Recovered Capital Methodology as a basis for setting the value of the opening regulatory asset base

Critical review

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Nova Transportadora do Sudeste S.A.

This report was prepared by:

Economic Consulting Associates Limited

41 Lonsdale Road, London NW6 6RA,
United Kingdom
tel: +44 20 7604 4546
www.eca-uk.com

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Abbreviations and acronyms

ACCC	Australian Competition and Consumer Commission
AER	Australian Energy Regulator
ANP	Agência Nacional do Petróleo, Gás Natural e Biocombustíveis
bps	Basis points (one basis point equals 0.01%, and 100 basis points equal 1%)
Capex	Capital expenditure
CAPM	Capital asset pricing model
CdU	Conselho de Usuários (CdU, Users' Council)
CMN	Conselho Monetário Nacional (National Monetary Council; used in this report in relation to the official inflation target)
CPI	Consumer price index
CSLL	Brazilian social contribution on net profit
DORC	Depreciated optimised replacement cost
DRC	Depreciated replacement cost
ECA	Economic Consulting Associates
EIA	Energy Information Administration (United States)
G&A	General and administrative expenses
GASBOL	Gasoduto Bolívia-Brasil
ICMS, PIS/COFINS, CPMF	Brazilian indirect taxes
IGP-M	Índice Geral de Preços – Mercado (General Market Price Index; the tariff index used in the relevant legacy contract)
IPCA	Índice Nacional de Preços ao Consumidor Amplo (Broad National Consumer Price Index; Brazil's main consumer price inflation index)
IRPJ	Brazilian corporate income tax
MAR	Maximum allowed revenue
NGR	Australian National Gas Rules
NTS	Nova Transportadora do Sudeste S.A.
O&M	Operating and maintenance costs
Opex	Operating expenditures or costs
RAB	Regulatory asset base
RCM	Recovered capital methodology
TAG	Transportadora Associada de Gás S.A.
TBG	Transportadora Brasileira Bolivia-Brazil S.A.
US	United States of America
WACC	Weighted average cost of capital

Executive summary

Brazil's gas transportation sector is undergoing a significant regulatory transition. For Nova Transportadora do Sudeste S.A. (NTS) and Transportadora Associada de Gás S.A. (TAG), the 2026-2030 tariff cycle marks the move from a legacy framework centred on bilateral transportation contracts, predominantly with Petrobras, to a regulated third-party access model based on entry-exit capacity contracting and tariffs approved by Agência Nacional do Petróleo, Gás Natural e Biocombustíveis (ANP). For NTS this transition requires ANP to determine the opening regulatory asset base (RAB) for the Malha Sudeste legacy contract assets entering the new tariff framework.

The opening RAB is central to the new regulatory regime and the building-block tariff framework. It determines the capital value on which NTS will earn a return and recover depreciation through future tariffs, and establishes the starting point for the RAB roll-forward in subsequent tariff cycles. **The decision** therefore **affects** not only allowed revenue in the 2026-2030 period, but also **tariff reasonableness over time, financeability, incentives for efficient investment, asset management decisions, and the credibility and stability of the new regulatory framework**.

ANP's own framework recognises this broader role. Technical Note No. 2/2026 states that the transition to the access-regulated regime requires a robust methodological framework for valuing the RAB and assessing operating costs recognised in maximum allowed revenue. It links robust RAB valuation and opex assessment to economic efficiency, protection of users from excessive tariffs, transparency, regulatory stability, and the reasonable opportunity for transporters to recover efficient costs and earn the allowed return. Resolution ANP No. 991/2026 also frames the tariff regime by reference to the objective that tariffs and access conditions should reflect and emulate the results of a genuinely competitive market.

Against that framework, **ANP has proposed to rely on the Recovered Capital Methodology (RCM) to support a zero opening RAB treatment for the NTS Malha Sudeste legacy contract assets**. **The regulatory concern invoked by ANP is the avoidance of double recovery**: users should not be required to pay again for capital that has already been recovered through historical transportation tariffs. That concern is legitimate. It does not, however, make RCM an appropriate method for determining, checking or supporting the opening RAB. Any adjustment for prior recovery should instead be made within a recognised asset valuation framework and supported by evidence identifying specific recovered capital.

This report's central conclusion is that **ANP has not justified relying on RCM** as the basis, cross-check, or complementary method for excluding the Malha Sudeste legacy contract assets from NTS's opening RAB.

RCM is not a recognised opening RAB valuation methodology

RCM is better characterised as a retrospective capital-recovery calculation, not as a recognised RAB valuation methodology. It does not directly value the assets entering the regulated tariff regime. Instead, it reconstructs historical revenues and deducts modelled operating costs, taxes, and return on capital to infer the amount of capital that may have been

recovered. The amount treated as return of capital is therefore a residual output of the calculation.

That distinction is central. Recognised opening RAB valuation approaches seek to establish the value of assets entering the regulated regime. They may do so using methods such as depreciated historical cost, indexed net book value, depreciated replacement cost, optimised replacement cost, or expressly transitional and negotiated valuation approaches. RCM performs a different exercise. It imposes an ex-post building-block structure on historical revenues from legacy contracts and *infers* capital recovery after deducting modelled non-capital components.

Historical revenues do not, by themselves, reveal recovered capital. Legacy contract revenues may reflect availability obligations, ship-or-pay commitments, indexation, risk allocation, tax assumptions, operational responsibilities, financing expectations, and other commercial features. Those revenues were not structured as regulatory building-block settlements identifying separate allowances for operating costs, tax, return on capital and return of capital. A retrospective calculation therefore has to allocate historical revenues between those components *after* the event.

This allocation is **inherently assumption-dependent**. In RCM, the assumed weighted average cost of capital (WACC) determines how much historical revenue is treated as return on capital rather than return of capital. Operating cost and tax deductions determine how much revenue remains available to be classified as capital recovery. The starting asset value determines the amount against which recovery is measured. Indexation and nominalisation assumptions affect the annual return-on-capital deduction and the roll-forward of the residual balance. A completed spreadsheet can therefore produce a precise numerical result without establishing that the amount treated as recovered capital has been objectively measured.

The problem is therefore broader than the mechanical performance of ANP's calculation. **ANP has not shown that RCM is an appropriate basis, cross-check, or complementary method for excluding assets from the opening RAB of a new ex-ante building-block tariff regime; nor has it shown that its retrospective calculation identifies recovered capital with the reliability required to support that exclusion**. More complete historical information could reduce uncertainty around particular inputs in a retrospective calculation, but it would not overcome that threshold methodological objection.

ANP's proposed exclusion also lacks the required evidential basis

The evidential standard should reflect the regulatory consequence ANP draws from the calculation. The opening RAB is a one-off transition decision. Once set, it defines the starting capital value to be rolled forward in future tariff cycles. If the opening RAB is overstated, users may pay again for capital already recovered. If it is understated, NTS may be denied recovery of capital that remains committed to providing regulated transportation services and has not been shown to have been recovered.

A zero opening RAB treatment for assets that continue to provide regulated services is therefore **a material regulatory outcome**. It would remove those assets from the capital base on which depreciation and return are calculated under the new building-block framework. That outcome requires more than a general concern about double recovery or a residual inference produced by a reconstructed model. Any prior-recovery adjustment must be made within a

recognised valuation framework and supported by evidence identifying specific capital already recovered in a measurable and attributable way.

This requirement follows from ANP's own stated regulatory objectives. Protecting users from double recovery is one objective, but it must be balanced against tariff reasonableness over time, economic efficiency, financeability, investment incentives, asset life optimisation, and regulatory stability. **An opening RAB decision that reduces tariffs in the short term by excluding assets on a weak evidential basis may undermine the credibility of the new framework, increase regulatory risk, affect future investment and financing costs, and weaken long-term efficiency**.

The opening RAB treatment may also affect asset management incentives. If existing assets that continue to provide regulated service are assigned no opening RAB value, while future replacement assets may be admitted to the RAB and earn depreciation and return, the framework may create a bias towards replacement rather than efficient maintenance, refurbishment, or life extension. The opening RAB decision should not create an artificial incentive against the efficient use of existing assets.

ANP has not resolved the evidential concerns it previously identified

ANP's own technical note sequence reinforces the concern with its proposed reliance on RCM. In Technical Note No. 7/2026, ANP described RCM as requiring historical tracking, year by year, of revenues actually collected, operating costs incurred, taxes paid and the rate of return associated with invested capital. ANP concluded that the information then available for NTS was not sufficient to support application of RCM in a technically consistent and prudent manner. It identified traceability, granularity, completeness, auditability and methodological robustness as necessary to the retrospective exercise it was considering. Those evidential requirements did not, and do not, establish RCM as an appropriate opening RAB methodology.

Technical Note No. 14/2026 represents a material change in approach. ANP has relied on an RCM calculation to support the conclusion that the Malha Sudeste legacy contract assets had been fully recovered and should have no residual value in NTS's opening RAB. The later note explains how ANP populated a retrospective model. However, that is not the same as demonstrating either that RCM provides an appropriate basis, cross-check or complementary method for the opening RAB decision, or that the evidential deficiencies identified in Technical Note No. 7/2026 have been resolved. Several of the principal value-driving inputs in ANP's calculation remain reconstructed, allocated or modelled rather than directly observed for the relevant legacy contract assets. **ANP therefore has not established the methodological or evidential basis needed to rely on RCM** for excluding the Malha Sudeste legacy contract assets from NTS's opening RAB.

ANP's RCM result is too dependent on reconstructed and modelled inputs

ANP documents the mechanics of its RCM workbook and the provenance of several of the inputs used. This allows the model's principal steps and assumptions to be examined. It does

not establish that the underlying information is complete, auditable or sufficiently reliable, or that the resulting calculation is an appropriate basis for an opening RAB decision. **ANP's result remains a residual output of several interacting assumptions**.

The starting asset value is partly based on proxy replacement cost evidence rather than observed capital effectively invested in the specific assets. A material part of the modelled cost base is derived from US Energy Information Administration project cost data, benchmarked to Brazilian pipeline segments and converted into Brazilian reais. Hence, the RCM calculation measures recovery against a reconstructed capital base rather than a fully observed historical investment base.

Historical revenue is based on contractual entitlement rather than a fully reconciled historical payment record. ANP's use of entitlement revenue is grounded in the terms of the legacy contract, as it reflects the revenue that the transporter was contractually entitled to receive. However, the workbook also contains Petrobras payment data, and the contractual revenue series differs from those payment data for the years where both are populated. The unexplained differences between the contractual and payment series are material because revenue is a principal driver of inferred capital recovery. Their reconciliation is necessary to understand ANP's result, but would not resolve the broader methodological objection to relying on RCM for the opening RAB decision.

Operating costs are assembled from different sources and periods. The series includes estimated early-period values, Petrobras / Transpetro payment data adjusted by uplift factors, NTS-declared data for later years, and allocation to the relevant contract perimeter using network length. This is not a consistent observed cost record for the full period. Since opex is deducted from revenue before capital recovery is inferred, any inconsistency in the opex series directly affects the RCM-implied residual capital balance.

Tax is modelled from ANP's own revenue, opex and fiscal depreciation assumptions, rather than observed as a tax record for the Malha Sudeste legacy contract assets. The WACC is used retrospectively as a proxy for the return embedded in historical legacy contract revenues, even though the return expectations embedded in long-term legacy contracts are not directly observable after the event. Inflation and indexation also affect the result: the inflation index used to nominalise the WACC affects the return-on-capital deduction and therefore the allocation of historical revenue between return on capital and return of capital.

These inputs interact. A change in revenue affects inferred return of capital and tax. A change in opex affects both taxable profit and the amount left to be classified as return of capital. A change in the starting asset value affects the annual capital balance and the return-on-capital deduction. A change in WACC or indexation affects the division of revenue between return on capital and return of capital. **The RCM output is therefore the cumulative result of several assumptions, not the product of a single observed recovery record**.

The sensitivity analysis conducted in the report confirms the materiality of this point. **Reasonable changes to selected assumptions on revenue, opex, real WACC, WACC nominalisation and indexation materially alter the RCM-implied residual capital balance produced by ANP's model**. These sensitivities are not intended to establish an alternative RAB value. They show that ANP's conclusion of full recovery is not stable enough to justify excluding the Malha Sudeste legacy contract assets from NTS's opening RAB.

CdU's support for RCM does not resolve the reliability concern

The Conselho de Usuários (CdU) submission does not alter these conclusions. It shows that another retrospective RCM model can be constructed using estimates and allocation rules; it does not establish that RCM is a recognised opening RAB valuation methodology or that the resulting inference of recovered capital is robust to reasonable alternative assumptions.

Prior Brazilian practice and international precedent do not support ANP's approach

ANP's prior treatment of TBG/GASBOL does not support reliance on RCM for NTS. In that process, ANP considered a prior-recovery concern associated with a legacy transportation contract, but did not address it through an RCM-type reconstruction of historical revenues, operating costs, taxes and returns. It used cost-based valuation methods and made specific exclusions or adjustments for identifiable items. **That prior practice creates a regulatory consistency question**. If ANP now relies on RCM to support a zero opening RAB treatment for the Malha Sudeste contract assets, it should explain the material differences in evidence, contractual arrangements, asset history, data quality or demonstrated double-recovery risk that justify a different approach. The material currently reviewed does not provide that explanation.

The Australian precedent cited by ANP also does not support ANP's proposed use of RCM. Australia has formalised RCM, but within the 'non-scheme' pipeline framework, which applies to pipelines not subject to ex-ante reference tariff regulation. That framework is designed to improve information disclosure, support commercial negotiation and provide a mechanism for access dispute arbitration. That is materially different from ANP's proposed use. ANP is not merely requiring disclosure to reduce information asymmetry or arbitrating an individual non-scheme access dispute. It is relying on a retrospective capital-recovery calculation to support the exclusion of legacy network assets from the opening RAB of a new ex-ante building-block tariff framework.

The Australian framework does not use RCM to establish the opening capital base of scheme pipelines subject to ex-ante RAB-based tariff regulation. For scheme pipelines, the opening capital base is determined under separate cost-based and roll-forward rules, including transitional rules linked to the earlier Gas Code. Australian experience also confirms that RCM is assumption-sensitive. It reinforces rather than removes the need for caution where RCM is used to infer capital recovery from historical revenues and modelled deductions.

The wider international experience reviewed in this report is consistent with the same conclusion. It does not identify precedent for using RCM to determine the opening asset value for assets entering an ex-ante RAB-based tariff framework. Regulators have used a range of approaches to opening asset valuation, including depreciated historical cost, indexed historical cost, depreciated replacement cost, optimised replacement cost, optimised deprival value, and expressly transitional or negotiated approaches. These approaches differ across jurisdictions, but they are directed at valuing the assets entering the regulated regime. They are not equivalent to a retrospective residual calculation of capital recovery from historical revenues. More importantly, **the international evidence shows that regulators have**

generally addressed prior-recovery and double-recovery concerns within recognised asset valuation or transitional frameworks, rather than by using a backward-looking capital-recovery calculation to determine the opening RAB. Where capital-recovery-type analysis has appeared, it has been used for a different regulatory purpose, such as assessing historical returns or the possible need for regulation, not as the basis for setting the opening asset value.

International experience also shows that opening RAB decisions are typically made by balancing several regulatory objectives, including user protection, fairness between users and investors, financeability, investment incentives, the opportunity to earn a reasonable return and regulatory stability. Regulators also place weight on whether asset values are supported by robust, verifiable and objective data. ANP's proposed reliance on RCM focuses on avoiding double recovery, but it has not shown that the retrospective calculation is sufficiently robust and verifiable to justify excluding the Malha Sudeste legacy contract assets from the opening RAB, nor that the resulting treatment is consistent with the wider objectives of the new tariff framework.

Implications for ANP's final decision

ANP should not treat its RCM calculation as establishing that the Malha Sudeste legacy contract assets have no residual value for opening RAB purposes. The calculation is too dependent on retrospective reconstruction, proxy assumptions and discretionary allocation choices to justify that conclusion.

If ANP remains concerned that the opening RAB may include capital already recovered under the legacy contracts, that concern should be addressed within a recognised RAB valuation framework and only through adjustments supported by reliable evidence. The relevant test should be whether specific capital has already been recovered in a measurable and attributable way. A general concern about double recovery, or a residual inference produced by a reconstructed RCM model, is not sufficient.

ANP has not demonstrated that it has adequately weighed the wider regulatory consequences of its proposed treatment against the uncertainty in its calculation. Nor has it shown that the proposed zero opening RAB treatment is consistent with the broader objectives of Resolution ANP No. 991/2026 and Technical Note No. 2/2026, including tariff reasonableness over time, economic efficiency, regulatory stability, financeability and efficient investment incentives.

The report's main conclusions are therefore as follows:

1. **ANP should not rely on RCM** as the basis, cross-check or complementary method for excluding the Malha Sudeste legacy contract assets from NTS's opening RAB.

2. At most, **ANP's RCM calculation** illustrates the difficulty of reconstructing historical capital recovery under the legacy contracts. It **does not provide a recognised or sufficiently reliable valuation basis** for excluding those assets from the opening RAB.

3. **A final opening RAB decision should instead be grounded in recognised regulatory asset valuation methods**, with any adjustment for prior recovery limited to amounts that ANP can identify and attribute with sufficient reliability. In the absence of such evidence, ANP's proposed reliance on RCM would risk undermining the credibility of the new building-block regime at the point of transition.

1 Context and scope

1.1 Context

Brazil's gas transportation sector is undergoing a material regulatory transition. For Nova Transportadora do Sudeste S.A. (NTS) and Transportadora Associada de Gás S.A. (TAG), the 2026-2030 tariff cycle marks the move from a legacy framework centred on bilateral transportation contracts, predominantly with Petrobras, towards a regulated third-party access model based on entry-exit capacity contracting and tariffs and the maximum allowed revenue (MAR) approved by Agência Nacional do Petróleo, Gás Natural e Biocombustíveis (ANP). This transition is reflected in **Resolution ANP No. 991/2026**, which establishes the tariff regime applicable to gas transportation systems, including the criteria for determining the MAR, the calculation of transportation tariffs, the tariff consultation process, and the revenue reconciliation mechanism.

The 2026-2030 tariff cycle is therefore **a critical point in the establishment of the new regulatory framework**. It coincides with the expiry of important legacy transportation contracts, and with the need to determine the opening regulatory asset base (RAB) for assets that will move from legacy contractual arrangements into the 'building-block' tariff regime.[1] For Nova Transportadora do Sudeste S.A. (NTS), the relevant assets are those associated with the **Malha Sudeste** legacy contract.

The **opening RAB** is central to the level of allowed revenue because it determines both the return on capital and the recovery of capital through regulatory depreciation. It also **has broader regulatory significance**. The opening RAB will affect the level and reasonableness of future tariffs, the treatment of past and future investment, the credibility of the new building-block framework, incentives for efficient network development, and the financeability of the regulated transportation business.

ANP itself **recognises this broader role**. In **Technical Note No. 2/2026**, ANP explains that the transition to the access-regulated regime requires a robust methodological framework for valuing the RAB, and assessing operating costs recognised in MAR. It also acknowledges that robust RAB valuation and the proper assessment of operating costs are necessary to support economic efficiency, protect users from excessive tariffs, and ensure that transporters have a reasonable opportunity to recover efficient costs and earn the allowed return.[2] The same note describes the building-block model as requiring transparency and rigour in the valuation of the RAB, and in the recognition of efficient operating costs.

