PAGE PARTNERSHIP FOR ACTION ON GREEN ECONOMY

POLICY BRIEF

From Plans to Proof — Embedding the Circular Economy in Indonesia's Climate Architecture through AKSARA



UN environment programme

International Labour Organization

UNDP

UNIDO

unitar United Nations Institute for Training and Research

Copyright © United Nations Development Programme 2026
First published 2026, on behalf of PAGE

This brief is published as part of the Partnership for Action on Green Economy (PAGE), an initiative by the United Nations Environment Programme (UNEP), the International Labour Organization (ILO), the United Nations Development Programme (UNDP), the United Nations Industrial Development Organization (UNIDO) and the United Nations Institute for Training and Research (UNITAR).

This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement of the source is made. The PAGE Secretariat would appreciate receiving a copy of any publication that uses this publication as a source.

No use of this publication may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from the PAGE Secretariat.

Citation
PAGE 2026, Policy Brief, From Plans to Proof: Embedding the Circular Economy in Indonesia's Climate Architecture through AKSARA

Disclaimer
This publication has been produced with the support of PAGE funding partners. The contents of this publication are the sole responsibility of PAGE and can in no way be taken to reflect the views of any Government. The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the PAGE partners concerning the legal status of any country, territory, city or area or of its authorities, or concerning delimitation of its frontiers or boundaries. Moreover, the views expressed do not necessarily represent the decision or the stated policy of the PAGE partners, nor do citing trade names or commercial processes constitute endorsement.

About this brief
This policy brief is published by UN-PAGE Indonesia. The CE planning and monitoring and evaluation modules in AKSARA are developed by the Ministry of National Development Planning (Bappenas) with support from the Partnership for Action on Green Economy (PAGE), coordinated in Indonesia by UNDP. PAGE is a joint initiative of UNEP, ILO, UNIDO, UNDP and UNITAR; Indonesia joined in 2018.

The methodology and baseline were reviewed by an external panel of researchers from BRIN, Institut Teknologi Bandung, Institut Teknologi Sepuluh Nopember and Life Cycle Indonesia in September 2026.

INDONESIA'S CIRCULARITY AT A GLANCE: 2025 INDICATIVE VALUES

6.47%	0.70%	3.29%
Circular Input Rate, 2025 (indicative): up from 4.82% in 2023	Usage Rate, 2025 (indicative): 0.76% in 2023; RAN ES target 4.00%	Recycling Rate, 2025 (indicative): 3.25% in 2023; RAN ES target 5.23%

Purpose of this brief

This brief is for policy-makers in Bappenas, line ministries, the Ministry of Finance and regional governments, and for Indonesia's development partners. It summarises how the circular economy has been embedded in Indonesia's climate planning and monitoring architecture through two modules in AKSARA, what the first results show, and what decisions are now needed to make the system permanent. Two technical papers, on the planning module and on the monitoring and evaluation module, provide the detail.

Key messages

- **The circular economy is now part of Indonesia's climate planning system, not a parallel agenda.** Actions under the National Circular Economy Roadmap are registered in AKSARA, the Bappenas platform that tracks the NDC and low-carbon, climate-resilient development (PRKBI), with the same owners, calendar and authority as other climate actions.
- **The activity already exists; what was missing was the connection.** Mapping ministries' detailed outputs (Rincian Output) found dozens of funded CE-relevant activities whose link to the climate agenda was implicit and fragmented. Tagging those outputs in AKSARA integrates them without any new reporting burden.
- **Indonesia has a reproducible measure of circularity.** Three national indicators (Circular Input Rate, Usage Rate and Recycling Rate) are calculated from fifteen sector indicators with documented formulas, boundaries and data sources, endorsed by external peer review.
- **The baseline shows how far there is to go.** On the current method, the Circular Input Rate rose from 4.82% (2023) to an indicative 6.47% (2025); the Usage Rate is below 1% and the Recycling Rate about 3.3%. Most 2025 figures are proxies and will be replaced by actual data.
- **On current trends the 2029 targets will not be met.** Reaching a Usage Rate of 4% and a Recycling Rate of 5.23% from 0.70% and 3.29% in four years requires a step change, not continuation. The system's value is to show, sector by sector, where that change must come from, in time for the RPJMN mid-term review.
- **Verification is built in.** No CE figure is published before a ministry submission passes system checks and Bappenas review; every value carries its confidence level, proxy status and data owner.
- **Integration should be differentiated by sector.** Food and construction link to both mitigation and resilience and are the entry points; plastic packaging and electronics are low-carbon contributors; textiles needs clearer policy articulation.
- **Emissions accounting is the missing link.** The indicators measure material circularity; translating them into greenhouse-gas terms for the NDC requires a complementary life-cycle assessment.

