

SCALE

ASSESSMENT OF CDR
PUBLIC POLICY

AUGUST 2026 UPDATE

MEASURING AND COMPARING GOVERNMENT PROGRESS ON CARBON DIOXIDE REMOVAL



VANCOUVER
— PROCESS —

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This document was originally developed by the Vancouver Process, a global initiative coordinated by the Science Communication Institute (SCI).

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SCALE Assessment of CDR Public Policy

INTRODUCTION

Governments are beginning to build elements of carbon dioxide removal (CDR) policy, but much of this activity remains dispersed, both thematically and administratively. CDR is often embedded within broader mitigation portfolios that also encompass emissions reduction, energy transition, avoidance, offsets, net zero, CCS, and land-based sequestration. As a result, responsibility for CDR is commonly distributed across multiple agencies, and there is little consistency between governments in where the policy function sits.

An animating goal of the Vancouver Process is to help governments develop the capacity needed to meet the coming challenges of CDR, both internally and collectively—to improve government-wide expertise and influence on CDR; improve funding and planning capacity for CDR; develop action plans built on joint needs, best practices and lessons of experience; and improve our capacity for global coordination. Some of this work can be done by Vancouver Process participants. Some will require broader, longer-term changes, such as improving political support for CDR, moving toward an ethos of climate repair instead of climate “stabilization” (which will require reorienting our goals around net negative and not just net zero), adding CDR as a new pillar of climate policy, and recognizing the importance of government leadership in the effort to scale CDR.

Step one in this process is to develop a clearer understanding of how governments can help each other. It isn’t enough to simply note that some governments are doing activity A and others activity B. It’s also important to understand how these policies and actions compare, specifically with regard to CDR and not simply climate or mitigation policy writ large.

The SCALE framework developed for this assessment measures five dimensions of CDR public policy:

- S** = Strategic commitment
- C** = Capacity and coordination
- A** = Accountability and public value
- L** = Long-term finance
- E** = Execution and delivery

As the SCALE assessments in this paper will show, even governments generally regarded as CDR leaders have incomplete CDR policy systems. Understanding each government's SCALE profile, as well as the international SCALE profile, can help Vancouver Process participants identify where capacity development may be most useful and where governments can learn from one another.

THE SCALE FRAMEWORK

The dimensions and sub-dimensions of the SCALE framework are described in the table below:

DIMENSION	SUB-DIMENSION	DESCRIPTION
S: Strategic commitment		Is there a sufficiently clear and durable understanding of CDR's role in climate action and of the government's responsibility for scaling it quickly, safely, and appropriately?
	S1: Strategic clarity	Has government distinguished between emissions reduction, residual-emissions neutralization, net zero, and net negative, and described the approximate scale and timing of its CDR need?
	S2: Public responsibility	Has government defined what it is responsible for doing, rather than leaving development entirely to voluntary buyers, private project developers, or future market demand?
	S3: Durability & urgency	Is the commitment supported by law, institutional mandates, milestones, review, and political backing capable of surviving elections and annual budget cycles?
C: Capacity & coordination		Do public institutions have the expertise, authority, staffing, and coordination needed to understand and manage CDR?
	C1: Technical & analytical expertise	Can government itself, or a public technical body acting under government mandate, independently evaluate atmospheric effect, lifecycle emissions, durability, cost, readiness, resource needs, environmental implications, and developer claims?
	C2: Institutional ownership	Is one public body accountable for CDR as a policy and delivery function, with an explicit mandate, authority, staff, resources, and responsibility to coordinate or cause action across the policy chain—not merely to study or administer one narrow program?
	C3: Government coordination	Can government use formal and recurring arrangements to coordinate climate, finance, energy, industry, land, science, infrastructure, procurement, and subnational authorities in ways that affect implementation?
A: Accountability & public value		Are credible and transparent rules in place for defining, measuring, governing, and taking responsibility for atmospheric carbon removal?
	A1: Carbon integrity & accounting	Does public policy consistently distinguish verified net atmospheric removal from adaptation, allowances, avoided-emissions offsets, avoided deforestation, protected carbon stocks, fossil CCS, and biogenic-carbon stabilization?
	A2: Safeguards & liability	Are environmental and health effects, resource demands, community rights, public participation, project failure, reversal, monitoring, remediation, and long-term liability governed?
	A3: Transparency, sovereign control & public value	Does government itself determine and enforce ownership, national accounting, international transfer, data access, contract disclosure, benefit distribution, and responsibility for long-term costs, rather than leaving these decisions to buyers, developers, or private standards bodies?
L: Long-term finance		Has government created sufficient, durable public or publicly mobilized finance across the complete CDR system?

	L1: Public financial commitment & adequacy	Has government committed or appropriated public resources for CDR across research, institutional capacity, demonstration, deployment, infrastructure, procurement, monitoring, and stewardship, and is that commitment proportionate to its anticipated CDR requirement?
	L2: Public mobilization & scaling architecture	Has government created mechanisms capable of mobilizing much larger and continuing flows of capital, such as regulated demand, contracts for difference, reverse auctions, public guarantees, concessional finance, infrastructure finance, or mandatory contributions?
	L3: Durability, completeness & scale pathway	Are financing arrangements multiyear, legally or institutionally durable, applicable across the full delivery chain, and capable of expanding from initial projects toward the quantities implied by net zero and eventual net-negative drawdown?
E: Execution & delivery		Are legal and operational arrangements producing verified atmospheric removals at a scale relevant to the policy's stated purpose?
	E1: Legal delivery arrangements	Has government created an operative mechanism such as procurement, a reverse auction, a contract for difference, a regulated obligation, or direct commissioning that causes or requires removal to occur?
	E2: Verified atmospheric removals	Are qualifying removals physically occurring and independently verified?
	E3: Scale & integration	Are volumes meaningful relative to the stated objective, and are they connected to functioning infrastructure, permitting, monitoring, enforcement, and policy learning?

POLICY PERSPECTIVE

SCALE is not policy-neutral. It reflects the Vancouver Process view that climate-relevant CDR will require an active public role in setting objectives, developing technical capacity and safeguards, mobilizing finance, coordinating across agencies, and, where needed, creating or assuring demand for delivery. It does not assume that governments must own or operate removal projects; private markets and project developers may perform much of the delivery. It does assume, however, that government retains responsibility for ensuring that the public-policy system is capable of producing outcomes consistent with its stated climate objectives. Jurisdictions that deliberately rely on voluntary markets or fragmented sector programs may therefore score lower on S2, C2, L, or E. Those scores reflect distance from this public-capacity model, not a finding that the jurisdiction's overall climate policy is ineffective.

SCALE also does not assign each jurisdiction a numerical share of historical atmospheric CO₂ or prescribe a single formula for post-net-zero drawdown. Any international allocation would involve unresolved choices about historical emissions, current and future emissions, financial and technical capacity, development circumstances, storage resources, and other equity considerations. The narrower SCALE question is whether a government has articulated the scale and timing of the removals it expects to need for its own stated objectives and, where it invokes net-negative or historical-emissions goals, whether it has translated them into a credible policy pathway.

SCOPE, COMPARABILITY AND LIMITATIONS

This paper examines the seven national participants in the Vancouver Process—the European Union, Kenya, Pakistan, the Philippines, Singapore, Sierra Leone, and Uganda—together with the participating state governments of California and Washington. It also considers Australia, Canada, New Zealand, Japan, and the United States as comparison cases, and Denmark, Sweden, and the United Kingdom as frontier reference cases because they have developed particularly significant financial, contractual, or institutional components.

The jurisdictions assessed do not have identical legal powers. SCALE therefore asks whether each required function is present within the public-policy system available to that jurisdiction, not whether every government has the same constitutional competence. Where authority is shared or reserved to another level of government, a formal coordination mechanism or reliable link to higher- or lower-level machinery can count toward the relevant function. Lack of unilateral legal authority is not, by itself, treated as policy failure. The scores are therefore best read as comparisons of policy-system completeness and dependencies rather than of constitutional power, effort, resources, or overall climate performance.

These assessments are based on publicly available laws, regulations, strategies, budgets, procurement actions, and government reports reviewed through 21 August 2026. The scores are provisional judgments. They have not been reviewed or endorsed by the governments concerned. They should be treated as hypotheses to be tested through government consultation and continued source review.

PRECEDENT

Using multidimensional indicators to simplify complex cross-jurisdiction comparisons is a common and well-established practice in international policy analysis. The [World Bank World Development Indicators](#) organize internationally comparable measures across economies; closer policy and institutional analogues include the [Worldwide Governance Indicators](#), which summarize governance across six dimensions, and the [Country Policy and Institutional Assessment \(CPIA\)](#), which scores sixteen policy and institutional criteria. The [OECD Climate Actions and Policies Measurement Framework \(CAPMF\)](#) similarly translates heterogeneous climate-policy instruments into common stringency scores and explicitly treats those scores as informative rather than as a performance ranking. SCALE is not derived from these systems and has not undergone equivalent statistical validation. It follows the same practical logic: disaggregate a complex policy environment into transparent dimensions, apply consistent criteria, and use the resulting profile to identify gaps, strengths, and opportunities for mutual learning and collaboration across different policy regimes.

WHAT THIS ASSESSMENT COUNTS AS CDR PROGRESS

SCALE is strict with regard to CDR. For example, it asks whether governments are developing the capacity to produce verified net atmospheric removal of CO₂, and doesn't simply award points for having CO₂-related policies, adaptation programs, emission-reduction policies, or other tangential work. This is important because most current CDR work is focused on efforts that don't actually remove accumulated CO₂.

The same strict formula applies to the machinery surrounding removal. For the finance dimension, for example, capacity is assessed with regard to the scale of the government's expected CDR need. Research grants, pilot funding, tax incentives, and isolated procurements therefore score poorly unless they form part of a broader scaling system; a good score requires a durable system capable of financing a material share of that need. For accountability systems, transferable expertise or rules from adjacent climate, forestry, CCS, carbon-market, or procurement programs receive credit only where the government has made them specifically applicable to CDR. A sophisticated pilot or pathway-specific instrument does not by itself constitute a complete public system. Overall, SCALE scores are assessed against the policy perspective described above: climate-relevant CDR requires sufficient public-sector capacity to regulate, coordinate, finance, and, where necessary, assure delivery.

SCALE applies the same atmospheric-accounting test to biochar as to other removal pathways. Biochar can constitute CDR when biogenic carbon that was recently drawn from the atmosphere is converted into a sufficiently durable form and the full project lifecycle yields additional net atmospheric removal. The feedstock need not have been planted specifically for CDR: residues or waste biomass can qualify where a credible counterfactual shows that the carbon would otherwise have returned to the atmosphere and where diversion does not create offsetting emissions or foregone higher-value uses. The assessment therefore looks to counterfactual use, lifecycle emissions, leakage, carbon durability, and monitoring rather than feedstock origin alone. This treatment is consistent with [IPCC AR6 WGIII Chapter 7, section 7.4.3.2](#) and [The State of Carbon Dioxide Removal, 3rd edition, Chapter 7](#).