Against this background, ANP has, in Technical Note No. 14/2026, proposed to rely on the **Recovered Capital Methodology** (RCM) to support a zero opening RAB treatment for the

[1] In this report, "opening RAB" means the initial regulatory asset base recognised for the 2026-2030 cycle under the new ex-ante building-block tariff framework. The term does not imply that the assets lacked economic value, or that the legacy tariffs lacked an underlying contractual or economic basis, before that transition.

[2] ANP also refers to the preservation of the transporters' *economic-financial balance*. In English regulatory economics terms, this is better understood as ensuring that an efficiently operated transporter has a reasonable opportunity to recover efficient costs, earn the allowed return on prudent investment, and remain financeable under the regulatory framework.

NTS Malha Sudeste legacy contract assets. The regulatory rationale invoked by ANP is the avoidance of double recovery of capital: that is, avoiding the inclusion in the opening RAB of capital that has already been recovered through historical transportation tariffs. Avoiding double recovery is a legitimate regulatory concern. However, **RCM is not a conventional or recognised RAB valuation methodology**. It is better characterised as a retrospective capital-recovery calculation, which reconstructs historical revenues and deducts modelled operating costs (opex), taxes, and return on capital to infer the amount of capital that may have been recovered. **ANP has not identified established regulatory precedent for using RCM to establish an opening RAB in a regulated ex-ante tariff framework**. The issue for this report is therefore whether ANP has justified relying on this retrospective calculation to exclude those assets from NTS's opening RAB. For the reasons set out in this report, it has not.

1.2 Purpose of this report

This report provides an **independent regulatory-economic critique** of ANP's proposed reliance on RCM to support its opening RAB treatment for the relevant NTS Malha Sudeste legacy contract assets for the 2026-2030 tariff cycle.

The report distinguishes between the regulatory concern and ANP's proposed remedy. It does not dispute that users should be protected from paying twice for the same capital. It does dispute that this concern makes RCM an accepted methodology for establishing the opening RAB. Any adjustment for prior recovery would need to be made within a recognised asset valuation framework and supported by evidence identifying specific recovered capital with sufficient reliability. **RCM does not value assets by applying recognised regulatory asset valuation approaches** commonly used in similar transition settings, such as depreciated historical cost, indexed net book value, depreciated replacement cost, or other cost-based assessments of the assets entering the regulated regime. Instead, it infers capital recovery residually from historical revenues after deducting modelled operating costs, taxes, and return on capital. That distinction is material because ANP's opening RAB decision must establish the value of assets entering the new forward-looking regulatory regime, whereas RCM seeks to infer historical capital recovery through a retrospective reconstruction of legacy contract revenues and costs.

The report's central conclusion is that **ANP has not justified relying on RCM - a retrospective capital-recovery calculation rather than a recognised RAB valuation methodology - as the basis, cross-check, or complementary method for excluding the NTS Malha Sudeste legacy contract assets from the opening RAB**. This conclusion is based on the distinction between RCM and recognised RAB valuation methodologies, the absence of identified regulatory precedent for using RCM to establish an opening RAB in a regulated ex-ante tariff framework, the way ANP has applied RCM in Technical Note No. 14/2026, and the comparative regulatory evidence reviewed in this report.

The report's conclusion rests on two distinct but cumulative grounds. **First, RCM is not a recognised methodology for establishing the opening RAB of assets entering an ex-ante building-block tariff regime**. **Second, even considered solely as a retrospective capital-recovery calculation, ANP's model does not identify recovered capital with the reliability required** to justify excluding the Malha Sudeste legacy contract assets from NTS's opening RAB. Improving the evidential basis of a retrospective calculation could reduce

uncertainty in that calculation; it would not convert RCM into a recognised opening RAB valuation methodology.

1.3 Scope and limitations

The report focuses on ANP's own regulatory framework, the principles set out in Resolution ANP No. 991/2026 and Technical Note No. 2/2026, and the application of RCM to NTS. It considers both the conceptual basis for RCM, and the specific implementation issues arising from ANP's calculations, including the construction of the starting cost base, the treatment of historical revenues, operating cost allocation, tax treatment, weighted average cost of capital (WACC) and indexation assumptions, and the interpretation of historical contract revenues.

This report is a regulatory-economic assessment and does not constitute a legal review or legal opinion. References to legislation, regulations, contracts and ANP decisions are included only insofar as they provide the relevant regulatory context for the economic analysis. The report does not assess the legality of ANP's proposed approach, interpret contractual rights or obligations as a matter of law, or address any legal remedies that may be available to the relevant parties.

The report also considers relevant international regulatory experience and the Australian RCM precedent relied upon by ANP. This comparative material is used to assess whether ANP's proposed use of RCM is supported by analogous regulatory practice, and whether the regulatory contexts and purposes for which RCM has been used elsewhere are comparable to the circumstances of NTS. The report does not seek to provide an exhaustive survey of all opening RAB valuation decisions internationally.

The analysis addresses both whether RCM is an appropriate basis, cross-check or complementary method for the opening RAB decision, and whether ANP's particular retrospective calculation is sufficiently reliable to support the regulatory consequence ANP draws from it: treating the Malha Sudeste legacy contract assets as fully recovered and excluding them from NTS's opening RAB. Historical contractual and operational arrangements are therefore considered only to the extent that they affect the availability, traceability, and interpretation of the evidence used in ANP's RCM calculation. The report does not seek to re-open or re-price the legacy contracts themselves.

The report also does not present a full alternative opening RAB determination. Where quantitative sensitivities are discussed, their purpose is to test the robustness of ANP's RCM result to plausible alternative assumptions, not to substitute ANP's calculation with a separate valuation. **The report therefore considers two cumulative questions: whether RCM is an appropriate methodology for the opening RAB decision, and whether ANP's specific retrospective calculation identifies recovered capital with sufficient reliability to support the exclusion of the Malha Sudeste legacy contract assets**.

1.4 Structure of the remainder of the report

The remainder of this report is structured as follows:

- **Section 2** sets out the relevant features of ANP's tariff framework and the role of the opening RAB within the new building-block regime. It explains why the opening RAB decision must be assessed against the broader objectives of the regulatory framework, including tariff reasonableness, economic efficiency, regulatory stability, financeability, efficient investment incentives, and the objective of emulating competitive market outcomes.

- **Section 3** considers the conceptual basis and limits of RCM. It explains why RCM is better characterised as a retrospective capital-recovery calculation rather than a recognised RAB valuation methodology, and why historical revenues do not directly reveal recovered capital.

- **Section 4** reviews ANP's treatment of RCM and RAB valuation in the relevant technical notes, and considers ANP's prior treatment of analogous prior-recovery issues in the Transportadora Brasileira Bolivia-Brazil S.A. (TBG) / Gasoduto Bolívia-Brasil (GASBOL) tariff process. It focuses on ANP's shift from discussing RCM but declining to apply it in Technical Note No. 7/2026 because of evidential limitations, to relying on an RCM calculation in Technical Note No. 14/2026 as the basis for its proposed opening RAB treatment of the NTS Malha Sudeste legacy contract assets.

- **Section 5** assesses ANP's implementation of RCM for NTS. It addresses the main elements of the calculation, including the construction of the starting cost base, historical revenues, operating costs, taxes, WACC, inflation and indexation, and the interpretation of the residual amount treated as recovered capital. It also considers the reasoning advanced by Conselho de Usuários (CdU, Users' Council) in support of RCM, to the extent that this reasoning is reflected in, or relevant to, ANP's proposed application of the methodology.

- **Section 6** considers the Australian RCM precedent relied on by ANP to support its proposed application of RCM for NTS. It shows that the Australian precedent does not support the use of RCM as an asset valuation methodology for determining the opening RAB in an ex-ante building-block framework.

- **Section 7** reviews relevant international approaches to opening RAB valuation, as part of transitions from legacy arrangements to regulated asset-based frameworks. It shows that there is no international precedent to support the application of RCM in setting the opening RAB in an ex-ante building framework and highlights how regulators balance different regulatory objectives and emphasise the importance of robust, verifiable information.

- **Section 8** sets out the report's conclusions. It summarises why ANP has not justified relying on RCM to support the exclusion of the Malha Sudeste legacy contract assets from NTS's opening RAB, and identifies the implications for ANP's final decision.

2 ANP's tariff framework and the role of the opening RAB

2.1 The regulatory framework

Resolution ANP No. 991/2026 establishes the tariff regime applicable to gas transportation systems and to transportation services offered under the entry-exit capacity contracting model. It defines the framework for determining MAR, calculating transportation tariffs, conducting tariff consultations, approving tariff proposals, and reconciling allowed and actual revenues through the 'regulatory account.'

The Resolution also defines the opening RAB as the transporter's RAB at the beginning of the tariff cycle, and defines the RAB by reference to assets directly related to the gas transportation activity. Regulatory depreciation is defined as the component of MAR that allocates the value invested in regulated assets over time, having regard to the economic useful life of the assets, and ensuring recovery of prudent invested capital over the period in which those assets remain in operation.

Technical Note No. 2/2026 explains the purpose of this framework. ANP states that the Brazilian gas transportation market is transitioning from a framework based predominantly on bilateral contracts with Petrobras to a regulated access regime under the New Gas Law (Law No. 14,134/2021), with tariffs proposed by transporters and approved by ANP after public consultation. ANP also recognises that the 2026-2030 tariff cycle is a critical point in that transition, because it coincides with the expiry of legacy transportation contracts, and the temporary coexistence of bilateral contractual regimes and the entry-exit tariff model.

Technical Note No. 2/2026 further states that consolidation of the regulated access regime requires a **robust methodological framework** for valuing the RAB, and assessing the opex recognised in MAR. ANP links robust RAB valuation and proper opex assessment to the achievement of several regulatory objectives:

- **protecting users from excessive tariffs**;
- **economic efficiency**;
- **transparency**;
- **regulatory stability**; and
- **ensuring that transporters have a reasonable opportunity to recover efficient costs and earn the allowed return**.

These objectives are not external to ANP's tariff framework. They are part of the framework ANP has adopted for the 2026-2030 cycle. **The opening RAB decision should therefore be assessed against the broader set of objectives** embedded in Resolution ANP No. 991/2026 and Technical Note No. 2/2026, not only against the narrower objective of avoiding double recovery.

Resolution ANP No. 991/2026 also frames the tariff regime by reference to the objective that tariffs and access conditions should reflect and emulate the results of a genuinely competitive market. This objective does not prescribe a particular opening RAB valuation methodology. Nor does it mean that the opening RAB should be assessed only by reference to the immediate tariff effect in the first regulatory cycle. In a regulated network setting, the emulation of competitive market outcomes requires attention both to efficient charges for users and to the credibility of the framework under which capital is committed to long-lived infrastructure. The opening RAB decision should therefore be based on a method that is robust, evidence-based, and proportionate to its regulatory consequences, including its effects on tariff reasonableness over time, investment incentives, financeability and regulatory predictability.

2.2 The RAB as a regulatory commitment device

In a building-block regime, the RAB is more than a calculation input. It is the mechanism through which the regulator records the capital accepted for recovery through the regulated tariff framework, and gives effect to the recovery of that capital over time through depreciation and an allowed return on the unrecovered balance.

That framework protects both users and transporters. Users should not be required to pay for assets outside the regulated service perimeter, costs not accepted for regulatory recovery, or capital that has already been recovered. Transporters, in turn, should have a reasonable opportunity to recover capital that is accepted for regulatory purposes, remains in service, and has not yet been recovered. The opening RAB fixes that balance at the start of the new regime.

Any adjustment for prior capital recovery must be supported by evidence identifying specific recovered capital with sufficient reliability and must be implemented within a recognised opening RAB valuation framework. RCM does not itself provide such a valuation framework. It is ANP's retrospective calculation of claimed capital recovery and must be assessed accordingly.

Because the opening RAB fixes the initial balance between user protection and recovery of capital accepted for regulatory purposes, it has consequences beyond the tariff level in the first regulatory cycle. Its value influences:

- the **MAR in the 2026-2030 cycle**, because it determines the amount of capital on which the allowed return is calculated, and the amount of capital to be recovered through depreciation;
- the **allocation of costs** between current and future users, because the RAB determines how much historical investment is treated as remaining to be recovered through future tariffs;
- **incentives for future investment**, because the treatment of the opening RAB signals the degree of confidence investors can place in the RAB as a stable measure of capital accepted for regulatory recovery and not yet recovered;
- **financeability and the ability to fund future investment** because the RAB is the regulated capital value on which allowed returns and depreciation are

calculated. Investors and lenders therefore assess the stability of the RAB as a basis for future allowed revenues, debt service, equity returns, and recovery of new investment over time; and

- **regulatory stability**, because consistency and predictability in RAB valuation reduce perceived regulatory risk, and therefore support a lower cost of capital.

The last point is especially important in network infrastructure. **A predictable RAB-based model supports investment by giving investors and lenders confidence that capital admitted to the RAB will be recovered through the regulatory framework**, subject to clearly defined and evidence-based adjustments under that framework.

The opening RAB may also affect incentives for asset life optimisation. If assets that continue to provide regulated service are assigned a zero opening RAB, while future replacement assets may be admitted to the RAB and earn depreciation and return, the regulatory framework may create an asymmetric incentive between maintaining or life-extending existing assets and replacing them. That does not mean replacement would necessarily be inefficient; replacement may be justified by condition, safety, reliability, or capacity requirements. However, **the opening RAB treatment should not create a bias towards premature replacement where continued maintenance, refurbishment or life extension would be the efficient long-term option**. This reinforces the need for the opening RAB decision to be assessed against long-term efficiency and investment incentives, not only against the immediate effect on allowed revenue.

2.3 The importance of the opening RAB decision in a transition setting

The 2026-2030 tariff cycle is not an ordinary periodic review. It is the first cycle in which the NTS Malha Sudeste legacy contract assets are to be brought into the new building-block tariff framework. That makes the opening RAB decision a one-off transition decision with **long-term consequences**.

In a mature RAB regime, the RAB evolves according to a transparent roll-forward: opening RAB plus approved capital expenditure (capex) or asset additions, less regulatory depreciation, adjusted for disposals and indexation as applicable. The opening RAB for NTS is different. It must establish the initial regulated capital value for assets that were developed and operated under legacy contractual arrangements. Those arrangements generated historical revenues, but they were not structured as a forward-looking building-block settlement that separately identified opex, tax, return on capital, and return of capital.

That means ANP must take account of any demonstrated prior recovery when determining the opening RAB, using a recognised valuation framework and evidence capable of identifying and attributing the relevant amounts. It does not follow that legacy contract revenues can be recast reliably as regulatory building blocks or that RCM provides an appropriate methodology for establishing the opening RAB. Historical revenues under legacy contracts were not, by themselves, regulatory building blocks. They may reflect contract structure, availability obligations, ship-or-pay capacity, risk allocation, indexation, operational responsibilities, and other commercial features.

The transition setting therefore makes reliability, proportionality and consistency especially important. An overstated opening RAB may expose users to recovery of capital already recovered; an understated opening RAB may deny recovery of capital that remains committed to the regulated service and has not been shown to have been recovered. Those risks cannot be resolved through **a retrospective calculation that lacks a recognised valuation basis and depends materially on reconstructed inputs, proxy assumptions and discretionary allocation choices**.

2.4 How RAB valuation affects the objectives of the regime

The objectives identified in ANP's framework translate into the RAB valuation decision through identifiable economic mechanisms.

First, **tariff reasonableness** is affected because the RAB determines the return on capital and depreciation components of MAR. A materially overstated RAB increases allowed revenues and tariffs without corresponding economic justification. A materially understated RAB may reduce tariffs in the short term, but does so by denying recovery of capital that remains economically committed to the regulated service. That is not a sustainable form of user protection. It creates regulatory risk, which may ultimately be reflected in higher financing costs, and higher tariffs for future users.

Second, **economic efficiency and investment incentives** are affected because the RAB signals how ANP will treat capital admitted to the RAB. In a regulated infrastructure context, the treatment of sunk investment is directly relevant to forward-looking incentives. Gas transportation assets are long-lived, capital-intensive, and largely irreversible. Once investment has been made, the investor is exposed to the regulator's future treatment of that capital. If capital used to provide regulated services can be excluded from the opening RAB through a retrospective capital-recovery calculation that is not a recognised RAB valuation methodology and depends materially on reconstructed historical inputs, investors will attach greater risk to future investment.

A stable RAB methodology mitigates this hold-up risk by giving credibility to the regulatory commitment that unrecovered capital admitted to the RAB will remain recoverable over time. Conversely, if capital outside the regulated service perimeter, not accepted for regulatory recovery, or already recovered is left in the RAB, users face excessive charges and inefficient price signals. The RAB valuation decision therefore has to balance both sides of the objective: avoiding double recovery while preserving the credibility of recovery for capital that remains committed to the regulated service and has not yet been recovered.

The same point applies to asset life optimisation. If existing assets that remain necessary for the regulated service are assigned no opening RAB value, while future replacement assets may be admitted to the RAB, the regulatory framework may distort the relative incentives between maintaining, refurbishing or life-extending existing assets and replacing them. This would be inconsistent with economic efficiency if it encouraged premature replacement where continued operation, supported by efficient maintenance or refurbishment, would be the lower cost long-term option.

Third, **financeability and the ability to fund future investment** are affected because the RAB is the regulated capital value on which allowed returns and depreciation are calculated. Investors and lenders assess whether that value provides a stable basis for future allowed revenues, whether those revenues are likely to support debt service and equity returns, and whether new investment admitted to the RAB can be recovered over time. If the opening RAB is materially uncertain, or can be reduced through weakly evidenced retrospective adjustments, this may weaken confidence in future cash-flow recovery, and increase the cost or reduce the availability of finance for regulated investment. The short term effect on allowed revenue should not be considered in isolation. The longer-term consequence may be higher financing costs, reduced willingness, or ability to finance network expansion, and greater pressure on the allowed return required to attract capital. The effect is not limited to the specific assets being valued. It can influence how investors assess the reliability of the broader regulatory framework.

Fourth, **regulatory stability** is affected because the opening RAB sets the starting point for future tariff cycles. The value determined now will influence the roll-forward of the asset base, future depreciation, future returns, and expectations about ANP's treatment of regulated capital. A decision that departs from ANP's own stated principles, or from prior regulatory practice without sufficient explanation, risks weakening predictability at the outset of the new regime.

These mechanisms show why the opening RAB decision cannot be reduced to whether historical capital recovery occurred. RCM is not a remedy prescribed by the framework; it is ANP's proposed retrospective calculation. It must therefore be assessed both as a methodology for the opening RAB decision, and against the broader regulatory objectives of the new regime.

2.5 Regulatory implications for the opening RAB decision

The objective of protecting users from double recovery does not prescribe RCM or justify excluding assets from the opening RAB on the basis of an inferred and assumption-dependent result. It is not sufficient to show that legacy contracts generated substantial revenues or that double recovery is possible in principle.

The remainder of this report therefore applies two cumulative tests. First, has ANP justified treating RCM as an appropriate basis, cross-check or complementary method for establishing the opening RAB in an ex-ante building-block regime? Second, even considered solely as a retrospective capital-recovery calculation, does ANP's model identify specific recovered capital with sufficient reliability to support the proposed exclusion and an outcome consistent with the broader objectives of the new tariff regime?

These questions do not exhaust the issues addressed in the report. The following sections also consider ANP's own treatment of RCM in the relevant technical notes, ANP's prior treatment of analogous prior-recovery issues in the TBG/GASBOL process, relevant international regulatory precedent, and the specific implementation choices made in ANP's NTS calculation. However, they provide the principal regulatory lens through which ANP's proposed use of RCM should be assessed.