Policy context

Table 1. Policy frameworks and what they ask of the circular economy

Framework	What it asks of the circular economy
Paris Agreement and Indonesia's Second NDC (2035)	Absolute 2035 emission levels against a 2019 reference year; mitigation in waste, IPPU, energy and agriculture; adaptation through food and infrastructure resilience; transparent, verifiable reporting of actions and effects
RPJPN 2025–2045 and RPJMN 2025–2029	A green, circular economy as part of the transformation agenda toward Indonesia Emas 2045, delivered through ministries' budgeted outputs
LCDI and the PRKBI framework	The planning and monitoring architecture, with AKSARA as its system, through which climate targets reach development plans and budgets
National CE Roadmap 2025–2045 and RAN ES 2025–2029	Five priority sectors, their actions and three national circularity indicators to be tracked
SDGs 12, 13, 9, 11 and 8	Responsible production and consumption, climate action, sustainable industry and cities, and decent green jobs

The common thread is that every framework expects the circular economy to be planned, budgeted and reported through the same machinery as the rest of the climate and development agenda, which is what the AKSARA modules provide.

The pull is no longer only domestic. Export markets increasingly require verified circularity data: the EU's deforestation regulation, carbon border adjustment, packaging and ecodesign rules, and buyers' recycled-content requirements all favour firms and governments that can document material flows. A government-owned, verified set of circularity indicators is therefore also a trade and investment asset, not only a reporting obligation.

What has changed since 2024

Four developments since the planning module was designed shape what the system must now serve.

Second NDC. Indonesia submitted its Second NDC on 27 October 2025. It replaces percentage reductions against a 2010 business-as-usual baseline with absolute emission levels for 2035 (1.26 to 1.49 $GtCO_2e$ under two growth scenarios) measured against a 2019 reference year, with emissions expected to peak by 2030. CE actions therefore need to be expressed in the Second NDC's sector categories and reported through the Biennial Transparency Report cycle, not only the Enhanced NDC categories to which the planning module was first mapped.

Institutional reorganisation. Environment and forestry are now separate ministries, and the National Registry System (SRN PPI) remains the Government's registry for mitigation actions and carbon units. The CE modules sit in AKSARA because it is where ministries and regions register and report low-carbon and climate-resilient actions against the development plan; SRN PPI is where those actions are recognised for the NDC. The interface between the two needs to be defined so that a CE action is neither reported twice nor recognised nowhere.

Fiscal tightening. Budget efficiency measures since early 2025 and the contraction of multilateral development finance mean that new programmes will not be funded. Integration through existing

outputs is now the only realistic route, and the AKSARA integration itself needs a line in Bappenas' own budget rather than continued reliance on partner support.

Growth and industrial policy. The 8% growth ambition and the downstreaming of minerals will raise demand for primary material, cement and energy. Without circular supply, these will dilute the Circular Input Rate even as recycling improves. CE is the policy that keeps industrial growth and the 2035 emission ceiling compatible, which is the case for treating it as a cross-sector approach rather than a waste-sector programme.

