2023 THOUGHT LEADERSHIP

CCS LEGAL AND REGULATORY INDICATOR 2023

GLOBAL CCS INSTITUTE

IAN HAVERCROFT
Principal Consultant – Policy, Legal and Regulatory

NABEELA RAJI
Consultant - Legal and Regulatory

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1.0 KEY MESSAGES

1. The 2023 assessment reveals a renewed, and in some instances more recent, focus upon the development of CCS-specific law and regulation in several jurisdictions globally. While a number of countries have experienced minor changes to their regulatory regimes, a further smaller number have seen more significant, material amendments that have significantly improved their performance in the assessment.

2. As per previous versions of the Indicator, the 2023 assessment reveals that the greater proportion of the more significant developments have occurred across Europe and North America. Previously high-scoring nations, including Australia, Canada, Denmark, and the United States, have again improved their assessment scores through enhancements to their CCS-specific legal and regulatory regimes and new sub-national developments. Additional nations have now also joined these traditionally high-scoring nations, with Norway, Iceland and the Netherlands all being assessed as possessing similarly advanced legal and regulatory frameworks for the technology.

3. A focus upon the strengthening of existing CCS-specific regimes, the removal of remaining barriers to deployment and the streamlining of approvals processes, are just some examples of the improvements that have led to the more significant increases in scoring. Less significant improvements to national scores have resulted from the formal recognition of the need for legislative development in national policies, and additional minor CCS-relevant changes to national or sub-national legislation.

4. The issue of transboundary movement of CO_2 for storage has proven a topic of considerable importance for several nations globally. The planned development of storage projects that will offer storage as a service, as part of regional hubs, as well as some nation's limited domestic storage potential, has led governments to focus upon addressing the legal and regulatory barriers of exporting and importing captured CO_2. Central to recent activity was the decision of the Parties to the London Protocol in 2019, to allow the provisional application of an earlier 2009 amendment that permits the export of CO_2 for sub-seabed storage. Consequently, several nations have taken steps to both ratify the earlier 2009 amendment, as well as enter into bilateral agreements with other countries around the transboundary movement of CO_2.

5. While a stronger performance has been achieved by several nations in Europe and North America, the 2023 assessment also notes the significant improvement recorded in the scores of two nations in Southeast Asia. Indonesia and Malaysia have both improved their scores in this year's assessment, as a result of introducing CCS-specific legislation. The introduction of a comprehensive national regulatory framework for CCS and CCUS projects by Indonesia's government has led to a considerable improvement in the nation's score. Similar development in the Malaysian state of Sarawak, which has passed legislation aimed at regulating CCS activities in the state, has also resulted in an increase in the nation's score. While other nations in Southeast Asia, and indeed the wider Asia Pacific region, have seen little change in their 2023 assessment results, more recent policy and project announcements suggest there will be further significant developments in the coming year.

6. Notwithstanding the improvements made to some nations' legal and regulatory frameworks, the 2023 assessment reveals that over one third of the countries reviewed have experienced no change to their CCS-specific frameworks, or made minor changes that did not impact their ultimate score. While it is positive to note that this number is significantly lower than in earlier editions of the Indicator, this lack of activity is likely to present a significant barrier to deployment in many jurisdictions. A greater focus upon the development of CCS-specific frameworks will likely be required in several countries in the coming years if they are to realise their ambition for domestic deployment and the emissions reductions afforded by the technology.

2.0 INTRODUCTION

CCS is increasingly recognised as a key climate change mitigation technology and a critical component for the global transition to net-zero emissions. As further countries explore a role for the technology in the achievement of their national climate targets, designing effective legal and regulatory regimes to facilitate CCS activities remains a key priority for governments.

Over the last two decades, many jurisdictions around the world have taken significant steps to develop and implement legislation aimed at regulating CCS activities. Several early mover governments, such as those in North America, the Asia Pacific and Europe, established sophisticated and comprehensive regulatory models that addressed many of the novel aspects of the CCS project lifecycle. While the core components of these frameworks have underpinned the development of regulatory models in other parts of the world in recent years, the emergence of new applications and business models for CCS projects has led to initiatives to actively refine and expand legal and regulatory frameworks to support implementation.

