

# Link between United Nations Sustainable Development Goals and CSA Z662:19 Oil and Gas Pipeline Systems – Industry Perspective

Enabling Sustainable Development through Standards



## United Nations Sustainable Development Goals Addressed:

**SDG 3** – Good Health and Well-being,  
**SDG 6** – Clean Water and Sanitation,  
**SDG 11** – Sustainable Cities,

**SDG 13** – Climate Action,  
**SDG 14** – Life below Water,  
**SDG 15** – Life on Land

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## Summary

CSA Group is a leader in standards research, development, education, and advocacy with the goal of enhancing the lives of Canadians through the advancement of standards in the public and private sectors. The purpose of this study is to determine the potential support towards achieving the United Nations Sustainable Development Goals ( UN SDGs) through the use of CSA Z662:19 *Oil and Gas Pipeline Systems* by typical standard users. It is intended to explore whether there are linkages to UN SDG 3, SDG 6, SDG 11, SDG 13, SDG 14, and SDG 15, as well as possible linkages to SDG 7 and SDG 8. This study describes perspectives from a variety of users, including an oil and gas regulator, a certification and advisory company, engineers, and pipeline managers. Additional background information about the standard was obtained through interviews with members of the Technical Committee that contributed to the development of CSA Z662:19. These interviews gave light to how sustainability and environmental issues are addressed within their companies and by the standard, which provided indirect connections to the SDGs mentioned above.



## 1 Introduction

Since their creation in 2015, organizations, companies, and governments across the globe have started to implement and create projects surrounding the 17 United Nations Sustainable Development Goals (UN SDGs). The CSA Group, as a standards development organization whose standards have been referenced in federal and provincial regulations and legislation, has identified an opportunity to help Canadian businesses become aware of the UN SDGs and how they can be part of driving progress towards achievement of these goals by 2030. The CSA Z662 standard was originally created by regulatory agencies and industry in the 1960s, initially published as two separate standard documents (CAN/CSA Z183 and CAN/CSA Z184) until it was incorporated into one standard in 1994. This standard has a long history of use within Canada (it has been used over approximately 60 years in its various forms) not as a sustainability document but as a standard that promotes safety and integrity of pipelines, and the connections between this standard and the SDGs may not be obvious at first glance.

Using the CSA mapping process, connections between CSA Z662:19 and UN SDGs 3, 6, 11, 13, 14, and 15 have been identified:

|                                                                                     |                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <b>SDG 3</b> – ensure healthy lives and promote well-being for all at all ages.                                                                                                                                |
|    | <b>SDG 6</b> – ensure availability and sustainable management of water and sanitation for all.                                                                                                                 |
|   | <b>SDG 11</b> – make cities and human settlements inclusive, safe, resilient, and sustainable.                                                                                                                 |
|  | <b>SDG 13</b> – take urgent action to combat climate change and its impacts.                                                                                                                                   |
|  | <b>SDG 14</b> – conserve and sustainably use the oceans, seas, and marine resources for sustainable development.                                                                                               |
|  | <b>SDG 15</b> – protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. |

As these SDGs have been identified to be the ones most relevant to CSA Z662:19, this study will explore these connections.

CSA Z662:19 is a National Standard of Canada that is referenced and incorporated into federal regulation by the Canada Energy Regulator (CER), formerly the National Energy Board through the National Energy Board Onshore Pipeline Regulations. It is also referenced in provincial and territorial regulations, such as the Pipeline Regulation of the *Oil and Gas Activities Act* in British Columbia. The aim of this standard is to help establish safety requirements and guidelines for pipeline systems, specifically for the design, construction, operation, maintenance, deactivation, and abandonment phases of a pipeline system. Though this standard is mandated for use, pipeline systems are regulated variably between the federal and provincial levels and not all provinces and territories apply this standard or its related pipeline regulations in the same way, which may affect how connections to environmental issues and sustainability can be made. While addressing the SDGs was not the original intent of this standard, by its very nature, the standard does support the SDGs, and the newest edition includes several changes that strengthen these connections, including reducing risk, providing safer environments for workers, and improving efficiencies. It also makes a more direct connection by introducing guidelines for the prevention of disasters and reducing their impact during the operation of pipeline systems (e.g., large spills).

Essentially, although the standard is very technical in nature, and does not mirror the wording of the SDGs, it does address sustainability concerns when a pipeline system meets the requirements of the standard itself. If a pipeline is safe and protects humans as well as wildlife, then it has prevented pollution, environmental degradation and biodiversity loss, protected the safety of water and terrestrial systems, and protected human health. For example, the standard promotes sound engineering principles and environmental practices, and includes requirements and guidance on safety loss management, hazard identification, risk and engineering assessments, and so on, that are intended to protect people, the environment, and property. It is intended for the requirements of the standard to be applied with due regard to the protection of the environment, which includes land, water, plant life, and animal life.