The challenge

Indonesia's National Circular Economy Roadmap 2025–2045 and its first Action Plan (RAN ES 2025–2029) set out a resource-efficient path for five priority sectors (food, plastic packaging, electronics, construction and textiles) that together account for roughly a third of national GDP. The roadmap is explicit that circularity is a climate strategy: less virgin material, longer product life and more recycling reduce emissions in the waste, industrial-process and energy sectors that Indonesia's NDC covers.

Until recently, however, nothing joined the roadmap to the system that plans and tracks Indonesia's climate commitments. The roadmap listed actions by sector; AKSARA tracked climate actions by category. A UN-PAGE analysis of the CE–NDC–PRKBI linkage found many CE-relevant activities already funded in ministries' work plans, but their climate contribution was implicit and fragmented: CE actions never appeared in the national climate accounts, Bappenas had no single register, indicators had no data owners, and there was no evidence on which to adjust the next plan. The problem was not a shortage of activity but the absence of an integration framework, coordination and a monitoring system able to read across sectors and across the mitigation–adaptation divide.

The data problem was as serious as the institutional one. The variables behind the CE indicators sit with more than ten ministries and agencies, industry associations and company reports, with different units, boundaries and release cycles. There was no standard reporting protocol, no measurement, reporting and verification (MRV) framework, and no way to tell a measured value from an estimate.

UN-PAGE has supported the Government in closing these gaps in two phases.

The response: two linked modules in AKSARA

Rather than build a separate CE portal, the Government placed the circular economy inside AKSARA, so that CE actions inherit the reporting calendar, user roles and institutional authority of every other low-carbon action.

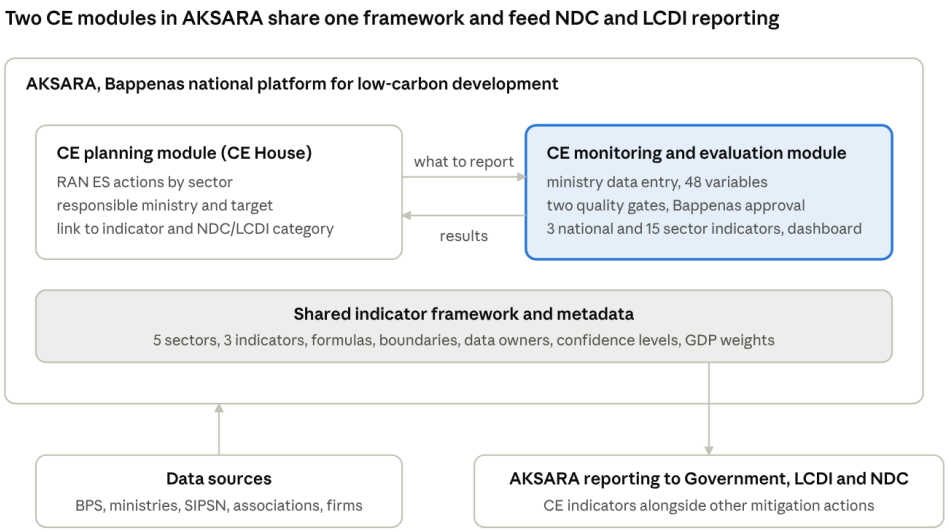


Figure 1. *CE modules in AKSARA: planning, M&E, shared indicator framework and reporting*

Phase 1 (completed) built the planning module, known as the "CE House". It registers each RAN ES action with its sector, responsible ministry, target and timeframe, and links it to the CE indicator it moves and, where established, to the NDC or LCDI mitigation category it supports. It also updated the CE baseline and assessed the analytical link between CE and the NDC.

Phase 2 (2026) designed the monitoring and evaluation module and its MRV framework: an indicator hierarchy from 48 variables through 15 sector indicators to 3 national indicators; metadata for every variable; an approval-based data workflow in which ministries submit and Bappenas verifies; a dashboard; and a data-improvement plan with named owners. The design has been through external peer review (September 2026) and a desk-based pilot, and is being prepared for a live pilot with ministries.