3 Conceptual basis and limits of RCM

3.1 The regulatory concern invoked by ANP: prior capital recovery

In an established RAB-based regime, the treatment of capital recovery is governed by the RAB roll-forward. The regulator starts from an established RAB, adds approved capex or asset additions, deducts regulatory depreciation, and makes any other adjustments required by the regime, such as disposals or indexation. Subject to the asset-recognition and recovery rules of the applicable framework, this provides a clear intertemporal record of the capital that has been recognised, recovered, and remains to be recovered.

That roll-forward logic is important because it protects both users and investors. Users are protected because capital is recovered only once, through depreciation or other recognised recovery mechanisms. Investors are protected because capital that has been admitted to the RAB remains recoverable over time, together with the allowed return, unless adjusted in accordance with transparent regulatory rules.

The opening RAB problem is different. At the point of transition from legacy contractual arrangements to a RAB-based regime, there may be no established RAB to roll-forward. The regulator must therefore determine the initial value of the capital that should be treated as remaining to be recovered through future regulated tariffs. That decision must avoid double recovery, but it must also preserve the regulatory commitment to recovering capital that has been accepted for regulatory recovery and remains unrecovered.

ANP invokes RCM as a way of addressing this concern. However, that should not be confused with recognising RCM as a RAB valuation methodology. **RCM does not value the assets entering the regulated regime**. It reconstructs historical revenues and deducts modelled costs, taxes, and return on capital to infer whether capital may previously have been recovered.

The existence of historical revenues does not, by itself, establish the amount of capital recovered. A retrospective capital-recovery calculation requires the regulator to identify how much of the historical revenue stream represented return of capital, rather than operating costs, tax, return on capital, or other contractual components. That is a demanding evidential exercise, particularly where the historical contracts were not structured as regulatory building-block settlements.

3.2 The retrospective logic of RCM

RCM reverses the usual direction of a building-block calculation. In a conventional forward-looking building-block model, the regulator starts with an opening RAB, adds approved capex or asset additions, deducts regulatory depreciation, and calculates allowed revenue by

applying the allowed return and depreciation profile to the RAB.[3] **RCM works backwards**. It starts from historical revenues, and asks how much capital must have been recovered after allowing for other components of the revenue requirement. In simplified terms, the method infers capital recovery by deducting from historical revenues:

- operating costs;
- taxes;
- an assumed return on the unrecovered capital balance; and
- any other relevant non-capital components of the historical revenue stream, such as pass-through costs, charges for specific services, fuel or gas use costs, balancing-related charges, penalties, rebates, or other contractual adjustments, where relevant and identifiable.

In simplified form, the inference can be expressed as:

Inferred return of capital = historical revenues – operating costs – taxes – return on capital – other non-capital revenue components

The RCM-implied residual capital balance is then derived as:

RCM-implied residual capital balance = starting asset value + relevant capex additions – inferred return of capital

This is a simplified representation. In practice, the calculation may also require assumptions on timing, indexation, currency, tax, asset lives, depreciation, disposals, allocation of shared revenues and costs, and the annual capital balance on which the assumed return is calculated. The important point is that recovered capital is inferred as a residual: it is inferred from the interaction between historical revenues and the modelled deductions. Any error in the starting asset value, operating costs, tax, WACC, indexation, asset lives, capex additions, revenue allocation, or treatment of other contractual components will therefore affect the amount treated as recovered capital. **This calculation may be mechanically coherent, but it remains a residual inference. It does not become a recognised RAB valuation methodology** merely because the arithmetic can be performed.

The WACC assumption is particularly important. In RCM, the assumed WACC determines the amount of historical revenue treated as return *on* capital rather than return *of* capital. This includes the assumed equity return. Even where historical debt costs can be observed or approximated, **the expected or target equity return embedded in the legacy contract at signature is not directly observable**.

This makes the inferred capital recovery sensitive not only to the level of WACC, but also to the conceptual basis on which the WACC is selected. A long-term legacy contract may have been priced by reference to expected risks and returns at the time of signature. Those ex-ante expectations are not directly observable after the event, and may differ materially from realised

[3] This is a simplified description; in practice, the roll-forward may also include disposals, indexation, asset transfers, working capital adjustments or other regime-specific items. These additional items do not change the underlying point: the RAB is normally built up and rolled forward from recognised asset values.

market conditions, or from a variable annual WACC series constructed ex-post. The issue is therefore not whether the calculation can be performed or populated with more detailed data, but whether a retrospective revenue allocation exercise is an appropriate means of determining, checking or supporting the opening RAB. For the reasons set out in this section, it is not. Sensitivity testing may reveal the materiality of a selected return assumption, but it cannot convert the resulting allocation into an observed measure of capital recovery.

RCM is therefore highly sensitive to assumptions that may be difficult to verify, and in some cases impossible to observe directly, many years after the relevant contracts were entered into and performed.

3.3 Why historical revenues do not necessarily reveal capital recovery

A material limitation of RCM is that it requires historical revenues to be translated into regulatory building-block elements. That translation is not straightforward where legacy revenues reflect **commercial features that were not separately priced, recorded or observable**, and therefore do not map cleanly onto return on capital, return of capital, operating costs, and tax.

Contractual tariffs may have been set to compensate the transporter for a range of obligations and risks. For example, availability obligations may increase revenues because the transporter is paid for making capacity available, not simply for volumes transported. Ship-or-pay commitments may allocate demand risk to the shipper and provide revenue certainty to the transporter. Indexation provisions may allocate inflation and currency risk in a way that differs from a regulatory indexation model. Contract terms may also embed assumptions about tax, financing, asset life, operational responsibilities, performance risk, force majeure, maintenance obligations, gas use, balancing, penalties, rebates, or other commercial arrangements.

These features matter for RCM because they affect the interpretation of the revenue stream. **If a contract price includes compensation for risks or obligations not recognised in the retrospective model, the model may misclassify part of that compensation as return of capital**. **Equally, if the model assumes an operating cost, tax or return profile that differs from the economic bargain reflected in the contract, the residual capital recovery will be distorted**.

This is especially important where the historical contracts were not designed as a regulatory building-block settlement. A building-block settlement identifies the regulatory logic of the revenue allowance: return on RAB, depreciation, opex, and tax. A legacy contract may generate a revenue stream, but that revenue stream does not necessarily reveal how much was intended to compensate operating costs, how much was return on capital, how much was compensation for risk, and how much was return of capital.

The issue therefore is not primarily the measurement of contractual revenue. Where tariffs, capacity obligations and ship-or-pay terms are known, historical revenues may be capable of reconstruction. **The more difficult issue is interpretation**. RCM treats part of the reconstructed revenue as recovered capital only after deducting modelled operating costs, tax, and return on capital. If those deductions do not adequately reflect the historical contractual and economic context, the inferred capital recovery is also unreliable.

A method that accurately reconstructs historical revenues may still fail to measure recovered capital reliably.

3.4 Evidential and attribution limitations of a retrospective capital-recovery calculation

The evidential issues considered in this section are additional to the threshold distinction already identified: RCM is a retrospective capital-recovery calculation, not a valuation of the assets entering the opening RAB. Even considered on its own terms, RCM does not identify recovered capital directly. It produces a residual from the interaction of a starting capital amount, historical revenues, capital additions, operating costs, tax, return assumptions, indexation and allocation choices. The evidential issue therefore concerns not only whether historical data exist, but whether the inputs are measured on a consistent basis and can properly support the interpretation ANP places on the resulting residual.

The starting capital amount must correspond to the assets, services and contractual perimeter whose historical recovery is being assessed. Relevant capital additions, replacements, disposals and changes in the service perimeter must be treated consistently over time. Where the starting value is reconstructed using replacement cost evidence, international benchmarks or depreciation assumptions, the exercise estimates both the capital amount against which recovery is measured and the amount said to have been recovered from it.

Historical revenues raise a different attribution problem. Even where tariffs, contracted capacity and amounts billed or paid can be identified, the revenue stream does not necessarily reveal how much represented return of capital. Legacy contract revenues may also have compensated for availability obligations, risk allocation, financing expectations, indexation, operational responsibilities and other contractual features. Unless those elements are identified and treated consistently, part of the contractual compensation may be classified residually as capital recovery.

Operating costs and tax also need to correspond to the same assets, services and period as the revenues included in the calculation. Company-level, system-level or aggregate records do not necessarily establish the amounts attributable to a particular contract or asset group. Where costs or taxes are estimated, reconstructed or allocated, the selected treatment directly affects the amount of revenue remaining to be classified as return of capital.

The return-on-capital assumption is especially significant because it determines rather than observes the division of historical revenue between return on capital and return of capital. The expected equity return and wider risk allocation embedded in a long-term legacy contract are not directly observable after the event. Selecting a retrospective WACC series therefore introduces a material modelled assumption even where other historical information is relatively detailed.

Timing, currency and indexation choices create further interactions. The treatment of capex, commissioning, disposals, inflation and nominalisation affects both the annual capital balance and the return deducted from revenue. Where assets, costs or revenues are shared across contracts or systems, allocation choices introduce an additional layer of attribution.

These features mean that a completed and traceable spreadsheet does not by itself establish that recovered capital has been measured. The output remains a model-dependent inference whose reliability depends on the combined consistency and justification of its inputs and assumptions. Where several material elements are reconstructed, allocated or selected retrospectively, as in ANP's calculation for NTS, the apparent precision of the resulting residual may exceed the evidential basis supporting it. This gives rise to the related risks of false precision and circularity considered in the following subsection.

3.5 The risk of false precision and circularity

RCM also creates **a risk of false precision**. The calculation may produce a specific numerical capital balance estimate, but that does not mean the result is objectively measured. A precise model output can still be unreliable if it depends on uncertain assumptions.

The risk is particularly acute where the method combines several reconstructed elements. For example, if the starting value is estimated using replacement cost evidence rather than observed historical investment, and historical opex, tax, and WACC are also modelled or allocated, the resulting output reflects **multiple layers of judgement**. The final number may appear precise, but its reliability depends on the combined robustness of all those assumptions.

There is also a risk of **circularity**. RCM seeks to infer how much capital was recovered under historical contracts by comparing actual or reconstructed historical revenues with a modelled regulatory revenue requirement. But the modelled revenue requirement itself depends on the assumptions about the very asset value, return, depreciation profile, costs, and indexation that the exercise is intended to resolve.

The circularity is most acute where the historical contracts were not structured as building-block contracts. In that case, the model imposes a regulatory building-block structure on contracts that did not separately identify return on capital, return of capital, opex and tax. The residual capital recovery is therefore not directly revealed by the historical arrangements. It is created by the retrospective regulatory model. If the model assumes a particular starting value, WACC, asset life or opex profile, **the residual will reflect** those **assumptions** as well as the historical revenue data, **rather than an independently observable amount of capital recovered**.

This reinforces the distinction between RCM as a retrospective capital-recovery calculation and recognised RAB valuation methodologies. **A calculation that allocates historical revenues under a hypothetical ex-post building-block model should not be treated as a direct valuation of the assets entering the regulated RAB**. The more the method depends on reconstructed or assumed inputs, the greater the risk that the calculation produces an apparently precise number that is, in substance, an artefact of the modelling assumptions. A related concern appears in ANP's own prior reasoning in the TBG/GASBOL process.[4] There, ANP rejected revenue-based approaches to asset valuation on the basis that, where revenues and tariffs are determined by the regulator, using revenues to determine the value of the asset may become circular. That reasoning was not directed specifically at RCM. However, it is

[4] ANP Technical Note No. 1/2020/SIM-CRJ/SIM/ANP-RJ, especially paragraph 4.36.

relevant by analogy because RCM also uses revenues as part of the process for inferring the residual value of regulated transportation assets.

3.6 Why RCM should not be treated as an opening RAB valuation methodology

Prior-recovery concerns do not convert RCM into an accepted methodology for valuing the opening RAB. RCM does not value the assets by applying recognised regulatory asset valuation approaches commonly used in comparable transition settings. Instead, it infers historical capital recovery residually from historical revenues after deducting modelled operating costs, taxes and return on capital. It is therefore a retrospective capital-recovery calculation, not a valuation of the assets entering the opening RAB.

We have not identified any regulatory precedent in which RCM has been used to establish an opening RAB in a regulated ex-ante tariff framework (see section 7). The Australian precedent (section 6) relied upon by ANP arose in a different context: non-scheme pipeline disclosure and access arbitration. It does not establish RCM as a RAB valuation methodology.

Accordingly, **ANP's RCM calculation should not be treated as an alternative, complementary or determinative valuation method for NTS's opening RAB**. The calculation may show how ANP has sought to infer historical capital recovery, but it does not provide a recognised valuation basis for excluding the Malha Sudeste legacy contract assets from the opening RAB.

3.7 Implications for assessing ANP's reliance on RCM

The preceding analysis supports two cumulative conclusions.

First, **RCM is not a recognised opening RAB valuation methodology**. It does not value the assets entering the new regime, and no identified regulatory precedent uses it to establish an opening RAB in an ex-ante building-block tariff framework.

Second, **even considered only as a retrospective capital-recovery calculation, RCM places a substantial evidential burden on ANP**. The amount treated as recovered capital is a residual produced by the interaction of the starting asset value, historical revenues, capex, opex, tax, WACC, indexation and allocation assumptions. ANP must therefore demonstrate that its model identifies specific recovered capital rather than merely producing a result from assumptions sufficient to populate a spreadsheet.

These objections are cumulative rather than alternative. More complete historical information could reduce uncertainty in a retrospective calculation, but would not convert RCM into a recognised methodology for valuing the assets entering the opening RAB. The following sections assess ANP's calculation both against that methodological objection and, separately, against the evidential standard ANP itself identified.

4 ANP’s treatment of RCM and prior RAB valuation practice

4.1 Introduction

Sections 2 and 3 established the regulatory and conceptual standards against which ANP’s proposed use of RCM should be assessed. This section considers ANP’s own treatment of RCM and RAB valuation against those standards.

The relevant record shows **a material evolution in ANP’s position**. In Technical Note No. 7/2026, ANP considered whether an RCM calculation could be used to assess historical capital recovery, but concluded that the information then available for NTS was not sufficient to support a technically consistent and prudent application. In Technical Note No. 14/2026, ANP then relied on an RCM calculation as the basis for its proposed zero opening RAB treatment for the NTS Malha Sudeste legacy contract assets.

That shift is assessed in this section alongside ANP’s prior treatment of analogous RAB valuation issues in the TBG/GASBOL process, where ANP considered prior-recovery concerns but relied on cost-based valuation methods rather than an RCM-type reconstruction of historical revenues, costs, taxes, and returns.

4.2 Technical Note No. 2/2026: the standard against which RCM should be assessed

Technical Note No. 2/2026 is relevant because it defines the regulatory standard that ANP’s later RCM decision must satisfy. As explained in Section 2, ANP framed RAB valuation and opex assessment as part of the broader task of establishing a robust, transparent, and stable building-block regime for the 2026-2030 regulatory cycle.

That framing matters for ANP’s later reliance on RCM. ANP’s stated concern about double recovery cannot be assessed in isolation from the wider objectives it identified for the new regime. It must also be assessed by asking **whether ANP’s reliance on a retrospective capital-recovery calculation is consistent with the objectives ANP identified for the new regime**: tariff reasonableness, economic efficiency, transparency, regulatory stability, and the reasonable opportunity for transporters to recover efficient costs and earn the allowed return.

Technical Note No. 2/2026 therefore provides the benchmark for the analysis that follows. It is not sufficient that ANP’s calculation appears to reduce the risk of double recovery. ANP must also demonstrate that the proposed opening RAB treatment is robust, transparent and consistent with tariff reasonableness, economic efficiency, regulatory stability and the reasonable opportunity for transporters to recover efficient costs and earn the allowed return. The question for the remainder of this section is whether ANP’s treatment of RCM in Technical Notes No. 7/2026 and No. 14/2026 satisfies that standard.

4.3 Technical Note No. 7/2026: ANP's initial evidential standard for RCM

Technical Note No. 7/2026 is important because it shows that **ANP initially adopted a cautious evidential standard for RCM**.

In that note, ANP characterised RCM as a calculation based on the capital effectively invested, less the amount already recovered by the transporter during the period in which the assets were used to provide transportation services. ANP further stated that this calculation requires historical tracking, year by year, of revenues actually collected, operating costs incurred, taxes paid, and the rate of return associated with invested capital. On ANP's description, the amount of recovered capital is then calculated residually.[5]

This description matters because ANP's own formulation links RCM to the effective capital invested and to the historical trajectory of financial recovery. It does not treat recovered capital as directly observable from historical revenues alone. Nor does it suggest that completion of a model is sufficient. ANP's formulation instead emphasises traceability, granularity and a complete, auditable and methodologically robust information base as necessary to assess whether a retrospective inference of recovered capital can be relied upon.

ANP then applied that standard to the information available for NTS. It requested accounting and operational information from NTS and Petrobras. Despite the submission of reports and spreadsheets, ANP concluded that the information available was not sufficient to support application of RCM in a technically consistent and prudent manner. In particular, ANP found that it was not possible to ensure, with the degree of traceability and granularity required by the method, full reconciliation of revenues actually earned, operating costs incurred, taxes paid, and the appropriate rate of return over the contractual period. **ANP stated that the use of RCM in those conditions could introduce distortions in RAB valuation, with potential impacts on tariff reasonableness and regulatory neutrality**.[6]

This is a material point for the present assessment. The significance of Technical Note No. 7/2026 is not that it establishes RCM as a recognised RAB valuation methodology. It is that, having considered a retrospective capital-recovery exercise, ANP itself identified the evidential standard against which any later reliance on that exercise should be judged. On ANP's own analysis at that stage, the information available for NTS did not satisfy that standard.

ANP also left open the possibility of revisiting the calculation during the 2026-2030 tariff cycle if additional consistent and verifiable information became available through the consultation process.[7] If ANP subsequently relied on RCM to support its proposed opening RAB treatment for NTS, it needed to identify what additional information had become available and explain how that information resolved the deficiencies previously identified, rather than merely bridging them through assumptions, proxies, allocations or retrospective modelling choices.

[5] Technical Note No. 7/2026, paragraphs 31-33.
[6] Technical Note No. 7/2026, paragraphs 34-40.
[7] Technical Note No. 7/2026, paragraph 41.

4.4 ANP's prior practice in the TBG/GASBOL process

ANP's prior treatment of TBG/GASBOL is relevant because it shows how ANP previously addressed a prior-recovery concern in Brazilian gas transportation. The case is not identical to NTS, and is not relied upon here as a legally binding precedent. However, it is an important domestic reference point because ANP was asked to consider whether assets associated with a legacy transportation contract had already been amortised or depreciated through historical tariffs, and it **did not resolve that issue through an RCM-type reconstruction** of historical revenues, costs, taxes, and returns.

