DRAFT DECISION
Australian Gas Networks Access Arrangement 2016 to 2021

Attachment 9 – Efficiency carryover mechanism

November 2015

AUSTRALIAN ENERGY REGULATOR

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Note

This attachment forms part of the AER's draft decision on Australian Gas Networks access arrangement for 2016–21. It should be read with all other parts of the draft decision.

The draft decision includes the following documents:

Overview

Attachment 1 - Services covered by the access arrangement

Attachment 2 - Capital base

Attachment 3 - Rate of return

Attachment 4 - Value of imputation credits

Attachment 5 - Regulatory depreciation

Attachment 6 - Capital expenditure

Attachment 7 - Operating expenditure

Attachment 8 - Corporate income tax

Attachment 9 - Efficiency carryover mechanism

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Attachment 12 - Non-tariff components

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Attachment 14 - Other incentive schemes

Contents

Shortened forms

Shortened form	Extended form
AA	Access Arrangement
AAI	Access Arrangement Information
AER	Australian Energy Regulator
ATO	Australian Tax Office
capex	capital expenditure
CAPM	capital asset pricing model
CCP	Consumer Challenge Panel
CESS	Capital Expenditure Sharing Scheme
CPI	consumer price index
CSIS	Customer Service Incentive Scheme
DRP	debt risk premium
EBSS	Efficiency Benefit Sharing Scheme
ECM	Efficiency carryover mechanism
ERP	equity risk premium
Expenditure Guideline	Expenditure Forecast Assessment Guideline
gamma	Value of Imputation Credits
GSL	Guaranteed Service Level
MRP	market risk premium
NECF	National Energy Customer Framework
NERL	National Energy Retail Law
NERR	National Energy Retail Rules
NGL	national gas law
NGO	national gas objective
NGR	national gas rules
NIS	Network Incentive Scheme
NPV	net present value
opex	operating expenditure
PFP	partial factor productivity
PPI	partial performance indicators
PTRM	post-tax revenue model

Shortened form	Extended form
RBA	Reserve Bank of Australia
RFM	roll forward model
RIN	regulatory information notice
RoLR	retailer of last resort
RPP	revenue and pricing principles
SLCAPM	Sharpe-Lintner capital asset pricing model
STPIS	Service Target Performance Incentive Scheme
TAB	Tax asset base
UAFG	Unaccounted for gas
WACC	weighted average cost of capital
WPI	Wage Price Index

9 Efficiency carryover mechanism

An efficiency carryover mechanism provides an additional incentive for service providers to pursue efficiency improvements in operating expenditure (opex).

It is often used as part of incentive regulation. Given that opex is largely recurrent and predictable, opex in one period is generally a good indicator of opex in the next period. Where a service provider is relatively efficient, we use the actual opex it incurred in a chosen base year to forecast its opex for the next access arrangement period.

To encourage a service provider to become more efficient during the access arrangement period it is allowed to keep any difference between its approved forecast and its actual opex during an access arrangement period. This is supplemented by the efficiency carryover mechanism which allows the service provider to retain efficiency savings and efficiency losses for a longer period of time. Together, these rewards and penalties work to provide a continuous incentive for a service provider to pursue efficiency gains over the access arrangement period. The efficiency carryover mechanism also discourages a service provider from incurring opex in the expected base year in order to receive a higher opex allowance in the following access arrangement period.

An efficiency carryover mechanism applied to AGN during the 2011–16 access arrangement period. AGN proposed an efficiency carryover mechanism apply to it in the 2016–21 access arrangement period.

AGN also proposed that incentive schemes for capital expenditure, customer service and innovation be introduced. We do not approve the introduction of these schemes. Attachment 14 outlines our draft decisions on the additional incentive schemes proposed by AGN.

9.1 Draft decision

9.1.1 Carryover amounts from the 2011–16 period

We accept AGN's proposal to carryover $4.8 million ($2015–16) from the 2011–16 access arrangement period to the revenue building blocks for the 2016–21 access arrangement period.