The two modules share one indicator framework. An action registered at the planning stage defines what a ministry will later be asked to report; a result verified in the M&E module flows back as evidence for the next planning cycle.

A third element ties both modules to the rest of AKSARA: a thematic CE layer over ministries' detailed outputs (*Rincian Output*, RO). Each CE-relevant RO is tagged by CE sector, climate pillar, type of contribution (direct, co-benefit or enabling) and lead and supporting ministries. It is still reported once and still appears in the PRK or PBI dashboard; it simply becomes readable through the CE lens as well, and outputs that recur across ministries or span both pillars are flagged for coordination. This is what integrates CE into the climate architecture without new targets, indicators or reporting obligations.

What the system delivers

A national measure of circularity. Three indicators follow material through one cycle (into production, through use, and back after use), each a GDP-weighted aggregate of the five priority sectors:

Table 2. National circularity indicators: baseline, indicative 2025 values and RAN ES targets

Indicator	What it measures	2023 baseline	2025 indicative	RAN ES target
Circular	Share of secondary, recycled,	4.82%	6.47%	8.75%

Indicator	What it measures	2023 baseline	2025 indicative	RAN ES target
Input Rate	reused or alternative material entering production			
Usage Rate	Share of material or product kept in use through reuse, repair, refill, refurbishment or food rescue	0.76%	0.70%	4.00%
Recycling Rate	Share of post-use material returned to the cycle as secondary material	3.25%	3.29%	5.23%

Source: CE indicator metadata and calculation workbook, October 2026 (peer-reviewed methodology). Most 2025 values are proxies or policy milestones, to be replaced with realised data; targets are those stated in the RAN ES.

The gains so far are concentrated on the input side, led by construction (circular input 40% → 48%) and food (3% → 7%), the two sectors with the largest GDP weights. Usage and recycling are flat or slightly down at national level, even though plastic-packaging recycling rose sharply (25% → 45%) once national waste-system data were included, an example of how a small sector's progress is muted by GDP weighting. Sector values are therefore published alongside the national aggregate.

A verifiable data chain. Every one of the 48 underlying variables has a definition, unit, boundary, source, data owner, update cycle, confidence level and a flag for actual versus proxy data. Submissions pass an automated check and a Bappenas review before entering the calculation. The methodology follows ISO 59020 principles and was tested through material-flow analysis for each sector.

Institutional clarity. Bappenas holds the super-administrator role and approval authority; mapped ministries and agencies are contributors for the variables they own; BPS supplies the GDP weights and production statistics. The approval-based workflow keeps CE figures under the same quality control as other AKSARA data.

A place in climate reporting. Approved indicators flow into AKSARA's standard reports to Government, the LCDI and NDC processes, where CE appears alongside other mitigation actions. What the system does not yet do is convert indicator changes into emission reductions; that requires a complementary life-cycle assessment identified for the next phase.

Strategic implications

Table 3. What the system enables and requires, by stakeholder

For	The system enables	It requires
Bappenas	A single register of CE actions aligned with RPJMN, RAN ES and NDC categories; evidence for the RPJMN mid-term review; a cross-sector view of which ministries carry the agenda	Formal guidance on reporting and tagging; chairing coordination on shared outputs; resourcing the AKSARA integration
Line ministries	Existing outputs recognised as climate contributions without new reporting; clear ownership of data variables	Current RO tags; annual indicator reporting; named data owners
Ministry of Finance	A defined set of CE-tagged outputs that can be aligned with climate budget tagging, making CE expenditure visible within the climate budget	A CE marker or cross-reference in the climate budget tagging system
Regional	A future route for regional CE actions and data into	Participation in the next-phase

For	The system enables	It requires
governments	national planning	workstream on sub-national roles
Development partners and private sector	A government-owned register of actions and data gaps against which to align support, investment and sustainability reporting	Alignment with registered actions rather than parallel pipelines

Early lessons

Boundaries first, indicators second. The peer review's most consistent message was that ratios can be computed from mismatched data and still mean nothing. The design response was to lock a system boundary per variable and per period, harmonise GDP bases to the KBLI classes closest to each sector, and treat any flow that cannot be reconciled as a documented gap rather than closing it by assumption.