The Global CCS Institute has continued to track the development of national legal and regulatory frameworks worldwide, to provide contemporary insights and commentary on the status and trends relating to the regulation of CCS. As part of this on-going programme of work, the Institute developed the CCS Legal and Regulatory Indicator (LRI) to assess and compare the national legal and regulatory regimes of selected jurisdictions worldwide. Two formal editions of the LRI were published by the Institute in 2015 and 2018, with a further assessment undertaken in 2020.

Now in its 3rd formal edition, the Institute's 2023 assessment is an in-depth analysis of the legal and regulatory frameworks applicable to CCS in 56 jurisdictions. The 2023 assessment now also includes two new jurisdictions that were not previously covered in earlier iterations of this report. The aim of the Indicator remains the same, however, and it seeks to examine and assess national approaches to the range of legal and regulatory factors that are critical to establishing a comprehensive legal and regulatory framework for the technology.

The assessment model that underpinned previous editions once again forms the basis of the Institute's 2023 Indicator. As per previous editions, the 2023 assessment seeks to:

- Highlight to a global audience of policymakers, regulators and project proponents, examples of law and regulation for the technology.
- Determine the comprehensiveness of an individual jurisdiction's legal and regulatory framework for the deployment of CCS projects.
- Generate a clearly-defined methodology for undertaking a regular assessment and comparison of national legal and regulatory developments.
- Enable the Institute to track the progress of legal and regulatory developments, as well as identify gaps and opportunities, across a number of jurisdictions worldwide.
- Analyse key trends and factors driving changes to the legal and regulatory frameworks of countries assessed in previous years.
- Offer a further, Institute contribution to the global debate on the development of policy, law and regulation for CCS.

The 2023 CCS Legal and Regulatory Indicator is strongly complemented by two further assessment tools, aimed at assessing global geological resources available for storage and policy support for the technology. Updated versions of the Global Storage Readiness Assessment (SI) and CCS Policy Indicator (PI) are also to be published by the Institute in 2023.

Project Team

The LRI project was led, and the final report prepared, by the Global CCS Institute. Mr. Ian Havercroft, Principal Consultant – Policy, Legal and Regulatory and Ms. Nabeela Raji – Consultant – Legal and Regulatory were the project's coordinators.

Baker McKenzie acted as consultants for the project and their regional offices assisted in the legal and regulatory review of the 56 countries covered by the Indicator. The Institute would like to acknowledge Ruth Dawes, Tom Webb and Amber Hu of the firm's Australia-based Environmental Practice Group for their work on the project.

3.0 2023 RESULTS

COUNTRY	SCORE
Australia	70
United Kingdom	68
Denmark	66.5
United States of America	66.5
Canada	66
Norway	61.5
Croatia	60.5
Iceland	58
Netherlands	58
Germany	57.5
Greece	57.5
Italy	57.5
Cyprus	57
Malta	56
Sweden	56
Luxembourg	53.5
Czechia	51.5
Bulgaria	49.5
Hungary	49.5
Slovak Republic	48.5
France	48
Indonesia	48
Lithuania	47.5
Belgium	47
Portugal	47
Romania	45.5
Finland	45
Poland	45

COUNTRY	SCORE
Malaysia	44.5
Spain	43.5
Mexico	41.5
Korea	39.5
Japan	36.5
New Zealand	36.5
South Africa	36.5
Singapore	36
Slovenia	36
Trinidad and Tobago	34.5
Latvia	32.5
Egypt	32
Estonia	31
Algeria	30
Austria	30
Brazil	30
China	28
Philippines	26.5
Vietnam	26
India	25
Ireland	25
Oman	23
Thailand	22
Botswana	18
Brunei	16
United Arab Emirates	13
Saudi Arabia	10.5
Switzerland	N/A

4.0 ANALYSIS AND CONCLUSIONS

The 2023 assessment has revealed a significant shift in the pace of legal and regulatory development globally. For several jurisdictions this activity has resulted in an improvement to domestic legal and regulatory frameworks and consequently their national assessment scores. Since 2020, 11 jurisdictions have noted material changes to their regulatory regimes that have resulted in significant changes to their 2023 score, while 19 further countries have seen changes resulting in minor revisions to their scores.