Information for this study was obtained from CSA Group, the UN SDGs website, and the Government of Canada website, with the majority coming from the interviews with the three key standard users and Technical Committee members. Furthermore, CSA Z662:19 was reviewed to confirm the interview findings and to collect additional information.

## 2 Results and Impact

### 2.1 Industry Use and Perspective of CSA Z662:19

There was a good variety in the backgrounds of those who participated in the interview process and how they related to the safety, design, and operations of pipeline systems. Despite differing backgrounds, all participants had a similar perspective and view of the standard. As this is a standard referenced and adopted into regulations at both the federal and provincial level, it is a mandatory standard for all those who do work within the pipeline realm, forming the basis of those projects, and it is applicable throughout the entire life cycle of a pipeline system. However, because of the many layers of regulations and legislation at federal and provincial levels regarding the safety and design of pipeline systems, especially surrounding the prevention of environmental impacts during their use, participants felt that CSA Z662:19 was not typically considered to have an environmental undertone. The standard itself is broad and generic, and although in some instances the requirements are prescriptive in nature, many are performance based with room for flexibility. Participants



that directly refer to the standard either in their own applications or with their clients saw the standard as the base level of implementation, and they supplemented the project using other standards depending on the specific scenario the project entailed. Because of the broad use of this standard, the participants felt that specific environmental issues and sustainability were more thoroughly dealt with in supplemental documents. Participants felt that this standard does appropriately address environmental impacts and sustainability within its scope of application, but that it should remain a technical document and not go beyond its reach, as other documents already exist for that function.

As one participant explained, while CSA Z662:19 is adopted in British Columbia's regulations, sustainability and environmental protection is within the language of that regulation already, as well as being part of the mandate of their organization. In this case, adding environmental and sustainability language more directly within the standard would not be necessary as these issues are addressed elsewhere within their provincial regulations, as would be the case in other provinces and territories. They felt that in CSA Z662:19, sustainability impacts are appropriately acknowledged to the extent that they related to prevention of pipeline failure, but that wording could potentially be improved to make those connections more evident. For example, issues around damage prevention and land use planning are discussed in further depth in related CSA standards and products such as CSA Z663 and CSA Z247. Further discussion regarding environmental issues and how they relate to the SDGs will be laid out below.

## 2.2 Links to the UN Sustainable Development Goals

The goal of this study was to further understand CSA Z662:19 and how the use of this standard creates positive action towards achieving SDGs 3, 6, 11, 13, 14, and 15. The interview process was used to highlight potential connections with these standards through experience using the standard, as well as from personal understanding of the SDGs. Interviews revealed that there was some level of understanding within the industry regarding what the SDGs are and their connection with CSA Z662:19, but this varied among participants. Three organizations worked with the SDGs in their business, with some participants being able to identify specific goals that their company works towards and specific goals that connect to CSA Z662:19. The organizations and companies themselves also had various levels of environmental consciousness regarding the scope of their work. The oil and gas regulator had significant levels of environmental and sustainability consciousness as regulations that dictated their work directly referenced these issues and they were addressed in the regulator's service plan, strategic plan, and other business plans. Another company that directly works with the SDGs recently helped create an annual report for the UN Global Compact, and it uses the Global Reporting Initiative carbon reporting system in its business, the ISO standards within its management systems, and has created its own corporate social responsibility plan. The engineering firm that uses the SDGs within its work creates projects and sustainability initiatives that work towards achieving SDGs on a social impact level; it also



addresses specific SDGs in its annual meetings and monthly meetings, discussing projects that the firm wants to work towards. As a firm that advises clients in a variety of manners, it chooses projects that it feels highlight these goals and will use these to show a client how the project supports the SDGs. Thus, there was a strong knowledge base regarding environmental issues and the SDGs to work from when going through the interview process.

While interviews with standard users and the Technical Committee members revealed different experiences, they all came to similar conclusions regarding the applicability of environmental and sustainability matters in regards to CSA Z662:19. As stated, the participants thought there was some applicability to CSA Z662:19, but more specific action and policy development should target federal and provincial legislation and not be included in this standard. When asked about whether the standard would benefit from additional language reflecting the connection between the standard and the SDGs, the interviewees stressed that any such additional language should not change the technical nature of the standard. Participants agreed that the environmental and sustainability connections within the standard relate to the prevention of environmental impact through the safe use of pipelines or, in other words, the lack of environmental incidents and spills from malfunctioning of pipeline systems. Thus, the connection to sustainability and the SDGs is from the overall safe design and operation of pipeline systems that prevent failures and incidents, which translates to the prevention of pollution and disasters, as opposed to requirements that address environmental matters directly, such as preservation of the environment and ecosystems. These connections are described further below.