Make data quality visible, not hidden. Publishing confidence levels and proxy flags alongside the numbers was initially a concession; it has become the module's main management tool. The data-quality view is the work list for the next reporting cycle, and it gives each gap a named owner. It also makes it reasonable for design to run ahead of data: the module, metadata and workflow are complete, and the binding constraint is now the replacement of proxies with realised data under standing agreements with data holders.

Weighting is a policy choice. Three weighting and methodology scenarios produced materially different national figures. Settling on the most robust one required an external peer review and a Bappenas decision, not just a technical preference; the other scenarios are kept as sensitivity tests. The decision to publish unweighted sector values alongside the aggregate followed directly from the review.

Approval beats direct entry. An approval-based workflow is slower than letting ministries publish directly, but it is what makes a national CE figure defensible in NDC and LCDI reporting. Bappenas' "helicopter view" is needed to reconcile submissions that use different years, units or boundaries.

Integrate through what already exists. The RO mapping showed that the fastest route to integration is to re-read activities ministries already fund and report, rather than to create a CE programme beside them. A thematic tag on an existing output costs ministries nothing and gives Bappenas a cross-sector view it did not have. The same logic argues for connecting existing data systems (SIINas, SIPSN, e-waste reporting) before building new ones.

Mitigation and adaptation are not symmetrical. CE's contribution to the low-carbon agenda is reasonably well articulated; its contribution to climate resilience is real (food-system stability, resilient infrastructure, reduced pressure on ecosystems) but mostly appears as a co-benefit and is rarely written into adaptation policy. Integration strategies need to be differentiated by sector and by pillar rather than applied uniformly.

Risks and dependencies

The roadmap set out in the Conclusion depends on five things that lie outside the modules' control.

Data agreements are not signed. Without standing agreements the 2027 live pilot would run on proxies and lose credibility. Mitigation: make the agreements a condition of RAN ES governance (Recommendation 3) and publish the data-quality view so that gaps are attributed, not hidden.

Ministries treat RO tagging as a new burden. Mitigation: keep tagging a Bappenas task performed on existing RO lists and confirmed by ministries once a year, rather than a ministry-side data entry.

The AKSARA platform is not maintained or integration is deferred. Mitigation: a budgeted line for the AKSARA team within Bappenas and a fixed integration date ahead of the 2027 reporting cycle (Recommendation 4).

Partner support ends before institutionalisation. Mitigation: a hand-over plan with named Bappenas owners for method, data and platform by end-2026, so that the system does not depend on UN-PAGE beyond the pilot.

Mandate or leadership changes. A change in Bappenas' convening role or in RAN ES governance would stall cross-ministry coordination. Mitigation: anchor reporting obligations in formal guidance (Recommendation 2) rather than in working arrangements.

Policy recommendations

The recommendations are grouped by horizon. Short term means before the first live reporting cycle (2027); medium term means within the RAN ES 2025–2029 period; long term means the next planning cycle.

Table 4. Policy recommendations by lead, supporting institution and horizon

#	Recommendation	Lead	Supporting	Horizon
1	Position the circular economy as a cross-sector approach within the NDC–PRKBI framework: a policy statement giving ministries a common reference for framing CE outputs as climate contributions, without new targets or changes to NDC or PRKBI documents	Bappenas	Ministry of Environment, UN-PAGE	Short
2	Adopt the CE indicator metadata, reporting calendar, verification procedure and RO-tagging convention as formal Bappenas guidance, making annual reporting an obligation under RAN ES governance	Bappenas	Line ministries	Short
3	Put standing data-sharing agreements in place with BPS, the Ministries of Agriculture, Industry, Trade, Environment and Public Works, the National Food Agency and industry associations, naming variables, format and delivery month	Bappenas	BPS, data-holding ministries	Short
4	Complete technical integration of the CE modules with the core AKSARA platform (schema, API, RO-tagging fields)	Bappenas / AKSARA team	UN-PAGE	Short
5	Use the RO mapping as the agenda for existing cross-ministry coordination forums, starting with food and construction, where output density and climate linkage	Bappenas	Coordinating ministries, line ministries	Short–medium