The country-level analysis once again reveals a select group of nations that have developed legal and regulatory frameworks which address CCS activities across most aspects of the project lifecycle. Positive to note in this assessment, however, are the number of countries that have substantially improved their CCS-specific regimes and may now be considered amongst the early-mover nations of Australia, Canada, Denmark, the United Kingdom, and the United States. Significant and recent legal and regulatory interventions in Norway and Iceland, for example, have resulted in substantive improvements in these nations' scores, enabling more comprehensive regulation of the technology throughout the project lifecycle.

Since the previous assessment exercise, new legal and regulatory provisions and amendments to existing regimes have significantly improved the scores of several nations, including those which received lower scores in prior assessments. Notable among the previously high-scoring nations are Canada, the United States, Denmark and Australia, which have all further improved their performance. In these instances, CCS-specific frameworks have been strengthened by addressing the remaining gaps in regimes and the streamlining of associated approval processes. The development and implementation of CCS-specific legislation in Indonesia and the State of Sarawak in Malaysia, has resulted in a significant improvement in the assessment scores of both nations.

Notwithstanding the pace of development in many jurisdictions, however, the 2023 assessment also reveals that 24 of the 56 nations examined have seen minor or no change to their regimes since the previous review. As a direct result, these nations' scores remain unchanged. While the number of countries that fall within this category has declined since the previous assessment, the inactivity may present a challenge to more widespread deployment of the technology in many parts of the world.

4.1 Significant trends and key issues

The 2023 assessment results also highlight several wider themes and trends within national governments' approach to the development of CCS-specific law and regulation. A focus upon facilitating and regulating the transboundary movement of CO_2, the strengthening and improvement of existing CCS-specific regimes, and the facilitation of early projects, have been revealed as particular trends within the 2023 assessment.

4.1.1. Regulating the transboundary movement of CO_2

The legality and regulation of the transboundary movement of CO_2, for the purpose of geological storage, has become an important consideration within several nations' approach to CCS deployment. The proposed development of industrial hubs, with the potential to receive CO_2 from a variety of industrial sources and offer a financially viable pathway to deployment, will in some instances feature cross-border movement of CO_2 as part of these projects. Similarly, limited domestic storage capacity will mean that some nations will look to export their captured CO_2 to storage sites beyond their domestic borders, as a part of decarbonising national industry.

The Institute's assessment reveals that several nations have sought to address the issue of transboundary movement through their ratification of the London Protocol and the provisional application of a subsequent 2009 amendment to the agreement. To date, Belgium, Denmark, Estonia, Finland, Iran, South Korea, the Netherlands, Norway, Sweden, and the United Kingdom have all ratified the 2009 amendment to enable the export of CO_2 for the purpose of sub-seabed geological storage. In addition, Denmark, South Korea, the Netherlands and Norway have also formally deposited declarations, to avail themselves of the provisional application of this amendment, in accordance with the 2019 decision of the Protocol's contracting parties.

In addition to the ratification of international commitments, several nations have also taken steps to address the issue within their domestic legal and regulatory regimes. While the outcomes of these actions remain unresolved in some countries, in others legislation is now in-place. Belgium and Denmark, for example, have formally entered into a memorandum of understanding with regard to the transportation of CO_2 between the two nations. The agreement has been critical for supporting the operations of Project Greensand, which commenced in March 2023. Similar arrangements have also been discussed between other countries in Europe, with Norway, France, Germany, Poland and Sweden all taking steps to formalise agreements and partnerships that will facilitate the transboundary movement of CO_2 in the coming years. Beyond Europe, legislation has been introduced in Sarawak, Malaysia, which enables the import of CO_2 into the state where a permit to undertake storage is awarded.

4 COUNTRIES HAVE DEPOSITED DECLARATIONS REGARDING THE PROVISIONAL APPLICATION OF THE 2009 AMENDMENT TO THE LONDON PROTOCOL

10 COUNTRIES HAVE RATIFIED THE 2009 AMENDMENT TO THE LONDON PROTOCOL*

*Only 9 of these countries are included in the Indicator assessment.