This number differs from the $5.7 million initially provided in AGN's access arrangement RIN and which was outlined in its proposed access arrangement information.[1] The reason for the difference is AGN subsequently updated its insurance costs, which are an excluded cost category in its existing efficiency carryover

[1] AGN, *Australian Gas Networks SA Access Arrangement Information*, July 2015, p. 193, and RIN: '7.5 Efficiency Benefit Sharing Scheme – Rolling Carry-over mechanism for opex'.

mechanism.[2] We accept the updated costs should be applied in calculating AGN's carryover amounts. Further, AGN's efficiency carryover mechanism calculation contained an error in the conversion of actual opex from $nominal to $2015–16 real. Correcting this results in a small change in actual opex for the purpose of the efficiency carryover mechanism. shows our draft decision on the proposed carryover amounts.

Table 9.1 AER draft decision on carryover amounts ($million, $2015–16)

	2016-17	2017-18	2018-19	2019-20	2020-21	Total
AER draft decision on carryover amounts	6.7	(1.3)	(2.1)	1.5	0.0	4.8

Source: AER analysis.

9.1.2 Incentive mechanism for the 2016–21 period

While we support the continued application of an efficiency carryover mechanism to AGN in the 2016–21 access arrangement period, we do not approve the efficiency carryover mechanism proposed by AGN. We have amended AGN's proposal to:

- apply the formulas to calculate incremental efficiency gains (losses) as outlined in the AER's 'Efficiency Benefit Sharing Scheme (EBSS) for electricity network service providers' released in November 2013.[3] This approach provides a service provider with a continuous incentive to pursue efficiency gains throughout the access arrangement period. Incremental efficiency gains or losses in each year are carried forward typically for five years. As a result of this approach, increases or decreases in opex are shared approximately 30:70 between service providers and consumers.
- streamline and reduce the costs excluded from the operation of the mechanism.

Table 7.1 in Attachment 7 sets out the total opex forecasts we will use to calculate efficiency gains and losses for the 2016–21 access arrangement period.

9.2 AGN's proposal

9.2.1 Carryover amounts from the 2011–16 period

AGN proposed to carryover an amount of $4.8 million ($2015–16) from the 2011–16 period to the revenue building blocks for the 2016–21 period.

AGN used the equations set out in clause 5.1 of its 2011–16 access arrangement to calculate its annual efficiency gains (or losses) in each year. Table 9.2 shows AGN's calculation of its incremental efficiency gains (losses).

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2 AGN, response to AER Information request – AER AGN 027 – Opex model.

3 AER, *Efficiency Benefit Sharing Scheme for Electricity Network Service Providers*, November 2013, pp. 7–9.

Table 9.2 AGN's carryover calculations ($million, 2015–16)

Opex	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	Total
Benchmark	77.0	75.7	75.0	73.3	70.6						
Actual	68.9	66.9	69.7	66.5	63.9						
Underspend	8.1	8.9	5.2	6.7	6.7						
Incremental gain (loss)	8.1	0.8	(3.6)	1.5	0.0						
Carryover											
2016-17		8.1	8.1	8.1	8.1	8.1					
2017-18			0.8	0.8	0.8	0.8	0.8				
2018-19				(3.6)	(3.6)	(3.6)	(3.6)	(3.6)			
2019-20					1.5	1.5	1.5	1.5	1.5		
2020-21						0.0	0.0	0.0	0.0	0.0	
Efficiency carryover						**6.7**	**(1.3)**	**(2.1)**	**1.5**	**0.0**	**4.8**

Source: AGN, *Australian Gas Networks SA Access Arrangement Information*, July 2015, p. 193, and RIN: '7.5 EBSS – Rolling Carry-over mechanism for opex'; with corrected conversion formulas; and AGN, Response to AER information request 27.