HOW THIS ANALYSIS IS QUANTIFIED

Each main dimension of SCALE is assigned a numerical value from zero to nine by adding the three sub-dimension scores, each of which ranges from zero to three. These are ordinal maturity scores rather than cardinal performance measures: a score of 2 is not twice a score of 1, and the five-digit SCALE profile is intended to show the shape of a policy system rather than produce a single league-table ranking. The default interpretation is:

- 0 = No significant CDR-specific activity, or only adjacent activity with no demonstrated application to CDR
- 1 = Emerging: formal recognition, analysis, consultation, proposal, pilot, or limited operating activity, but not yet a stable or complete policy function
- 2 = Established: an adopted and resourced policy, program, mandate, or recurring activity exists, but remains incomplete or inadequate relative to the stated CDR need
- 3 = Operational: the function is legally or administratively in force, durable, and functioning at a level reasonably adequate for that sub-dimension's stated purpose.

HOW POLICY STAGES ARE TREATED

- **Proposals and drafts:** A proposal, consultation, draft protocol, or announced intention normally supports no more than a score of 1. Adoption, appropriation, or another formal act is generally required for a score of 2.

- **Adopted policy:** An adopted law, regulation, strategy, or mandate can support S, C, or A scores, but does not by itself earn execution credit.
- **Funding:** Appropriated or committed funding supports L. It contributes to E only when it is tied to a CDR-specific delivery mechanism rather than research, general climate finance, or broad market eligibility.
- **E1 - legal delivery arrangements:** A score of 1 indicates a formally launched CDR-specific procurement, market-making, or contracting process that remains at an early stage. A score of 2 indicates an adopted and resourced CDR delivery program with a formal solicitation, selection, or negotiation process under way but no binding delivery award yet. A score of 3 requires a binding contract, award, regulated CDR obligation, or equivalent enforceable arrangement in force.
- **Broad carbon markets:** A carbon market or offset system that merely allows removals among many compliance options does not earn E1 by itself, although it may contribute to accountability or finance scores.
- **E2 and E3:** E2 requires independently verified qualifying removals directly connected to the government delivery arrangement. E3 additionally requires volumes material to the stated objective and integration with infrastructure, permitting, monitoring, enforcement, and policy learning.

Where evidence falls between two levels, SCALE uses the lower score unless the evidence clearly meets the higher threshold. This conservative rule is intended to make the assessment easier to reproduce and defend.

The table below is an example of how a SCALE “report card” for a government might read:

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity		0			0	0							0	0	0
1 — Emerging	1		1	1			1				1				
2 — Established								2	2	2		2			
3 — Operational															
TOTALS	2			1			5			5			0		

In this case, the country’s SCALE score would be written as 21550, reflecting limited progress in strategic and capacity considerations, more developed accountability and long-term finance components, and no execution or delivery activity. This score should not be seen as a grade, but as a numerical way to visualize policy-system maturity and identify opportunities for policy growth and engagement.

PROVISIONAL RESULTS AT A GLANCE

As a starting point for discussion, the SCALE scores and sub-scores of Vancouver Process participants might be as follows (please see the annex section for details):

GOVERNMENT	SCALE	SUB-SCORES
European Union	54421	S=212, C=211, A=211, L=110, E=100
Kenya	11200	S=100, C=001, A=011, L=000, E=000
Pakistan	01100	S=000, C=001, A=001, L=000, E=000
Philippines	11200	S=100, C=001, A=011, L=000, E=000
Singapore	22200	S=110, C=101, A=011, L=000, E=000
Sierra Leone	01100	S=000, C=001, A=001, L=000, E=000
Uganda	01200	S=000, C=001, A=011, L=000, E=000
California	55410	S=212, C=212, A=211, L=100, E=000
Washington State	42210	S=211, C=101, A=110, L=100, E=000

Comparison governments might have these scores:

GOVERNMENT	SCALE	SUB-SCORES
Australia	23210	S=200, C=201, A=110, L=100, E=000
Canada	34322	S=111, C=211, A=111, L=110, E=200
New Zealand	34400	S=111, C=211, A=211, L=000, E=000
Japan	23110	S=101, C=201, A=100, L=100, E=000
United States	24230	S=110, C=211, A=110, L=210, E=000

And our “frontier” reference cases might have these scores:

GOVERNMENT	SCALE	SUB-SCORES
Denmark	44343	S=211, C=211, A=111, L=121, E=300
Sweden	54343	S=212, C=211, A=111, L=121, E=300
United Kingdom	44442	S=211, C=211, A=211, L=121, E=200

The annex section of this report describes how these scores were calculated.

WHAT THESE RESULTS REVEAL

The most consistent conclusion from this analysis is that public CDR policy systems remain incomplete. Across the jurisdictions assessed:

1. **Strategic commitment remains incomplete:** CDR appears in an increasing number of climate plans, but it is also generally assigned to a narrow role: balancing emissions that remain after conventional mitigation has been exhausted. This is not the same as a coherent and connected strategy for atmospheric CO₂ removal. Few governments have, for example, set a net-negative objective, assigned responsibility for delivering that objective, established a timetable extending beyond net zero, or explained what should happen if private markets fail to supply the assumed removals. Even Denmark, Sweden, and the United Kingdom receive only moderate strategic scores. They have stronger programs and institutions than most jurisdictions, but no complete public strategy linking residual-emissions neutralization to any post-net-zero atmospheric drawdown they expect to pursue.
2. **Technical expertise is more common than institutional ownership:** Several countries possess considerable scientific and engineering expertise, including public research capability. But much expertise still sits outside the agencies that would need to make and implement policy. More importantly, no jurisdiction assessed scores highly on C2

(institutional ownership). Even the strongest cases assign narrow functions—research, certification, regulation, tender administration, or business-model design—without making one public body accountable for the CDR function as a whole or for ensuring that the government’s removal objective is met. California comes closest to a formal regulatory home, but responsibility for planning, safeguards, permitting, natural lands, geological storage, finance, and delivery remains distributed.

3. **Accountability systems remain partial:** The EU, New Zealand, California, and the United Kingdom have the clearest public distinctions or assessment rules for qualifying removals, while several other governments have narrower pathway-specific protocols or project rules. But most climate and carbon-market systems still combine reductions, avoidance, stock protection, temporary sequestration, fossil CCS, and removal in ways that obscure atmospheric effect. No government scores high on A3 (sovereign control): public rules for ownership, national claims, international transfer, open data, benefit distribution, contract disclosure, and responsibility for long-term costs remain incomplete. Many current systems were built to certify transactions, not to determine whether government has fulfilled a long-term public obligation.
4. **Finance is concentrated and incomplete:** Current public and publicly mobilized CDR finance is directed mainly toward research, demonstrations, isolated procurements, tax incentives, and a small number of contracted projects. These commitments represent progress, but they also remain tiny relative to the investment that would be needed for sustained, climate-relevant atmospheric drawdown. Voluntary private investment can support innovation and project development, but it cannot substitute for public financing systems capable of mobilizing capital across infrastructure, procurement, monitoring, stewardship, and long-term liability. No government has yet created such a system at adequate scale.
5. **Delivery is the weakest dimension:** A legal framework, grant, or broad carbon-market mechanism is not the same as a CDR delivery arrangement. Denmark and Sweden receive an E1 score of three because they have entered legally operative, performance-linked public arrangements specifically requiring removal. Canada and the United Kingdom receive E1=2 because dedicated, funded delivery programs have moved into formal competitive solicitation or project negotiation, but binding delivery awards have not yet been demonstrated. The EU receives E1=1 for an emerging CDR-specific market-making process. Broad compliance systems in California and Washington can support removal projects, but because they do not require any minimum quantity of CDR they do not, by themselves, earn E1 under the clarified rule. The US purchase pilot is stalled and receives no E1 credit. No government receives E3 credit; even the strongest delivery arrangements have not yet demonstrated government-arranged removal at a scale proportionate to the stated challenge.

All this said, it’s also clear that governments don’t need to score highly on every SCALE dimension to accomplish a limited objective. Denmark’s approach, for example, has successfully commissioned CDR removal without being part of a complete net-negative national strategy. New Zealand’s assessment framework may successfully screen proposed pathways without financing deployment. Canada’s first procurement process may develop valuable government expertise even before meaningful volumes are purchased. Still, this unevenness will become problematic when governments expect a limited instrument to perform functions it was never designed to perform. It will also pose problems for scaling international collaborative work on CDR.

THE INTERNATIONAL SCALE PROFILE

Individual government policies on CDR exist inside an international system. How CDR develops within this system will likely depend on cross-border finance, technology transfer, shared scientific knowledge, interoperable accounting, CO2 transport, foreign storage, and long-term cooperation between purchasing and host governments. It would be inefficient - and likely impossible - for every jurisdiction to reproduce every capability independently. In other words, individual SCALE profiles show whether public systems are equipped to act; the international profile asks whether the wider system is equipped to support governments acting together.

The international profile is not an average of the jurisdiction scores and is not intended as a statistically representative score for every government worldwide. It is a separate qualitative assessment of cross-border public-policy architecture using the same 15 sub-dimensions, drawing on the assessed jurisdictions together with international rules, institutions, finance, accounting arrangements, transport and storage cooperation, and evidence of government-arranged delivery. The 12111 profile should therefore be read as a provisional system-level diagnostic, not as a measure of world performance.

The following table suggests what this international system profile currently looks like.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity		0	0		0			0	0		0	0		0	0
1 — Emerging	1			1		1	1			1			1		
2 — Established															
3 — Operational															
TOTALS	1			2			1			1			1		

What does this international SCALE profile of 12111 mean?

- **Strategic commitment = 1 (S=100):** CDR is increasingly recognized in climate science and national net-zero planning. But there is no international agreement defining how CDR goals and responsibilities should be allocated, nor is there a durable international timetable for coordinating post-net-zero atmospheric drawdown.
- **Capacity and coordination = 2 (C=101):** Significant expertise exists, but it is concentrated and not equally accessible to governments. As well, no international institution has a clear mandate and adequate resources to coordinate public CDR policy as a whole. Scientific networks, standards initiatives, Article 6 cooperation, research programs, and emerging government forums provide limited coordination.
- **Accountability and public value = 1 (A=100):** Multiple methodologies and standards exist, but they use inconsistent categories and often combine removals, avoidance, biological stabilization, and offsets. No comprehensive international system governs CDR-specific safeguards, reversal, project failure, transboundary effects, long-term liability, host-country interests, or benefit-sharing.