4.1.2 Strengthening of CCS-specific legal and regulatory frameworks

In the period since the previous Indicator assessment, several jurisdictions with advanced CCS-specific frameworks have further developed and enhanced their regimes. In many instances, these developments build upon detailed models, to address discrete issues, remove remaining obstacles, or add new frameworks as part of sub-national regimes.

In the United States, new legislation has been developed at both the federal and state level, further enhancing and complementing the regimes that were developed in previous years. Of particular note are the state-level interventions, with several additional states introducing laws to regulate CCS activities. At the Federal level, new legislation has been introduced to allocate further funding for CCS investment and increase the tax incentives for CO_2 storage, enhancing existing legislation and addressing gaps in the government's support package.

In Australia, where a comprehensive legal and regulatory framework for regulating the technology is in place in several jurisdictions, new legislation was introduced to enable CCS operations to generate revenue under the Federal government's Emissions Reduction Fund. The introduction of a new CCS Method, through a determination under the Carbon Farming Initiative legislation, will enable projects that capture, transport and permanently store CO_2 to be issued Australian Carbon Credit Units (ACCUs). To date, one CCS project has received certification under the scheme and will be eligible to receive ACCUs for the CO_2 emissions it successfully stores. Recent amendments to the government's Safeguard Mechanism legislation, however, limit the application of these provisions for on-site CCS projects.

4.1.3 Facilitation of early projects

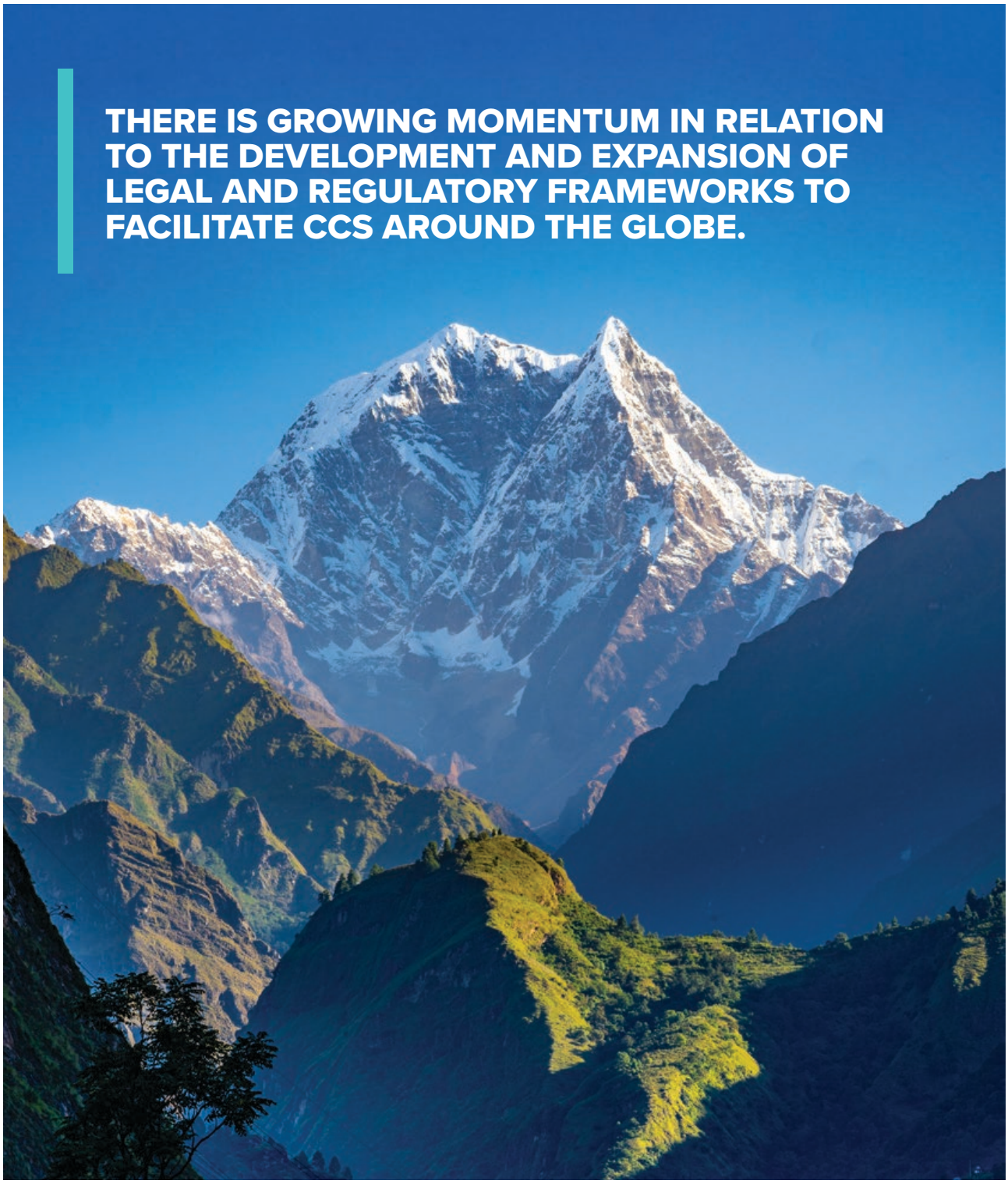
While legislation remains at a formative stage in many jurisdictions globally, the number of CCS projects announced and entering the early stages of development continues to rise. In many instances these developments are the result of a supportive and strengthened policy environment for the technology, however, it is also clear from the examples to date that legal and regulatory frameworks play an important role in underpinning these policy regimes.

