VerifiGlobal

Clean Technology Innovation Initiative

16 February 2022 Second Online Workshop Report

February 2022

1. Introduction

The 2nd Clean Technology Innovation Initiative (CTII) Online Workshop took place on16 February 2022 at 11:00-12:30 EST. Fleming College provided the web-based platform for the Workshop.

Workshop Agenda

1. Introduction
2. Clean Technology Innovation Initiative (CTII) objectives
3. Value proposition of international standards
4. Strengthening global capacity to assess, select and deploy innovative solutions with sustainable outcomes – Climate change mitigation/adaptation
5. Positioning innovative technologies, products, and services to support sustainable development goals – Water efficiency and resiliency
6. Development and application of the CTII relationship map.

Brady Allin (Manager of Infrastructure and Climate Change, Standards Council of Canada) and **John Neate** (Co-Managing Director, VerifiGlobal) welcomed Workshop participants.

Opening remarks were provided by **Brett Goodwin** (Vice-President, Office of Applied Research & Innovation, Fleming College), **Pierre Bilodeau** (Vice-President, Strategy & Stakeholder Engagement, Standards Council of Canada), and **Sheila Leggett** (Chair of International Organization for Standardization Technical Committee 207).

The Standards Council of Canada (SCC) *is a federal Crown corporation and part of the Innovation, Science and Economic Development portfolio.*

SCC oversees Canada's national standardization network and facilitates the development and use of national and international standards and accreditation services to enhance Canada's competitiveness and well-being. Standards help ensure better, safer, and more efficient methods and products, and are an essential element of technology, innovation and trade.

VerifiGlobal *helps clients demonstrate effective performance of innovative solutions through independent performance benchmarking and verification. This helps advance viable, eco-efficient solutions that create value and reduce risk.*

VerifiGlobal conducts environmental technology performance verification (ETV) through qualified technical organizations that are members of the VerifiGlobal Alliance. VerifiGlobal Alliance members have the personnel, equipment and facilities to conduct independent performance testing and verification of technologies within their respective areas of expertise, in accordance with the ISO 14034 ETV Standard.

VerifiGlobal and the Standards Council of Canada launched the Clean Technology Innovation Initiative to advance global sustainability.

The ISO/TC 207 Technical Committee on Environment *has been a leader in the development of standards in the field of environmental management systems and tools in support of sustainable development around the world since 1993.*

TC 207 develops standards and tools in the field of environmental management, through a team of five subcommittees and various working groups supported by international Member Bodies. These subcommittees focus on various areas of standards development that relate to environmental management systems, lifecycle assessment, greenhouse gas management, environmental labelling, environmental performance evaluations and environmental auditing. Canada has chaired this Committee since its inception.

The Fleming College Office of Applied Research and Innovation *provides applied research and development services to business, industry, institutions, and community organizations.*

The Fleming Office of Applied Research and Innovation serves as a gateway to college applied research and development expertise by supporting efforts to innovate and improve products and processes, enhancing student education and research skills, and promoting the expertise and professional development of college faculty and employees through research opportunities.

2. Clean Technology Innovation Initiative Objectives

United Nations SDGs
The UN Sustainable Development Goals (SDGs), recognize the importance of international trade as an engine for development and sustained economic growth, and the need for an equitable rules-based, multilateral trading system that uses standards to effectively translate sustainable development commitments into tangible outcomes.

Thomas Bruun (Co-Managing Director, VerifiGlobal) outlined the objectives of the Clean Technology Innovation Initiative (CTII), noting that public and private organizations are challenged, when considering environmental issues and new international agreements in the context of their activities and business operations. Often, they are not fully aware of the benefits and pivotal role of standards in assessing environmental performance.

Positioning environmental performance standards to effectively support sustainable development

With growing demand for green technologies, products and services, environmental performance standards need to be better understood and positioned to effectively support sustainable development goals. Ensuring market relevance of these products, technologies, and services requires mutual understanding and trust through meaningful engagement and the articulation of shared performance objectives, with a focus on evidence-based outcomes.

Deployment of innovative clean technologies and the use of standardization.

The importance of innovative clean technologies in achieving sustainability goals, was highlighted, pointing out the need to strengthen capacity to assess the benefits and risks of these technologies, enabling the selection and deployment of effective solutions with sustainable outcomes. The CTII aims to improve understanding and mobilize knowledge directed at the development and deployment of innovative clean technologies and the effective use of standardization.

The CTII has two parts:

1 - Consensus on principal elements

2 - Solution pathways

The CTII has two parts – Part 1 aims to reach consensus on the principal process elements and relationships that enable the development and deployment of innovative environmentally sound solutions, and the essential linkages to existing and proposed standards; Part 2 involves assessment and analysis of key issues and opportunities in selected sectors where relationship mapping and performance benchmarking could be effectively applied to untangle complex issues, illustrate solution pathways, and add value.

Relationship mapping for decision support *(see next page)*

An example was provided on how ISO TC 207 processes and relationships could be mapped to show logical links between individual elements, noting that relations in complex situations don't necessarily fit into familiar structures such as hierarchies. A relationship map can be used to understand and organize any type of logical relationship between ideas, factors, or issues, in any direction and between any number of items.