- **Long-term finance = 1 (L=100):** Several wealthy governments have made significant public investments in research, demonstrations, infrastructure, tax incentives, and early procurement, but these commitments remain far below the amounts needed for sustained atmospheric drawdown. Global support for government capacity, deployment, monitoring, and stewardship is still inadequate, and no dependable international architecture exists to mobilize public and publicly backed finance across the full policy horizon.
- **Execution and delivery = 1 (E=100):** A small number of governments have established procurement programs, auctions, or contractual systems capable of causing qualifying removals to occur. These arrangements remain fragmented and concentrated in a few jurisdictions, however, and there is no international delivery system or clearly identifiable portfolio of verified government-arranged removals operating across countries. Delivery remains nowhere near internationally meaningful scale and is not organized around a shared approach to post-net-zero atmospheric drawdown.

WHAT THIS MEANS FOR THE VANCOUVER PROCESS

For our purposes here, SCALE can be used to give participating governments a more tangible, quantifiable sense of where they can improve their CDR policies and how these policies can benefit from engagement with other participating governments (e.g., in terms of seeking lessons of experience). Some of the ways that participants can begin engaging with these profiles right away include:

- **Validate the evidence and scores:** Have government policies been correctly and completely understood and tabulated?
- **Examine ambition-capacity mismatches:** Does the government expect more from CDR than its current policy machinery can plausibly deliver?
- **Organize cooperation around sub-scores:** Vancouver discussions could be organized around specific policy needs. For example:
 - **S1:** Separating residual neutralization from net-negative drawdown.
 - **S2:** Defining public responsibility.
 - **C1:** Building independent government expertise.
 - **C2:** Assigning whole-of-government institutional ownership.
 - **A1:** Distinguishing actual removal from offsets and avoided emissions.
 - **A2:** Establishing liability and reversal rules.
 - **A3:** Establishing sovereign control, transparency, and public-value rules.
 - **L1:** Building adequate public financial commitment.
 - **L2:** Designing public mobilization and scaling mechanisms.
 - **L3:** Creating durable, complete pathways to scale.
 - **E1:** Drafting procurement and delivery mechanisms.
 - **E2:** Verifying physical removals.
 - **E3:** Connecting individual projects to national-scale objectives.
- **Match complementary experience:** Different governments can contribute to group learning on different dimensions. No government has all the pieces. Vancouver can help

participants understand how the pieces fit. For example, contributions like these might be helpful:

- The EU on certification and methodology.
 - Denmark and Sweden on auctions, contracts, and long-term public support.
 - The United Kingdom on business-model design and infrastructure integration.
 - Canada on early public procurement.
 - Singapore on international purchasing and bilateral carbon arrangements.
 - New Zealand on screening unfamiliar removal pathways.
 - California on statutory definitions and pathway-specific innovation support.
 - Washington on articulating atmospheric removal as a public-policy concern.
 - Kenya, Uganda, and the Philippines on sovereign authorization, land governance, benefit-sharing, and host-country interests.
 - Australia, Japan, and the United States on scientific and technological capability.
- **Address weaknesses in the international profile:** Not all policy shortcomings can be addressed by improving internal capacity alone. Some progress will also require international collaboration. Helping understand exactly “external” components are needed will help the Vancouver Process better understand what kinds of policy recommendations to make. These external developments might include:
 - Widely accessible public technical expertise.
 - Predictable finance for lower-capacity governments.
 - Interoperable MRV rules.
 - Cross-border transport and storage rules.
 - International rules for reversal and long-term liability.
 - Open project and performance data.
 - Shared approaches to post-net-zero atmospheric drawdown, including unresolved burden-sharing questions.

CONCLUSION

The public CDR policy landscape is incomplete and fragmented. Governments have built pieces of what a future removal system might require: scientific programs, laws, certification methods, registries, carbon-market rules, grants, infrastructure plans, procurement pilots, and long-term contracts. But these pieces do not yet form complete systems. As well:

- Most governments have not yet defined their responsibility for ensuring that removals occur.
- None has assigned a single public body complete ownership of the CDR function.
- Few have distinguished clearly between achieving net zero and becoming net negative.
- Public and publicly mobilized finance remains far below what scaled CDR will require.
- Accountability systems remain designed largely for transactions rather than long-term public obligations.
- Sovereign decisions about ownership, accounting, transfer, data, benefit distribution, and long-term costs are rarely complete.
- Legal delivery mechanisms are rare.
- Verified government-arranged delivery at meaningful scale is rarer still.

The provisional scores noted in this report should not be read as declarations that one government is succeeding and another is failing. Governments have different circumstances, legal powers, resources, and ambitions, and some may reasonably choose a smaller CDR role. The scores reflect the completeness of public CDR machinery relative to the SCALE policy perspective described above, not overall climate performance. They instead expose three things:

1. What policy machinery currently exists.
2. Which functions remain unsupported.
3. Whether the system is adequate for what government expects it to accomplish.

Going forward, it is important to reiterate that governments will be working on this challenge together in the future. No government will build the necessary global CDR capacity on its own, or develop all the regulatory mechanisms or lessons of experience on its own. To this end, the Vancouver Process can help make this growth and cooperation possible, and on a faster time scale, by helping define what an effective global CDR policy framework requires, documenting what policy progress different governments have made and how these progress points compare and relate, and helping interested governments organize around specific capacity-building efforts.

Annex A: Vancouver Process participants

A1. European Union

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 212; total 5).** The European Climate Law makes climate neutrality by 2050 legally binding and provides for negative emissions thereafter. The amended LULUCF Regulation also sets a binding Union target of 310 MtCO₂e of net land-sector removals in 2030, with Member-State targets and a 2026–2030 trajectory. This is a quantified and durable removal obligation, but it does not define the Union's complete CDR need, separate residual neutralization from atmospheric-stock drawdown, or assign a defined quantity of durable removals for public procurement or delivery. The CRCF separately recognizes permanent removals. This supports S1=2, S2=1, S3=2.
- **C: Capacity and coordination (sub-scores 211; total 4).** DG CLIMA, the Joint Research Centre, scientific contractors, certification expert groups, Horizon Europe, and Innovation Fund administrators provide substantial public analytical capacity. The Commission can develop common methodologies and recognize certification schemes, and EU institutions can coordinate climate, agriculture, research, competition, state-aid, and industrial policy. Responsibility nevertheless remains distributed across Commission directorates, agencies, Member States, and private certification schemes. No EU body is accountable for CDR as a complete policy and delivery function or for ensuring that an EU-wide removal quantity is achieved. The evidence supports C1=2, C2=1, C3=1.
- **A: Accountability and public value (sub-scores 211; total 4).** The 2026 CRCF methodology for permanent removals separately addresses DACCS, BioCCS, and biochar carbon removal and requires quantification, additionality, long-term storage, and third-party certification. This is a major public-accounting advance. However, the CRCF umbrella also includes carbon farming, temporary biogenic storage, and storage in products, so the wider architecture does not consistently separate atmospheric drawdown from emissions reduction, stock protection, or stabilization. Safeguards and liability are pathway-specific, and decisions about ownership, claims, transfers, disclosure, benefit distribution, and long-term public costs remain incomplete or divided among EU and national systems. This supports A1=2, A2=1, A3=1.
- **L: Long-term finance (sub-scores 110; total 2).** The Innovation Fund, Horizon Europe, the European Innovation Council, and Member-State aid finance research, demonstration and early deployment. On 17 July 2026 the Commission proposed an EU ETS mechanism under which it would purchase an equivalent of 250 million domestic permanent BioCCS/DACCS removal units from 2031–2040, financed through allowance auctions and paid on delivery. This would be a major scaling instrument if enacted, but it is not yet law or an operative purchasing system, and current finance does not cover the complete CDR chain. L1=1, L2=1, L3=0.
- **E: Execution and delivery (sub-scores 100; total 1).** The EU has operational certification rules, funding programs, and a Buyers' Club that may help projects reach transactions, but it has not established an EU-wide procurement, regulated demand obligation, or direct commissioning mechanism that guarantees delivery of a defined quantity of qualifying removal. Some EU-supported projects may produce removals, yet delivery is not organized as

fulfillment of an EU public obligation and has not been demonstrated at a scale proportionate to the Union's residual or net-negative need. Limited enabling and pilot activity supports E1=1, while E2=0 and E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity												0		0	0
1 — Emerging		1			1	1		1	1	1	1		1		
2 — Established	2		2	2			2								
3 — Operational															
TOTALS	5			4			4			2			1		

SCALE 54421

Assessment	Finding
Why	The EU has the strongest multinational certification architecture in the assessment, but its public responsibility, finance, and delivery machinery remain incomplete and distributed.
Vancouver relevance	The EU can contribute on definitions, methodology, certification governance, and interoperability while learning from jurisdictions that have created public auctions or contracts for delivery.

References (official sources)

1. [European Climate Law](#). European Commission, official policy page.
2. [Carbon Removals and Carbon Farming Certification Regulation](#). European Commission, official CRCF overview.
3. [Certification methodologies](#). European Commission, updated June 2026.
4. [EU CRCF Buyers' Club](#). European Commission, official initiative page.
5. [An EU purchasing programme for permanent carbon removals](#). European Commission study, 2025.
6. Regulation (EU) 2023/839 (LULUCF 2030 net-removal target). EUR-Lex.
7. COM(2026) 616 final: proposed EU ETS permanent-removal purchasing mechanism. European Commission, 17 July 2026.

A2. Kenya

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 100; total 1).** Kenya's Climate Change Act and 2024 Carbon Markets Regulations recognize activities that reduce or remove greenhouse gases and establish national authority over carbon-market participation. They do not identify atmospheric carbon removal as a separate national policy function, estimate a national removal requirement, distinguish residual neutralization from net-negative drawdown, or assign government responsibility for ensuring delivery. Most relevant activity is framed through forestry, land, mangroves, mitigation projects, and international crediting. Recognition within the broader carbon-market system supports S1=1; the absence of a public CDR delivery commitment or durable CDR-specific mandate supports S2=0 and S3=0.
- **C: Capacity and coordination (sub-scores 001; total 1).** The Designated National Authority, National Registrar, sector ministries, county governments, and project approval processes create a real administrative network for carbon transactions. This can coordinate authorization, registry functions, environmental review, community consultation, and Article 6 decisions. It does not yet provide government with a dedicated technical unit capable of independently testing lifecycle atmospheric effect, counterfactuals, durability, or developer claims across CDR pathways, and no body owns CDR from strategy through delivery. The formal coordination machinery earns C3=1, while C1=0 and C2=0.
- **A: Accountability and public value (sub-scores 011; total 2).** The 2024 Regulations require project documentation, validation and verification, environmental assessment, free prior informed consent where applicable, annual reporting, registry entry, benefit-sharing arrangements, and government authorization for international transfers. These are important sovereign-control and safeguard measures. However, the rules govern reductions and removals together, permit project categories with mixed effects, and do not create a CDR-specific lifecycle-accounting or long-term liability regime. The evidence supports A1=0, A2=1, A3=1.
- **L: Long-term finance (sub-scores 000; total 0).** Kenya's framework is designed primarily to attract private and international climate finance and to allocate benefits from project revenue. No dedicated public CDR appropriation, public procurement program, regulated demand system, infrastructure-finance mechanism, or multiyear stewardship fund has been identified. Carbon-market fees and benefit-sharing provisions govern transactions but do not constitute public finance for a national removal requirement. L1=0, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** The legal framework can authorize carbon projects and international transfers, but it does not itself require the Kenyan government to purchase, commission, or cause qualifying atmospheric removal to occur. Publicly authorized projects may generate units, but the assessment found no government-arranged CDR delivery mechanism, verified public delivery portfolio, or connection between project volumes and a national atmospheric-drawdown objective. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity		0	0	0	0		0			0	0	0	0	0	0
1 — Emerging	1					1		1	1						
2 — Established															
3 — Operational															
TOTALS	1			1			2			0			0		

SCALE 11200

Assessment	Finding
Why	Kenya has meaningful sovereign oversight of carbon projects and community-benefit requirements, but no distinct atmospheric-removal strategy, institutional owner, public finance route, or delivery system.
Vancouver relevance	Kenya can contribute practical experience on authorization, registries, consent, and benefit-sharing while using Vancouver to separate qualifying removal from avoidance and determine what national claims should be retained or transferred.