Among those nations that have seen an improvement in their scores in the 2023 assessment, improvement and development of legal and regulatory frameworks would appear a critical element of the domestic policy initiatives aimed at supporting project deployment. This approach is particularly true of nations such as Indonesia and Malaysia, where the development of CCS-specific legislation is an important aspect of the government response in supporting and incentivising the deployment of the technology. In both nations, these developments will support the recently announced projects, to be developed in part by state-owned oil and gas companies.

In other jurisdictions, including those which have yet to see any change to their performance under the 2023 assessment, the development of law and regulation has been signposted as an important element of the future policy response to commercialisation of the technology. In Japan, the government's recent Long-Term CCS Roadmap seeks to promote the domestic deployment of the technology, with an ambition to achieve a storage capacity of between 120 and 240 Mt of CO_2 by 2050. The government has highlighted the development and implementation of domestic CCS-specific legislation as an activity central to achieving this ambition.

4.2 Regional assessments and conclusions

A regionally focused review of the 2023 assessment results provides further insight into the status of CCS-specific legislation globally. While the pace and scale of legal and regulatory development has increased significantly in recent years, resulting in significant developments in several jurisdictions, a regional assessment suggests there remains many nations whose policy ambitions for deployment of the technology are not matched by their domestic legal and regulatory regimes. The following sections examine the 2023 assessment results in greater detail and provide broader qualitative analysis as to the current status of CCS-specific law and regulation across the four regions.



4.2.1 Europe

23 NATIONS WITHIN THE REGION HAVE RECORDED IMPROVED SCORES IN THIS ASSESSMENT

7 OF THE **10** HIGHEST-SCORING NATIONS GLOBALLY ARE EUROPEAN

MAJORITY OF IMPROVEMENTS, HOWEVER, REPRESENT MINOR AMENDMENTS TO THEIR LEGISLATIVE FRAMEWORKS

Europe

The 2023 results reveal progress within the region, with a number of legal and regulatory developments implemented by European Member States (MSs) and wider European nations, since the Institute's previous assessment. A renewed focus upon commercial deployment of the technology, reflected in national policy commitments and recent project announcements, has led to several countries substantially improving their existing legal and regulatory regimes.

In many instances, these improvements have been achieved through the streamlining of approvals and licensing processes, the removal of remaining barriers and the clarification of administrative responsibilities. A focus upon the transboundary movement of CO_2, as discussed previously, has also led to several nations in the region implementing agreements and MOUs aimed at formalising relationships to enable these activities. Denmark, Greece, Iceland and Norway are demonstrative of this progress, with these nations all implementing material changes to their CCS-specific regimes and as a result, improving their assessment scores.