The TBG/GASBOL process concerned capacity to be contracted after the expiry of the TCQ Brasil contract. TCQ Brasil was the legacy transportation contract between TBG and Petrobras associated with a substantial share of GASBOL capacity. In the subsequent public call process, ANP had to determine the RAB value to be used in calculating tariffs for capacity made available following the expiry of that contract. Petrobras argued that the assets associated with TCQ Brasil had already been amortised and should therefore not retain residual value for RAB purposes.[8]

ANP's own analysis recognised the difficulty of resolving that issue from the original tariff-setting record. The original tariff calculation memory was not available, despite efforts to locate relevant documents. ANP also recorded scarcity of documents and data relating to the original tariff-setting process. This meant that ANP could not establish from the original tariff calculation how depreciation had been reflected in the historical tariff, or how the tariff had been constructed more generally.[9]

The specific controversy in TBG also concerned the change in the depreciation period of the GASBOL asset from 10 years to 30 years. Petrobras argued that, if the tariff was not revised after that change, TBG may have earned higher returns and effectively amortised the investment, leaving no residual asset value to be included in the RAB. **ANP treated this as a relevant prior-recovery concern, but did not conclude that the change in depreciation period necessarily meant that the asset had been remunerated twice**. Rather, ANP considered that, if other tariff parameters were maintained, the change may have increased the realised return on the project relative to a counterfactual tariff recalibrated to the longer asset life. ANP distinguished that possibility from a finding that the capital associated with the asset had necessarily been recovered twice or fully amortised for RAB purposes.[10]

ANP therefore addressed the prior-recovery concern through a cost-based RAB valuation framework, rather than through a retrospective revenue reconstruction methodology. In Technical Note No. 13/2019, ANP had calculated the RAB using the simple arithmetic average of two cost-based methods: historical cost corrected for inflation, net of depreciation, and replacement cost, net of depreciation. ANP subsequently revised the value through Board Decision 604/2020 and adopted historical cost corrected for inflation, net of depreciation. The point for present purposes is not whether either valuation choice was correct. The point is that both approaches were cost-based; ANP did not infer recovered

[8] Technical Note No. 1/2020, paragraphs 2.5-2.8, 4.11, and 4.31-4.34; Technical Note No. 1/2021, paragraphs 9 and 15.
[9] Technical Note No. 1/2020, paragraphs 1.3, 2.6-2.8, 3.16-3.24, and 5.2-5.6.
[10] Technical Note No. 1/2020, paragraphs 4.10-4.16, 4.31-4.34, and 5.18-5.20.

capital by reconstructing historical revenues, operating costs, taxes, and returns over the life of the legacy contract.[11]

ANP also made specific adjustments to avoid clear cases of over-recovery or non-recoverable value. For example, it excluded or adjusted for elements that had been prepaid or were not attributable to the capacity being re-contracted. It also pro-rated the RAB to reflect the share of GASBOL capacity associated with the TCQ Brasil contract, rather than applying the full asset value to the capacity made available by the expiry of that contract.[12]

This prior practice is relevant to the present report in three respects.

First, it shows that **ANP has previously recognised the evidential difficulty of determining prior capital recovery where the original tariff calculation cannot be reconstructed with confidence**. That is closely related to the evidential problem raised by RCM for NTS. Where the regulator cannot reliably decompose historical tariffs into operating costs, tax, return on capital, and return of capital, a residual inference of recovered capital is uncertain.

Second, ANP's TBG reasoning shows that **a prior-recovery concern does not automatically require an RCM-type calculation**. ANP accepted the need to avoid double recovery, but addressed that concern through cost-based valuation methods and specific exclusions for identifiable items, rather than through a full reconstruction of historical capital recovery.

Third, ANP identified **a related circularity concern** when discussing revenue-based approaches to asset valuation. That reasoning was directed at income-based valuation methods rather than RCM specifically. However, it remains relevant by analogy because RCM also uses historical revenues as part of the process for inferring the residual value of regulated transportation assets.

The TBG/GASBOL process therefore creates a regulatory consistency question. ANP previously addressed a prior-recovery concern through cost-based valuation methods and specific exclusions for identifiable items, rather than through an RCM-type reconstruction of historical revenues, costs, taxes and returns. If ANP now relies on RCM for NTS, it should **explain the material differences in evidence, contractual arrangements, asset history, data quality or demonstrated double-recovery risk that justify that change in approach**.

The differences between TBG and NTS reinforce rather than remove the consistency question. TBG concerned a single pipeline operated by a dedicated transporter, a specific legacy contract associated with an identifiable share of capacity, and a prior-recovery allegation linked to a particular change in depreciation life. NTS involves a network with different contractual and corporate histories and more complex questions of asset-service matching, historical cost allocation and revenue interpretation. **ANP should therefore explain why those circumstances justify departing from the cost-based approach retained in TBG/GASBOL and relying instead on RCM to support a zero opening RAB treatment for NTS**.

[11] Technical Note No. 1/2021, paragraphs 11-17.
[12] Technical Note No. 1/2020, paragraph 4.32; Technical Note No. 1/2021, paragraphs 15, 22 and 23.

4.5 Technical Note No. 14/2026: ANP's shift to reliance on RCM

Technical Note No. 14/2026 represents **a material shift in ANP's approach**. In Technical Note No. 7/2026, ANP considered whether an RCM calculation could be used to assess historical capital recovery, but declined to apply it because the information then available was not sufficient to support a technically consistent and prudent application. In Technical Note No. 14/2026, ANP relies on an RCM calculation as the basis for its proposed opening RAB treatment of the NTS Malha Sudeste legacy contract assets.

The consequences are substantial. For NTS, Technical Note No. 14/2026 concludes that the assets corresponding to the Malha Sudeste legacy contract were fully recovered during the life of the contract, leaving no residual value to be included in the opening RAB.

Technical Note No. 14/2026 develops a retrospective capital-recovery calculation. It reconstructs starting asset values, historical revenues, operating costs, taxes, return assumptions, nominal indexation, capex additions, and the evolution of the asset balance over the legacy period. For RCM precedent, Technical Note No. 14/2026 relies principally on Australian experience. As discussed in Section 6, that experience arose in the context of non-scheme pipeline disclosure and access arbitration, not the establishment of an opening RAB under an ex-ante regulated tariff framework.

The existence of a populated retrospective model does not resolve either of the report's objections. It does not establish RCM as a recognised basis, cross-check or complementary method for an opening RAB decision. Nor does it demonstrate that the evidential deficiencies identified in Technical Note No. 7/2026 have been resolved. A completed model may still depend on reconstructed inputs, proxies, allocation assumptions and judgement-heavy choices.

The shift between the earlier and later note is therefore central. In Technical Note No. 7/2026, ANP stated that RCM required complete, auditable, and methodologically robust information, and that the available information for NTS was not sufficient. In Technical Note No. 14/2026, ANP relied on RCM to support a zero opening RAB treatment for the Malha Sudeste legacy contract assets. Technical Note No. 14/2026 should therefore **explain not only how ANP populated the model, but why the model overcomes the deficiencies previously identified**.

4.6 The evidential implications of ANP's change in approach

Quite apart from the threshold methodological objection, **ANP's particular calculation must be assessed against the evidential concerns identified in Technical Note No. 7/2026**. Presenting a completed model does not demonstrate that the information, assumptions and modelling choices support the conclusion that the Malha Sudeste legacy contract assets were fully recovered.

Technical Note No. 14/2026 relies on proxy values, allocations and modelled deductions to bridge missing, aggregated or non-segregated historical information. Those inputs permit the calculation to be completed, but they are not equivalent to observed evidence of capital recovery.

ANP's treatment of historical information creates a further consistency issue. In Technical Note No. 7/2026, ANP rejected the corrected historical cost method because of material inconsistencies between audited records, the absence of segregated historical accounting, retrospective allocations arising from corporate restructuring and other limitations in the historical information.[13] Technical Note No. 14/2026 then relies on a substantially more assumption-intensive retrospective exercise that combines historical information with proxy asset values, allocations and modelled deductions. This does not establish that the corrected historical cost method should necessarily have been adopted. It does mean that **ANP needed to explain why the historical data limitations that precluded that cost-based method did not equally, or more strongly, undermine the reliability of its RCM inference**.

These points reinforce the report's separate evidential conclusion that ANP's NTS result is not sufficiently reliable. They do not alter the threshold conclusion that RCM is not an appropriate basis, cross-check or complementary method for establishing the opening RAB.

4.7 Implications for the assessment that follows

ANP's record therefore supports two points relevant to Section 5. First, Technical Note No. 7/2026 recognised the limitations of drawing a residual capital-recovery inference from incomplete, aggregated or non-segregated historical information. Second, Technical Note No. 14/2026 does not demonstrate that the identified deficiencies have been resolved; its result remains dependent on proxy values, allocations and modelled deductions. Section 5 examines the materiality of those choices in ANP's NTS calculation.

[13] Technical Note No. 7/2026, paragraphs 48-55.

5 ANP's implementation of RCM for NTS and implications for the opening RAB

5.1 Overview of ANP's RCM calculation

Technical Note No. 14/2026 applies RCM through a **retrospective annual calculation covering the period 2006-2025**. The calculation is expressed in nominal Brazilian reais and seeks to determine whether, and to what extent, the capital associated with the relevant legacy contract assets was recovered before the start of the 2026-2030 regulatory cycle.

The structure of the calculation is as follows. ANP first constructs a cost base for the assets included in the relevant legacy contract perimeter. It then reconstructs historical revenues and deducts operating costs, taxes, and an assumed return on capital. The remaining amount is treated as return of capital. The model incorporates asset additions directly into the annual cost base. For each year, ANP combines the relevant construction cost and capex additions, adjusts for any disposals or reductions, and compares that annual cost base with the amount of capital inferred to have been recovered in that year. The resulting annual residual is then rolled forward to produce the closing asset value at the end of 2025.

The main components of ANP's calculation are summarised below.

Table 1 Headline RCM calculations (R$ million, nominal)

Item	Malha Sudeste
Analysis period	2006-2025
Modelled cost base	4,154.4
Historical revenues	22,870.5
Operating cost deduction	(4,191.4)
Tax deduction	(5,570.3)
Return-on-capital deduction	(8,870.9)
Inferred return of capital	4,237.9
RCM-implied residual capital balance	(83.5)
ANP opening RAB treatment	Treated as fully recovered

Source: NTS RCM workbook, sheet RCM Nominal (R$), rows 10, 19, 36-38, and 45-49. Values in the workbook are expressed in R$ thousand and converted here to R$ million.

The inferred return of capital exceeds the modelled cost base, producing **a negative RCM-implied residual capital balance of approximately R$83.5 million**. ANP therefore treats the Malha Sudeste legacy contract assets as fully recovered for NTS's opening RAB purposes.

These headline results are useful for understanding the mechanics of the calculation, but they do not by themselves establish that ANP's inferred full recovery conclusion is reliable. The RCM result is a residual. It depends on the cost base used as the starting point, the revenue series included in the calculation, the operating cost and tax deductions, the assumed WACC,

the inflation and indexation treatment, and the way those inputs interact through the annual roll-forward of the residual asset balance. The following subsections assess the main value-driving inputs and sensitivities that are material to the reliability of ANP's RCM result.

The assessment in the following subsections does not seek to re-perform ANP's RCM calculation or substitute an alternative asset valuation. The purpose is to **assess whether ANP has justified the main inputs and modelling choices sufficiently** to support the regulatory consequence it draws from the calculation: treating the Malha Sudeste legacy contract assets as fully recovered for opening RAB purposes. Where the report identifies uncertainty in ANP's inputs, the assessment focuses on whether ANP has demonstrated that its conclusion of full recovery is sufficiently reliable to justify excluding those assets from NTS's opening RAB.[14]

This implementation review does not assume that a better-populated RCM model would become a recognised opening RAB valuation methodology. It tests ANP's particular calculation as an additional and independent reason why RCM cannot support the proposed exclusion in this case.

5.2 Starting asset value and construction of the cost base

The starting asset value is a central input to ANP's RCM calculation. It defines the capital amount against which historical recovery is measured. If the starting value is uncertain, the RCM calculation does not simply estimate how much of an observed capital base has been recovered. It **estimates both the capital base and the amount recovered from that base**. ANP's model constructs a cost base using a combination of replacement cost estimates, other construction cost items, capex additions, and disposals or reductions. **A material part of the construction cost base is derived** from a replacement cost methodology based on project cost data from the US Energy Information Administration (EIA), rather than directly observed historical investment cost for the specific assets. The headline composition of the modelled cost base is summarised below.

[14] We also note that the report does not independently verify every asset addition, disposal, or asset-service perimeter allocation in ANP's model.

Table 2 Headline composition of the modelled cost base (R$ million, nominal)

Item	Malha Sudeste
EIA-derived depreciated replacement cost component	1,269.1
Other construction cost items	2,372.0
Total construction cost assets	3,641.2
Capex additions	738.3
Disposals or reductions	(225.1)
Total modelled cost base	4,154.4
EIA-derived component as % of total construction cost assets	34.9%
EIA-derived component as % of total modelled cost base	30.6%

Source: NTS RCM workbook, sheet RCM Nominal (R$), cells D10:D19, D36:D38. Values in the workbook are expressed in R$ thousand and converted here to R$ million. EIA-derived components are calculated from NTS RCM Nominal (R$)!D11:D15. Percentages are calculated as EIA-derived component divided by total construction cost assets and total modelled cost base, respectively.

The EIA-derived component is estimated using historical US natural gas pipeline project cost data. ANP's model selects benchmark projects, calculates unit costs by pipeline diameter category, applies those unit costs to the relevant Brazilian pipeline segments, applies depreciation, and converts the resulting values into Brazilian reais. In this report, these values are referred to as EIA-derived depreciated replacement cost (DRC) estimates.[15] Table 2 isolates the component that is visibly derived from the EIA-based DRC methodology. It does not imply that all other construction cost items are directly observed historical investment costs.

This approach creates an important implementation issue. In Technical Note No. 7/2026, ANP described RCM as a method based on capital effectively invested and the amount already recovered over time. In Technical Note No. 14/2026, however, a material part of the cost base is reconstructed using replacement cost evidence, international benchmark projects, depreciation assumptions, and exchange rate conversion. Replacement cost evidence may be relevant within a recognised asset valuation methodology where historical investment records are incomplete. Its use nevertheless changes the character of the RCM exercise. **The resulting calculation measures recovery against a reconstructed capital base, rather than a fully observed historical investment base**.

This matters because the starting asset value is a direct determinant of the RCM-implied residual capital balance. A higher starting value increases the capital amount available to be recovered and tends to increase the RCM-implied residual capital balance. A lower starting value has the opposite effect and can increase the likelihood that the model concludes that the asset has been fully recovered. The reliability of ANP's RCM result therefore depends partly on whether the EIA-derived replacement cost values and other construction cost items provide a sufficiently robust proxy for the capital base whose recovery is being tested.

ANP provides a detailed methodological explanation of the EIA-based replacement cost calculation. It identifies the data source, sample period, project filters, outlier exclusions,

[15] The corresponding Portuguese terms are Custo de Reposição Novo (CRN) and Valor de Reposição Depreciado (VRD).

diameter categories, weighted average unit cost calculation, depreciation approach, and workbook traceability. However, traceability of the calculation is not sufficient by itself for the use ANP makes of the calculation in the opening RAB decision.

The remaining evidential issue is robustness. ANP does not appear to demonstrate how the resulting starting values would change under reasonable alternative benchmark samples, outlier treatments, diameter groupings, depreciation assumptions, exchange rate assumptions, or benchmark sources. Nor does it appear to demonstrate that the US project data have been adjusted, or otherwise shown to be appropriate, for the Brazilian construction conditions relevant to the assets being valued, including differences in terrain, permitting, right-of-way, procurement, labour, environmental constraints, and construction complexity.

The opening RAB is being determined by a residual calculation that depends on the selected starting cost base and other value-driving assumptions. Where the starting asset value is reconstructed from proxy replacement cost evidence rather than observed capital effectively invested in the specific assets, the RCM result is necessarily more model-dependent. The implication is that the starting value must be assessed not only for traceability, but also for whether it provides a sufficiently reliable proxy for the capital base whose recovery is being tested.

5.3 Historical revenues

Historical revenue is the main source from which ANP infers capital recovery. In the RCM calculation, higher historical revenue increases the amount treated as return of capital after deducting operating costs, taxes, and the assumed return on capital. **The revenue series used in the model is** therefore **a central value driver**.

ANP's RCM workbook uses a contractual revenue series for NTS. This series is calculated from the relevant legacy contract tariff, contracted capacity, days in the year, an energy conversion factor, and indirect tax adjustments. The resulting net revenue values are then linked directly into the RCM calculation. The workbook also contains Petrobras historical payment data, but those payment data are not the revenue series used in the RCM calculation.

ANP explains this choice in Technical Note No. 14/2026. It states that the contractual revenue series reflects the transporter's tariff entitlement over the full period, calculated consistently with the parameters of the legacy contract. It also recognises that this series may differ from Petrobras historical payment data.

The distinction between the two revenue series is shown in the table below.

Table 3 Contractual revenue and historical payment data in ANP's RCM workbook (R$ million, nominal)

Item	Malha Sudeste
Net contractual revenue used in RCM, 2006-2025	22,870.5
Net contractual revenue, 2006-2024	20,938.0
Petrobras historical payment data, 2006-2024	20,726.1
Difference: contractual revenue less historical payment data, 2006-2024	211.9
Modelled contractual revenue for 2025	1,932.6
Historical payment data row for 2025	not populated in *Receita Malha SE (PBR)* worksheet

Source: NTS RCM workbook, sheet RCM Nominal (R$), cells D41 and E41:X41; sheet Receita Malha SE (PBR), cells F15:Y15 and F22:X22. Values in the workbook are expressed in R$ thousand and converted here to R$ million.

ANP's use of contractual entitlement provides a contract-based mapping between the revenue series and the relevant legacy contract perimeter. It does not, however, establish that the resulting series is the appropriate measure of historical revenue for a retrospective capital-recovery calculation. The contractual revenue series exceeds the Petrobras historical payment data for 2006-2024 by approximately R$211.9 million. That difference is material because additional revenue increases inferred capital recovery, all else equal.

We note also that the historical Petrobras payment series shown in the *Receita Malha SE (PBR)* worksheet stops in 2024, although ANP's source worksheet *Dados históricos de PGTO (PBR)* includes a 2025 Malha Sudeste payment amount of R$1,131.0 million. It is unclear whether the 2025 value was not carried forward because of a linking omission, a deliberate exclusion, or uncertainty over the 2025 amount. This does not appear to affect ANP's contractual revenue series directly, but the treatment of the 2025 payment data should be explained if the historical payment series is used as a cross-check.

ANP explains that differences between contractual revenue and historical payment data may reflect billing adjustments, ship-or-pay credits, error corrections, and other contractual reconciliations. The RCM implication depends on the nature of those differences. Timing differences or reconciliations of amounts properly due under the legacy contract may support the use of contractual entitlement revenue. Credits, rebates, corrections, or offsets that reduced the amount effectively collected or available to the transporter may require different treatment. The absence of reconciliation is therefore an additional evidential defect in ANP's proposed calculation. Resolving it would be necessary to understand the revenue input, but would not address the broader objection that RCM is not a recognised methodology for establishing the opening RAB.

A separate point concerns **how the contractual revenue stream is interpreted within RCM**. The fact that revenue is contractually linked to the relevant capacity does not mean that the residual amount, after deducting modelled opex, taxes, and return on capital, necessarily represents return of capital. Legacy contract revenues may also have reflected contractual risks, service obligations, reconciliation mechanisms, billing adjustments, or other elements that are not separately identified in the RCM model. If those elements are not captured in ANP's deductions, **the residual may combine capital recovery with other contractual**

revenue components. In that case, the RCM result would be an assumption-dependent allocation of historical revenues, rather than a direct measure of recovered capital.

A further reconciliation issue arises from ANP's own published tariff information. The published tables for the Malha Sudeste contract report changes in contracted capacity and tariff during the 2006-2010 period, including intra-year changes.[16] Technical Note No. 14/2026 instead constructs the revenue series using the contractual parameters selected for its model. ANP does not appear to reconcile the modelled values with the tariff and capacity information previously published on its website. Because historical revenue is a principal driver of inferred capital recovery, ANP should explain the source hierarchy it has adopted and the effect of using the alternative published values.