References (official sources)

1. [Climate Change Act, 2016 \(as amended\)](#). Kenya Law.
2. [Climate Change \(Carbon Markets\) Regulations, 2024](#). Kenya Law, Legal Notice No. 84 of 2024.
3. [Kenya Nationally Determined Contribution 2031-2035](#). Ministry of Environment, Climate Change and Forestry.
4. [National Climate Change Action Plan 2023-2027](#). Government of Kenya.

A3. Pakistan

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 000; total 0).** Pakistan's Updated NDC, National Climate Change Policy, and 2025 Policy Guidelines for Trading in Carbon Markets establish broad mitigation, adaptation, forestry, climate-finance, and trading priorities. They do not treat verified atmospheric removal as a distinct public-policy function, estimate a national removal need, distinguish net zero from net-negative drawdown, or state what government must deliver if markets do not. References to sequestration and nature-based mitigation remain embedded in wider mitigation and land-use categories. On the strict SCALE test, S1=0, S2=0, and S3=0.
- **C: Capacity and coordination (sub-scores 001; total 1).** The Ministry of Climate Change and Environmental Coordination has a Climate Finance Wing with Carbon Markets and Green Finance sections, technical staff, a Carbon Market Working Group, and coordination links to the Ministry of Finance, Planning Ministry, State Bank, provinces, and development partners. This is meaningful adjacent machinery and supports emerging whole-of-government coordination. It is not a public CDR analytical service or a body accountable for a removal strategy and delivery chain, however. Accordingly, C1=0, C2=0, C3=1.
- **A: Accountability and public value (sub-scores 001; total 1).** The 2025 carbon-market guidelines were approved by the Federal Cabinet and the government is developing rules, a registry, project pipelines, and Article 6 procedures. These steps indicate emerging sovereign authorization and accounting control. The system is still being operationalized, and available public materials do not show a CDR-specific distinction among avoided emissions, stock protection, fossil CCS, biological stabilization, and net atmospheric removal, nor a complete CDR safeguard and liability regime. This supports A1=0, A2=0, A3=1.
- **L: Long-term finance (sub-scores 000; total 0).** Pakistan has a National Climate Finance Strategy, climate-budget tagging, climate-fund access, and a mandate to mobilize public and private finance. The identified priorities are economy-wide mitigation, adaptation, resilience, energy, agriculture, water, waste, and development rather than a dedicated CDR system. No public CDR appropriation, procurement mechanism, regulated demand architecture, or long-term monitoring and stewardship finance has been identified. L1=0, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** The carbon-market framework is intended to enable project investment and international transactions, but it does not create an operative public mechanism requiring atmospheric removal to occur. No government CDR purchase, auction, contract for difference, delivery obligation, verified public removal portfolio, or national scale pathway has been identified. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity	0	0	0	0	0		0	0		0	0	0	0	0	0
1 — Emerging						1			1						
2 — Established															
3 — Operational															
TOTALS	0			1			1			0			0		

SCALE 01100

Assessment	Finding
Why	Pakistan has rapidly developing climate-finance and carbon-market machinery, but the machinery is not yet organized around CDR-specific strategy, accounting, finance, or delivery.
Vancouver relevance	Vancouver can help Pakistan test whether its emerging registry and Article 6 rules need distinct treatment of atmospheric removal and whether a federal-provincial CDR function would add public value.

References (official sources)

1. [Pakistan Policy Guidelines for Trading in Carbon Market](#). Ministry of Climate Change and Environmental Coordination, January 2025.
2. [Pakistan Updated Nationally Determined Contribution 2021](#). Ministry policy repository.
3. [National Climate Change Policy 2021](#). Ministry policy repository, published 2022.
4. [Climate Finance Wing](#). Ministry of Climate Change and Environmental Coordination, updated 2026.
5. [National Adaptation Plan 2023](#). Ministry policy repository.

A4. Philippines

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 100; total 1).** The Philippines' NDC Implementation Plan sets sector actions, phasing, costs, and institutional responsibilities for mitigation through 2030, while forest and land policies recognize sequestration and carbon projects. Neither the NDC framework nor the forest-carbon rules establish atmospheric removal as a separate national objective, estimate a removal requirement, or distinguish residual-emissions neutralization from net-negative drawdown. Because sequestration is recognized but remains embedded in broader mitigation, forestry, ecosystem, and adaptation policy, S1=1, S2=0, S3=0.
- **C: Capacity and coordination (sub-scores 001; total 1).** The Climate Change Commission is the government's lead climate policy and coordination body, while DENR, its Forest Management Bureau, the National Forest Monitoring System, and other sector agencies maintain relevant inventories and technical functions. Formal coordination exists across NDC sectors and government levels, but no dedicated public unit evaluates CDR pathways across lifecycle emissions, durability, additionality, resource use, and atmospheric effect, and no institution owns CDR through finance and delivery. This supports C1=0, C2=0, C3=1.
- **A: Accountability and public value (sub-scores 011; total 2).** DENR Administrative Order 2021-43 created a Carbon Accounting, Verification and Certification System for forest-carbon projects, and DAO 2021-32 operationalized the National Forest Monitoring System for REDD+. These are important MRV and administrative steps, supported by stakeholder consultation and national GHG inventory work. They still govern forest projects that may combine avoided deforestation, enhanced stocks, ecosystem protection, adaptation, and removals, and they do not form a complete CDR-specific liability, ownership, transfer, or long-term-cost system. A1=0, A2=1, A3=1.
- **L: Long-term finance (sub-scores 000; total 0).** The NDC Implementation Plan identifies costs and potential financing needs, and forest-carbon policy is intended partly to support market participation and private investment. The assessment found no dedicated public CDR appropriation, procurement budget, regulated demand mechanism, infrastructure-finance architecture, or durable fund for verification, reversal, and stewardship. Adjacent climate finance does not meet the strict test for financing atmospheric removal at the scale of a national requirement. L1=0, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** Forest-carbon accounting and project certification can enable transactions, but government has not created a procurement, auction, contract, regulated obligation, or direct commissioning mechanism that causes qualifying atmospheric removal to occur for a national public objective. No verified government-arranged removal portfolio or nationally integrated delivery pathway has been identified. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity		0	0	0	0		0			0	0	0	0	0	0
1 — Emerging	1					1		1	1						
2 — Established															
3 — Operational															
TOTALS	1			1			2			0			0		

SCALE 11200

Assessment	Finding
Why	The Philippines has meaningful climate coordination and emerging forest-carbon MRV, but current instruments combine removal, avoidance, stock protection, and adaptation and do not constitute a national atmospheric-removal system.
Vancouver relevance	The Philippines can contribute experience with forest monitoring and multi-agency implementation while Vancouver helps distinguish ecosystem stewardship from qualifying removal and identify missing sovereign and delivery functions.

References (official sources)

1. [Philippine NDC Implementation Plan 2020-2030](#). Climate Change Commission, adopted 2024.
2. [Climate Change Commission Resolution No. 2024-004](#). Adopts the NDC Implementation Plan.
3. [DAO 2021-43: Carbon Accounting, Verification and Certification System for Forest Carbon Projects](#). DENR Forest Management Bureau.
4. [DAO 2021-32: National Forest Monitoring System for REDD+](#). DENR Forest Management Bureau.
5. [National Greenhouse Gas Inventory](#). NICCDIES / Climate Change Commission.

A5. Singapore

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 110; total 2).** Singapore's long-term low-emissions strategy, carbon tax, and international carbon-credit framework reflect a durable commitment to net zero and an active public role in carbon-market development. The government has not established a domestic or international CDR quantity, a net-negative objective, or a strategy for post-net-zero atmospheric drawdown. International credits can include reductions, avoidance, and sequestration, and current purchasing and tax-compliance arrangements are not dedicated to removal. Recognition and active government engagement support S1=1 and S2=1; the absence of a CDR-specific durable mandate supports S3=0.
- **C: Capacity and coordination (sub-scores 101; total 2).** The National Environment Agency, Ministry of Sustainability and the Environment, Ministry of Trade and Industry, and other public bodies possess strong expertise in carbon pricing, eligibility screening, Article 6 implementation agreements, procurement, and international contracting. Singapore also uses an international advisory panel and bilateral joint committees. This is sophisticated transferable capacity, but it is not a dedicated public CDR analytical or delivery function and no body is accountable for a removal need across the policy chain. C1=1, C2=0, C3=1.
- **A: Accountability and public value (sub-scores 011; total 2).** Singapore has published seven eligibility principles for international carbon credits, requires correspondence with host-country arrangements, limits credit use under the carbon tax, and specifies approved standards and methodologies by partner country. These measures create real sovereign screening and transaction control. The eligibility lists still cover a broad range of reductions and avoidance activities and exclude or include methodologies for policy reasons rather than applying a consistent CDR-only atmospheric test. Long-term reversal, ownership, public disclosure, benefit allocation, and responsibility for future costs remain project- and standard-dependent. A1=0, A2=1, A3=1.
- **L: Long-term finance (sub-scores 000; total 0).** The carbon tax and international-credit arrangements mobilize private compliance spending, and government has demonstrated the ability to contract and structure bilateral markets. No public budget or regulated demand obligation is dedicated to purchasing qualifying CDR, and no financing architecture covers domestic capacity, infrastructure, deployment, monitoring, and long-term stewardship at a scale tied to a national removal need. L1=0, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** Singapore has operational carbon-tax and international-credit systems and has entered arrangements that can facilitate carbon-credit transactions. The assessed portfolio is not a dedicated procurement of verified atmospheric removal, and the government has not created a public mechanism that requires a specified quantity of CDR to be delivered, verified, and integrated into a net-negative objective. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity			0		0		0			0	0	0	0	0	0
1 — Emerging	1	1		1		1		1	1						
2 — Established															
3 — Operational															
TOTALS	2			2			2			0			0		

SCALE 22200

Assessment	Finding
Why	Singapore has strong administrative, contracting, and bilateral-market capability, but current instruments govern broader mitigation outcomes and do not yet create a CDR-specific public system.
Vancouver relevance	Singapore can contribute practical experience on eligibility rules, bilateral authorization, registry interoperability, and purchasing while exploring how these tools could be adapted to durable atmospheric removal.