Previous versions of the Legal and Regulatory Indicator have noted the influence of the shared legal and regulatory objectives that were enshrined in national legal and regulatory regimes when countries transposed the EU Directive on the geological storage of carbon dioxide. As a result, many European nations have an established foundation for the regulation of domestic CCS activities. The 2023 assessment suggests that several countries have built upon this established base, as policy commitments to the technology in many jurisdictions continue to strengthen.

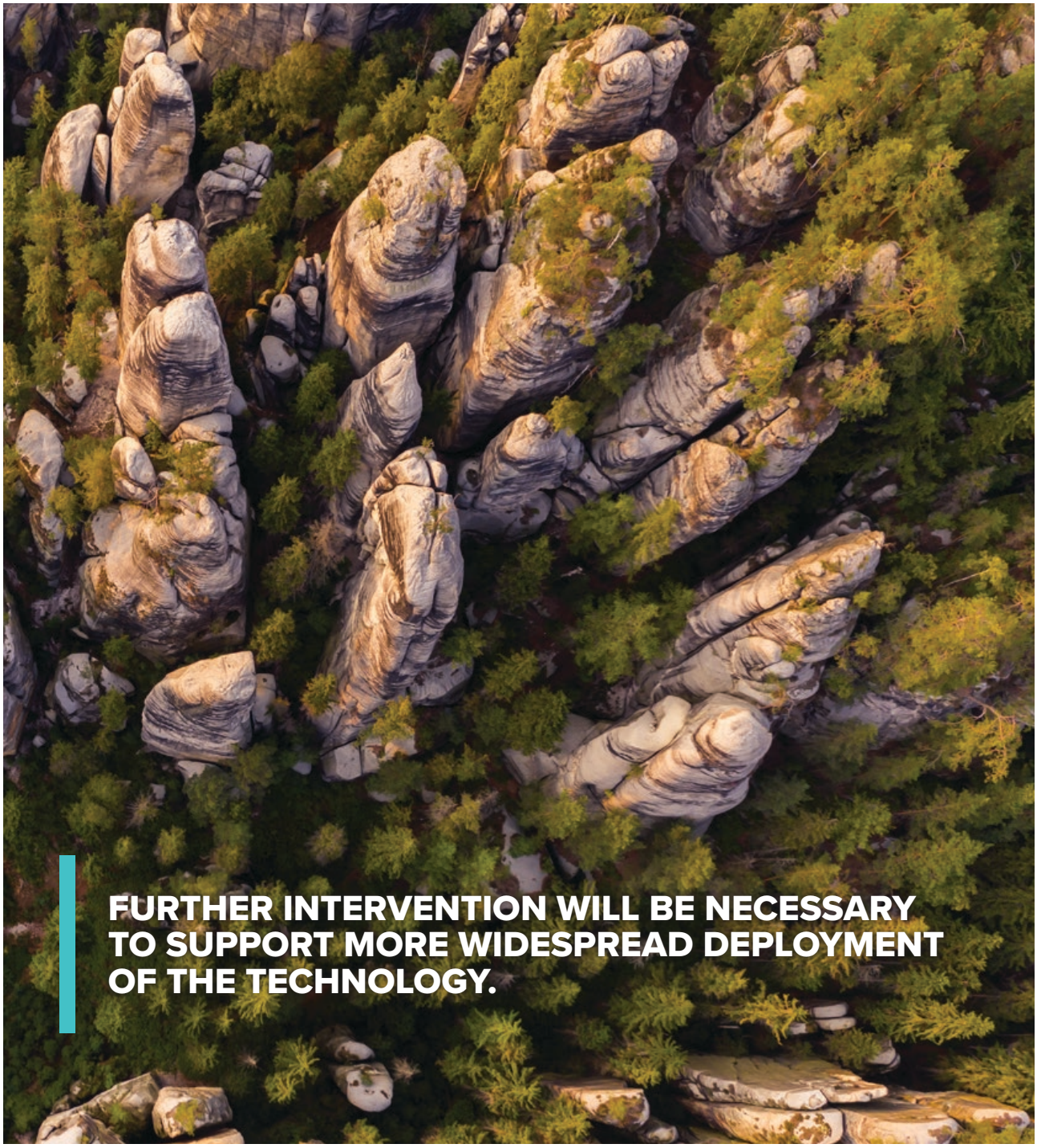
The Institute anticipates that the European Commission's recent policy and regulatory commitments to the technology, together with further project announcements across the region, will see a greater focus upon enhancing national legal and regulatory frameworks.