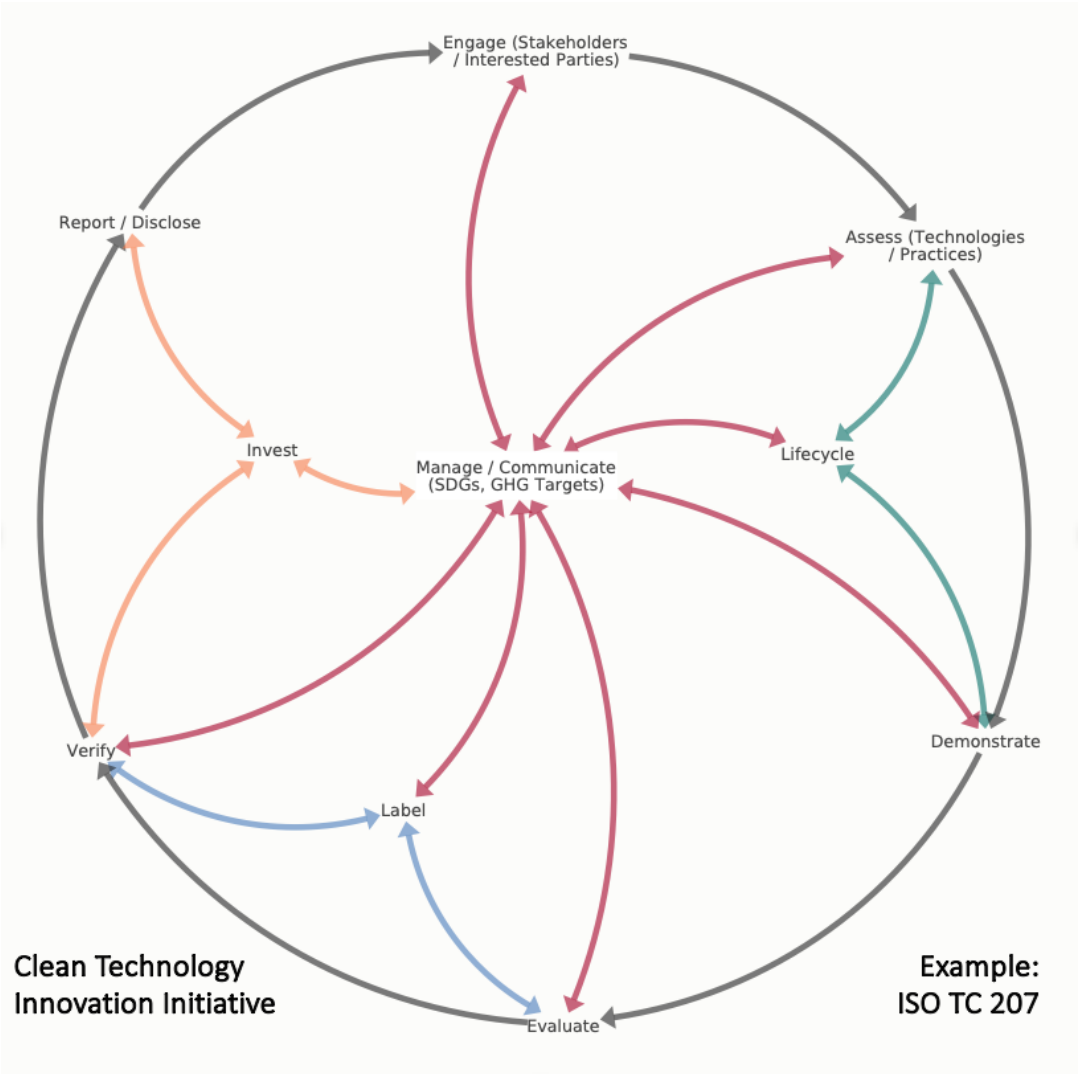
Anticipated outcomes:

Role of standardization in supporting global sustainability

Publicly accessible, web-based relationship map

Effective application of environmental standards in support of technology innovation.

Thomas concluded by reiterating the anticipated outcomes of the CTII, including:
- Increased awareness and understanding about the role of standardization in supporting global sustainability objectives.
- How the 'cross-cutting' family of ISO TC- 207 standards are particularly relevant in supporting technology innovation and the realization of
- A web-based relationship map, illustrating how global sustainability goals and international standards interact and relate in a systematic way.



The Clean Technology Innovation Initiative was initiated in June 2021.
The September 2021 CTII Introductory Workshop was the first major project milestone.

Moving forward, priority has focused on the following three tasks:

#1. Engagement and collaboration with an expanding network of key stakeholders

#2. Analysis of key opportunities where relationship mapping and performance benchmarking can be effectively applied to untangle complex issues

#3. Further development of the clean technology innovation relationship map, to be publicly accessible on the VerifiGlobal website, illustrating solution pathways in the context of climate change mitigation/adaptation and water efficiency/resilience.

The 2nd CTTI Workshop in February 2022 provided an opportunity to consolidate and report on progress in addressing these three tasks. The remaining sections of this report focus on the above three priority tasks.

3. Value proposition of international standards

Lynn Johannson, President of E2 Management Corporation, is the catalyst for a cross-sector industry initiative called "Are You Climate Ready?" (AYCR). This is a systems approach that leverages the value proposition enabled by a robust, credible, and reliable environmental management system (EMS). It addresses risks and opportunities to accelerate climate action.

Organizations with an EMS, using the international standard ISO 14001, are better positioned to provide internal and external stakeholders with greater confidence based on objective evidence. To thrive, these organizations need to take decisive action supported by effective management to achieve environmental, social, and business objectives.

Priority #1 – Engagement and collaboration with key stakeholders

Working collaboratively is critical in a world where planetary boundaries have been exceeded. Added to this is the fact that social disruption is rising, and financial instability is becoming all too common. By leveraging the synergy of citizens, communities, corporations and countries, a shift to a sustainable future is possible ***if action is taken now***. People need to feel empowered. Communities must solicit the interest and cooperation of their citizens. Corporations need to receive feedback from their customers and other stakeholders on their needs and expectations. Countries rely on feedback from the concerned voting public, and those that pay taxes, to do what is needed.

"Are You Climate Ready"

"Are You Climate Ready?" evolved from a stakeholder engagement process involving organizations from 16 different business sectors. The original mandate was to provide Canadian organizations with an investment in ISO 14001 the opportunity to offer their insight during the third revision of the standard and bring greater understanding of the consequences of the proposed changes to the market.

Task Force on Climate-related Financial Disclosures (TCFD), the UN SDGs and Project Drawdown

The collective wisdom and practical recommendations brought forward by this cross-sector group, "THE Collaboration", then turned towards the demand for reporting on climate risk, which was highlighted by the Task Force on Climate-related Financial Disclosures (TCFD). The TCFD recognizes both the physical and transformative risks of climate change. With priorities established in their EMS, organizations can determine which of the UN Sustainable Development Goals, ***at the target level,*** align with their business objectives and stakeholder needs and expectations. AYCR also seeks to leverage the opportunities to reduce or sequester carbon and other GHGs through proven solutions offered by Project Drawdown, and report based on objective data enabled through their EMS.

Stockholm Resilience Centre

While "Are You Climate Ready?" has linked to the TCFD to enhance reporting on climate risk, an EMS aligned to ISO 14001 requires that an organization determine all its important environmental impacts, not just its GHG emissions or its carbon footprint, and the effects these have on the organization. AYCR monitors the work of several entities, such as the Stockholm Resilience Centre, which provides an understanding of the complex, dynamic interactions of people and nature in the biosphere. "THE Collaboration" understands the need to bring human activity back inside a safe operating space.