5.4 Operating costs

Operating costs are deducted from historical revenues before ANP infers return of capital. In the RCM calculation, higher operating cost deductions reduce the amount treated as recovered capital, while lower operating cost deductions increase inferred capital recovery. **The operating cost series is** therefore **an important value driver**, although the direction of the effect is different from the revenue series.

Technical Note No. 14/2026 recognises the institutional and informational difficulties created by the historical operation of the Malha Sudeste assets within the Petrobras / Transpetro structure, and by the later transition to independently operated transporters. ANP identifies the periods for which different data sources are available and constructs a consolidated opex series using explicit assumptions. ANP describes the assumptions used to assemble the consolidated series. This allows the mechanics of the reconstruction to be followed, but does not establish that the underlying cost record is complete or comparable across the full period.

ANP's consolidated opex series covers 2006-2025 and totals approximately R$4,191.4 million. The series is constructed from three blocks:

- estimated values for 2006 and 2007, based on the adjusted 2008 unit cost;
- Petrobras historical payment data to Transpetro for 2008-2016, adjusted by a multiplier of 1.3811 to reflect additional general and administrative expenses (G&A) and right-of-way costs; and
- NTS-declared data for 2017-2024, together with a separate 2025 estimate, allocated to the Malha Sudeste contract using the 62% network length allocation applied in ANP's workbook.

The table below summarises the structure of ANP's consolidated opex series and the main assumptions used to bridge the periods for which directly comparable cost data are not available.

[16] ANP, Detalhamento das Tarifas de Transporte, table "Contrato de Serviço de Transporte de Gás Natural da Malha Sudeste", p. 1.

Table 4 Operating cost treatment in ANP's RCM workbook (R$ million, nominal)

Item	Malha Sudeste
Total opex deduction used in RCM, 2006-2025	4,191.4
Estimated early-period opex, 2006-2007	310.5
Petrobras / Transpetro period, adjusted, 2008-2016	1,184.5
Independent-transporter period, 2017-2025	2,696.4
Main allocation / uplift basis	62% network length allocation; 1.3811 historical multiplier

Source: NTS RCM workbook, sheet RCM Nominal (R$), cells D42 and E42:X42; sheets O&M e G&A Malhas SE (PBR), O&M e G&A Malhas SE (NTS), Memória O&M G&A 2025, and Evolução Malha Sudeste (KM). Values in the workbook are expressed in R$ thousand and converted here to R$ million.

ANP recognises that there is no complete, segregated historical opex record for the Malha Sudeste legacy contract assets. The resulting series is not an observed cost record prepared on a consistent basis across the full historical period. It is assembled from different sources and methods: estimated values for 2006-2007; Petrobras / Transpetro payment data, adjusted by ANP, for 2008-2016; NTS-declared O&M and G&A data for 2017-2024; and a separate estimate for 2025.

This matters because the series shows **a material discontinuity between periods**. In nominal terms, average annual opex for 2017-2025 is approximately 2.3 times the average for 2008-2016. Adjusting for inflation reduces the difference, but does not remove the step-change. The break is especially visible between 2016 and 2017, when the workbook's opex estimate increases from approximately R$104.8 million to R$239.1 million in nominal terms. This does not, by itself, demonstrate that either period is incorrectly measured. It does, however, show that the inferred capital-recovery result is sensitive to the comparability of the cost data being spliced together.

The data limitations differ by period. For 2006-2007, ANP estimates opex from an adjusted 2008 unit cost, derived from the 2008 Petrobras / Transpetro payment value after applying ANP's G&A and right-of-way uplift and dividing by the relevant network length. The 2006-2007 values are therefore parametric estimates based on the adjusted 2008 cost level, not observed historical costs for those years. For 2008-2016, ANP relies on aggregate Petrobras / Transpetro payment data, without detailed annual cost-category information. ANP also records Petrobras's express reservation that the amounts paid to Transpetro may not represent the full O&M cost of the relevant contracts. For 2017-2024, ANP uses NTS data, but must still allocate company-level or system-level costs to the relevant legacy contract perimeter.

ANP also records that Petrobras had separately identified information concerning compression service contracts for Malha Sudeste and that this information was available to ANP through NTS.[17] Technical Note No. 14/2026 does not explain whether, or how, those compression service costs were incorporated into the reconstructed 2008-2016 opex series. This is material because any omitted operating cost increases the amount residually classified as recovered capital.

[17] Technical Note No. 14/2026, sections 9.1.3.

These limitations affect the use that can be made of the reconstructed opex series. Since opex is deducted from historical revenues in ANP's RCM calculation, any inconsistency in the opex series directly affects the amount of revenue inferred to have been available for capital recovery. If opex is understated, the model overstates capital recovery and understates the RCM-implied residual capital balance. If opex is overstated, the model understates capital recovery and overstates the RCM-implied residual capital balance. The issue is therefore not only the level of opex, but whether the spliced series provides a comparable measure of operating costs across the full historical period.

The use of network length as an allocation driver should be considered in that context. Network length is simple and transparent, and may be a reasonable allocation proxy in some circumstances. The issue here is not the use of network length as such, but whether the underlying historical cost record is sufficiently complete and comparable to support a retrospective allocation for the purpose of inferring capital recovery. Where the underlying data are incomplete, aggregated or affected by changes in organisational structure, the allocation exercise remains subject to material uncertainty.

The uplift multipliers raise a related concern. They are intended to make the historical Petrobras / Transpetro period more comparable with the later independent-transporter period by adding G&A and right-of-way costs. However, the multipliers are derived from later-period cost structures and applied uniformly to earlier years. They therefore do not convert the historical series into an observed record of actual opex for the relevant contracts. If the Petrobras / Transpetro payment data omitted other cost categories, or if the relationship between O&M, G&A and right-of-way costs differed materially during the earlier period, the adjusted opex series may still understate the costs associated with the legacy contracts. That would overstate inferred capital recovery and reduce the RCM-implied residual capital balance.

5.5 Tax treatment

Taxes are deducted from historical revenues before ANP infers return of capital. In ANP's RCM calculation, the main direct tax deduction is **IRPJ**, the Brazilian corporate income tax, and **CSLL**, the social contribution on net profit. A higher tax deduction reduces inferred capital recovery, while a lower tax deduction increases inferred capital recovery.

ANP's workbook treats indirect taxes through the revenue calculation. Gross contractual revenue is calculated by grossing up the contractual tariff revenue for ICMS, PIS/COFINS, and CPMF, and **net contractual revenue** is then calculated after deducting those indirect tax amounts. The separate tax deduction in the RCM calculation relates to IRPJ and CSLL.

ANP estimates IRPJ and CSLL annually by applying **a combined 34% rate** to adjusted taxable profit under the Brazilian actual profit tax regime, known as Lucro Real. Adjusted taxable profit is calculated as net revenue less opex and fiscal depreciation. Where adjusted taxable profit is negative, the workbook formula sets the tax deduction to zero. In the workbook reviewed, adjusted taxable profit is positive in all years, so this rule does not affect the annual tax calculation.

Fiscal depreciation is calculated on a straight-line basis using a 30-year fiscal life. For pre-2006 assets, ANP uses replacement cost new ('CRN'), converted into Brazilian reais, as the

fiscal depreciation base. For post-2006 capex additions, ANP uses the relevant asset additions as the fiscal depreciation base. The resulting fiscal depreciation series is then deducted from net revenue and opex to estimate **adjusted taxable profit** and IRPJ/CSLL.

The table below summarises ANP's tax calculation.

Table 5 IRPJ/CSLL calculation in ANP's RCM workbook (R$ million, nominal)

Item	Malha Sudeste
Net contractual revenue, 2006-2025	22,870.5
Opex deduction, 2006-2025	(4,191.4)
Fiscal depreciation deduction, 2006-2025	(2,295.9)
Adjusted taxable profit, 2006-2025	16,383.2
IRPJ/CSLL deduction, 2006-2025	(5,570.3)
Applied IRPJ/CSLL rate	34.0%

Source: NTS RCM workbook, sheet RCM Nominal (R$), cells D41:D43 and E41:X43; sheets Receita Malha SE (PBR), cells F11:Y15, Depreciação Fiscal, and Avaliacao Dep Fiscal, cells A8:F28. Values in the workbook are expressed in R$ thousand and converted here to R$ million.

ANP's technical notes explain the tax calculation and recognise the difficulty of observing tax at the level of a specific contract or asset group within a legal entity. This is important. Even where company-level tax data exist, they do not directly show the tax associated with Malha Sudeste. A contract-specific RCM calculation therefore requires an allocation or modelling exercise.

For NTS, ANP compares the modelled IRPJ/CSLL for the Malha Sudeste contract with direct taxes declared by NTS for the company as a whole over 2017-2024. ANP notes that NTS stated that the declared tax values could not be directly allocated between transportation contracts. These comparisons are therefore useful cross-checks, but they are not observed tax records for the specific legacy contract assets.

The resulting tax deduction is modelled from ANP's own revenue, opex, and fiscal depreciation inputs. This creates an additional layer of dependence on earlier assumptions in the RCM calculation. If contractual revenue is overstated or opex is understated, adjusted taxable profit will be higher and the modelled tax deduction will also be higher. The higher tax deduction partially offsets the effect on inferred capital recovery, but it does not remove the underlying uncertainty. **The tax calculation** therefore **propagates uncertainty from the revenue, opex, capex, and depreciation inputs into the RCM-implied residual capital balance result**.

ANP's use of replacement cost new as the fiscal depreciation base also means that **the tax deduction is linked to the same proxy asset valuation exercise used elsewhere in the RCM model**. Where historical tax-basis information is unavailable, ANP has introduced a proxy depreciation base. The resulting tax deduction remains a modelled input rather than evidence of taxes actually paid in respect of the relevant legacy contract assets. Its effect on inferred capital recovery therefore depends on the same underlying assumptions about asset value, capex additions, and fiscal depreciation used in the wider RCM calculation.

The tax line should therefore **be understood as a dependent modelled deduction**, not as independent evidence of taxes actually paid in respect of the capital recovery of the relevant legacy contract assets.

5.6 WACC and return on capital

The WACC assumption is **one of the main determinants of inferred capital recovery** in ANP's RCM calculation. In the model, historical revenue is first reduced by opex and tax. ANP then deducts an assumed return on the outstanding capital balance. The remaining amount is treated as return of capital. A higher WACC therefore reduces inferred capital recovery, while a lower WACC increases inferred capital recovery.

ANP's workbook calculates return on capital using a nominal annual WACC applied to the relevant outstanding capital balance. **The nominal WACC is derived from a real WACC and the selected inflation index**. The resulting return-on-capital deduction is substantial: approximately R$8,870.9 million over 2006-2025 (see Table 6).

Table 6 Return-on-capital deduction in ANP's RCM workbook (R$ million, nominal)

Item	Malha Sudeste
Return-on-capital deduction, 2006-2025	(8,870.9)
Real WACC basis, 2006-2013	Annual WACC calculated using ANP's adapted CAPM framework; selected real WACC values range from 6.86% to 11.87%
Real WACC basis, 2014-2018	7.15%
Real WACC basis, 2019-2025	7.25%
Nominalisation approach	Real WACC converted to nominal WACC using selected inflation index

Source: NTS RCM workbook, sheet RCM Nominal (R$), cells D44 and E44:X44 for the return-on-capital deduction, cells E59:X60 for the real and nominal WACC series, and sheet WACC Regulatório. Values in the workbook are expressed in R$ thousand and converted here to R$ million.

For 2006-13, the workbook uses a WACC calculation based on **ANP's adapted capital asset pricing model (CAPM) framework for emerging markets**, drawing on ANP Technical Note No. 27/2006-SCM. The calculation includes a US risk-free rate, global market risk premium, Brazil country-risk spread, unlevered beta range, assumed gearing, tax rate, default spread, and US inflation adjustment. ANP then uses the maximum value from the calculated real WACC range. This provides a documented WACC series for the early period, but it remains **a reconstructed proxy** for the historical return embedded in the legacy contract tariffs.

For 2014 onward, ANP applies real WACC values of 7.15% and 7.25%, drawn from regulatory references in the Brazilian gas transportation sector. Their provenance does not establish that either value informed the pricing or expected return of the Malha Sudeste legacy contract. They remain **retrospective proxies selected by ANP for allocating historical contract revenue between return on capital and return of capital**.

This distinction is important because RCM uses WACC retrospectively to divide historical revenue between return on capital and return of capital. That is different from using WACC prospectively to set allowed revenue under a building-block regime. The tariffs under long-term legacy contracts may have reflected risk allocation, financing assumptions, market conditions, ship-or-pay protections, indexation arrangements, and expected returns at the time the contracts were agreed. The contract-specific return assumptions are not directly observable after the event.

The direction of the WACC effect is important. A higher WACC increases the amount of historical revenue treated as return on capital and reduces the amount inferred to be return of capital; a lower WACC has the opposite effect. The issue therefore is not necessarily the level of ANP's WACC in isolation, but whether the annual WACC series is a reliable proxy for the historical return embedded in the legacy contract revenues.

The WACC assumption also interacts with the annual capital balance. The return-on-capital deduction is calculated by applying the nominal WACC to the outstanding capital balance in each year. Any uncertainty in the starting asset value, capex additions, disposals, and inferred prior-year capital recovery therefore affects the return deduction as well as the RCM-implied residual capital balance. **WACC is not an isolated assumption; it amplifies the effect of other value-driving inputs in the RCM model**.

The WACC deduction therefore **cannot be treated as independent evidence of recovered capital**. It is part of the model's allocation of historical revenue between return on capital and return of capital. Where the historical return embedded in legacy contract pricing is not directly observable, the WACC series remains an assumption used to perform that allocation. The relevant question is whether reasonable alternative return assumptions would materially change the amount of revenue classified as recovered capital.

5.7 Inflation and indexation

Inflation and indexation enter ANP's RCM calculation through both the revenue series and the return-on-capital deduction. The contractual revenue series is based on tariffs indexed to IGP-M, while the real WACC is converted into a nominal WACC using the selected inflation index. **Inflation therefore affects both the nominal revenue stream and the nominal return-on-capital deduction used to infer return of capital**.

ANP selects IGP-M as the price index in the base case. This has a clear contractual rationale. Technical Note No. 14/2026 states that IGP-M is the tariff index under the relevant legacy transportation contracts. The workbook uses IGP-M-linked tariff series to calculate contractual revenue. The workbook also uses IGP-M to convert the real WACC into a nominal WACC through the standard Fisher formula:

$$\text{Nominal WACC} = (1 + \text{real WACC}) \times (1 + \text{inflation index}) - 1.$$

The table below summarises the main inflation and indexation assumptions and the effect of the workbook sensitivities that change the inflation index used to nominalise the WACC.

Table 7 Inflation and WACC nominalisation treatment in ANP's RCM workbook

Item	Malha Sudeste
Base case price index	IGP-M
Contractual tariff series	IGP-M-linked tariff series
Annual IGP-M range, 2006-2025	-3.18% to 23.14%
Cumulative IGP-M increase, 2006-2025	253.72%
Cumulative IPCA increase, 2006-2025	192.02%
Cumulative CMN inflation target, 2006-2025	126.00%
Nominal WACC range using IGP-M, 2006-2025	3.84% to 32.07%
RCM-implied residual capital balance under IGP-M base case	(R$83.5m)
RCM-implied residual capital balance using IPCA for WACC nominalisation	(R$1,972.1m)
RCM-implied residual capital balance using CMN inflation target for WACC nominalisation	(R$3,693.5m)

Source: NTS RCM workbook, sheet RCM Nominal (R$), cells D51 and E55:X60 for the inflation index selector, annual inflation series, real WACC, and nominal WACC; cells X49 and E44:X44 for the RCM-implied residual capital balance and return-on-capital calculation; sheet Receita Malha SE (PBR), cells F9:Y15 for the tariff and contractual revenue calculation. Cumulative inflation increases are calculated from the annual inflation series in the RCM Nominal (R$) sheet as PRODUCT(1 + annual inflation rates) – 1. RCM-implied residual capital balance values under IPCA and the CMN inflation target are generated from the workbook sensitivity selector by changing the inflation index used to nominalise WACC. Values in the workbook are expressed in R$ thousand and converted here to R$ million where applicable.

The use of IGP-M as the base case index is internally consistent with ANP's contractual revenue approach. If the historical revenue series is calculated from IGP-M-linked tariffs, then nominalising the WACC using IGP-M avoids an immediate asymmetry between the revenue stream and the return-on-capital deduction. ANP's treatment of IPCA and the CMN inflation target as sensitivity cases, rather than as the base case, is therefore understandable. These sensitivity cases are useful, but they test only the inflation index used to nominalise WACC; they do not address the robustness of the wider RCM calculation to other material assumptions.

Those sensitivities nevertheless show that the inflation index used to nominalise the WACC is highly material. Using IPCA or the CMN inflation target reduces the nominal WACC relative to the IGP-M base case. This reduces the return-on-capital deduction, increases inferred return of capital, and lowers the RCM-implied residual capital balance. This does not mean that IPCA or the CMN inflation target is preferable to IGP-M. It shows that **the RCM result is materially affected by the way ANP converts real return assumptions into nominal reais**.

The use of realised IGP-M also needs to be interpreted in light of the role WACC plays in the model. WACC is normally a forward-looking expected return concept. ANP's RCM calculation uses a real WACC series and converts it into nominal terms using realised inflation. That may be coherent within an ex-post nominal model, especially where the revenue series is also linked to realised IGP-M. However, **it is still a proxy for the nominal return embedded in historical legacy contract pricing, not direct evidence of that return**.

The mechanics of the nominal model are important. ANP's RCM calculation uses nominal contractual revenue, nominal opex and tax deductions, a nominal WACC, and a nominal roll-forward of the residual asset balance. In each year, the model deducts opex, tax, and nominal return on capital from nominal revenue, and treats the remaining amount as return of capital. **The inflation index used to nominalise WACC therefore affects the allocation of historical revenue between return on capital and return of capital**. It is not merely a presentational choice.

The timing profile of the inferred capital recovery reinforces this point. In ANP's workbook, **the years 2022-2025 account for** approximately 35% of modelled revenue, 31% of opex, 38% of tax, and only 8% of the return-on-capital deduction, but approximately **89% of the net inferred return of capital over the full 2006-2025 period**. This concentration does not by itself demonstrate a spreadsheet error. It reflects the mechanics of ANP's retrospective nominal calculation: as the modelled opening balance declines, and as the nominal WACC falls in years of low or negative IGP-M, a larger share of late-period nominal revenue is classified as return of capital. However, it shows that ANP's conclusion of full capital recovery depends heavily on the timing profile created by the nominal WACC, indexation and roll-forward assumptions. **The result should therefore not be treated as an observed pattern of historical depreciation or actual capital recovery under the legacy contracts**.

This differs from a standard forward-looking MAR calculation. In that setting, a real formulation and a nominal formulation should be capable of producing economically equivalent results if the RAB indexation, WACC, depreciation and timing assumptions are specified consistently. In ANP's RCM calculation, by contrast, the historical revenue stream is already fixed or reconstructed in nominal terms, and the nominal WACC is used to infer how much of that revenue should be treated as return on capital. Changing the inflation index used for nominalisation therefore changes the inferred amount of recovered capital and the resulting RCM-implied residual capital balance.