4.2.2 Middle East and Africa

Middle East and Africa

Nations within the Middle East and Africa (MEA) remain some of the lowest-scoring countries within the Institute's assessment. The 2023 assessment reveals that legal regimes in these jurisdictions continue to reflect only a few CCS-specific or existing laws that are applicable across parts of the CCS project lifecycle. The results are consistent with previous editions of the Institute's Indicator and once again reflect the nascent stage of policy deployment and/or interest in the development of CCS legislation in these jurisdictions.

Among the MEA nations assessed, Egypt remains the only nation to have improved its score. Amendments the Egyptian Investment Law No. 72 of 2017, which were introduced in August 2022, have now brought CCUS projects within the scope of the nation's single approval system. The amendments now enable CCS projects, which satisfy two or more of the listed conditions, to be considered strategic or national projects and therefore able to avail themselves of an expedited approvals pathway.



4.2.3 Asia Pacific

Asia Pacific

CCS technologies are increasingly expected to play a significant role in supporting the region's climate mitigation commitments, and several countries have already established policy support to incentivise the technology's deployment. The 2023 assessment results reflect the progress made to date across the region but are also demonstrative of the challenges facing many nations that have yet to consider their approach to regulating the technology.

Australia remains a stand-out nation within the region, with a highly advanced legal and regulatory regime governing CCS activities, at both the Commonwealth and state level. The Commonwealth regime is sophisticated and further complimented by state-level regimes in Victoria, Queensland and South Australia. Project-specific legislation in the form of the Barrow Island Act 2002 regulates the storage of CO_2 on Barrow Island in the state of Western Australia. While the legal and regulatory landscape is both complex and comprehensive, further improvements may be made to the Australian regime. Recent activity suggests, however, that both the Commonwealth and wider state governments will take steps to address the remaining barriers and further enhance regulatory landscape.

Across the Asia Pacific region there have been fewer developments, with little change to many nations' scores in the 2023 assessment. Recent policy and project announcements from governments and industry, however, suggest that further legal and regulatory development will be likely in the coming years. In Japan, the government's 2022 Long-Term CCS Roadmap includes a reference to the development of CCS-specific legislation, and the government is currently preparing draft legislation. South Korea has also committed to developing legislation that will support CCUS within its National Framework Plan.

In Southeast Asia, where several CCS projects are now in the early stages of development, few countries have considered or implemented CCS-specific legal and regulatory frameworks. For a CCS project to be regulated in the near term, policymakers and regulators in many of these jurisdictions will be required to rely upon existing regulatory regimes. Recent developments in Indonesia and the Malaysian state of Sarawak, however, have resulted in detailed legal and regulatory frameworks that will regulate storage operations within these jurisdictions. The regimes offer the first examples of CCS-specific legislation in the region and as such, offer tangible models and principles that may prove relevant to other nations in Southeast Asia.

4.2.4 Americas

AMENDMENTS TO EXISTING OIL & GAS FRAMEWORKS IN BRITISH COLUMBIA & ALBERTA HAVE LED TO IMPROVED SCORING FOR CANADA

NO UPDATES HAVE BEEN RECORDED IN THE COUNTRIES IN CENTRAL & SOUTH AMERICA

Americas

The United States and Canada remain high scoring within the 2023 assessment, with the two nations continuing to improve their regulatory frameworks for the technology. The US states and Canadian provinces also continue to play an important role, with regulators and policymakers in these jurisdictions continuing to develop and expand their CCS-specific regimes under their delegated authorities.

As highlighted previously, the Federal government in the United States has implemented legislation that will expand the incentives afforded to project development, as well as to enable offshore carbon sequestration on the nation's Outer Continental Shelf. These developments have been further complemented by state-level activity and the introduction of new laws to regulate CCS activities. Additional legislation is anticipated in the coming year to further expand these regulatory regimes and address remaining issues.