9.2.2 Incentive mechanism for the 2016–21 period

AGN proposed that an efficiency carryover mechanism apply in the 2016–21 access arrangement period.[4] The proposed mechanism is not the same as the 2011–16 efficiency carryover mechanism. The key change AGN proposed was to allow it to retain an increased (50 per cent) share of efficiency gains and losses.[5]

AGN noted:[6]

- the power of the EBSS is low relative to other similar schemes (such as the total expenditure incentive scheme in the UK that allows for 65% of the efficiency to be retained by the business) for gas and up to 70 per cent for electricity distribution
- as the industry matures and privately-owned business such as AGN improve in terms of productivity, it becomes more difficult to achieve further productivity gains; in light of this, it is appropriate that incentive

[4] AGN used the term, Efficiency Benefits Sharing Scheme (EBSS). The term EBSS is defined under the National Electricity Rules (NER). We prefer to use the term, efficiency carryover mechanism.

[5] An outcome of the carryover efficiency mechanism that applied to AGN in the 2011–16 period is that increases or decreases in opex relative to allowances are shared approximately 30:70 between service providers and customers respectively.

[6] AGN, *Australian Gas Networks SA Access Arrangement Information*, July 2015, p. 195.

mechanisms are strengthened in order to ensure that businesses remain adequately incentivised to continue to strive for additional efficiency gains.

The equations AGN proposed to calculate efficiency gains (losses) adopt a net present value approach. In addition to retaining the benefits (costs) resulting from difference between its approved and actual opex forecasts (refer to equation 1 below),[7] AGN proposed to retain a specified (50 per cent) share of 'total efficiency created' within the access arrangement period (equation 2).

Equation 1:

$$Benefit\ retained = \sum_{i=1}^{5} \left(Adj\ forecast_i - Actual_i\right) \text{ x } (1 + \text{WACC})^{5-i}$$

Equation 2:

$$EBSS\ Reward = Target\ Reward - Benefit\ Retained$$

Where:

$$Target\ reward\ = Target\ share\ \text{ x } \left(Benefit\ retained + \left(\frac{Adj\ forecast_5 - Actual_5}{WACC}\right)\right)$$

$$Target\ share = 50\ per\ cent$$

In its proposal, AGN excluded the following costs from the operation of its proposed efficiency carryover mechanism:[8]

- costs associated with impost of complying with any retailer of last resort requirements
- amounts for approved cost pass through events
- debt raising costs
- insurance costs
- superannuation costs for defined benefits and retirement schemes
- other specific uncontrollable costs incurred and reported by AGN during the access arrangement period and which the AER considers should be excluded in accordance with the NGL and NGR
- costs of any other activity that AGN and the AER agree to exclude from the operation of the efficiency carryover mechanism.

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[7] Adjustments are also made to remove the impacts of efficiency gains made between the base and final year of the previous access arrangement:

$$Adj\ Forecast_i = Forecast_i - \left((Forecast_{2015-16} - Forecast_{2014-15}) - (Actual_{2015-16} - Actual_{2014-15})\right) .$$

[8] Australian Gas Networks, *Access Arrangement for AGN's South Australian Gas Distribution Network 1 July 2016 – 30 June 2021,* July 2015 p. 15.

AGN also proposed changes in the scope of activities where these arise from exogenous factors and impose material additional costs be reflected in forecast opex. It proposed the AER would, without limitation, quantify and substantiate the impact of the scope of change on the original benchmarks following the provision of information by AGN.[9]

9.3 AER's assessment approach

An efficiency carryover mechanism is a form of incentive mechanism. A full access arrangement may include (and we may require it to include) one or more incentive mechanisms to encourage efficiency in the provision of services by the service provider.[10] Incentive mechanisms may provide for carryover increments for efficiency gains, or decrements for efficiency losses, from one access arrangement period to the next.[11] An incentive mechanism must be consistent with the revenue and pricing principles.[12]

We consider the following revenue and pricing principle is most relevant for assessing AGN's efficiency carryover mechanism proposal:

> A service provider should be provided with effective incentives in order to promote economic efficiency with respect to reference services the service provider provides.
>
> The economic efficiency that should be promoted includes—
>
> (a) efficient investment in, or in connection with, a pipeline with which the service provider provides reference services
>
> (b) the efficient provision of pipeline services
>
> (c) the efficient use of the pipeline.[13]

Under the NGR we have full discretion in our decision as to whether to apply an incentive scheme.[14]

9.3.1 Interrelationships

The efficiency carryover mechanism we apply to opex is intrinsically linked to a revealed cost forecasting approach for opex. Under this forecasting approach, the efficiency carryover mechanism has the following functions:

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9 Australian Gas Networks, *Access Arrangement for AGN's South Australian Gas Distribution Network 1 July 2016 – 30 June 2021*, July 2015 p. 15.