References (official sources)

1. [Singapore's Long-Term Low-Emissions Development Strategy](#). National Climate Change Secretariat.
2. [Carbon Tax](#). National Environment Agency.
3. [Eligibility Criteria for International Carbon Credits](#). National Environment Agency, October 2023.
4. [Eligibility List for International Carbon Credits](#). National Environment Agency, December 2023.
5. [International Cooperation under Article 6](#). Ministry of Sustainability and the Environment.

A6. Sierra Leone

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 000; total 0).** Sierra Leone's NDC 3.0 sets mitigation and adaptation priorities through 2035 and a net-zero aspiration for 2050, with strong links to development, energy access, food security, resilience, forests, and ecosystems. Restoration and land measures may increase carbon stocks, but public materials do not define qualifying atmospheric removal, estimate a national removal requirement, distinguish net zero from net-negative drawdown, or assign government responsibility for delivery. On the strict CDR test, S1=0, S2=0, S3=0.
- **C: Capacity and coordination (sub-scores 001; total 1).** The Ministry of Finance has established a Climate Finance Unit to integrate climate into budgeting, mobilize finance, and develop a National Climate Finance Strategy. It is also working with the environment authorities and UNDP on a Carbon Market Policy Framework. These arrangements provide emerging cross-government coordination and a place to develop carbon-market capacity, but they do not yet constitute an independent public CDR analytical service or a body accountable for CDR strategy and delivery. C1=0, C2=0, C3=1.
- **A: Accountability and public value (sub-scores 001; total 1).** The Carbon Market Policy Framework process was initiated because government recognized the need for policy and legal rules before carbon assets are traded. This is an important sovereign-control signal, but the framework remains under development and available materials do not show CDR-specific definitions, lifecycle accounting, reversal and liability rules, ownership and transfer rules, data standards, or enforceable benefit-sharing arrangements. Emerging policy development supports A3=1; A1=0 and A2=0.
- **L: Long-term finance (sub-scores 000; total 0).** The NDC 3.0 identifies a large implementation-finance requirement and the Climate Finance Unit is seeking domestic and international sources. The National Climate Finance Strategy addresses economy-wide adaptation and mitigation rather than a dedicated public CDR system. No CDR appropriation, procurement mechanism, regulated demand structure, infrastructure finance, or long-term monitoring and stewardship fund has been identified. L1=0, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** Sierra Leone is developing the policy conditions for climate finance and carbon markets, but no public mechanism has been identified that purchases, auctions, commissions, or otherwise requires qualifying atmospheric removal. No verified government-arranged removal delivery or national scale pathway has been demonstrated. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity	0	0	0	0	0		0	0		0	0	0	0	0	0
1 — Emerging						1			1						
2 — Established															
3 — Operational															
TOTALS	0			1			1			0			0		

SCALE 01100

Assessment	Finding
Why	General climate-finance and carbon-market capacity is emerging, but CDR has not yet become a distinct strategy, accountability category, financing function, or delivery obligation.
Vancouver relevance	Early Vancouver engagement can help Sierra Leone establish public rules before private transactions set precedents on carbon rights, transfers, community benefits, data, and liability.

References (official sources)

1. [Sierra Leone NDC 3.0](#). Environment Protection Agency, November 2025.
2. [Climate Finance Unit](#). Ministry of Finance.
3. [National Climate Finance Strategy validation](#). Ministry of Finance.
4. [Development of a Carbon Market Policy Framework](#). Ministry of Finance, June 2024.

A7. Uganda

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 000; total 0).** Uganda's National Climate Change Act, updated NDC, and 2025 regulations establish broad climate-planning, mitigation, adaptation, finance, and carbon-market functions. They recognize emissions and removals for inventory and market purposes, but do not define atmospheric CDR as a separate national policy objective, quantify a removal requirement, distinguish net zero from net-negative drawdown, or assign responsibility for causing removals to occur. S1=0, S2=0, S3=0.
- **C: Capacity and coordination (sub-scores 001; total 1).** The Climate Change Department in the Ministry of Water and Environment coordinates national climate policy, and the Act and regulations create roles for sector ministries, local governments, project authorities, and reporting systems. This provides emerging formal coordination relevant to carbon projects. The assessment did not identify a dedicated public technical body capable of evaluating CDR pathways across lifecycle effect and durability, or one institution accountable for CDR strategy, finance, safeguards, and delivery. C1=0, C2=0, C3=1.
- **A: Accountability and public value (sub-scores 011; total 2).** The Act and 2025 regulations provide a legal basis for measurement, reporting and verification, carbon-project approval, registries, ownership and authorization questions, and participation in Article 6 and other markets. These are real governance advances. They apply to reductions and removals together and do not establish a consistent atmospheric-removal definition, complete CDR-specific safeguards, reversal and long-term liability rules, or a public-value framework covering national claims and future costs. A1=0, A2=1, A3=1.
- **L: Long-term finance (sub-scores 000; total 0).** Uganda has general climate-finance powers and seeks international and private investment for mitigation, adaptation, land, agriculture, and ecosystem programs. No dedicated public CDR budget, procurement commitment, regulated demand system, infrastructure finance, or enduring monitoring and stewardship mechanism has been identified. L1=0, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** The legal framework can authorize and govern projects, but it does not create an operative public delivery mechanism requiring a specified amount of qualifying atmospheric removal. The assessment found no government CDR purchase, auction, contract, verified public delivery portfolio, or connection between removals and a quantified national drawdown pathway. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity	0	0	0	0	0		0			0	0	0	0	0	0
1 — Emerging						1		1	1						
2 — Established															
3 — Operational															
TOTALS	0			1			2			0			0		

SCALE 01200

Assessment	Finding
Why	Uganda has a statutory climate and carbon-market architecture with relevant safeguards and transfer governance, but no CDR-specific strategy, analytical capacity, finance, or execution.
Vancouver relevance	Uganda can contribute experience in building a national carbon-governance system while Vancouver helps distinguish removal from avoidance and define retained claims, transferred outcomes, and long-term obligations.

References (official sources)

1. [National Climate Change Act, 2021](#). Uganda Legal Information Institute.
2. [National Climate Change Regulations, 2025](#). Ministry of Water and Environment.
3. [Climate Change Department](#). Ministry of Water and Environment.
4. [Uganda Updated Nationally Determined Contribution](#). Ministry of Water and Environment policy repository.
5. [From Policy to Practice: Uganda's 2025 Carbon Market Regulations](#). Ministry of Water and Environment.

A8. California

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 212; total 5).** AB 1279 makes net-zero greenhouse-gas emissions by 2045 and net-negative emissions thereafter state policy, requires at least an 85 percent gross emissions reduction by 2045, and directs CARB to identify and implement policies enabling CDR and CCUS. The 2022 Scoping Plan identifies modeled CDR quantities of approximately 7 million metric tons in 2030 and 75 million in 2045. These are unusually clear and durable signals. They still do not set a quantified post-2045 drawdown obligation or make one agency responsible for securing the modeled removals if markets and projects fall short. This supports S1=2, S2=1, S3=2.
- **C: Capacity and coordination (sub-scores 212; total 5).** CARB has substantial regulatory and modeling expertise, and SB 905 directs it to establish a Carbon Capture, Removal, Utilization, and Storage Program, a public database, protocols, and financial-responsibility rules. The law also creates roles for the Natural Resources Agency, California Geological Survey, CalGEM, Energy Commission, water boards, air districts, and other agencies, providing formal implementation coordination. This distributed structure is progress but not whole-of-function ownership: CARB regulates and plans, while no body is accountable for financing and delivering the state's assumed CDR quantity. C1=2, C2=1, C3=2.
- **A: Accountability and public value (sub-scores 211; total 4).** California statutes explicitly distinguish a carbon dioxide removal project from point-source capture and define CDR as removing CO₂ from the atmosphere. SB 905 requires monitoring, public data, financial responsibility, air-quality protections, geologic expertise, leakage response, and responsibility lasting at least 100 years after injection. These are substantial safeguards, especially for geologic storage. The implementing regulations and broader pathway rules remain incomplete, and ownership, state accounting, credit claims, contract disclosure, benefit distribution, and responsibility across non-geologic pathways are not governed as one public system. A1=2, A2=1, A3=1.
- **L: Long-term finance (sub-scores 100; total 1).** California supports research, demonstrations, and pathway-specific programs, and its Cap-and-Invest compliance system creates continuing private demand for approved offset credits, including forest protocols capable of generating verified removal enhancements. This is a meaningful financing channel, but it is not a CDR-specific scaling architecture: compliance offsets encompass reductions and sequestration as well as removals, regulated entities are not required to purchase any minimum quantity of CDR, and the mechanism is not tied to the 2030 and 2045 removal quantities modeled in the Scoping Plan. California also has no recurring public appropriation proportionate to those quantities. SB 643 would have created a \$50 million dedicated CDR purchase program with verification and retirement requirements, but the Governor vetoed it in October 2025. The remaining financing landscape therefore does not provide a durable system covering CDR deployment, infrastructure, procurement, monitoring, and stewardship at the scale of the state's anticipated need. L1=1, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** California's Cap-and-Invest compliance system can create demand for offset credits, and approved forest protocols can encompass removal enhancements. But the system was designed for broader mitigation, does not require any minimum quantity of CDR, and does not tie compliance demand to the Scoping Plan's

modeled removal quantities. Under the clarified E1 rule, a broad offset market that merely permits removals does not by itself constitute a CDR-specific delivery mechanism. SB 643 would have created a dedicated state purchase program but was vetoed in 2025. No operative state procurement, CDR-specific regulated obligation, or direct commissioning mechanism currently requires a specified quantity of qualifying CDR to be delivered. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity											0	0	0	0	0
1 — Emerging		1			1			1	1	1					
2 — Established	2		2	2		2	2								
3 — Operational															
TOTALS	5			5			4			1			0		

SCALE 55410

Assessment	Finding
Why	California has the clearest net-negative statutory direction and one of the strongest regulatory architectures assessed, including a compliance-market mechanism capable of supporting removals, but responsibility remains distributed, CDR-specific finance remains limited, and no quantified CDR delivery obligation or verified state-arranged removal portfolio exists.
Vancouver relevance	California illustrates the value of explicit definitions, multi-agency safeguards, and integrating removal pathways into an existing compliance market, while also showing the difference between creating limited demand for removals and ensuring delivery at the quantities assumed in climate planning.