The indexation treatment should therefore be understood as part of ANP's wider modelled revenue allocation exercise. ANP's base case use of IGP-M is defensible within its contractual revenue approach. However, the sensitivity results show that **the RCM-implied residual capital balance is materially affected by the inflation index used to nominalise WACC**. This means that the indexation treatment is not merely a presentation issue; it affects the model's allocation of historical revenue between return on capital and return of capital.

5.8 Sensitivity and robustness of ANP's RCM result

The preceding subsections identify several inputs in ANP's RCM calculation that are not directly observed historical measures for the relevant legacy contract assets. These include the reconstructed starting asset value, the contractual revenue series, the reconstructed opex series, the modelled tax deduction, and the WACC used to allocate historical revenue between return on capital and return of capital. Capital additions and disposals also form part of the annual roll-forward and interact with the WACC and tax calculations.

Given the reliance of ANP's RCM calculation on reconstructed and modelled inputs, the relevant test is whether ANP's conclusion of full capital recovery is stable under reasonable alternative assumptions. The purpose of the sensitivity analysis is not to propose an alternative valuation or to treat RCM as a valid valuation cross-check. It is to **test whether the**

inferred capital-recovery result on which ANP relies remains robust when reasonable changes are made to the assumptions embedded in ANP's own retrospective calculation. If that conclusion is not stable, the calculation cannot provide a reliable basis for excluding the Malha Sudeste legacy contract assets from NTS's opening RAB.

ANP's workbook includes sensitivity functionality for the inflation index used to nominalise WACC, and those sensitivities themselves show that the RCM-implied residual capital balance is materially affected by the nominalisation assumption. However, ANP has not shown that the RCM result is robust to reasonable alternative assumptions across the broader set of key value-driving inputs, including the starting asset value, revenue basis, opex reconstruction, real WACC level, tax treatment, and allocation assumptions.

Table 8 presents illustrative sensitivities using ANP's workbook structure. These sensitivities are not proposed alternative valuations. They are intended to show the materiality of assumptions that ANP's model relies on when historical data are incomplete or require interpretation.

Table 8 Illustrative sensitivity of RCM-implied residual capital balance to selected assumptions (R$ million, nominal)

Scenario	RCM-implied residual capital balance	Change vs base	Change as % of NTS cost base
ANP base case	(83.5)	-	-
Revenue reconciliation sensitivity	1,123.9	+1,207.4	+29.1%
Opex +10%	1,023.2	+1,106.7	+26.6%
Opex -10%	(1,181.1)	(1,097.6)	(26.4%)
Real WACC +100 bps	3,096.5	+3,180.0	+76.5%
Real WACC -100 bps	(2,432.7)	(2,349.2)	(56.5%)

Source: ECA calculations using ANP's RCM workbook structure. Base case values are from NTS RCM workbook, sheet RCM Nominal (R$), cell X49. Revenue sensitivity replaces the contractual revenue inputs for 2006-2024 with Petrobras historical payment data in NTS sheet Receita Malha SE (PBR), cells F22:X22, with 2025 contractual revenue retained from cell Y15 in the revenue sheet. The sensitivity is implemented so that the revised revenue series is reflected in both the RCM revenue line and ANP's modelled tax calculation. Opex sensitivities apply a ±10% variation to the annual opex deduction in NTS RCM Nominal (R$), cells E42:X42, with tax, return on capital, inferred return of capital, and the RCM-implied residual capital balance recalculated using ANP's model logic. WACC sensitivities apply a symmetric ±100 basis point change to ANP's annual real WACC series, while retaining ANP's base case IGP-M nominalisation. The adjusted real WACC is applied in NTS RCM Nominal (R$), cells E59:X59. Values in the workbook are expressed in R$ thousand and converted here to R$ million.
Note: Positive values indicate an RCM-implied residual capital balance under the relevant sensitivity. Negative values indicate that ANP's retrospective calculation implies capital recovery in excess of the modelled cost base. The figures are presented to test the stability of ANP's inferred capital-recovery conclusion; they are not proposed as alternative RAB valuations.

The revenue sensitivity should not be interpreted as a conclusion that Petrobras historical payment data are the correct revenue measure. As discussed in Section 5.3, ANP has a contractual rationale for using contractual entitlement revenue. The sensitivity instead tests the materiality of the difference between the contractual revenue series and the historical payment data retained in the workbook. **The result is material** and confirms that the contractual

revenue / historical payment reconciliation is relevant to the reliability of inferred capital recovery.

The opex sensitivities are also illustrative. A 10% variation is not presented as a specific estimate of omitted or overstated opex. It is used to show the effect of uncertainty in a reconstructed opex series that depends on estimated early-year values, Petrobras / Transpetro payment data, uplift multipliers, NTS-declared data, and network length allocations. **The results show that plausible variation in opex materially affects the RCM-implied residual capital balance**.

The WACC sensitivities are similarly illustrative. They do not represent an alternative view on the appropriate regulatory WACC. They apply a symmetric ±100 basis point adjustment to ANP's annual real WACC series, while retaining ANP's base case IGP-M nominalisation. The purpose is to test the materiality of the return assumption in the RCM calculation. In RCM, WACC determines how much historical revenue is treated as return on capital rather than return of capital. The WACC sensitivity therefore tests a core allocation mechanism in the model, rather than proposing a different allowed return.

The WACC and inflation sensitivities shown in Section 5.7 provide a related but distinct example of material sensitivity. Those sensitivities test the inflation index used to nominalise WACC, whereas the WACC sensitivities in Table 8 test the level of the real WACC itself. Together, they show that **ANP's RCM result is materially affected both by the assumed return and by the way that return is expressed in nominal terms**.

These sensitivities provide a bridge to the synthesis in Section 5.10. They show that **selected changes** to revenue, opex, real WACC, WACC nominalisation and indexation assumptions **can materially alter the RCM-implied residual capital balance produced by ANP's model**. The result therefore does not provide a stable basis for treating the Malha Sudeste legacy contract assets as fully recovered and excluding them from NTS's opening RAB.

5.9 CdU submission

The CdU submission supports the use of RCM as a safeguard against double recovery. CdU argues that the legacy Malha Sudeste contracts generated stable revenues under ship-or-pay arrangements, that incomplete historical data should not prevent RCM from being applied, and that estimates and allocation rules may be used where complete data are unavailable. CdU also relies on Australian regulatory material to support the proposition that RCM can be applied using estimates where historical records are incomplete.

Those points are relevant, but they **do not resolve the central issue addressed in this report**. CdU's submission shows that a retrospective model can be populated using estimates and allocation rules where direct historical records are unavailable. That mechanical possibility does not address either of the objections identified in this report: it does not make RCM a recognised opening RAB valuation methodology, and it does not establish that the resulting inference of recovered capital is sufficiently reliable.

CdU's own calculations also illustrate the assumption-dependent nature of RCM. CdU reaches a conclusion of full recovery for the Malha Sudeste assets, but it does so through its own modelling assumptions. That conclusion is directionally consistent with ANP's proposed

treatment of NTS, but it does not provide independent evidence that ANP's RCM calculation identifies recovered capital with sufficient reliability. The relevant point is not whether two RCM models can be constructed to produce a zero RCM-implied residual capital balance outcome. It is whether the underlying inference of recovered capital is robust to reasonable alternative assumptions.

CdU's submission therefore does not alter the report's conclusions. Its calculations show that another RCM model can be constructed, not that RCM is an appropriate methodology for establishing the opening RAB or that the underlying recovery inference is robust to reasonable alternatives. The Australian material on which CdU relies is addressed separately in Section 6.

5.10 Synthesis: reliability of ANP's RCM result

The mechanics of the principal components of ANP's model can be followed from Technical Note No. 14/2026 and the workbook published with this. ANP identifies the use of contractual revenue, the limitations of the historical opex data, the tax calculation, the WACC series and the use of IGP-M. This permits scrutiny of how the result was produced, but does not establish that the underlying data are complete, auditable or sufficiently reliable, or that RCM provides an appropriate methodology for the opening RAB decision. The remainder of this subsection addresses the second, evidential objection: whether ANP's calculation, taken as a whole, supports its conclusion of full recovery.

The difficulty is that traceability of a retrospective model is different from reliable identification of recovered capital. ANP's RCM result depends on a sequence of reconstructed and modelled inputs:

- The starting asset value is partly based on EIA-derived replacement cost evidence rather than observed capital effectively invested in the specific assets.
- Revenues are based on contractual entitlement rather than the historical payment data retained in the workbook.
- Opex is reconstructed from estimated early-year values, Petrobras / Transpetro payment data, uplift multipliers, NTS-declared data, and network length allocations.
- Tax is calculated from modelled revenue, opex, and fiscal depreciation.
- WACC is used retrospectively as a proxy for the return embedded in legacy contract revenues.
- Inflation affects the nominal return deduction and, therefore, the allocation of historical revenue between return on capital and return of capital.

These inputs also interact. A change in the starting asset value affects the capital base, the return-on-capital deduction, and the RCM-implied residual capital balance. A change in revenue affects inferred return of capital and, through the tax calculation, the tax deduction. A change in opex affects both taxable profit and the revenue left after operating costs. A change in the inflation index used to nominalise WACC affects the amount of revenue treated as

return on capital. **The RCM output is therefore not the product of a single judgement; it is the cumulative result of several interacting assumptions**.

This is the main implication of the sensitivity results. The sensitivities do not establish a preferred alternative RAB value. They show that **reasonable changes to selected inputs can materially alter the RCM-implied residual capital balance produced by ANP's model**. The revenue reconciliation sensitivity, opex sensitivities and real WACC sensitivities produce materially different results. The WACC/indexation sensitivities shown in Section 5.7 also materially affect the calculation by changing the nominal return-on-capital deduction. This degree of sensitivity is particularly important where ANP relies on the RCM output to support the conclusion that the Malha Sudeste legacy contract assets have been fully recovered and should be excluded from NTS's opening RAB.

The absence of complete contemporaneous records intensifies the evidential problem, but it is not the report's only objection. More complete data could make a retrospective capital-recovery calculation less uncertain; they would not convert RCM into a recognised methodology for valuing assets entering an ex-ante RAB-based tariff regime. In this case, **both objections apply: RCM does not provide a recognised opening RAB valuation basis, and ANP's particular result depends materially on reconstructed, allocated and modelled inputs**.

The implication for the opening RAB decision is therefore that ANP should not rely on its RCM calculation as the basis, cross-check, or complementary method for excluding the Malha Sudeste legacy contract assets from NTS's opening RAB. The calculation is too dependent on reconstructed and inferred inputs, and too sensitive to reasonable alternative assumptions, to establish the amount of recovered capital with the reliability needed to justify excluding the Malha Sudeste legacy contract assets from NTS's opening RAB.

5.11 Implications for ANP's opening RAB decision for NTS

5.11.1 Framework for applying the preceding assessment

The preceding assessment establishes two cumulative objections to ANP's proposed treatment. RCM is not a recognised methodology for establishing the opening RAB, and ANP's particular retrospective calculation is not sufficiently robust to support the exclusion of the Malha Sudeste legacy contract assets. The following application considers the regulatory consequence of those conclusions for NTS.

This must be assessed in light of the role of the opening RAB in the new tariff regime. The opening RAB will determine future depreciation and return allowances, affect tariff levels over the 2026-2030 cycle and beyond, and set the initial capital value to be rolled forward in future regulatory periods. A finding that the Malha Sudeste legacy contract assets have been fully recovered must therefore rest on a robust evidential basis, not on a retrospective calculation whose result depends materially on reconstructed or modelled assumptions.

5.11.2 Application to NTS

ANP's RCM calculation for NTS is a residual calculation. It does not observe recovered capital directly. It infers recovered capital by combining a reconstructed asset value, historical revenue inputs, operating cost deductions, tax calculations, WACC assumptions, inflation and indexation treatment, asset additions, and an annual roll-forward of the resulting balance.

The mechanics of ANP's calculation can be followed, and ANP describes the principal modelling choices. The difficulty is that several of the main value-driving inputs are not directly observed historical measures for the relevant legacy contract assets. They are reconstructed from proxy asset values, contractual revenue modelling, allocated or estimated opex, modelled tax, proxy WACC assumptions and indexation choices.

The sensitivity analysis confirms the practical significance of this issue. Reasonable changes to selected assumptions materially alter the assumed capital recovery produced by ANP's model. In some cases, they change not only the size of the result, but also the interpretation of whether the assets appear to have been fully recovered or to retain material residual value. **The model is** therefore **more informative about the uncertainty of applying RCM in these circumstances than about the actual amount of capital recovered under the legacy arrangements**.

ANP's base case RCM calculation produces a negative RCM-implied residual capital balance and **leads ANP to treat the Malha Sudeste legacy contract assets as fully recovered. That is a strong regulatory conclusion**. It would remove those assets from the opening RAB for the new building-block regime, notwithstanding their continuing role in the regulated transportation system.

Such a conclusion requires particularly robust evidence. The relevant question is not only the result produced by ANP's base case model. It is whether the conclusion of full recovery remains reliable when the main assumptions are tested. The sensitivity results indicate that it does not. Changes to revenue, opex, WACC and indexation assumptions can produce materially different outcomes. **The conclusion that the NTS assets have been fully recovered is therefore not sufficiently stable to support ANP's proposed zero opening RAB outcome**.

5.11.3 Implications for ANP's opening RAB decision

ANP should not rely on RCM as the basis, cross-check or complementary method for excluding the Malha Sudeste legacy contract assets from NTS's opening RAB. Its model also does not identify recovered capital with sufficient reliability to support treating those assets as fully recovered.

If ANP remains concerned that the opening RAB may include capital already recovered under the legacy contracts, that concern should be addressed within a recognised opening RAB valuation framework and only through adjustments supported by reliable evidence. The evidential requirements identified in Technical Note No. 7/2026 are relevant to assessing the credibility of ANP's retrospective calculation; they are not sufficient conditions for treating RCM as an opening RAB valuation method and do not define a general data threshold at which it becomes one. In any event, where material inputs are reconstructed or

inferred, ANP has not shown that its NTS conclusion is robust to reasonable alternative assumptions.

In the absence of such evidence, **the concern about possible double recovery cannot justify adopting a precise RCM-derived zero-RAB treatment**. The consequences of applying ANP's RCM result are material. ANP's proposal would treat the relevant Malha Sudeste assets as fully recovered for opening RAB purposes. Where that result is materially sensitive to assumptions on revenue, opex, WACC and indexation, reliance on it risks undermining tariff reasonableness over time, financeability, incentives for future investment, the ability to fund future network requirements, and confidence in the new building-block regime.

ANP has not demonstrated that it has adequately weighed those wider regulatory consequences, which are central to Resolution ANP No. 991/2026 and to the objectives identified in Technical Note No. 2/2026, against the material uncertainty in the RCM calculation. **ANP's RCM calculation should therefore not be treated as establishing that the Malha Sudeste legacy contract assets have no residual value for opening RAB purposes. The calculation is too dependent on retrospective modelling assumptions to bear that regulatory weight**.

ANP should also take account of the potential effect of a zero opening RAB treatment on incentives to maintain, refurbish or life-extend existing assets relative to replacing them with assets eligible for future RAB inclusion. **ANP does not appear to have assessed this potential dynamic effect when weighing the regulatory consequences of its proposed RCM result**.

6 Australian RCM precedent

6.1 Purpose and conclusion of this section

ANP relies materially on Australian experience in support of its proposed reliance on RCM for NTS. That material is relevant to assessing ANP's argument, but only if the Australian framework is characterised accurately and its limits are recognised.

The Australian framework does not establish RCM as a recognised methodology for setting an opening RAB in an ex-ante building-block tariff regime. RCM was introduced in Australia for a narrower purpose: to support information disclosure, negotiation, and arbitration for 'non-scheme pipelines,' which are not subject to ex-ante price regulation. It is not used as the general method for establishing the opening capital base of scheme pipelines subject to ex-ante RAB-based tariff regulation.

The Australian precedent therefore supports a more limited proposition than ANP appears to draw from it. It shows that a retrospective capital-recovery calculation can be specified in rules and used as part of a transparency and access dispute framework, subject to safeguards and to the objective of facilitating access on reasonable terms. It does not support ANP's reliance on RCM as the basis, cross-check, or complementary method for excluding the Malha Sudeste legacy contract assets from NTS's opening RAB.

6.2 ANP's reliance on Australian material

ANP refers to Australian experience at several points in the technical note sequence. In Technical Note No. 2/2026, ANP refers to the Australian regulatory and legislative framework, and to the use of RCM in Australia for regulatory transparency and cost benchmarking.[18] In Technical Note No. 7/2026, ANP also refers to the Australian National Gas Rules (NGR) and to the practices of the Australian Energy Regulator (AER), describing the Australian framework as a methodological reference for the system being implemented in Brazil.[19]

In Technical Note No. 14/2026, ANP identifies that RCM was developed in Australia in relation to non-scheme pipelines subject to negotiated access arrangements. ANP then relies on that experience as evidence that RCM can be applied in institutional transition settings involving legacy energy infrastructure assets, and can be compatible with legal certainty, regulatory predictability and investment incentives if supported by transparent, auditable, and methodologically consistent criteria.[20]

The fact that RCM has been formalised in Australia is not disputed. The relevant question is what that formalisation was designed to do, and whether it is comparable to ANP's proposed reliance on RCM for NTS. **The Australian framework uses RCM in a specific non-scheme pipeline context, principally for transparency, negotiation, and arbitration**. **It does not**

[18] Technical Note No. 2/2026, paragraph 44.
[19] Technical Note No. 7/2026, paragraph 98.
[20] Technical Note No. 14/2026, section 2.4.

treat RCM as a recognised opening RAB valuation methodology for pipelines entering ex-ante building-block regulation.

6.3 The Australian framework: scheme and non-scheme pipelines

The Australian gas pipeline framework distinguishes between scheme and non-scheme pipelines.

Scheme pipelines are subject to formal access regulation. For those pipelines, access arrangements and reference tariffs are approved through an ex-ante regulatory process. The price and revenue framework is based on building-block regulation, including a capital base, return on capital, depreciation, opex, and tax.

Non-scheme pipelines are different. They are not subject to ex-ante tariff determination by the regulator. Instead, they operate under a transparency, negotiation, and dispute resolution framework. Users and prospective users negotiate access with the service provider. If negotiations fail, an access dispute may be referred to arbitration.

This distinction is central to the relevance of the Australian precedent. The purpose of RCM in Australia is not to set regulated tariffs for scheme pipelines. It is used within the non-scheme framework to assist users in assessing the reasonableness of prices, and, under the access dispute framework now contained in NGR Part 12, to provide a default asset valuation approach for non-scheme pipeline arbitration unless that approach is inconsistent with the relevant asset valuation objective.

That context is materially different from the issue now before ANP. ANP is not merely requiring NTS to disclose an RCM estimate to support commercial negotiation. Nor is ANP acting as an arbitrator of an individual access dispute between a shipper and a non-scheme pipeline. ANP is proposing to use a retrospective capital-recovery calculation to support a zero opening RAB treatment for assets entering a new ex-ante building-block tariff framework.

6.4 The role of RCM in Australian non-scheme pipeline regulation

RCM was introduced into the Australian framework through reforms to the non-scheme pipeline regime. Those reforms responded to concerns about bargaining power imbalance, information asymmetry, and the reasonableness of pipeline access prices. The regulatory response was not to bring all pipelines into ex-ante price regulation. It was to strengthen disclosure and dispute resolution.