Priority #2 – Opportunities for relationship mapping

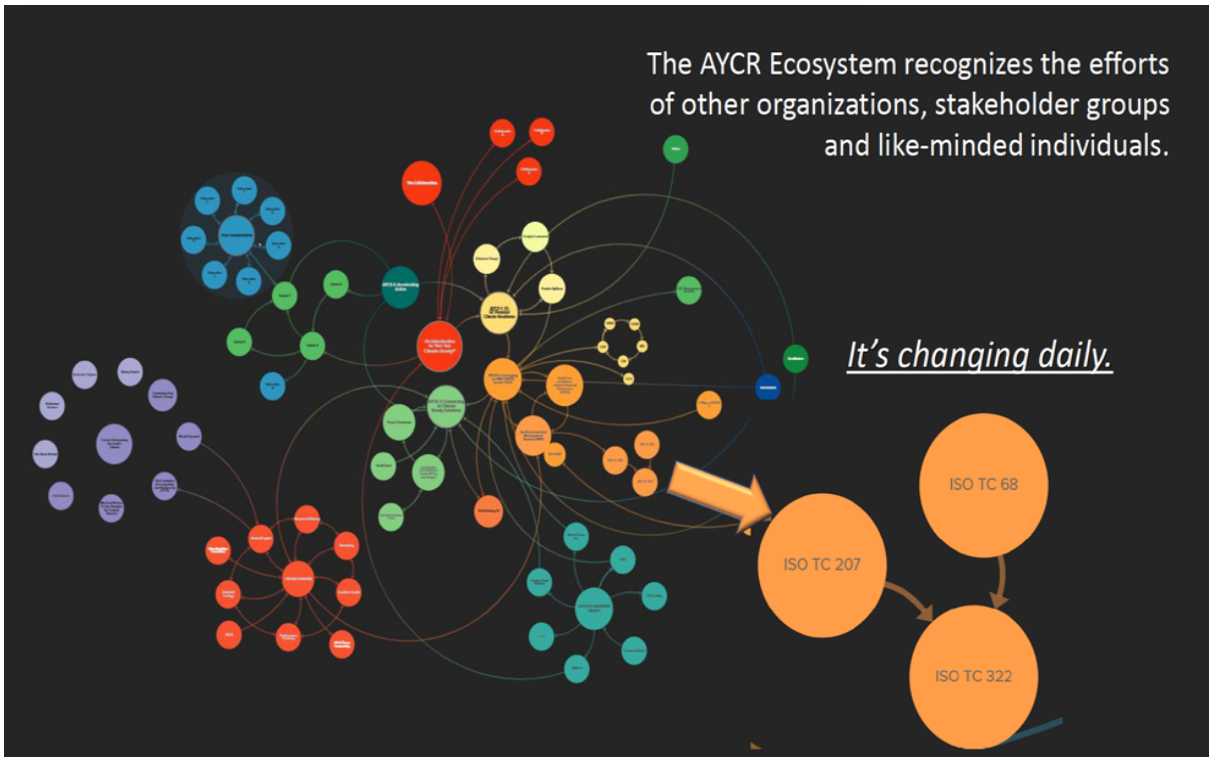
"Are You Climate Ready?" builds on the power of relationship mapping using kumu.io to examine interdependencies and opportunities to work with like-minded entities to accelerate climate action and ensure reliable disclosure.

"Are You Climate Ready?" enables users to identify and choose opportunities for innovative solutions to achieve their business and environmental objectives. It was designed to leverage objective evidence, build confidence, and enhance trust in the marketplace.

AYCR is comprised of four key elements that are interdependent:
- AYCR 1 addresses personal climate readiness and the positive spillover that can occur.
- AYCR 2 maps the objective evidence enabled by ISO 14001 to granular questions from the TCFD, and other sources.
- AYCR 3 leverages the knowledge from AYCR 2 to address the SDGs is at the target level and links them to Project Drawdown.
- AYCR 4 is a feedback mechanism, which identifies patterns and trends from shared data to accelerate improvement through collaboration.

Priority #3 - Further development of the CTII relationship map

Lynn presented the following ACYR relationship map, which recognizes the efforts of other organizations. including stakeholder groups and like-minded individuals. It represents a dynamic ecosystem that continues to evolve daily.



4. Strengthening global capacity to assess, select and deploy innovative solutions with sustainable outcomes – Climate change mitigation/adaptation

Tim Hansen, Founder and CEO of 350Solutions, a cleantech and low-carbon technology evaluation and consulting firm, addressed strengthening global capacity to assess, select and deploy innovative climate change mitigation/adaptation solutions.

Clean technology innovation is critical to solving global environmental challenges, such as climate change. As a result of global compacts, corporate commitments, and other initiatives to address climate change, significant growth in low-carbon technology development has occurred in the past five years. Efforts to ensure that new technologies perform as claimed and impacts are measurable and verifiable are needed. Tied to this is the importance of:

- Sustainable development goals (the UN SDGs) address climate risks and impacts,
- ClimateTech innovations with the relevant standards and protocols to support them, and
- Continuous evaluation and improvement as standards/protocols rapidly evolve.

Priority #1 – Engagement and collaboration with key stakeholders

Multiple new and existing carbon offset and removal credit markets have developed to address targets and commitments:

- 23% of Fortune 500 companies have committed to carbon neutrality by 2030
- Carbon negative commitments will be the next phase
- 10 gigatons/year carbon removal needed by 2050
- All business sectors impacted and ESG achievements becoming critical to investment & financial performance.

Microsoft, Stripe, Shopify

There are also rapidly developing standards, protocols, guidelines for carbon removal (e.g., Microsoft, Stripe, Shopify), as well as existing and changing carbon offset accounting protocols.

Global competitions

Global competitions (e.g., $20M NRG COSIA Carbon XPRIZE, $100M Musk C Removal XPRIZE) are driving tech development and markets, and hundreds of new technologies rapidly developing, gaining investment, seeking credits:

- New innovations needed to achieve all targets
- Technology and carbon offsets will not meet need
- As carbon becomes valued, technology impacts need to be verifiable.

ClimateTech/ CarbonTech

When developing new technology innovations, such as CarbonTech, various standards and protocols come into play throughout the technology development lifecycle. In theory, these standards and protocols should provide useful information to stakeholders (investors, purchasers, regulators, the tech developer) about the technology through the development and deployment processes.

Consensus approaches

Consensus approaches needed to evaluate and verify impacts, performance, and credits. Verification valuable because new technology can be a risky bet:

- >$0.5B in CCUS technology investment in 2019 & 2020
- >$25B invested in cleantech 2006-2011
- Hype, overcommitment, poor performance mean that carbon reduction targets not achieved.

Priority #2 – Opportunities for relationship mapping

The CarbonTech sector becomes complicated because stakeholders may want standards and guidelines to be implemented for a variety of potentially related reasons, for example:

- Does the technology work? What are its potential impacts? Is it worth investing in?
- When implemented, how much carbon is it actually removing, or offsetting – in a real-world, large-scale project?
- Does the environmental performance meet requirements dictated in its sustainability linked loan?

Rapid growth in the CarbonTech sector causes development of new guidelines and protocols at a rapid pace, out of necessity, but sometimes reduces the development of consensus, and leads to multiple standards or guidelines existing in the same space.

