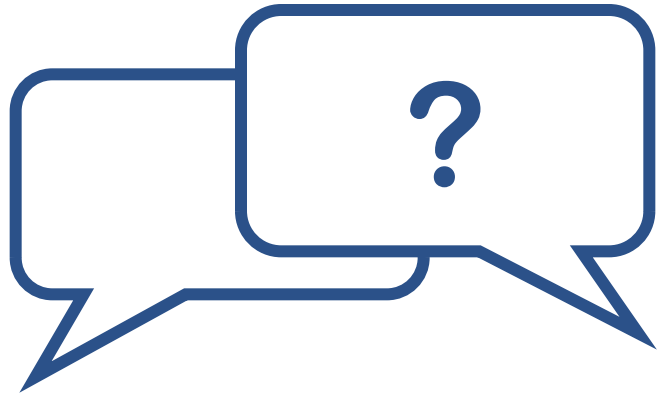
Ontario is expanding digital options at ServiceOntario locations, including video health-card renewal appointments and applying for marriage licences online. Premier Doug Ford says the moves will save people time and money.

The province says an enhanced booking system is now running at 64 of the busiest ServiceOntario locations and it lets people book a single appointment for multiple services or multiple family members. As well, people who aren't able to visit a ServiceOntario centre in person can book virtual appointments to have their health cards renewed in a live video call.



The Internet of Things (IoT) has been an incredible contributor to humanity, but it comes at a cost. According to Statista the global number of connected IoT devices is expected to grow to 30 billion connections by 2025. Everything from car keys to baby monitors, laptops to mobiles are all potential single points of failure as their internet connectivity opens back doors to vulnerable networks.

In the past, enterprise and institutional security was ring-fenced, and could be managed within the walls of the organization, but with servers moving to the cloud, remote workers, and a proliferation of IoT devices creating a huge mesh of interconnectivity, borders are no longer identifiable or defensible.



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