#	Recommendation	Lead	Supporting	Horizon
	are highest			
6	Differentiate the integration strategy by sector: food and construction as cross-pillar entry points; plastic packaging and electronics as low-carbon contributors; textiles as a sector needing policy articulation	Bappenas	Sector ministries	Medium
7	Replace low-confidence proxies first (organic fertiliser, alternative feed protein, circular fibre, PCB collection, recycled construction material) and widen the construction sample	Data-owning ministries	Bappenas, BPS	Medium
8	Connect existing reporting systems (SIINas, SIPSN, e-waste recovery reporting) rather than creating new ones	Ministries of Industry, Environment, Communication and Digital Affairs	Bappenas	Medium
9	Align CE-tagged outputs with climate budget tagging so that CE expenditure becomes visible within the climate budget	Ministry of Finance	Bappenas	Medium
10	Commission the life-cycle or complementary assessment that translates indicator changes into greenhouse-gas terms, so CE can be counted against the Second NDC's 2035 emission levels and reported through the Biennial Transparency Report	Bappenas	Ministry of Environment, BRIN, UN-PAGE	Medium
11	Extend to provinces and districts: map regional roles and data, design reconciliation with national figures, add spatial breakdowns	Bappenas, Ministry of Home Affairs	Regional governments	Short–medium
12	Add a gender and social-inclusion marker to the RO tagging convention, drawing on existing gender-responsive planning and budgeting practice	Bappenas	Ministry of Women's Empowerment and Child Protection, UN-PAGE	Medium
13	Evaluate for patterns as well as targets (which sectors are most integrated across PRK and PBI, which outputs recur across ministries without coordination, where leverage lies) and feed the answers into the next planning round	Bappenas	All contributing ministries	Long

Conclusion

Indonesia has moved the circular economy from a parallel agenda to a managed part of its climate architecture. The planning module gives CE actions a place in the system that plans the NDC and the PRKBI; the M&E module gives them a verified measure; and the RO layer connects both to the outputs ministries already fund and report. The design is complete, peer-reviewed and government-owned.

What remains is institutional rather than technical: guidance that makes reporting routine, data agreements that make it reliable, coordination that makes shared outputs coherent, and the emissions link that lets circularity count toward the Second NDC. The indicative roadmap runs from finalisation at the end of 2026, through a live pilot in 2027 and full sector coverage in 2028, to an institutionalised annual cycle feeding the RPJMN mid-term review and Indonesia's transparency reporting. The decisions listed above are what will carry it there.

Abbreviations

AKSARA	Bappenas platform for planning and monitoring the NDC and low-carbon, climate-resilient development	**PRK / PBI / PRKBI**	Low-carbon development / climate-resilient development / both combined
BPS	Statistics Indonesia	**RAN ES**	National Action Plan for the Circular Economy 2025–2029
BRIN	National Research and Innovation Agency	**RO**	Rincian Output: ministries' detailed budgeted outputs
BTR	Biennial Transparency Report (UNFCCC)	**RPJMN / RPJPN**	National Medium-Term / Long-Term Development Plan
CE	Circular economy	**SIINas**	National Industrial Information System (Ministry of Industry)
KBLI	Indonesian Standard Industrial Classification	**SIPSN**	National Waste Management Information System
LCDI	Low Carbon Development Indonesia	**SRN PPI**	National Registry System for Climate Change Control
MRV	Measurement, reporting and verification	**UN-PAGE**	Partnership for Action on Green Economy
NDC	Nationally Determined Contribution	**IPPU**	Industrial processes and product use (NDC sector)