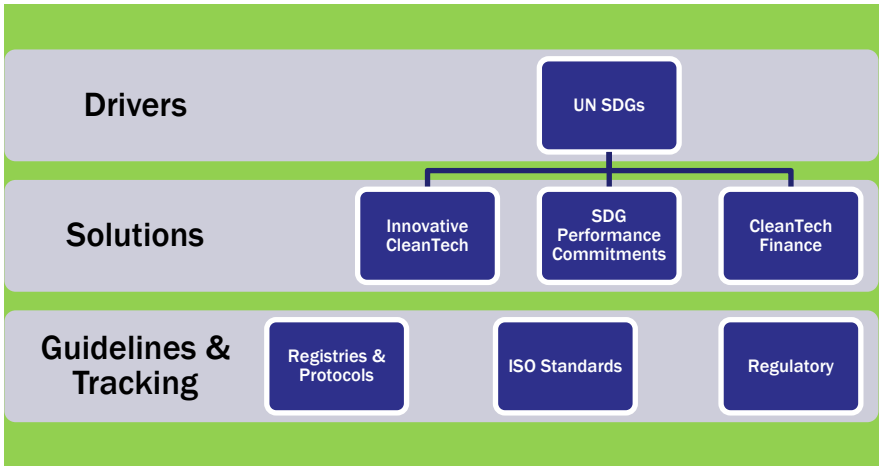
Priority #3 - Further development of the CTII relationship map

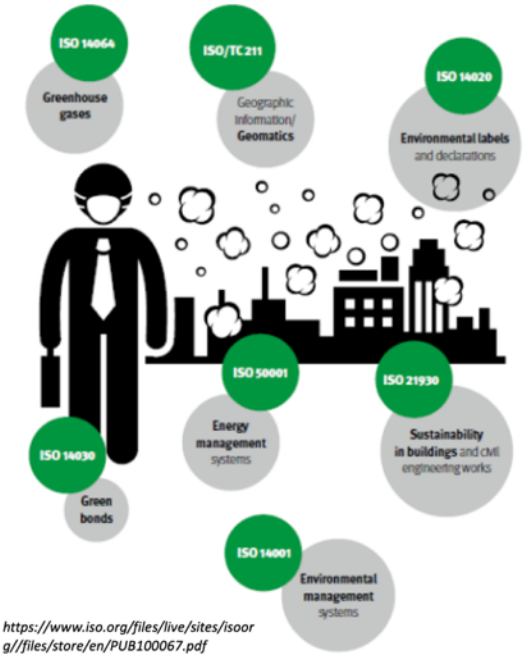
Tim provided an overview of the various ISO Technical Committees, notably TC 207 (Environmental management), TC 265 (Carbon capture transportation and geological storage), and TC 322 (Sustainable finance).

He also presented a relationship map, which shows four primary groups:

- Carbon accounting standards and programs,
- Technology evaluation focused standards and protocols,
- Green (carbon-related) finance standards or protocols, and
- Some carbon removal and offset credit markets that might fit in the middle.

The relationship map also includes dotted lines of potential relationships that don't exist right now. Improving the relationships among the standards, protocols, and programs in the CarbonTech sector and moving toward consensus approaches could significantly improve outcomes related to reducing carbon levels in the atmosphere – by providing consistent, high quality, 3rd party verified outputs and data for the market to use in making investment, purchase, and policy decisions. But we also need to act quickly as the CarbonTech sector is developing rapidly.





https://www.iso.org/files/live/sites/isoorg//files/store/en/PUB100067.pdf

TC207
Environmental Management

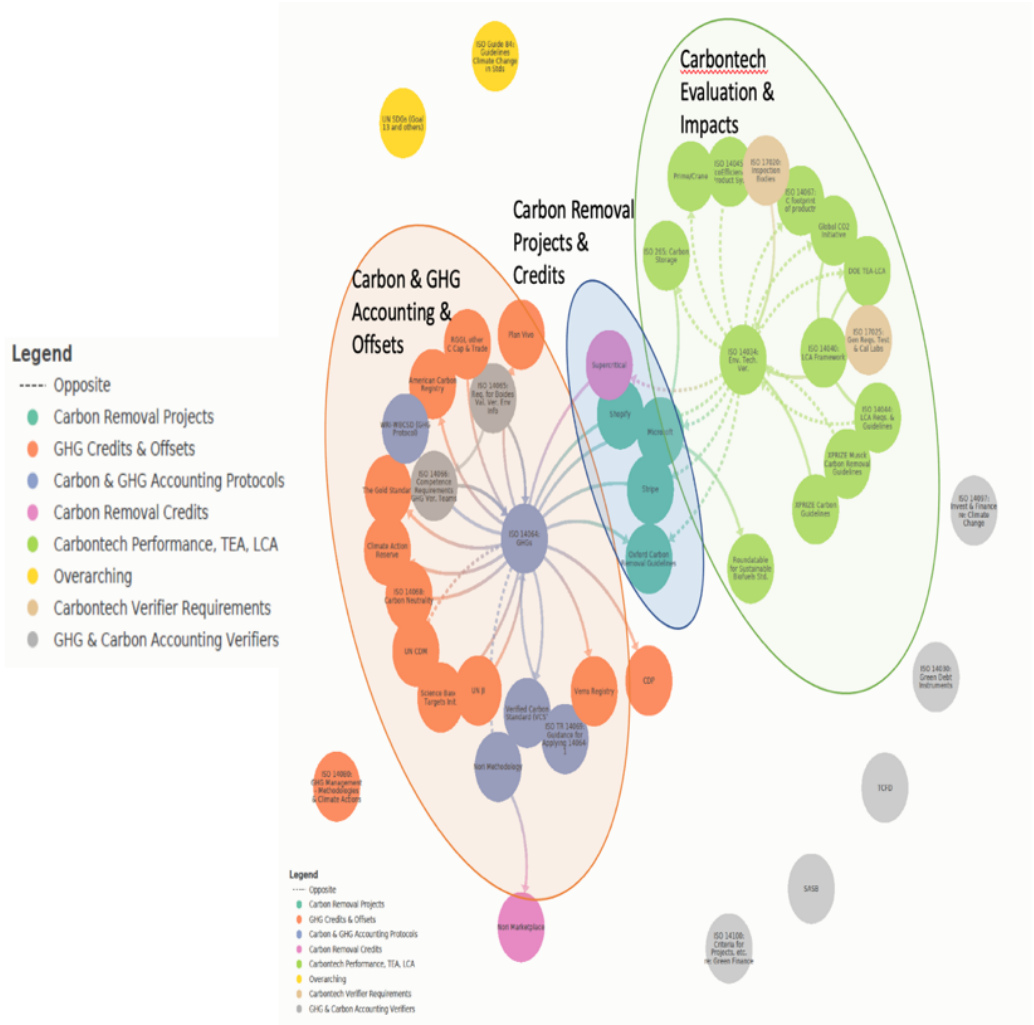
- 57 Published Standards
- 19 under development
- ISO 14064/14065 GHG Emissions
- ISO 14001 EMS
- ISO 14034 Env. Tech Verification
- ISO 14090/14091 Adaptation

TC265
CO_2 Capture Transportation, Geo. Storage

- 12 Published Standards
- 3 under development
- ISO 27915 CO2 C,T,S Quant./Ver.
- ISO 27919 CO2Capt Perf. Eval.
- ISO 27922 TR CO2 Capture tech – Cement Ind.