### 2.2.1 SDG 3 – Good Health and Well-being

Participants agreed that the linkage to SDG 3 was clear, in particular to target 3.9, *“By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination”*. A key driver for the development of this standard was the technical integrity of pipelines to prevent releases, which then supports the protection, well-being, and health of people. The latest revision of the standard also includes language to promote safer environments for workers, so it could reasonably be said to extend beyond general good health and include SDG 8 on decent work, and in particular target 8.8, *“Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment”*.

### 2.2.2 SDG 6 – Clean Water and Sanitation

Pipeline integrity ensures that all components are working properly and that processes are in place to prevent failures. This ties into the protection of source water and was identified as a linkage by participants. One participant noted that *“Alberta has seen several incidents in the past decades where crude oil has impacted important water sources through accidents and equipment failures, but these incidents are declining with stronger technical standards and regulations”*, which makes a clear connection to target 6.3 which states, *“By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally”*.

### 2.2.3 SDG 11 – Sustainable Cities

SDG 11 focuses on making cities and human settlements inclusive, safe, resilient, and sustainable. Target 11.5 focuses on losses due to disasters: *“By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.”* While participants debated whether this goal was focused only on natural disasters or if it would include infrastructure, several noted specifically that new wording in this edition of the standard focuses on incident prevention, which relates strongly to disaster avoidance, and which would directly contribute to the safety, resiliency, and sustainability of communities, and should therefore be considered a linkage.

### 2.2.4 SDG 13 – Climate Action

Participants noted that this linkage had strengthened in the last revision. Connections between CSA Z662:19 and SDG 13 are mainly focused on reducing future pipeline failures, thereby ensuring the resilience of pipeline systems to climate change impacts, which addresses target 13.1, *“Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.”*

Although CSA Z662:19 was not developed with the SDGs in mind and does not include language to directly reflect climate change resilience, these connections were highlighted by interview participants and also identified by Technical Committee members, who noted that *“the standard’s evolution to a risk focus inherently encompasses the increasing need to address the changing climate in technical planning.”*

### 2.2.5 SDG 14 – Life Below Water and SDG 15 – Life on Land

Reducing incidents that impact the environment, and that could lead to disasters, has a direct connection to protecting life below water and on land, and the standard therefore has linkages to targets 14.1, *“By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution,”* and 15.1, *“By 2020, ensure the conservation, restoration and sustainable*



*use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements,”* as noted by all participants.

## 2.3 Additional Notes

An interesting development during the interview process was the various participants’ view on how the SDG connections could or should be reflected in the standard. While the connection to environmental protection, sustainability, and environmental practice was made by all participants, some participants immediately stated there was a connection to the SDGs and the standard, while others were more hesitant about making specific linkages because of the technical nature of the standard, and a lack of sustainability wording within. One participant felt that the language of the standard as it is now does not promote connections as it is a highly technical document, and does not directly tell a user what to do in a specific situation, as the standard covers a broad range of scenarios. The participant felt that if the standard was revised in the future to be more risk-based in its language style, then there would be a greater justification for including the SDGs in the standard itself. The user did mention that including the connections in a separate section and detailing how these connections are made using this standard might be the best way to describe these connections within the standard. Another participant felt that only connections that are able to be directly articulated within the language of the standard should be included, and that there may be some barriers to what type of wording would be supported by regulators



given that it is referred to within legislation. Another participant who is also a member of the Technical Committee mentioned that, in recent committee meetings, the SDGs were included in the discussions, and that consideration of inclusion of some of their language, where appropriate, within the CSA Z662:19 standard would be part of future discussions.

Additionally, though the environmental and sustainability matters referred to in the standard are high level in scope, some standard users also mentioned new technologies and safety requirements surrounding those technologies that are in the process of being added to this standard that may create additional connections in the future. Pipeline systems cover a wide range of uses and, in the frame of the transition to cleaner energy, additional energy sources that use pipelines are also being researched. Natural gas is growing in the energy sector and a spinoff of this energy source is hydrogen, either pure or blended with natural gas, which is being positioned as the newest clean energy source. Some energy companies in Canada are already looking into creating pipeline systems surrounding this; however, conventional pipeline systems cannot handle hydrogen at this point. As the participant mentioned, technical committees and researchers are looking into what new requirements for pipelines would be necessary for transporting hydrogen and, if included, would add connections to SDG 7.

### 3 Conclusions and Next Steps

As one participant noted, “Despite a lack of sustainability language, this standard does contribute to sustainability through the protection of ecosystems”. While users had varying degrees of knowledge of the SDG process, and many could not identify linkages without prompting, when the SDGs were described, participants in this study could clearly see the linkages and provide examples as outlined above.

Participants expressed a desire to understand the SDGs further and to have a more thorough discussion as part of their Technical Committee deliberations going forward. Many felt that while the standard is technical in nature, wording could be included not to create new connections beyond the scope of this technical standard but to show how the nature of the standard supported sustainable development more directly, and to clarify that for existing and future users.