Under the current framework, the AER's Pipeline Information Disclosure Guidelines require prescribed transparency information to be published. The stated purpose is to provide users and prospective users with increased information to reduce bargaining power imbalances when negotiating access to pipeline services. The information is intended to help users assess the reasonableness of standing prices, offers and terms and conditions.[21]

[21] AER, Pipeline Information Disclosure Guidelines and Price Reporting Guidelines for Part 18A Facilities, October 2023, section 1.2.1.

RCM forms part of that disclosure framework. For relevant pipelines, service providers are required to publish asset value information using more than one method. In particular, the AER's current guidelines distinguish between the depreciated book value method, regulatory asset base / capital base information for scheme pipelines, and RCM. The AER has explained that these methods reveal different aspects of pipeline costs.[22] RCM is therefore not treated as a stand-alone regulatory valuation answer. It is part of a prescribed information set intended to improve transparency and bargaining power.

The arbitration role of RCM is also limited. Under the current NGR Part 12 framework for access disputes, RCM remains the default asset valuation approach for non-scheme pipeline arbitration unless its use is inconsistent with the asset valuation objective. That objective is set out in rule 113Z(5)(a) of the NGR. It requires the value of assets used in providing the pipeline service to be determined using asset valuation techniques consistent with facilitating access to pipeline services on non-scheme pipelines on reasonable terms, taken to mean prices and other terms and conditions that, so far as practicable, reflect the outcomes of a workably competitive market.[23] The AER's 2023 guidance reflects the same structure: service providers must use RCM to calculate recovered capital values unless RCM is inconsistent with the asset valuation objective, in which case an alternative asset valuation method consistent with that objective must be used.[24]

The Australian Competition and Consumer Commission's (ACCC) July 2019 Gas Inquiry considered the earlier Part 23 framework, which was the predecessor non-scheme pipeline access framework before the current Part 12 access dispute provisions. The ACCC described the arbitration role of RCM under that earlier framework in materially similar terms: RCM operated as a default starting point, but disputing parties could argue that another asset valuation method was more consistent with the workably competitive market objective.[25] RCM therefore remains an important feature of Australian non-scheme pipeline arbitration, but it is not mandatory where it would produce an outcome inconsistent with the workably competitive market objective.

The Australian use of RCM therefore contains two safeguards that are absent from ANP's proposed use for NTS. First, for disclosure, RCM is one item of transparency information, not a binding opening RAB decision. Second, for arbitration, RCM is not mandatory where it is inconsistent with the relevant objective. The Australian framework does not treat the mechanical calculation of an RCM value as sufficient to determine the regulated value of pipeline assets.

6.5 RCM under the Australian framework is recognised as assumption-sensitive

The Australian material also confirms the concerns identified earlier in this report about RCM's sensitivity to inputs and assumptions.

[22] AER, October 2023, *op. cit.*, sections 2.4-2.6.
[23] NGR rule 113Z(5)(a), as quoted in AER, Explanatory Note: Pipeline Information Disclosure Guidelines, October 2023, p 9.
[24] National Gas Rules, rule 113Z(5)(b); AER, October 2023, *op. cit.*, section 2.6.2.
[25] ACCC, Gas Inquiry 2017-2020 Interim Report, July 2019, section 6.3.4 and Box 6.3.

The AER's 2023 explanatory note recognises that RCM is highly sensitive to the inputs and assumptions used. It also records concerns arising from the earlier Part 23 reporting experience, the predecessor non-scheme pipeline information disclosure framework, including cases where recovered capital values reported by service providers were well above construction cost and depreciated book value. The AER linked those outcomes to recovered capital values increasing over time, including through the effect of return-on-capital assumptions used in the calculation. In response, the AER's 2023 guidance sought to reduce the discretion available to service providers in selecting the rate of return used in the RCM calculation, requiring the return-on-capital component to follow the Sharpe-Lintner CAPM and an approach similar to that used in the AER's rate of return instrument.[26]

The ACCC's July 2019 Gas Inquiry interim report is relevant for the same reason. The Gas Inquiry was the ACCC's continuing review of the east coast gas market, including transportation pricing and the operation of the then-applicable Part 23 information disclosure and arbitration framework for non-scheme pipelines. In that context, the ACCC reviewed how Part 23 was operating and identified a series of concerns with the recovered capital values reported by pipeline operators. Those concerns included overstated recovered capital values, calculation and input errors, assumptions that inflated reported values, rates of return that the ACCC considered too high, and other inconsistencies affecting the reported recovered capital values. The ACCC therefore recommended improvements directed at strengthening the quality, accessibility, and usability of Part 23 information, including the information used by shippers in negotiations and by arbitrators in access disputes.[27]

The Brattle Group's 2019 report is also relevant because it was commissioned by the Australian Department of the Environment and Energy to review the first financial disclosures made under the then-applicable Part 23 framework for non-scheme transmission pipelines. Brattle's task included assessing whether the information disclosed under Part 23 was consistent and usable, identifying gaps, and considering what cost-based pricing benchmarks could be calculated from the disclosed information. Brattle identified inconsistencies in the reported information, including differences in estimation methods, allocation approaches, and assumptions across pipelines. It also noted that depreciation under RCM is a residual estimate rather than actual depreciation of pipeline assets.[28]

This distinction is directly relevant to ANP's use of RCM. A retrospective model may produce a capital-recovery figure, but that figure is not an observed depreciation or recovery record. It is the result of a residual calculation that depends on the inputs and assumptions used. **The Australian experience therefore does not remove the evidential concerns with RCM. It reinforces them. Even in a framework with standardised templates, disclosure obligations and regulatory guidance, RCM values have been sensitive to assumptions, have produced inconsistent reported outcomes, and have required further regulatory clarification**.

[26] AER, Explanatory Note: Pipeline Information Disclosure Guidelines, October 2023, section 1.7 and Appendix A, especially pp. 19-22.
[27] ACCC, July 2019, *op. cit.*, section 6.3, especially pp. 145-152.
[28] Brattle Group, Financial Information Disclosed by Gas Pipelines in Australia under Part 23 of the National Gas Rules, October 2019, especially paragraphs 23, 66 and 94-95.

6.6 Australian arbitration experience is limited and distinguishable

The practical arbitration experience with RCM in Australia is limited.

The **Tasmanian Gas Pipeline** arbitration was a non-scheme pipeline access dispute under the then-applicable Part 23 framework. The AER's published information records that the final access determination was made in April 2018 and that the valuation method accepted by the arbitrator was not RCM. The arbitrator adopted **a modified depreciated actual cost approach**, described as an indexed and depreciated actual cost approach with a downward adjustment to exclude the value of assets used to provide services other than transportation.[29]

The Tasmanian Gas Pipeline example is therefore not a precedent for applying RCM to determine an opening RAB. Rather, it **illustrates that the Australian arbitration framework allowed a method other than RCM to be used where that method was accepted as more appropriate in the circumstances**.

The **Carisbrook to Horsham Pipeline** dispute is a published example in which RCM was adopted in an Australian non-scheme pipeline arbitration. The published AER information records that the dispute was referred to the arbitrator in October 2020, that a final access determination was made in January 2021, and that the valuation method adopted was the RCM under the relevant NGR rule. The asset value determined was A$25.77 million in 2019 prices.[30]

That example has limited relevance to ANP's decision for NTS. It was an arbitration of a non-scheme pipeline access dispute, not an opening RAB decision for an ex-ante building-block regime. It concerned a specific firm forward-haul service on a single non-scheme pipeline. It does not establish that RCM is an appropriate method for excluding a substantial legacy network from the opening RAB of a new regulated tariff framework.

The Australian arbitration experience is therefore narrow. One published arbitration did not use RCM. Another used RCM in a specific non-scheme dispute. Neither provides precedent for ANP's proposed use of RCM to support a zero opening RAB treatment for the NTS Malha Sudeste legacy contract assets.

6.7 Opening capital base for Australian scheme pipelines

The most direct comparison for ANP's decision is not Australian non-scheme pipeline disclosure or arbitration. It **is the treatment of the opening capital base for pipelines entering, or operating under, ex-ante RAB-based tariff regulation**.

For scheme pipelines, the NGR contain a separate price and revenue framework. That framework uses a building-block approach and includes rules on total revenue, the opening

[29] AER, Final access determination - Tasmanian Gas Pipeline, final access determination made 12 April 2018 and published 25 May 2018.
[30] AER, Access dispute - Carisbrook to Horsham Pipeline, final access determination made 28 January 2021.

capital base, the projected capital base, new capex, rate of return, depreciation, tax, and opex.[31] The opening capital base rules are not framed as an RCM exercise.

For a pipeline commissioned after the commencement of the NGR, the opening capital base is based on the cost of construction of the pipeline, plus capex since commissioning, less depreciation and the value of assets disposed of since commissioning.[32] This is a cost and roll-forward formulation. It does not infer asset value by reconstructing historical revenues, operating costs, taxes, and return.

For pipelines commissioned before the commencement of the NGR, the NGR looks back to the transitional arrangements and to the earlier Gas Code framework. The Gas Code was the National Third Party Access Code for Natural Gas Pipeline Systems, the predecessor access regime that applied to covered gas pipelines before the National Gas Law and the NGR. Under that regime, the initial capital base was determined by reference to recognised asset valuation methods and regulatory factors. Those methods included depreciated actual cost and depreciated optimised replacement cost (DORC), together with other valuation considerations specified in the Gas Code.[33]

This pre-NGR position is particularly relevant to ANP's reliance on Australia. It shows that, **where Australia had to establish an initial capital base for pipelines already in existence before the current NGR building-block framework, the regulatory framework did not use RCM. It used recognised cost-based asset valuation approaches**, including depreciated actual cost and DORC, and then transitioned those values into the regulated capital base framework. The relevant point for present purposes is that the Australian transition into ex-ante RAB-based tariff regulation relied on asset valuation methods and subsequent roll-forward rules, not on a retrospective residual calculation of recovered capital from historical revenues.

The NGR also preserved continuity from the Gas Code through transitional provisions. Access arrangement information submitted under the Gas Code was treated as access arrangement information for the purposes of the NGR. Mechanisms for removing redundant capital and depreciation schedules under the Gas Code were carried forward into the new rules. Where total revenue under a transitional access arrangement had been calculated under the Gas Code using an internal rate of return or net present value methodology, the opening capital base for the next access arrangement period was based on the capital base value at the end of the transitional period. These provisions reinforce the point that **the Australian transition was built around continuity of cost-based capital base values and roll-forward logic, not an ex-post reconstruction of capital recovery using RCM**.[34]

ANP's situation is closer to the establishment of an initial regulated capital value for assets entering an ex-ante building-block tariff regime than to an Australian non-scheme pipeline disclosure exercise. In that closer Australian comparator, RCM is not the method used to establish the opening capital base. **The Australian framework therefore does not support ANP's proposed reliance on RCM to justify a zero opening RAB treatment. Australia formalised RCM for non-scheme transparency and arbitration; it did not make RCM the**

[31] NGR, Part 9, especially rules 76-91.
[32] NGR, rule 77(1)(b).
[33] National Third Party Access Code for Natural Gas Pipeline Systems, section 8.10.
[34] National Gas Rules, Schedule 1, clause 3(11), clause 3(13)–(14), and clause 5(1)(d). These provisions respectively address continuity of access arrangement information, redundant capital mechanisms, IRR/NPV capital base continuity and Gas Code depreciation schedules.

method for setting the opening capital base of pipelines entering ex-ante RAB-based tariff regulation.

6.8 Summary of the Australian precedent

The Australian precedent is therefore more limited than ANP's reliance on it suggests. Australia has formalised RCM, but only within a specific non-scheme pipeline framework. That framework is designed to address information asymmetry, support commercial negotiation and provide an arbitration mechanism for access disputes. It is not the framework used to establish the opening capital base for scheme pipelines subject to ex-ante RAB-based tariff regulation. The key points are summarised in Table 9.

Table 9 Summary of Australian RCM precedent and relevance to ANP's proposed use for NTS

Issue	Australian position	Implication for ANP's reliance on Australia
Regulatory context	RCM is used in the non-scheme pipeline framework, which is based on transparency, negotiation, and arbitration.	This is materially different from ANP's proposed reliance on RCM to support the opening RAB treatment in an ex-ante tariff regime.
Disclosure role	RCM is disclosed as part of a wider information set, alongside other asset value information such as depreciated book value or capital base information where relevant.	RCM is not treated as a stand-alone valuation answer. It is used to improve transparency and reduce bargaining power imbalance.
Arbitration role	RCM remains the default asset valuation approach for non-scheme pipeline arbitration under the current NGR Part 12 access dispute framework, but it is subject to the objective of facilitating access on reasonable terms reflecting workably competitive market outcomes.	An arbitrator is not bound to apply RCM where another method better satisfies the objective of the non-scheme access framework.
Practical arbitration experience	The Tasmanian Gas Pipeline arbitration used a modified depreciated actual cost approach, not RCM. The Carisbrook to Horsham Pipeline arbitration used RCM in a specific non-scheme access dispute.	The practical precedent is narrow and distinguishable. It does not involve setting an opening RAB for a pipeline network entering ex-ante building-block regulation.
Scheme pipeline opening capital base	The opening capital base for scheme pipelines is determined under cost-based and roll-forward rules, including transitional rules linked to the earlier Gas Code framework.	The closer Australian comparator to ANP's opening RAB decision does not use RCM.
Evidential reliability	Australian regulators and reviewers have identified sensitivity, inconsistency, and rate of return issues in RCM reporting.	Australian experience confirms the need for caution where RCM is used to infer capital recovery from historical revenues and modelled deductions.

The overall conclusion is that **the Australian precedent does not establish RCM as a recognised opening RAB valuation methodology**. It shows that RCM can be used in a defined non-scheme context, subject to disclosure rules, arbitration safeguards, and regulatory guidance. It also shows that RCM outputs can be sensitive to input assumptions and may diverge materially from cost-based asset value measures. That is materially different from using RCM to support the exclusion of legacy network assets from the opening RAB of a new ex-ante building-block tariff regime.

6.9 Implications for ANP's use of RCM for NTS

The Australian precedent does not support ANP's proposed reliance on RCM to exclude the Malha Sudeste legacy contract assets from NTS's opening RAB.

At most, the Australian material supports three narrower propositions. First, RCM may be required as one component of a prescribed information disclosure framework for non-scheme pipelines. Second, it may operate as a default valuation approach in a particular non-scheme access arbitration, subject to the applicable workably competitive market objective. Third, Australian experience demonstrates that RCM outputs remain assumption-sensitive even under detailed rules and regulatory guidance.

Those propositions do not establish that RCM is a recognised RAB valuation methodology. Nor do they establish that RCM is suitable for supporting a zero opening RAB treatment for assets entering an ex-ante building-block regime. The Australian framework preserves a clear distinction between non-scheme pipeline transparency and arbitration, on the one hand, and scheme pipeline price regulation and opening capital base determination, on the other. RCM belongs to the former context, not the latter.

This distinction is directly relevant to NTS. ANP is not using RCM merely to require additional disclosure, reduce information asymmetry or assist commercial negotiation. Nor is it applying RCM within an individual non-scheme access arbitration. ANP is relying on a retrospective capital-recovery calculation to support the exclusion of the Malha Sudeste legacy contract assets from the opening RAB of a new regulated tariff framework. That is not the use of RCM reflected in the Australian precedent.

The Australian material therefore reinforces the central conclusion of this report. The fact that RCM has been formalised in Australia does not resolve the evidential and regulatory concerns identified in Sections 3 to 5. Australian experience shows that RCM is assumption-sensitive, that its outputs can diverge from cost-based asset value measures, and that even in Australia it is embedded in a framework designed for transparency, negotiation, and arbitration rather than opening RAB determination. **ANP should therefore not rely on the Australian precedent as establishing that RCM is an appropriate basis, cross-check, or complementary method for excluding the Malha Sudeste legacy contract assets from NTS's opening RAB**.

7 Wider international approaches to opening RAB valuation

7.1 Purpose and conclusion of this section

ANP recognises that international experience can play an important role in guiding the approach to setting the opening RAB and designing the ex-ante building-block framework more broadly. For example, in Technical Note No. 2/2026, ANP states that periods of regulatory transition create a greater risk of incorporating historical inefficiencies or investments, and that **regulation should simulate market discipline through objective evaluation criteria**.

However, in the subsequent technical note sequence, **ANP does not appear to consider wider international experience in any detail**, except for its reliance on Australia. As shown in Section 6, the Australian precedent does not support ANP's proposed reliance on RCM for NTS. Technical Note No. 14/2026 states that the Australian experience has become particularly relevant in the international regulatory literature, but it does not identify the literature relied upon, or explain how that literature supports using RCM to exclude assets from the opening RAB of an ex-ante building-block regime.

There is a broad range of international experience in setting the opening RAB for gas transportation networks when moving to regulated ex-ante building-block tariff frameworks. That experience is more directly comparable to the issue before ANP than the Australian non-scheme pipeline disclosure and arbitration framework discussed in Section 6. The international experience shows **no established precedent for using RCM**, or a comparable retrospective residual capital-recovery calculation, as the methodology for setting an opening RAB in an ex-ante building-block tariff regime. It also shows that regulators typically consider **a range of regulatory objectives, including user protection, fairness between users and investors, investment incentives, reasonable returns, financeability, and regulatory stability**.

7.2 International experience in setting the opening RAB

Regulatory precedent can be drawn from a range of jurisdictions in which gas networks were privatised, vertically unbundled, opened to third-party access, or brought under ex-ante building-block regulation. The precise form of transition varies across jurisdictions. However, in each case the regulator or public authority faced a common question: how to establish the opening asset value to be used in the regulated tariff framework.

An overview of relevant international experience is provided in Table 10. The table shows that regulators have used a range of asset valuation approaches, including depreciated historical cost, indexed depreciated historical cost, DORC, and related replacement cost approaches. The important point for present purposes is that **none of the jurisdictions reviewed used RCM, or an equivalent backward-looking residual capital-recovery calculation**, to set the

opening RAB. This is consistent with ANP's own observation in Technical Note No. 2/2026 that RCM is not the predominant methodology for ex-ante tariff setting in Europe.

Most jurisdictions reviewed applied a form of depreciated historical cost, often indexed to preserve value in real terms. The main exceptions are Sweden and New Zealand, which applied DORC, or optimised deprival value approaches, and Germany, which applied a split approach under which the equity-financed share of assets was valued using DORC, while the debt-financed share was valued using nominal historical cost. In France and Great Britain, the approach was also linked to privatisation or transfer values, so that the opening RAB reflected the value attributed to the assets at the point of transition.

Table 10 Approaches to setting the opening RAB for gas transportation networks

Jurisdiction	Nature of transition to ex-ante building-block regulation	Approach to setting opening RAB	Approach for RAB roll-forward
Australia	Privatisation in the 1990s followed by vertical unbundling. Dual regime with scheme and non-scheme pipelines, with pipelines capable of being brought into regulation where relevant criteria are met.	Pre-NGR: initial capital base determined by reference to the Gas Code valuation factors, including depreciated actual cost and DORC. Under NGR: cost-based opening capital base and transitional continuity rules.	Opening capital base rolled forward under the Part 9 capital base rules; conforming new capex added at cost.
France	Market opening in 2000, with regulated tariffs first set in 2002.	Indexed depreciated historical cost determined by an independent commission to value gas network assets, largely based on historical cost records adjusted for inflation to maintain real value.	Opening RAB locked in. New capex added at historical cost.
Germany	Transition to regulated third-party access in 2005. Revenue-cap regulation introduced in 2009.	Split RAB approach: equity-financed share based on DORC; debt-financed share based on nominal historical cost.	Opening RAB locked in. New capex added at historical cost.
Great Britain	Privatisation in 1986 followed by vertical unbundling in 1997.	Current cost accounting approach, based on original cost revalued for changes in prices, with a downward adjustment to reflect the discounted price at which the network was privatised.	Opening RAB locked in and indexed to inflation. New capex added at allowed historical cost.
Italy	Liberalisation in 2000 followed by vertical unbundling in 2001.	Indexed depreciated historical cost.	Opening RAB locked in and indexed to CPI. New capex added at historical cost at commissioning.