TC322
Sustainable Finance

- ISO 32210: Framework for Sustainable Finance



5. Positioning innovative technologies, products, and services to support sustainable development goals – Water efficiency and resiliency

Jennifer Andersen, Manager of the Centre for Advancement of Water and Wastewater Technologies (CAWT), at Fleming College, addressed the challenge of positioning innovative technologies, products, and services to support sustainable development goals related to water efficiency and resiliency.

Jennifer noted that, while water is the focus of Sustainable Development Goal 6 (Clean water and sanitation for all), it is well connected to many of the other SDGs. For example, SDG goal 11 targeted to making cities sustainable along with and SDG 13, which takes action to combat climate change would each have a water component within them. Connections like this demonstrate that even though the SDGs are defined separately, overlapping themes like water make the pursuit of them collaborative, and not separate and distinct from one another. SDGs should be viewed together and addressing them will require integrated policies and collaboration. There needs to be cross-sectional dialogue at an institutional level if we are going to make an impact or have measurable outcomes.

Standards are an important aspect to this, they provide a benchmark for performance, guidelines on how to achieve them, and most importantly they produce results that are reliable and consistent across the water sector.

Priority #1 – Engagement and collaboration with key stakeholders	Jennifer noted the importance of engagement and collaboration in addressing integrated water resources management, as well as the political and environmental costs of inaction. Although water efficiency and resilience may come at a higher economic cost, the significant benefits are well demonstrated
World Health Organization	The World Health Organization has developed a report that addresses the resilience of water supply and sanitation in the face of climate change. Important in this report is the key conclusions outlined, including highlighting that climate change is a perceived threat and not an opportunity. Major changes in policy are needed in ongoing and future investments are not to be wasted. Resilience needs to be integrated into drinking water and sanitation management. There are important gaps in our knowledge that if not addressed will impeded our ability to take effective action.
UN Global Compact CEO Water Mandate	The United Nations Global Compact CEO Water Mandate is an industry-driven initiative committed to reducing water stress by 2050. The mandate outlines six commitment areas including supply chain and watershed management. This initiative mobilizes business leader on water, sanitation, and the SDGs. Endorsers of the CEO water mandate commit to continuous progress against the six core elements of stewardship and in doing so the manage their own water risks.
Water Environment Federation (WEF)	The Water Environment Federation (WEF) is a UN water partner. Its mission is to establish the conditions that promote accelerated development and implementation of innovative technologies and approaches in the water sector. WEF provides a suite of services including education, economic, and information sharing forums which support the UN SDGs and, in particular, advancing SDG6.

International Institute for Sustainable Development (IISD)

The International Institute for Sustainable Development (IISD) is an independent research institute with the goal of accelerating solutions for a stable climate, sustainable resource management, and fair economies. This organization develops policy work and reports addressing critical topics like climate change, green infrastructure and sustainability tools. IISD has created a knowledge hub dedicated to the SDGs, which compiles news, guest articles, policy briefs and events, broken down by each SDG. Much of the Institute's research and support is directly related to water resources management. Particularly their frameworks for several water related topics, such as advancing natural infrastructure, sustainable asset valuation tools, and advancing the climate resilience of Canadian infrastructure, to name a few.

CSA Group

The CSA group has developed a report that investigates the possible role standards and related instruments can play to help ensure safe, stable and accessible water and sanitation for Canada's northern population. While significant investments have been made in water and wastewater infrastructure, water systems are still generally below the Canadian average in these northern areas, with risk levels reported to be on the rise, especially in indigenous communities. This guideline is a great tool that can be used in addressing water needs, and many of the SDGs.

Priority #2 – Opportunities for relationship mapping

Valuing water - The 2021 World Water Development Report published by the UN focuses on the ways water is valued across different sectors and identifies how this valuation process can be improved. Properly valuing water is a critical step in decision-making processes. Assigning accurate value to water is a fundamental step to achieving the SDGs. The World Water Development Report notes that there are very few standardized approaches to the valuation of water and that these approaches do not always acknowledge the perspectives of different belief systems, cultures, genders, or scientific disciplines. If we are going to work towards attaining SDGs, it is important that we incorporate all of these viewpoints.

Valuing water

Water footprint

A water footprint is a way to assess the potential environmental impacts related to water. ISO 14046 is the international standard that specifies the principles, requirements, and guidelines of assessing and reporting water footprints. This applies to water footprint assessments of products, processes and organizations, based on life-cycle assessments. The ISO 14046 standard contributes to achieving several SDGs, including SDG 6, 13, and 14. It provides terms and definitions for types and classifications of water. This standard can be used to;

- Assess the extent of potential environmental impacts related to water use along with ways to reduce those impacts,
- Provide scientifically consistent and reliable information for reporting water footprint results that can be tracked over time.
- Improve the efficiency of products, processes and organizational levels
- Identify the quantity of water used and changes in water quality across geographical spaces and over time.

Natural capital	Natural capital is the world's stock of renewable and non-renewable natural resources. It includes plants, animals, air, soils, minerals and water. The Natural Capital Protocol is a standardized framework prepared by the Natural Capital Coalition. This protocol allows organizations to identify, measure and value their direct and indirect impacts (both positive and negative) along with the dependencies they may have on natural capital. Natural capital has largely been excluded from decision making processes up until now. As a result organizations can be entirely unaware of the impacts they may have. Including natural capital in decision making processes is a critical step to achieving the SDGs and evaluating the impact and dependencies organizations can have on resources, such as water. The Protocol Framework covers four stages, "Why", "What", "How" and "What Next". Each stage contains specific questions to be answered when integrating natural capital into organizational processes.
Green infrastructure	Green infrastructure is an approach to water management that protects, restores or mimics the natural water cycle. It combines natural and human-made elements, such as vegetable rooftops, roadside plants, adsorbent gardens, to name a few. The Green Infrastructure Guide for Water Management was developed to raise awareness around the benefits of Green Infrastructure solutions for water resource management. It demonstrates that green infrastructure can provide a significant benefit to water management, it can also provide support to existing grey water infrastructure, and that the mix of green and grey solutions can have added benefits. In addition to providing significant water management benefits, Green Infrastructure offers multiple secondary co-benefits such as provision of food, recreation and erosion control, that can extend far beyond those a specific water management intervention may initially seek to address. Much like the previous standards this guideline can serve as an important tool for achieving the SDGs as they relate to water protection and resiliency.
Envision	Envision is a framework managed by the Institute for Sustainable Infrastructure. This framework provides a consistent, consensus-based framework for assessing sustainability, resiliency, and equity in civil infrastructure. Essentially it highlights the importance of identifying better solutions during the planning, design, and construction of an infrastructure project. It provides the framework to help make these decisions, along with education and training on the topic.
Climate change adaptation technologies for water	The Climate Change Adaptation technologies for water report is a guideline developed by the UN focused on adapting technology for building resilience to climate change induces hazards in the water sector. The guide includes a water climate change adaptation technology taxonomy, identifying the most pressing climate change challenges in the water sector and corresponding adaptation technologies. Although the guide focuses primarily on adaptation technologies relevant to ensuring sustainable supplies of clean water and mitigation of water-related disasters, it emphasizes that implementing these technologies would have considerable impacts on other sectors, as well as on the sustainable development goals.