References (official sources)

1. [AB 1279: California Climate Crisis Act](#). California Legislature, 2022; Health and Safety Code section 38562.2(b)-(e).
2. [2022 Scoping Plan for Achieving Carbon Neutrality](#). California Air Resources Board.
3. [SB 905: Carbon Capture, Removal, Utilization, and Storage Program](#). California Legislature, 2022; including Health and Safety Code sections 39741-39741.5 and Public Resources Code sections 71460-71464.
4. [Carbon Sequestration, Carbon Capture, Removal, Utilization, and Storage Program](#). California Air Resources Board.
5. [SB 643: Carbon Dioxide Removal Purchase Program](#). California Legislature, enrolled September 2025.
6. [Governor Newsom legislative update: SB 643 veto](#). Office of the Governor, October 2025.
7. [Compliance Offset Program](#). California Air Resources Board. Current compliance-offset program and approved protocols; reviewed August 2026.
8. [ARB Offset Credit Issuance](#). California Air Resources Board. Current offset-credit issuance and compliance-use page; reviewed August 2026.

A9. Washington State

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 211; total 4).** RCW 70A.45.100 states that promoting removal of excess atmospheric carbon through voluntary and incentive-based sequestration is state policy, separate from statutory emissions limits. Ecology also describes carbon management as relevant to removing historical emissions. This is a clear public-policy recognition, but the state has not quantified its CDR need, distinguished residual neutralization from post-net-zero drawdown, or accepted responsibility for securing delivery. The statutory statement supports S1=2 and S3=1; the limited public obligation supports S2=1.
- **C: Capacity and coordination (sub-scores 101; total 2).** The Legislature commissioned a detailed Carbon Dioxide Removal Evaluation Study, and Ecology, the Department of Natural Resources, geological specialists, and other agencies possess relevant regulatory and technical capacity. Ecology is conducting public engagement on engineered carbon management under Cap-and-Invest. No lead body owns CDR as a complete strategy and delivery function, and technical capacity remains distributed across programs. Limited public analytical capacity and coordination support C1=1, C2=0, C3=1.
- **A: Accountability and public value (sub-scores 110; total 2).** Washington law and Ecology guidance distinguish CDR from point-source capture, and existing rules require long-term storage for certain sequestration exemptions. The Cap-and-Invest framework also has offset protocols and public engagement. However, eligible categories remain broader than strict atmospheric drawdown, and the state has not established a complete CDR accounting, safeguard, liability, ownership, transfer, disclosure, and long-term-cost system across pathways. A1=1, A2=1, A3=0.
- **L: Long-term finance (sub-scores 100; total 1).** Climate Commitment Act revenues may support carbon removal, capture, mineralization, sequestration, and related work, and the state has financed policy studies. Washington's Cap-and-Invest program also creates a continuing compliance market for Ecology-issued offset credits: regulated entities may use offsets for a limited share of their compliance obligations, and approved protocols include reforestation and urban forestry pathways capable of producing atmospheric removal. This provides a real regulated-demand channel, but it is not a dedicated CDR financing system. Offset eligibility also includes emissions reductions, avoided conversion, methane destruction, and other outcomes; no minimum quantity of CDR must be purchased; and the mechanism is not tied to a quantified state removal requirement or long-term CDR scale pathway. Washington likewise has no dedicated recurring CDR appropriation, infrastructure-finance mechanism, or stewardship fund. L1=1, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** Washington's Cap-and-Invest system allows regulated entities to use a limited quantity of independently verified offset credits, and approved protocols include pathways capable of producing atmospheric removal. But no minimum quantity of CDR is required and the compliance system serves a broader mitigation purpose. Under the clarified E1 rule, eligibility of removal credits within a broad offset market does not by itself constitute a CDR-specific delivery mechanism. The assessment found no dedicated state procurement, CDR-specific auction or regulated obligation, or direct commissioning mechanism tied to a quantified removal schedule. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity					0				0		0	0	0	0	0
1 — Emerging		1	1	1		1	1	1		1					
2 — Established	2														
3 — Operational															
TOTALS	4			2			2			1			0		

SCALE 42210

Assessment	Finding
Why	Washington has unusually explicit recognition of atmospheric removal as a public concern, but institutional ownership, CDR-specific accounting, continuing finance, and execution remain limited.
Vancouver relevance	Washington is a useful case of how a mature carbon-pricing system can create a limited regulated-demand pathway for removals even before the state has developed a dedicated CDR strategy, financing architecture, or quantified delivery schedule.

References (official sources)

1. [RCW 70A.45.100: Carbon sequestration](#). Washington State Legislature.
2. [Carbon capture and carbon dioxide removal](#). Washington State Department of Ecology, updated 2026.
3. [Carbon Dioxide Removal Evaluation Study](#). Washington State Department of Ecology, 2025 report to the Legislature.
4. [Carbon dioxide removal project standards analysis](#). Washington State Department of Ecology, 2023.
5. [Cap-and-Invest Offset Program](#). Washington State Department of Ecology. Current offset program, compliance use, approved protocols, and verification requirements; reviewed August 2026.
6. [Chapter 173-446 WAC – Cap-and-Invest Offsets \(U.S. Forest Protocol\)](#). Washington State Department of Ecology, adopted June 2026; effective July 2026.

Annex B: Comparison jurisdictions

B1. Australia

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 200; total 2).** The CSIRO Australian Carbon Dioxide Removal Roadmap clearly distinguishes atmospheric removal from point-source CCS, assesses pathway potential and constraints, and estimates that Australia may need very large annual removals by mid-century. This is among the clearest analytical statements in the assessment. The roadmap is advisory and industry-development oriented rather than an adopted national obligation; Australia has not set a net-negative target, assigned a public delivery responsibility, or enacted a timetable for securing the assessed quantities. This supports S1=2, S2=0, S3=0.
- **C: Capacity and coordination (sub-scores 201; total 3).** CSIRO, DCCEEW, the Clean Energy Regulator, Geoscience Australia, and public research institutions possess substantial expertise in carbon accounting, geology, land-sector sequestration, technology assessment, and carbon markets. The roadmap itself demonstrates high public technical capability. No public body is accountable for CDR as a complete strategy and delivery function, and coordination remains distributed between research, climate policy, crediting, energy, land, and state authorities. C1=2, C2=0, C3=1.
- **A: Accountability and public value (sub-scores 110; total 2).** The ACCU Scheme has formal methods, audits, registry functions, integrity governance, and an independent review process. It nevertheless issues units for a wide range of emissions-avoidance, reduction, land-sequestration, and removal activities, so the national crediting architecture does not consistently isolate net atmospheric removal. Project safeguards and integrity controls are meaningful but not a complete CDR-specific liability and sovereign-control system. A1=1, A2=1, A3=0.
- **L: Long-term finance (sub-scores 100; total 1).** Australia funds public research, demonstrations, land-sector programs, and ACCU purchases and contracts, but no dedicated public financing system is tied to the removal quantities identified in the CSIRO roadmap. Existing mechanisms primarily purchase or incentivize broad abatement and do not cover the complete CDR chain from capacity and infrastructure through monitoring and long-term stewardship. L1=1, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** The ACCU Scheme and related contracts can cause mitigation projects to occur, but they are not a dedicated public mechanism requiring qualifying atmospheric removal, and project units cannot readily be treated as a verified national CDR portfolio under the strict SCALE definition. No government-arranged delivery program tied to a national net-negative objective has been identified. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity		0	0		0				0		0	0	0	0	0
1 — Emerging						1	1	1		1					
2 — Established	2			2											
3 — Operational															
TOTALS	2			3			2			1			0		

SCALE 23210

Assessment	Finding
Why	Australia has unusually strong public analysis and scientific capacity, but its national policy has not converted the roadmap into institutional ownership, CDR-specific finance, or delivery machinery.
Vancouver relevance	Australia offers a valuable example of rigorous national option assessment while illustrating the difference between an evidence-based roadmap and an enacted public delivery obligation.

References (official sources)

1. [Australian Carbon Dioxide Removal Roadmap](#). CSIRO, updated December 2025.
2. [Australia's Long-Term Emissions Reduction Plan](#). Australian Government.
3. [Australian Carbon Credit Unit Scheme](#). Department of Climate Change, Energy, the Environment and Water.
4. [Independent Review of Australian Carbon Credit Units](#). Australian Government, 2022-2023.
5. [ACCU Scheme methods](#). Department of Climate Change, Energy, the Environment and Water.

B2. Canada

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 111; total 3).** Canada's Carbon Management Strategy explicitly distinguishes technology-based CDR from point-source CCUS, recognizes durable storage, residual emissions, historical emissions, and the possibility of net-negative outcomes. The Greening Government Strategy also commits the federal government to use removals for residual operational emissions. These are meaningful strategic signals, but Canada has not quantified a national CDR requirement or assigned government responsibility for delivering removals beyond a small operational procurement. The strategy is directional rather than a binding delivery law. S1=1, S2=1, S3=1.
- **C: Capacity and coordination (sub-scores 211; total 4).** Natural Resources Canada, Environment and Climate Change Canada, federal laboratories, the Treasury Board Secretariat, and provincial institutions possess strong technical, geological, regulatory, procurement, and industrial expertise. The federal strategy was built through broad intergovernmental and stakeholder engagement, and multiple departments administer relevant programs. Responsibility is nevertheless split between CCUS, offsets, research, government operations, tax policy, and provincial storage regulation, with no single body accountable for CDR across the policy chain. C1=2, C2=1, C3=1.
- **A: Accountability and public value (sub-scores 111; total 3).** The preliminary federal DACCS offset protocol provides detailed requirements for eligibility, legal additionality, project boundaries, quantification, monitoring, storage, verification, and reporting. This is substantial pathway-specific work. It remains a draft protocol within an offset system, rather than a complete national framework that consistently distinguishes all removals from reductions and governs safeguards, liability, ownership, national claims, transfers, disclosure, and long-term costs across CDR pathways. A1=1, A2=1, A3=1.
- **L: Long-term finance (sub-scores 110; total 2).** The federal government has supported carbon-management RD&D and announced at least CAD 10 million in CDR purchases through 2030 for government operations, using the Low-Carbon Fuel Procurement Program. These commitments build capacity and market experience but are small relative to a national removal need and do not create a durable scaling architecture across infrastructure, deployment, monitoring, and stewardship. L1=1, L2=1, L3=0.
- **E: Execution and delivery (sub-scores 200; total 2).** Canada has moved from an announced purchase commitment into formal competitive procurement. Public Services and Procurement Canada issued Request for Standing Offer 24062-250403 in March 2026 for the acquisition of CDR credits across DACCS, BECCS, biochar, other biomass carbon removal and storage, and enhanced mineralization; the solicitation closed in May 2026 and contemplates standing offers through March 2029. This is a CDR-specific, funded delivery program with a formal solicitation process, supporting E1=2. At the assessment date, the assessment did not identify executed purchase contracts or verified government-arranged delivery, and volumes remain small relative to Canada's economy-wide need. E2=0 and E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity												0		0	0
1 — Emerging	1	1	1		1	1	1	1	1	1	1				
2 — Established				2									2		
3 — Operational															
TOTALS	3			4			3			2			2		

SCALE 34322

Assessment	Finding
Why	Canada has meaningful public capacity, unusually clear strategic language, a detailed pathway-specific draft protocol, and an active competitive CDR procurement; whole-of-system ownership, finance scale, and verified delivery remain limited.
Vancouver relevance	Canada can help participants examine how government moves from a purchase commitment into competitive procurement and how early purchasing can be translated into durable accounting, finance, and delivery systems.