In Canada, the provinces of British Columbia and Alberta have continued to strengthen their regulation of the technology. Improvements made to these province's regimes have led to an improved score in the 2023 assessment. In British Columbia, the province's 2022 amendments to its existing oil and gas regime now provide a comprehensive tenure and approval framework for the technology; while in Alberta, new provisions have seen CCS activities awarded sequestration credits under the province's Technology Innovation and Emissions Reduction Regulation.

The position in Central and South America is less positive, with no significant developments made to the legal and regulatory regimes in Mexico, Trinidad and Tobago, and Brazil.

5.0 METHODOLOGY

The Institute's assessment model centres upon a comparison of models and contrasts national circumstances to determine the effectiveness and comprehensiveness of legal and regulatory regimes in regulating the discrete aspects of the CCS process.

The methodology that underpins the Institute's 2023 assessment remains unchanged from earlier iterations of the LRI. For each country, the assessment model focused upon the approach to the development of national and sub-national legal and regulatory frameworks for regulating CCS. In jurisdictions where no CCS-related regulatory frameworks have been developed to date, the model also enables an assessment of existing law and regulation which may support the deployment of the technology.

5.1 Assessment criteria

The development of an assessment model that may address a diverse range of approaches to the regulation of CCS is central to the LRI assessment exercise. The resulting assessment methodology therefore allocates individual countries both quantitative and qualitative rankings, based upon the efficacy and extensiveness of a country's CCS regime.

Scrutiny of several detailed criteria enables an assessment of the legal and regulatory regimes for each of the 56 countries. These criteria are designed to reflect the core elements of a comprehensive legal and regulatory model for the technology. The criteria address issues which are likely critical to the regulation of a project throughout its lifecycle and include administrative arrangements and potential permitting pathways for CCS projects, as well as allied issues such as environmental impact assessment and public consultation provisions.

Five overarching primary criteria, set out in Table 1 below, provide the foundation of this assessment.

1	The clarity and efficiency of the administrative process under the CCS legal framework to apply for, and obtain, regulatory approval for CCS projects.
2	The comprehensiveness of the legal framework in providing for all aspects of a CCS project, including siting, design, capture, transport, storage, closure and monitoring for potential releases of stored CO_2.
3	The extent to which the CCS legal and regulatory framework provides for the appropriate siting of projects and adequate environmental impact assessment processes.
4	The extent to which the CCS legal and regulatory framework provides for and incorporates meaningful and effective stakeholder and public consultation.
5	The way in which laws and regulations deal with long-term liability for closure, monitoring and accidental releases of CO_2.

Table 1: Primary Assessment Criteria

The assessment methodology is also accompanied by further sub-criteria which were developed to assist with providing a further filter for assessing national regimes and arriving at the overall score in relation to each primary criterion.

5.2 Scoring of individual nations

The national and subnational legal and regulatory frameworks of the 56 countries reviewed were compiled within a database. The findings of the assessment and the database were then used as the basis for the broader assessment process.

The scoring scale set out in Table 2 below was used to score each of the jurisdictions against the various sub-criteria, which sit below the five primary assessment criteria. Scores awarded across all the assessment criteria have resulted in a composite score - the basis for each country's total score in the LRI.

3	Clearly and unequivocally capable of satisfying the criterion.
2	Moderately capable of satisfying the criterion, subject to conditions or limitations.
1	Capable of satisfying the criterion only in some minor respects.
0	Largely incapable of satisfying the criterion.

Table 2: Scoring scale for assessment

Evaluation of the results and the subsequent scoring was undertaken by the Baker McKenzie teams in collaboration with Global CCS Institute staff.

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AMERICAS

Washington DC, United States

americasoffice@globalccsinstitute.com

AUSTRALIA

Melbourne, Australia

info@globalccsinstitute.com

CHINA

Beijing, China

chinaoffice@globalccsinstitute.com

EUROPE

Brussels, Belgium

europeoffice@globalccsinstitute.com

MIDDLE EAST AND NORTH AFRICA

Abu Dhabi, United Arab Emirates

menaregion@globalccsinstitute.com

UNITED KINGDOM

London, United Kingdom

ukoffice@globalccsinstitute.com

JAPAN

Tokyo, Japan

japanoffice@globalccsinstitute.com