Match! Water Solutions Portal

Building on the UN Climate Change Adaptation Technologies for Increased Water Sector Resilience report, the Match! Water Solutions Portal is a digital knowledge sharing and technology transfer tool, which helps to establish direct contact between practitioners and decision makers with water challenges and solution providers. The water solutions available are applied over different spatial scales, time scales and cost ranges. They include hard technologies such as physical tools, soft technologies such as processes and knowledge, and organizational technologies referring to ownership and management solutions. The Match! Water Solutions Portal aims to add value in 3 key areas:

1) Practitioners and decision makers with water-related challenges are guided towards solutions they may not otherwise have known about for free

2) Solution providers have their products and knowledge disseminated for free in a way that might expand their markets

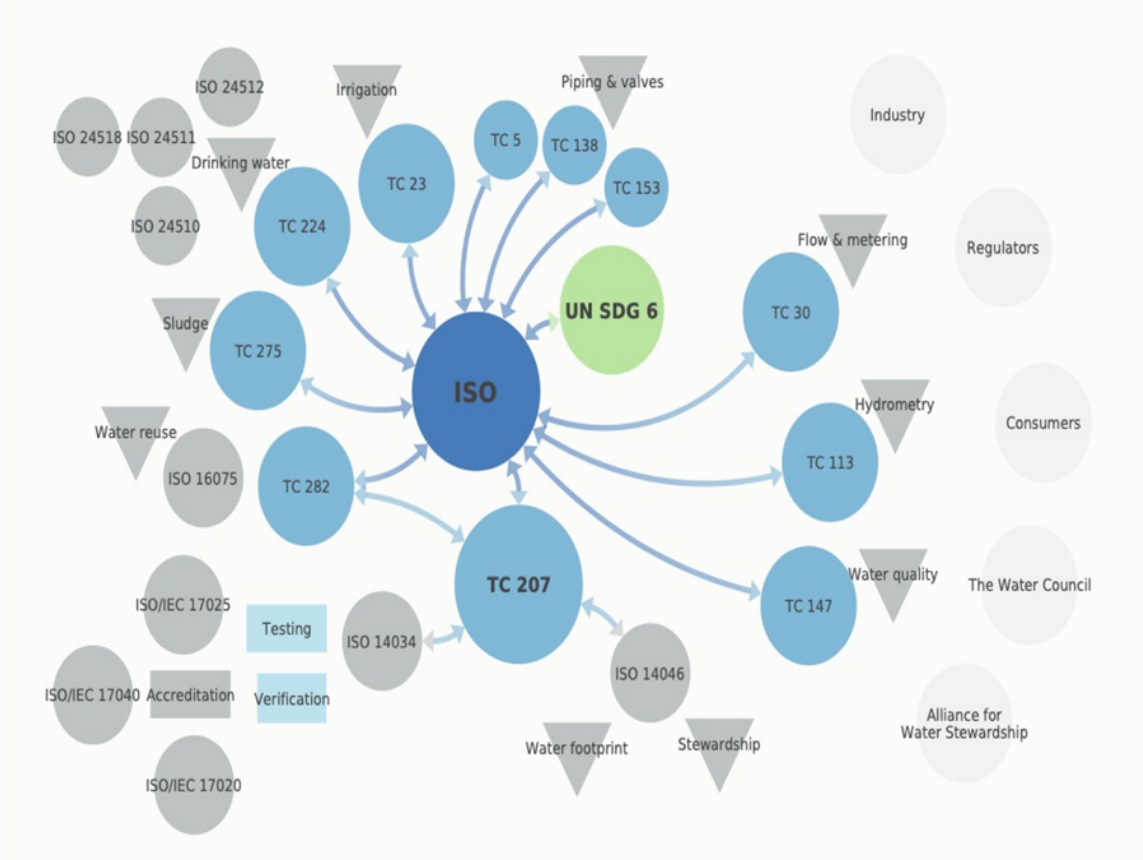
3) Water related challenges are addressed and countries progress towards achieving the Sustainable Development Goals.

Priority #3 - Further development of the CTII relationship map

Jennifer presented two relationship maps.

Looking at the Standards relationship map, you can see how standards play a significant role in water resource management and in achieving SDG 6. The ISO standards and Technical Committees (TCs) provide us with the frameworks we need to achieve consistent and reliable information and data across sectors and globally. They ensure the goals we set out have measurable results that can identify whether we are on target to achieving them, or not.

Mapping the frameworks, guidelines, organizations and collaborative efforts described above, it is clear that they all impact water resiliency, which emphasizes the importance of collaborative approaches. If we are to achieve the UN SDGs, it is imperative that we collaborate, with institutions, governments and the private sector working together to inform decisions and optimize the efficient use of resources. Standards are essential to this process.


ISO 24512
Irrigation
Piping & valves
Industry
ISO 24518
ISO 24511
Drinking water
TC 5
TC 138
TC 153
TC 23
ISO 24510
TC 224
Flow & metering
Regulators
UN SDG 6
TC 30
Sludge
TC 275
ISO
Water reuse
Hydrometry
Consumers
ISO 16075
TC 282
TC 113
TC 207
Water quality
The Water Council
ISO/IEC 17025
Testing
ISO 14034
TC 147
ISO 14046
ISO/IEC 17040
Accreditation
Verification
Alliance for
Water Stewardship
Water footprint
Stewardship
ISO/IEC 17020


VALUING WATER
UNESCO
UN SDGs
VISION 2030
WHO
GREEN
UNEP
WBCSD
UNEP-DHI
Water Resilience
EPA
NCP
NATURAL CAPITAL PROTOCOL
GSA
Water Footprint
ISO 14046
ISO 14046
ENVISION
ISI
Sustainable Asset Valuation Tool
WATER INFRASTRUCTURE
MATCH!

The next presenter was **Greg Williams**, Director of Water Quality at StormTrap, a company that provides solutions for managing runoff, protecting waterways, and improving property use. Greg addressed the challenge of positioning innovative stormwater treatment technologies, products, and services to support sustainable development goals.

Like carbon capture, stormwater management is essential to sustainability. Managing the quality and quantity of stormwater as it flows off man-made surfaces is essential to avoiding floods, droughts and harmful algae blooms.

- Stormwater management is an integral part of water resiliency and sustainability.
- It includes addressing water quantity especially flooding and water quality.
- The industry has been developing standards since 2000.