References (official sources)

1. [Canada's Carbon Management Strategy](#). Natural Resources Canada, 2023; updated 2026.
2. [Greening Government Strategy](#). Treasury Board of Canada Secretariat.
3. [Government commitment to purchase CDR services](#). Treasury Board of Canada Secretariat, October 2024.
4. [Preliminary Draft Federal Offset Protocol: Direct Air Carbon Dioxide Capture and Geological Storage](#). Environment and Climate Change Canada.
5. [2030 Emissions Reduction Plan](#). Government of Canada.
6. [RFSO 24062-250403: Acquisition of Credits From Carbon Dioxide Removal Projects](#). Public Services and Procurement Canada / Treasury Board of Canada Secretariat, issued March 2026; solicitation closed May 2026.

B3. New Zealand

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 111; total 3).** New Zealand has committed to developing a Carbon Removals Strategy and has explicitly stated that a broader portfolio is needed beyond continually expanding forests. Government materials define removals as drawing CO₂ from air and recognize that removals are relevant to net-negative outcomes beyond 2050. The strategy remains under development, and New Zealand has not adopted a quantified non-forest removal requirement, public delivery obligation, or durable implementation timetable. S1=1, S2=1, S3=1.
- **C: Capacity and coordination (sub-scores 211; total 4).** The Ministry for the Environment has created an operational science-assessment pathway with published criteria, applicant guidance, and public decision-making stages. New Zealand also has strong national inventory, land-accounting, and policy-analysis capability, with the Ministry for Primary Industries and other agencies participating in strategy development. The Ministry owns the assessment process but is not accountable for financing and delivering CDR as a whole. This supports C1=2, C2=1, C3=1.
- **A: Accountability and public value (sub-scores 211; total 4).** The 2026 Assessment Framework provides a government-led process for testing whether an activity removes atmospheric CO₂ and for examining evidence, quantification, durability, and scientific uncertainty before recognition. This is one of the clearest public pathway-screening systems assessed. It is not yet a complete regulatory regime for environmental and community safeguards, reversal and liability, ownership, national and international claims, disclosure, benefit distribution, or long-term public costs. A1=2, A2=1, A3=1.
- **L: Long-term finance (sub-scores 000; total 0).** The strategy and assessment framework may inform future incentives through the emissions trading system or other mechanisms, but no substantial public CDR appropriation, procurement program, scaling architecture, or long-term stewardship finance has been adopted. L1=0, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** New Zealand can now assess proposed removal activities, but scientific recognition is not an operative delivery mechanism. The assessment found no public purchase, auction, contract, regulated obligation, verified government-arranged removal portfolio, or nationally integrated delivery system. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity										0	0	0	0	0	0
1 — Emerging	1	1	1		1	1		1	1						
2 — Established				2			2								
3 — Operational															
TOTALS	3			4			4			0			0		

SCALE 34400

Assessment	Finding
Why	New Zealand has an unusually clear public science-assessment framework and an emerging strategic process, but no deployment finance or legal delivery arrangement.
Vancouver relevance	New Zealand can help participants design transparent pathway-assessment processes and can use Vancouver to connect scientific eligibility with safeguards, finance, sovereign accounting, and delivery.

References (official sources)

1. [Carbon removals strategy](#). Ministry for the Environment.
2. [Developing a Carbon Removals Strategy: Cabinet paper](#). Ministry for the Environment, 2024.
3. [Assessment Framework for Carbon Removals](#). Ministry for the Environment, May 2026.
4. [How to seek a science assessment for a carbon removal activity](#). Ministry for the Environment, 2026.
5. [New Zealand's Second Emissions Reduction Plan](#). Ministry for the Environment.

B4. Japan

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 101; total 2).** METI's Negative Emissions Technologies study examines the quantities that may be needed for carbon neutrality, analyzes individual pathways, and considers market creation and rule-making. The DAC Working Group has developed methodology and roadmap materials. These are substantial analytical steps, but Japan's binding and planning framework remains centered on carbon neutrality rather than net-negative atmospheric drawdown, and government has not accepted responsibility for delivering a quantified CDR portfolio. S1=1, S2=0, S3=1.
- **C: Capacity and coordination (sub-scores 201; total 3).** METI, the Ministry of the Environment, NEDO, national research institutions, and expert working groups possess strong public technology, lifecycle, and industrial-policy capability. The NET study and DAC Working Group demonstrate independent analysis and structured engagement with experts and companies. Responsibility remains distributed among technology, climate, inventory, market, and industrial programs, with no whole-of-government CDR owner. C1=2, C2=0, C3=1.
- **A: Accountability and public value (sub-scores 100; total 1).** The DAC Working Group has examined a methodology for confirming removal effects, lifecycle impacts, and environmental and social considerations. This is meaningful pathway-specific groundwork. Japan does not yet have a complete public CDR accounting system spanning all pathways, nor comprehensive safeguards, reversal and liability, ownership, transfer, disclosure, benefit, and long-term-cost rules. A1=1, A2=0, A3=0.
- **L: Long-term finance (sub-scores 100; total 1).** Japan supports public research, innovation, demonstration, and industrial development for negative-emissions technologies. These investments are important but are not a dedicated, durable financing system tied to a national removal requirement and do not cover procurement, infrastructure, monitoring, and long-term stewardship across the CDR chain. L1=1, L2=0, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** Working groups, methodologies, roadmaps, and R&D support do not themselves cause qualifying removal to be delivered. The assessment found no operative national CDR procurement, reverse auction, regulated removal obligation, verified government-arranged delivery portfolio, or integrated scale pathway. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity		0			0			0	0		0	0	0	0	0
1 — Emerging	1		1			1	1			1					
2 — Established				2											
3 — Operational															
TOTALS	2			3			1			1			0		

SCALE 23110

Assessment	Finding
Why	Japan has substantial public technical and industrial-policy capacity and unusually detailed NET analysis, but strategy, accountability, finance, and delivery remain exploratory and fragmented.
Vancouver relevance	Japan can contribute on technology assessment, lifecycle analysis, DAC methodology, and industrialization while learning from jurisdictions with operative contracts and broader sovereign-accountability systems.

References (official sources)

1. [Future Directions for Social Implementation and Industrialization of Negative Emissions Technologies](#). Ministry of Economy, Trade and Industry, June 2023.
2. [DAC Working Group](#). Ministry of Economy, Trade and Industry.
3. [Fourth DAC Working Group materials: draft methodology and roadmap issues](#). METI, May 2024.
4. [Japan's Nationally Determined Contribution](#). Ministry of the Environment, 2025.
5. [Plan for Global Warming Countermeasures](#). Ministry of the Environment, 2025.

B5. United States

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 110; total 2).** The Department of Energy's Carbon Negative Shot, Roads to Removal work, regional DAC hubs, and CDR Purchase Pilot recognize the need to develop multiple removal pathways and examine gigaton-scale potential. These programs provide a significant federal technology and market-development signal. The United States has not adopted a national net-negative or post-net-zero atmospheric-drawdown objective, quantified a federal delivery requirement, or assigned public responsibility for securing removals across administrations. S1=1, S2=1, S3=0.
- **C: Capacity and coordination (sub-scores 211; total 4).** DOE, national laboratories, the US Geological Survey, EPA, USDA, Treasury, and other federal bodies possess extensive technical, geological, economic, lifecycle, and project-management capability. Federal programs coordinate research, hubs, infrastructure, tax policy, permitting, and procurement, but responsibility is fragmented and no institution owns CDR from national strategy through accounting, safeguards, finance, and delivery. The evidence supports C1=2, C2=1, C3=1.
- **A: Accountability and public value (sub-scores 110; total 2).** Individual programs impose technical eligibility, measurement, reporting, verification, community-benefit, and storage requirements, and tax and reporting rules address some geologic-storage pathways. The national architecture remains fragmented by agency, statute, funding program, and pathway; it does not consistently distinguish all removals from avoided emissions and point-source CCS or establish one public system for liability, ownership, national claims, transfers, open data, benefit distribution, and long-term costs. A1=1, A2=1, A3=0.
- **L: Long-term finance (sub-scores 210; total 3).** Federal law has committed major resources to research, DAC hubs, demonstrations, infrastructure, tax credits, and an initial purchase pilot. The scale of public investment is unusually large and some instruments can mobilize private capital. Nevertheless, funding is fragmented, not tied to a national removal obligation, incomplete across monitoring and stewardship, and not institutionally durable as a complete CDR finance system. This supports L1=2, L2=1, L3=0.
- **E: Execution and delivery (sub-scores 000; total 0).** DOE's \$35 million CDR Purchase Pilot was designed to culminate in removal-credit purchase agreements, but the 2026 State of CDR reports that the pilot has stalled. DOE's current program page still lists the May 2024 Phase 1 semifinalists and describes later purchase-agreement phases prospectively. No operative federal procurement or removal obligation is presently causing qualifying delivery. E1=0, E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity			0						0			0	0	0	0
1 — Emerging	1	1			1	1	1	1			1				
2 — Established				2						2					
3 — Operational															
TOTALS	2			4			2			3			0		

SCALE 24230

Assessment	Finding
Why	The United States has exceptional scientific and financial capacity and several major development programs, but no durable national CDR obligation, single institutional owner, unified accountability system, or verified delivery at scale.
Vancouver relevance	The United States can contribute research, infrastructure, procurement-pilot, and project-development experience while illustrating the risks created by fragmented authority and finance.

References (official sources)

1. [Carbon Negative Shot](#). US Department of Energy.
2. [Roads to Removal report](#). US Department of Energy, 2024.
3. [Carbon Dioxide Removal Purchase Pilot Prize](#). US Department of Energy.
4. [Regional Direct Air Capture Hubs](#). US Department of Energy.
5. [Section 45Q carbon oxide sequestration credit guidance](#). Internal Revenue Service.
6. Lebling et al., Chapter 5: Policymaking and governance, The State of Carbon Dioxide Removal, 3rd ed. (2026).
7. DOE CDR Purchase Pilot Prize current program page, reviewed 19 August 2026.