Jurisdiction	Nature of transition to ex-ante building-block regulation	Approach to setting opening RAB	Approach for RAB roll-forward
Ireland	Third-party access and price control introduced in 2002.	Depreciated historical cost.	Opening RAB locked in. New capex added at historical cost.
Netherlands	Vertical unbundling in 2004-2005, with the Government acquiring the shares of the transmission company in 2005. Price control first set in 2005. Opening RAB subject to disputes from 2005 to 2011.	Final determination largely based on indexed depreciated historical cost.	Opening RAB locked in and indexed to inflation. New capex added at historical cost.
New Zealand	Privatisation in the 1990s, initially with light-handed regulation. Transition to ex-ante RAB-based tariff regulation in 2011.	Existing disclosed regulatory asset values were adopted, subject to specified adjustments, as a 'line-in-the-sand.' Those values reflected earlier valuation practices based on optimised deprival value.	Opening RAB locked in and indexed to CPI. New capex added at historical cost at commissioning.
Spain	Privatisation in 1994, with third-party access and regulation introduced in 1998.	Depreciated historical cost.	Opening RAB locked in. New capex added at historical cost.
Sweden	Transition to incentive-based regulation in 2012.	Indexed depreciated replacement cost.	Opening RAB is locked in, indexed to inflation. New capex added at replacement cost.

Source: ECA analysis based principally on ACER (2018) and ECA (2018), section 12.1 and the relevant country profiles, supplemented by the Australian and New Zealand sources cited in Sections 6 and 7.4-7.5.[35]

7.3 Balance of regulatory objectives

International experience also shows that opening RAB decisions are not made by reference to a single objective. **Regulators generally seek to balance user protection, fairness between users and investors, economic efficiency, investment incentives, financeability, and regulatory stability**. In Europe, gas tariffs must also comply with principles of non-discrimination, reflect the needs of a well-functioning internal market, take

[35] ACER, Report on the methodologies and parameters used to determine the allowed or target revenue of gas transmission system operators, 30 October 2018; Economic Consulting Associates, Methodologies and parameters used to determine the allowed or target revenue of gas transmission system operators, Final report submitted to ACER, September 2018, section 12.1 and relevant country profiles; for Australia, see the sources cited in Section 6.7; for New Zealand, see New Zealand Commerce Commission, Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper, 22 December 2010, paragraphs 4.3.12-4.3.13 and Appendix E2.

account of actual costs insofar as those costs correspond to those of an efficient and structurally comparable network operator, and provide an appropriate return on investments.[36]

The balance between those objectives is reflected in the valuation approaches used across jurisdictions. Many regulators have adopted depreciated historical cost or indexed historical cost approaches, which limit the scope for repeated asset revaluation and thereby reduce double-recovery risk relative to full replacement cost approaches. At the same time, other regulators have allowed replacement-cost-based approaches where they considered this necessary to preserve investment incentives or regulatory commitment. Sweden and Germany provide examples where DORC or replacement-cost-related approaches formed part of the opening asset valuation. Italy applied indexed historical cost in a way that supported investment in the sector, while excluding revaluations and contributions to avoid double recovery and maintain fairness to users.

Similar trade-offs can be seen in Great Britain and France. In Great Britain, the regulatory framework was required to support the ability of network companies to finance their licensed obligations and earn a reasonable return. At the same time, the opening asset value was adjusted to reflect the lower price at which the network had been privatised. In France, the opening RAB was linked to the price at which the network was transferred, with the valuation supported by an independent expert process intended to ensure objectivity.

The Netherlands also illustrates the importance of balancing regulatory objectives. The process for setting the opening RAB was contentious and subject to challenge. In developing the final determination, the regulator identified objectivity, comparability, and fairness as key objectives. It then considered different asset valuation approaches against those objectives.[37] Although an accounting net book value based on shorter asset lives may have reduced the risk of double recovery, the regulator adopted a real depreciated historical cost approach as a balance between fairness to users and preservation of investment incentives.

The wider international evidence shows that regulators have considered prior-recovery and double-recovery concerns when setting an opening RAB. However, those concerns have not been considered in isolation. Regulators have also considered the opportunity to earn a reasonable return, investment incentives, financeability, regulatory stability and the need for a transparent and objective transition.

ANP's earlier technical notes are consistent with that wider practice. Technical Notes No. 2/2026 and No. 7/2026 consider a broader range of objectives and recognise the need for robust evidence. **Technical Note No. 14/2026, however, does not demonstrate that ANP has balanced those wider objectives when relying on RCM** to support the exclusion of the Malha Sudeste legacy contract assets from NTS's opening RAB.

7.4 Importance of regulatory commitment

A further theme in the international experience is the **importance of regulatory commitment**. Opening RAB decisions are not only valuation exercises. They also define the initial capital

[36] Regulation (EU) 2024/1789 of the European Parliament and of the Council of 13 June 2024 on the internal markets for renewable gas, natural gas and hydrogen, Article 17(1).
[37] Oxera, The opening regulatory asset base of the Dutch gas transmission system. Prepared for the NMA, April 2011.

value that will be rolled forward in future regulatory periods. **Regulators therefore place weight on clarity, transparency, and stability**, because those features support confidence that capital accepted into the regulated framework will be recoverable over time, subject to the rules of the regime.

New Zealand provides a further example. The Commerce Commission recognised that the existing DORC approach could produce potential windfall gains.[38] However, it also recognised that assets had already been valued under that approach for disclosure purposes and that a new revaluation could create windfall gains or losses. It therefore adopted a 'line-in-the-sand' approach, preserving the existing disclosed asset values as the opening RAB while removing scope for future revaluations.

This experience is relevant to ANP's decision for NTS. It shows that regulators may **preserve established regulatory values where doing so supports stability, transparency and regulatory commitment, provided future treatment is then controlled through a clear roll-forward framework**. It does not support the use of a retrospective residual calculation to remove continuing regulated assets from the opening RAB where the inferred recovery result depends materially on reconstructed inputs and assumptions.

7.5 Reliance on robust and transparent data

International experience also shows that **regulators place substantial weight on the quality of the data used to set the opening RAB**. In several cases, regulators have supported the use of historical-cost-based approaches because they are grounded in verifiable historical records, whereas replacement cost approaches may require more discretion and judgement. Where replacement-cost-based methods have been used, they have generally been applied within an explicit valuation framework rather than as a residual inference from historical revenues.

The importance of robust retrospective data can also be seen in New Zealand. Before the move to the current building-block regime, an RCM-type approach was used as a diagnostic tool in the New Zealand Commerce Commission's 2004 Gas Control Inquiry.[39] That inquiry did not seek to establish an opening asset value. It was concerned with assessing potential historical excess returns in order to determine whether a new form of regulation may be required.

The Commerce Commission therefore used a backward-looking calculation for a different regulatory purpose from ANP's opening RAB decision. It also limited the analysis to the 1997-2004 period, reflecting the period for which disclosure information was available, and acknowledged that robust and reliable information was not available for the pre-1997 period. The Commission also recognised limitations in the methodology, the data, and consequently the calculation for the period assessed.

[38] New Zealand Commerce Commission, Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper, 22 December 2010, paragraphs 4.3.12-4.3.13 and Appendix E2, especially paragraphs E2.53-E2.70.
[39] New Zealand Commerce Commission, Gas Control Inquiry, Final Report, Public Version, 29 November 2004, especially chapters 5 and 8.

The New Zealand example does not establish RCM as an opening RAB methodology. It shows the opposite distinction: **backward-looking capital-recovery analysis was confined to a diagnostic inquiry into historical returns and the possible need for regulation**. It was not used to determine the opening asset value under the subsequent building-block regime.

7.6 Implications for ANP's opening RAB decision for NTS

The international experience reviewed in this section does not support ANP's proposed reliance on RCM for NTS. It **does not identify precedent for using RCM to set the opening RAB of gas transportation assets entering an ex-ante building-block tariff regime**. Regulators have used a range of valuation approaches, but those approaches are directed at valuing the assets entering the regulated regime. They are not equivalent to a retrospective residual calculation of capital recovery from historical revenues.

International experience shows that regulators have generally addressed prior-recovery and double-recovery concerns within recognised asset valuation or transitional frameworks. They have not used a backward-looking residual capital-recovery calculation to establish the opening RAB. Where capital-recovery-type analysis has appeared, it has been used for a different purpose, such as assessing historical returns or the possible need for regulation.

ANP's proposed reliance on RCM does not reflect that wider international practice. First, **no identified jurisdiction has used RCM as the opening RAB valuation methodology** in an ex-ante building-block tariff regime. Second, **ANP has not demonstrated that its proposed treatment adequately balances the avoidance of double recovery with the wider objectives of the new tariff framewor**k, including investment incentives, financeability and regulatory stability. Third, as shown in Sections 4 and 5, **ANP's RCM calculation relies on retrospective reconstruction, allocation, and inference rather than a robust and verifiable record of recovered capital**. That is inconsistent with the international emphasis on transparent, objective, and reliable evidence when setting the opening RAB.

8 Conclusions

8.1 Overall conclusion

ANP has not justified relying on RCM as the basis, cross-check, or complementary method for excluding the NTS Malha Sudeste legacy contract assets from the opening RAB for the 2026-2030 tariff cycle.

Avoiding double recovery is a legitimate regulatory objective. Users should not be required to pay again for capital that has already been recovered. However, that objective does not itself justify the use of RCM, nor does it justify a zero opening RAB treatment where the capital treated as recovered has not been identified with sufficient reliability. The opening RAB decision must also be assessed against the wider regulatory objectives of tariff reasonableness over time, economic efficiency, financeability, investment incentives, asset life optimisation, and regulatory stability.

RCM is not a recognised RAB valuation methodology. It is a retrospective capital-recovery calculation. It reconstructs historical revenues and deducts modelled operating costs, taxes, and return on capital to infer the amount of capital that may have been recovered. That residual inference is materially different from valuing the assets entering the new regulated tariff regime using recognised RAB valuation approaches, such as depreciated historical cost, indexed net book value, depreciated replacement cost, or other cost-based assessments.

The report's conclusion rests on two cumulative grounds. First, ANP has not shown that RCM is an appropriate basis, cross-check or complementary method for establishing the opening RAB of assets entering an ex-ante building-block tariff regime. Second, its particular retrospective calculation does not identify recovered capital with sufficient reliability to justify excluding the Malha Sudeste legacy contract assets from NTS's opening RAB. The first of these conclusions is methodological and does not depend on the incompleteness of the historical data available for NTS. The second provides an additional and independent reason why ANP's particular RCM result cannot support the proposed exclusion.

8.2 The opening RAB decision requires a robust and evidence-based valuation approach

The opening RAB is a one-off transition decision with long-term consequences. It establishes the initial capital value to be rolled forward in future tariff cycles. It affects allowed revenue, depreciation, return on capital, tariff levels over time, financeability, investment incentives, asset management decisions, and the credibility of the new building-block framework. **RCM does not provide a recognised valuation basis for that opening RAB decision**.

That role **requires a robust and evidence-based valuation approach**. ANP's own tariff framework recognises that RAB valuation and opex assessment should support tariff reasonableness, economic efficiency, transparency, regulatory stability, and the reasonable opportunity for transporters to recover efficient costs and earn the allowed return.

RCM does not directly value the assets entering the regulated regime. It instead imposes an ex-post building-block structure on historical legacy contract revenues. That requires ANP to determine, after the event, how much of historical revenue should be attributed to operating costs, tax, return on capital, return of capital and any other contractual components. Where the historical contracts were not structured as regulatory building-block settlements, that exercise is inherently assumption-dependent.

The existence of legacy contract revenues therefore does not establish recovered capital. Nor does a negative RCM-implied residual capital balance establish, by itself, that the relevant assets have no residual value for opening RAB purposes. It shows only the result produced by ANP's constructed retrospective model.

8.3 ANP has not resolved the evidential concerns it previously identified

ANP's own technical note sequence reinforces this conclusion.

In Technical Note No. 7/2026, ANP recognised that RCM requires traceable, granular, and auditable historical information capable of supporting a year-by-year reconciliation of revenues, operating costs, taxes and return on invested capital. ANP concluded at that stage that the information available for NTS was not sufficient to support application of RCM in a technically consistent and prudent manner.

Technical Note No. 14/2026 represents a material change in approach. ANP has relied on an RCM calculation to support a zero opening RAB treatment for the Malha Sudeste legacy contract assets. However, **the later note does not demonstrate that the evidential deficiencies identified in Technical Note No. 7/2026 have been resolved**. It shows how ANP populated a retrospective model, but does not establish either that RCM is an appropriate methodology for the opening RAB decision or that the model reliably identifies capital already recovered.

Several of the main value-driving inputs in ANP's calculation are reconstructed, allocated or modelled rather than directly observed for the relevant legacy contract assets. The starting cost base includes material proxy replacement cost components. Revenues are based on contractual entitlement rather than fully reconciled historical payment data. Opex is assembled from different sources, periods, uplift factors, and allocation methods. Tax is modelled from ANP's own revenue, opex and fiscal depreciation inputs. WACC is used retrospectively as a proxy for the return embedded in legacy contract revenues. Inflation and indexation assumptions affect the nominal return-on-capital deduction and therefore the allocation of revenue between return on capital and return of capital.

Those inputs also interact. The RCM output is therefore not the product of a single assumption, but of a sequence of assumptions that together determine the inferred capital-recovery result.

8.4 ANP's RCM result is not stable enough to support the proposed opening RAB treatment

The sensitivity analysis confirms the materiality of these concerns. Reasonable changes to selected assumptions on revenue, opex, real WACC, WACC nominalisation and indexation materially alter the RCM-implied residual capital balance produced by ANP's model.

The result is especially sensitive to assumptions that affect how historical revenue is allocated between return on capital and return of capital. This is central to RCM. The assumed WACC determines how much revenue is treated as return on capital rather than capital recovery. The inflation index used to nominalise the WACC affects that allocation. The timing profile of inferred recovery also illustrates the importance of the model mechanics: in ANP's workbook, a large share of the net inferred capital recovery occurs in the final years of the historical period, reflecting the interaction between late-period nominal revenues, the declining modelled capital balance, and the nominal WACC assumptions.

These sensitivities do not establish an alternative RAB value. They show that ANP's conclusion of full recovery is not sufficiently stable to justify excluding the Malha Sudeste legacy contract assets from NTS's opening RAB. **A calculation that changes materially under reasonable alternative assumptions cannot bear the regulatory weight ANP places on it**.

8.5 Prior Brazilian practice, Australian precedent, and international experience do not support ANP's approach

The comparative and precedent evidence reviewed in this report does not support ANP's proposed reliance on RCM for NTS.

ANP's prior treatment of the TBG/GASBOL process does not support reliance on RCM for NTS. In that process, ANP addressed prior-recovery concerns through cost-based valuation methods and specific exclusions for identifiable items. It did not use an RCM-type reconstruction of historical revenues, operating costs, taxes and returns to determine the RAB value associated with legacy contract capacity. **That prior practice creates a regulatory consistency question that ANP has not adequately answered**.

The Australian precedent also does not support ANP's proposed reliance on RCM. Australia has formalised RCM, but within a specific non-scheme pipeline framework. That framework is designed to support transparency, negotiation, and arbitration. It is not the framework used to establish the opening capital base for scheme pipelines subject to ex-ante RAB-based tariff regulation.

Australian experience also confirms that RCM is assumption-sensitive and can produce values that diverge materially from cost-based asset value measures. **The Australian framework therefore does not establish RCM as a recognised opening RAB valuation methodology. It reinforces the need for caution where RCM is used to infer capital recovery from historical revenues and modelled deductions**.

The wider international experience reviewed is consistent with the same conclusion. **It does not identify precedent for using RCM to determine the opening asset value** for assets entering an ex-ante RAB-based tariff framework. Regulators have used a range of approaches to opening asset valuation, including depreciated historical cost, indexed net book value, depreciated replacement cost, optimised replacement cost and expressly transitional or negotiated approaches. Those approaches are directed at valuing the assets entering the regulated regime. More importantly, regulators have generally addressed prior-recovery concerns within recognised asset valuation or transitional frameworks. Where backward-looking capital-recovery analysis has appeared, it has served a different regulatory purpose, rather than establishing the opening asset value.

The international experience also shows that opening **RAB decisions are typically made by balancing several regulatory objectives, including user protection, fairness between users and investors, financeability, investment incentives and regulatory stability**. Regulators also place weight on whether the asset values used for the transition are supported by robust and verifiable data. ANP's proposed reliance on RCM for NTS does not adequately reflect that broader balance. ANP focuses on the avoidance of double recovery, but has not shown that its retrospective calculation is sufficiently robust and verifiable to justify excluding the Malha Sudeste legacy contract assets from NTS's opening RAB, nor has it demonstrated that the resulting treatment is consistent with the wider objectives of the new tariff framework.

8.6 Implications for ANP's final decision

ANP should not treat its RCM calculation as establishing that the Malha Sudeste legacy contract assets have no residual value for opening RAB purposes. The calculation is too dependent on retrospective reconstruction, proxy assumptions, and discretionary allocation choices to justify that conclusion.

If ANP remains concerned that the opening RAB may include capital already recovered under the legacy contracts, that concern should be addressed within a recognised RAB valuation framework and only through adjustments supported by reliable evidence. The relevant test should be whether specific capital has already been recovered in a measurable and attributable way. A general concern about double recovery, or a residual inference produced by a reconstructed RCM model, is not sufficient.

The consequence of ANP's proposed approach would be substantial. It would exclude assets that continue to provide regulated transportation services from the opening RAB of the new tariff regime. That outcome would affect allowed revenue, future depreciation, return on capital, financeability, future investment incentives and asset management decisions. It may also create a bias against efficient maintenance, refurbishment, or life extension if existing assets are assigned no RAB value while future replacement assets may be admitted to the RAB.

ANP has not demonstrated that it has adequately weighed those wider regulatory consequences against the uncertainty in its RCM calculation. Nor has it shown that the proposed zero opening RAB treatment is consistent with the broader objectives of Resolution ANP No. 991/2026 and Technical Note No. 2/2026, including tariff reasonableness over time, economic efficiency, regulatory stability, financeability and efficient investment incentives.

8.7 Final conclusion

The report's main conclusions are therefore as follows:

1. ANP should not rely on RCM as the basis, cross-check, or complementary method for excluding the Malha Sudeste legacy contract assets from NTS's opening RAB.

2. At most, ANP's RCM calculation illustrates the difficulty of reconstructing historical capital recovery under the legacy contracts. It does not provide a recognised or sufficiently reliable valuation basis for excluding the Malha Sudeste legacy contract assets from the opening RAB.

3. A final opening RAB decision should instead be grounded in recognised regulatory asset valuation methods, with any adjustment for prior recovery limited to amounts that ANP can identify and attribute with sufficient reliability. In the absence of such evidence, ANP's proposed reliance on RCM would risk undermining the credibility of the new building-block regime at the point of transition.