Priority #1 – Engagement and collaboration with key stakeholders

Stormwater quality control using manufactured devices is important for water resiliency which ties in with the broader theme of the value of standardization. The stormwater industry has been developing its own standards since Y2K, and there have been lessons learned.

These three programs three programs are the three most active today. Together they govern almost every kind of manufactured treatment device:

NJDEP

TAPE

TRCA

- The New Jersey Department of Environmental Protection, NJDEP.
- The Washington (State) Technology Assessment Protocol, Ecology (TAPE), protocol.
- The Toronto and Region Conservation Authority (TRCA) developed the "Procedure for Laboratory Testing of Oil-Grit Separators".

The primary things these programs got right was insisting on independent testing and verification and creating demand. For a manufacturer to sell a stormwater treatment device in New Jersey or Washington State, a manufacturer must demonstrate performance that meets or exceeds state requirements.

STEPP

NMSA

"Regionality", has caused programs to be adopted by other jurisdictions in a piecemeal fashion. There is no consistency. The STEPP (Stormwater Testing and Evaluation for Products and Practices) initiative, currently operating under the NMSA umbrella, aims to provide national level guidance and practices to improve consistency.

ASTM International

At the protocol level STEPP is working with ASTM International to develop a number of standards. At the testing level, STEPP is working with ASTM through its newly formed E64 Stormwater Control Measures Committee to develop standardized test methods. ASTM International is an SCC accredited standards development organization (SDO) which provides Canada an opportunity to effectively influence and contribute to these standards.

Connecting to the broader policy ecosystem

All the efforts outlined above have been undertaken within the context of the needs of the stormwater industry. There is a recognition of the importance of connecting to a broader policy ecosystem. The advantages of this include the opportunity for more engagement and the potential streamline efforts that might otherwise be redundant.

Water Environment Federation (WEF)

The Water Environment Federation (WEF) is a UN water partner. Its mission is to establish the conditions that promote accelerated development and implementation of innovative technologies and approaches in the water sector. WEF provides a suite of services including education, economic, and information sharing forums which support the UN SDGs and advancing SDG6.

CSA Group

The CSA Group has prepared a report that examines Nature-Based Solutions for Coastal and Riverine Flood and Erosion Risk Management. It addresses knowledge gaps and research needs, and provides technical guidance on planning, predicting performance, monitoring, and decision-making.

Priority #2 – Opportunities for relationship mapping

Greg highlighted the following opportunities and challenges to be addressed when mapping the business case for effective, streamlined deployment of innovative stormwater solutions:

Opportunities

Opportunities:

- Faster deployment of innovative stormwater solutions can be supported by clarifying testing and performance requirements, increasing testing and demonstration opportunities, and adopting global best practices and technology verification standards.
- Independent third-party verification of environmental performance and impact claims can stimulate stormwater technology innovation and competitiveness.
- Managing the standards development process for leading-edge technologies, influences market trends and acceptance of these technologies, locally and globally.
- Governments, regulators, and industry stakeholders have expressed interest in having clear ways to identify and assess innovative stormwater technologies.

Challenges:

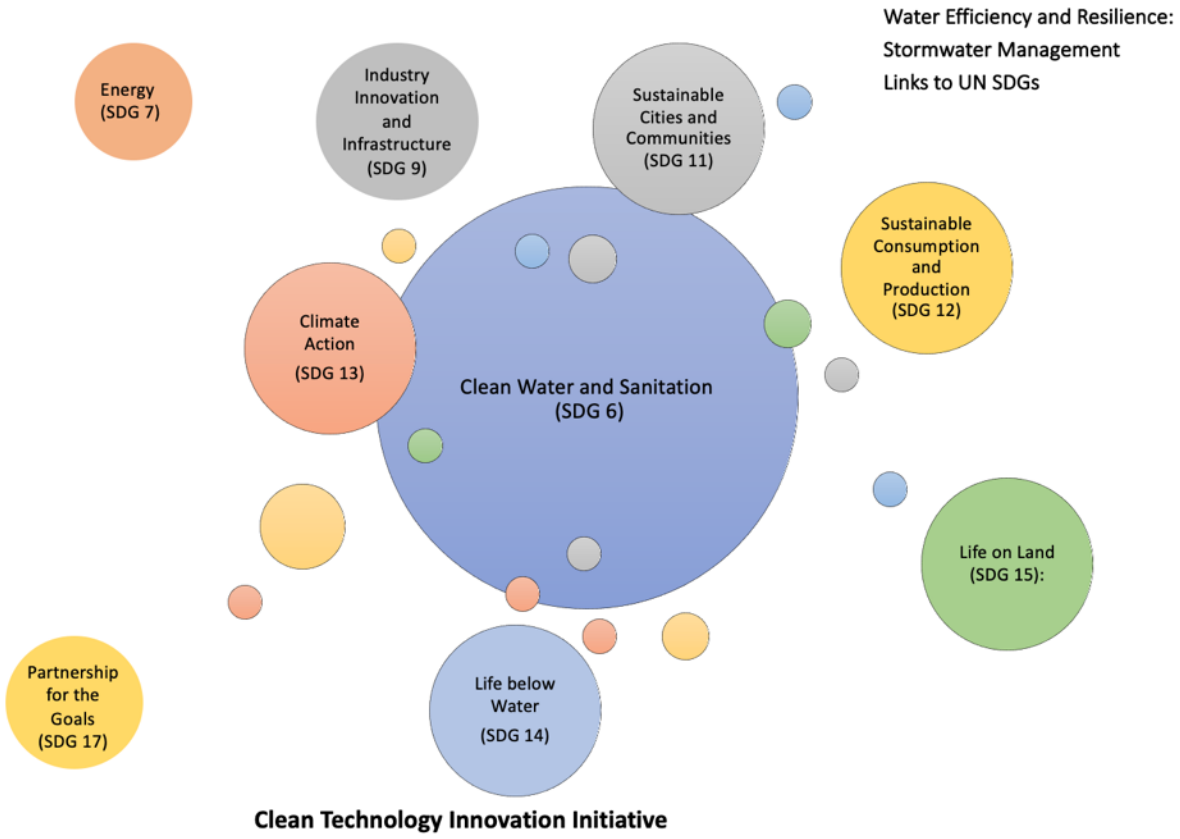
Challenges:

- Apparent decline in national commitments and support to produce updated, integrated procedures for stormwater technology testing and verification.
- Insufficient guidance on how stormwater technology testing and verification should be performed and reported.
- Need to build on knowledge and technology strengths related to sustainable water management.
- Need to maintain essential infrastructure information in useable formats.

Priority #3 - Further development of the CTII relationship map

Greg presented the following relationship maps:

- The highest level, where the Sustainable Development Goals are mapped,
- The program level, where the relationships are established, and
- The technical level, where the business and standardization work of the stormwater ecosystem is done.