Annex C: Frontier reference cases

C1. Denmark

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 211; total 4).** Denmark's climate policy treats CCS and negative emissions as tools for meeting 2030 and 2050 goals, and Parliament has established a dedicated Negative Emissions via CCS Fund. The public sector has accepted a concrete role in designing tenders and contracting for biogenic CO₂ capture and permanent storage. The strategy remains largely organized around national target compliance and specific CCS pathways rather than a quantified post-net-zero atmospheric-drawdown objective. The evidence supports S1=2, S2=1, S3=1.
- **C: Capacity and coordination (sub-scores 211; total 4).** The Danish Energy Agency has developed and administered multiple complex funds, market dialogues, tender specifications, contracts, state-aid arrangements, and cross-border storage planning. This is substantial public technical and procurement capacity, with formal coordination across capture, transport, storage, permitting, finance, and EU state-aid requirements. The Agency owns the subsidy programs but not CDR as a complete national policy and delivery function across pathways, accounting, and long-term public responsibility. C1=2, C2=1, C3=1.
- **A: Accountability and public value (sub-scores 111; total 3).** The NECCS tender is limited to biogenic or atmospheric CO₂ and requires permanent geological storage, performance-linked payment, monitoring, contractual enforcement, and safeguards against overcompensation. These are meaningful accountability mechanisms. The broader Danish CCS funding architecture also supports fossil point-source capture, and the public framework does not yet provide a complete CDR system for lifecycle accounting, ownership and claims, cross-border transfers, contract transparency, benefit distribution, and responsibility for long-term costs across pathways. A1=1, A2=1, A3=1.
- **L: Long-term finance (sub-scores 121; total 4).** Denmark has committed multiyear public resources through the NECCS Fund, CCUS Fund, and a large CCS Fund, and uses competitive tenders and payment per stored ton to mobilize private investment across the capture, transport, and storage chain. This is one of the strongest scaling architectures assessed. Much of the funding also supports fossil CCS, and the dedicated negative-emissions component remains narrow and well below a complete national CDR requirement. L1=1, L2=2, L3=1.
- **E: Execution and delivery (sub-scores 300; total 3).** The Danish Energy Agency has entered binding NECCS contracts with projects expected to capture and store 160,350 tons of biogenic CO₂ annually from 2026 through 2032. The contracts and performance-linked subsidy mechanism directly cause removal activity and justify E1=3. At the assessment date, verified program delivery had not yet been demonstrated and contracted volumes were not nationally meaningful relative to a complete CDR need, so E2=0 and E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity														0	0
1 — Emerging		1	1		1	1	1	1	1	1		1			
2 — Established	2			2							2				
3 — Operational													3		
TOTALS	4			4			3			4			3		

SCALE 44343

Assessment	Finding
Why	Denmark has moved beyond studies to binding public contracts and a sophisticated subsidy architecture, but the negative-emissions program is narrow and does not amount to a complete national CDR system.
Vancouver relevance	Denmark can provide unusually practical lessons on market dialogue, reverse tendering, contract design, value-chain risk, state aid, and performance-linked payment.

References (official sources)

1. [CCS tenders and other funding for CCS development](#). Danish Energy Agency, updated 2026.
2. [NECCS Fund adjustments and facts](#). Danish Energy Agency, June 2023.
3. [Three new CCS projects pledged support for biogenic CO₂](#). Danish Energy Agency, April 2024.
4. [First CCUS subsidy contract](#). Danish Energy Agency, May 2023.
5. [DKK 28.7 billion CCS Fund](#). Danish Energy Agency, 2024.

C2. Sweden

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 212; total 5).** Sweden's climate policy framework and Climate Act require net-zero greenhouse-gas emissions by 2045 and negative emissions thereafter. Government policy identifies supplementary measures, including increased sequestration and CCS, and the bio-CCS support system turns part of that commitment into a concrete public program. The framework does not specify a quantified post-2045 atmospheric drawdown objective for Sweden or a complete quantity and pathway mix beyond the bio-CCS ambition. This supports S1=2, S2=1, S3=2.
- **C: Capacity and coordination (sub-scores 211; total 4).** Since 2021 the Swedish Energy Agency has served as the national center for CCS and now coordinates support, analysis, stakeholder engagement, and bio-CCS calls. It designed and administers a reverse auction covering capture, transport, and storage and has public technical expertise across the value chain. The mandate is strong but pathway-specific; no body is accountable for the full national CDR function across all methods, accounting, safeguards, finance, and delivery. C1=2, C2=1, C3=1.
- **A: Accountability and public value (sub-scores 111; total 3).** The bio-CCS support scheme requires permanent geological storage, competitive bidding, verified stored tons before payment, revenue adjustment to avoid overcompensation, and EU state-aid compliance. These are robust contractual controls for one pathway. Sweden does not yet have a complete public framework consistently distinguishing and governing all CDR pathways, long-term reversal and liability, ownership and national claims, international transfer, data and contract disclosure, benefit distribution, and future public costs. A1=1, A2=1, A3=1.
- **L: Long-term finance (sub-scores 121; total 4).** Sweden has created a reverse-auction system with a multiyear public budget, support for investment and operations across the full bio-CCS chain, and payments over as many as 15 years after storage begins. The first award exceeded SEK 20 billion, and additional funds remain for later auctions. This is a powerful mobilization mechanism, but it is limited to bio-CCS and not demonstrably adequate for Sweden's complete removal need or other pathways and stewardship functions. L1=1, L2=2, L3=1.
- **E: Execution and delivery (sub-scores 300; total 3).** The first reverse auction awarded Stockholm Exergi more than SEK 20 billion to capture and store over 11 million tons of biogenic CO₂, with storage required to begin within three years and payment tied to stored tons. This operative, binding award justifies E1=3. At the assessment date, large-scale storage had not begun, so verified program delivery and nationally integrated scale were not yet demonstrated: E2=0, E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity														0	0
1 — Emerging		1			1	1	1	1	1	1		1			
2 — Established	2		2	2							2				
3 — Operational													3		
TOTALS	5			4			3			4			3		

SCALE 54343

Assessment	Finding
Why	Sweden combines a durable net-negative statutory objective with a large, performance-linked public bio-CCS auction, but the system remains pathway-specific and has not yet demonstrated delivery.
Vancouver relevance	Sweden can provide lessons on linking long-term climate law to reverse auctions, 15-year operating support, revenue adjustment, and whole-value-chain contracts.

References (official sources)

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5. [National Centre for CCS](#). Swedish Energy Agency.

C3. United Kingdom

Evidence by SCALE dimension

- **S: Strategic commitment (sub-scores 211; total 4).** UK carbon budgets and net-zero planning assign engineered and nature-based greenhouse-gas removals a defined role in balancing residual emissions, and government has developed a dedicated GGR policy and business-model program. The July 2026 response to the independent review reiterates a commitment to domestic deployment and a holistic framework. The strategy remains principally a net-zero and carbon-budget instrument rather than a quantified post-net-zero atmospheric-drawdown obligation, and public responsibility is expressed through market creation rather than a guarantee of delivery. S1=2, S2=1, S3=1.
- **C: Capacity and coordination (sub-scores 211; total 4).** The Department for Energy Security and Net Zero, technical advisers, UK Research and Innovation, the Climate Change Committee, regulators, and CCUS delivery bodies provide substantial public analytical and program-design capacity. Government has convened industry, academic, regulatory, and technical groups for MRV and business-model design and coordinates GGR with transport and storage networks. No single public body is accountable for CDR across all pathways, national accounting, safeguards, finance, and delivery. C1=2, C2=1, C3=1.
- **A: Accountability and public value (sub-scores 211; total 4).** The government has developed minimum quality thresholds, detailed draft contract and grant terms, and an MRV Task and Finish Group addressing quantification, additionality, durability, uncertainty, and verification. These are advanced public-accountability components. They are not yet a complete operative system across engineered and nature-based removals, and rules for ownership, national claims, international transfer, open data, contract disclosure, benefit distribution, reversal, liability, and long-term public costs remain incomplete. A1=2, A2=1, A3=1.
- **L: Long-term finance (sub-scores 121; total 4).** The GGR Business Model proposes a government top-up to an agreed price for credits sold, covers transport and storage charges, and protects projects from cross-chain risks. Alongside Power BECCS and CCUS business models, this is a sophisticated public mobilization architecture with potential multiyear support. At the assessment date it had not become a complete, adequately funded system covering the UK's full removal requirement and all pathways and stewardship functions. L1=1, L2=2, L3=1.
- **E: Execution and delivery (sub-scores 200; total 2).** The government has published a full-form GGR Contract and grant-funding terms, and relevant projects in the HyNet Track-1 expansion have progressed to a formal Project Negotiation List. This is more than an announced or exploratory mechanism: a dedicated, resourced CDR delivery process is in active project negotiation, supporting E1=2. The assessment did not identify a binding completed GGR contract or verified government-arranged removals at the assessment date, so E2=0 and E3=0.

DIMENSION & SUB-DIMENSION SCORES	STRATEGY (S)			CAPACITY (C)			ACCOUNT-ABILITY (A)			LONG-TERM FINANCE (L)			EXECUTION (E)		
	S1	S2	S3	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3
0 — No activity														0	0
1 — Emerging		1	1		1	1		1	1	1		1			
2 — Established	2			2			2				2		2		
3 — Operational															
TOTALS	4			4			4			4			2		

SCALE 44442

Assessment	Finding
Why	The United Kingdom has one of the most developed public GGR business-model and MRV systems assessed and has projects in formal negotiation, but binding GGR contracts and verified government-arranged delivery have not yet been demonstrated.
Vancouver relevance	The UK can contribute detailed experience on contracts for difference, transport-and-storage risk, minimum quality thresholds, industry consultation, and MRV design.

References (official sources)

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2. [Independent Review on Greenhouse Gas Removals](#). UK Government, 2025.
3. [Government response to the Independent Review on GGRs](#). UK Government, July 2026.
4. [Monitoring, Reporting and Verification of GGRs: Task and Finish Group report](#). Department for Energy Security and Net Zero.
5. [Carbon Budget and Growth Delivery Plan](#). UK Government, 2025.

BIBLIOGRAPHY AND AUGUST 2026 SOURCE AUDIT

This appendix distinguishes the sources cited in the July 2026 SCALE assessment from additional sources reviewed for the August 2026 update. The July reference set is reproduced from the jurisdiction annexes (with typographical normalization only). The August set includes databases and trackers used for cross-checking, the OECD IFCMA April 2026 workbook, primary sources used to validate score changes and important non-changes, and methodological and scientific references reviewed through 21 August 2026.

Source-audit result. Three jurisdiction scores changed as a result of the August source review: the European Union moved from SCALE 44421 to 54421 (S1: 1 to 2); Canada moved from SCALE 34321 to 34322 (E1: 1 to 2) after a formal CDR Request for Standing Offer was identified; and the United States moved from SCALE 24231 to 24230 (E1: 1 to 0) because the federal purchase pilot is stalled. Review of the OECD IFCMA April 2026 workbook produced no additional score changes. A separate methodology review clarified the E1 threshold: broad compliance markets that merely permit removal do not by themselves constitute CDR delivery mechanisms, while a dedicated, funded program in formal solicitation or project negotiation can support E1=2. On that basis, California and Washington remain at E1=0 and the United Kingdom moves from E1=1 to E1=2. The international SCALE profile is 12111.

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PART II: ADDITIONAL SOURCES REVIEWED FOR THE AUGUST 2026 UPDATE

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