Water Efficiency and Resilience:
Stormwater Management
Links to UN SDGs
Energy (SDG 7)
Industry Innovation and Infrastructure (SDG 9)
Sustainable Cities and Communities (SDG 11)
Sustainable Consumption and Production (SDG 12)
Climate Action (SDG 13)
Clean Water and Sanitation (SDG 6)
Life on Land (SDG 15):
Partnership for the Goals (SDG 17)
Life below Water (SDG 14)
Clean Technology Innovation Initiative


UN SDGs
ISO
Ocean Conserv'y
ITRC
ANSI
NMSA
ASTM
TRCA
WEF SWI
NJDEP
TAPE


UN SDGs
SCC
Other ISO TCs
ANAB
CSA
ISO TC207
ASTM
ISO 17025
ISO 17020
Washington State
ISO 14034
ITRC
MINN
Ontario
STEPP
TRCA STEP
NMSA
New Jersey
Toronto
MTDs
Quebec
NJCAT
IWA
SWEMA
TAPE
WEF

6. Development and application of the CTII relationship map

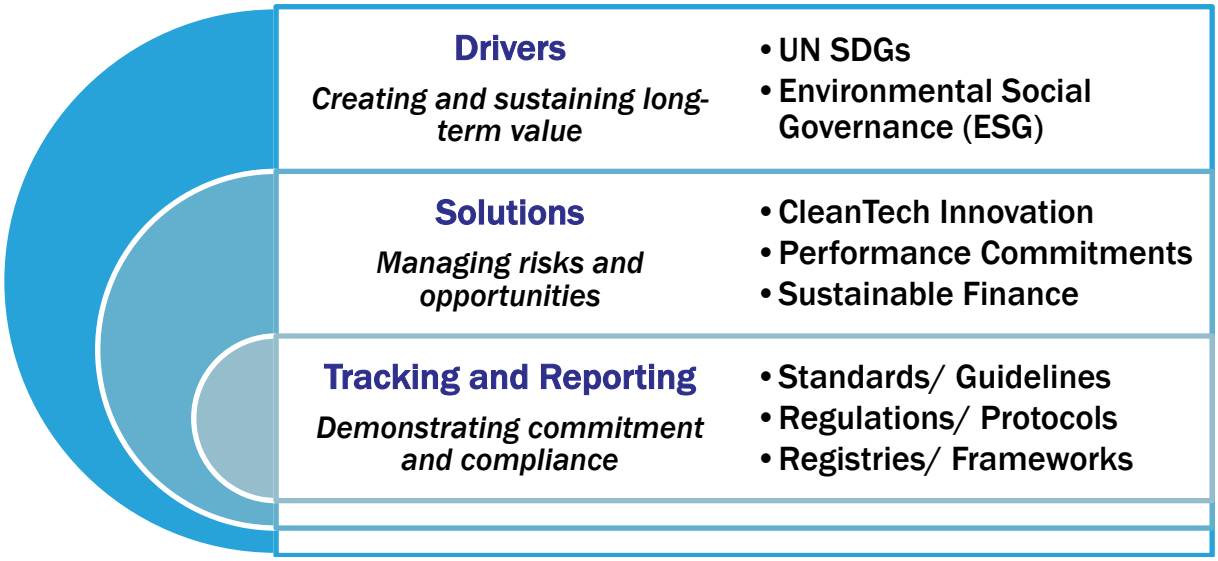
The 2nd CTTI Workshop provided an opportunity to consolidate and report on progress in addressing three priority tasks:

> #1. Engagement and collaboration with an expanding network of key stakeholders
>
> #2. Analysis of key opportunities where relationship mapping and performance benchmarking can be effectively applied to untangle complex issues
>
> #3. Further development of the clean technology innovation relationship map, illustrating solution pathways in the context of climate change mitigation/adaptation and water efficiency/resilience.

In addressing these priorities, each of the Workshop presenters provided their perspectives on the opportunities for linking ISO standards with the UN SDGs and other initiatives operating at multiple levels, with particular emphasis on climate change mitigation/ adaptation and water efficiency/ resilience.

During the Workshop we learned about specific concerns and needs in addressing these critical issues. We also learned more about the value of international standards and ways of strengthening global capacity to assess, select and deploy innovative solutions with sustainable outcomes. Underpinning this is the challenge of effectively positioning innovative technologies, products, and services to support sustainable development goals.

The figure below provides a framework for understanding how a relationship map could be constructed to show the connections between high level aspirational goals (e.g., the UN SDGs) and other levels of activity (e.g., solutions implementation and reporting on progress).



Within this framework, three primary relationship levels are identified: Drivers, Solutions and Tracking. The Drivers (Level 1) focus on creating and sustaining long-term value. Solutions (Level 2) focus on managing risks and opportunities. Tracking and Reporting (Level 3) focuses on demonstrating commitment and compliance.

Next Steps

Moving forward with the Clean Technology Innovation Initiative, here is where we stand on the three priority tasks identified on page 5 of this report.

#1 - Engagement and collaboration with key stakeholders –

As indicated in the workshop presentations, considerable time and effort has been invested in this. Stakeholder engagement is a dynamic ongoing process. We will continue to explore ways to stimulate collaboration. For example, we will be sharing our initial relationship map through presentations and website postings.

At the end of March 2022, the CTII project and relationship map will be presented at the Battelle Climate Resilience Conference in Columbus Ohio. We are also hoping to do the same at the World Bank INNOVATE4CLIMATE (I4C) event at the end of May 2022. This annual global conference on climate finance, climate investment and climate markets brings together thought leaders interested in linking climate innovation with investment opportunities – transforming dialogue into action.

We continue to welcome any other suggestions and opportunities for getting the word out and increasing the prospects of further collaboration

#2 - Opportunities for relationship mapping –

When the CTII was launched in June 2021, we indicated that the project would be open to ideas and suggestions from interested parties willing and able to provide leadership on various topics. Based on the feedback received it was decided that the first round of relationship map building would focus on the combined issues of climate change mitigation/adaptation and water efficiency/resilience.

These two issues will be the focus of the initial CTII relationship map using the layered, multi-level framework described earlier in this section. It is important to note that we remain open to other ideas, but for the purposes of the initial CTII relationship map we will be focusing on hese two issues.

#3 - Further development of the CTII relationship map –

Over the past six months we have explored various ways of structuring the relationship map. We have reached consensus on using the 3-tiered framework (presented earlier in the section) as an appropriate way of structuring the initial relationship, which will be posted on the VerifiGlobal website at the end of March 2022. The initial map will use examples to illustrate how relationship mapping and performance benchmarking tools can be applied to untangle complex issues and add value across sectors.

We remain very positive about the potential for the CTII to forge new connections, creating greater understanding of complex issues and opportunities to overcome barriers to the development and deployment of innovative clean technologies.

To track progress and become involved, please visit: https://www.verifiglobal.com/en

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