10 NGR, r. 98(1).

11 NGR, r. 98 (2).

12 NGR, r. 98 (3).

13 NGL, s. 24(3).

14 NGR, r. 40(3).

- To provide a continuous incentive for a service provider to make efficiency gains (service providers receive the same reward for an underspend and the same penalty for an overspend in each year of the access arrangement period).
- To mitigate the incentive for a service provider to increase opex in the expected 'base year' to increase its forecast opex allowance for the following access arrangement period.

9.4 Reasons for draft decision

9.4.1 Carryover amounts from the 2011–16 period

The efficiency carryover amount we calculate of $4.8 million ($2015–16) is the same as the carryover amount that AGN proposed to add to the revenue building blocks for the 2016–21 access arrangement period. As noted earlier, the $4.8 million amount differs to the $5.7 million amount initially included in AGN's draft proposal. The difference results from AGN subsequently providing updated insurance amounts for inclusion in its Regulation Information Notice (RIN), which we have accepted. Further, a conversion error in deriving actual opex in 2015–16 dollars within the RIN was corrected.

Our inputs and the treatment of these inputs was the same as that applied by AGN. We applied the equations set out in clause 5.1 of AGN's 2011–16 access arrangement to calculate the total carryover amount.

9.4.2 Incentive mechanism for the 2016–21 period

We approve the application of an efficiency carryover mechanism to AGN in the 2016–21 access arrangement.

We consider an efficiency carryover mechanism is required to provide AGN with a continuous incentive to pursue efficiency gains during the 2016–21 period. As we typically rely on a single year revealed cost approach to forecasting opex, we also consider an efficiency carryover mechanism is needed to provide AGN with an incentive not to increase its opex in the expected base year.

We do not approve the efficiency carryover mechanism proposed by AGN. We do not consider it is consistent with the revenue pricing principles and does not adequately consider and address interactions with our revealed opex forecasting approach.

Our efficiency carryover mechanism is consistent with the Efficient Benefit Sharing Scheme we published for electricity distributors in November 2013.[15]

Sharing ratio

AGN proposed increasing the share of efficiency gains and losses it retains to 50 per cent.

We do not accept AGN's contention that businesses require an increased share of efficiency gains as time passes to ensure they continue to seek efficiency gains. We do not consider that an increase in the sharing ratio of the ECM is necessary to provide AGN with effective incentives to promote economic efficiency. The available evidence suggests that the existing scheme has been effective in incentivising AGN to pursue opex efficiency. For example, in AGN's 2006–11 and 2011–16 access arrangements, actual opex was lower than the AER approved allowances.[16]

Further, no evidence was provided to support AGN's case that the existing scheme will not provide it with adequate incentives to continue to seek efficiencies in the 2016–21 period. While AGN referred to higher ratios that applied in the UK, it did not explain how this approach is relevant given the circumstances in Australia, including the differences in forecasting approaches applied in Australia and the UK.

A number of stakeholders did not support a change that reduced the benefit consumers receive from efficiency gains. These included the Consumer Challenge Panel, Business South Australia, Energy Consumers Coalition of South Australia (ECSSA), South Australian Council of Social Service (SACSS) and the Government of South Australia.[17]

Origin Energy and ECSSA also cautioned that the efficiency carryover mechanism should be considered with the rest of the regulatory framework to avoid creating perverse incentives, given the interlinkages.[18] AGL recommended that we consider whether AGN's proposal was sufficiently transparent, enforceable and equitable.[19]

While AGN indicated it is seeking to increase the share of efficiency gains in opex it retains to 50 per cent we consider that its proposed scheme as currently specified will result in a higher sharing ratio. This is because AGN's proposed equations do not recognise any efficiency savings made after the base year and which are not reflected in the forecast for the following period. This means AGN would retain these efficiency

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16 This was also noted in the Government of South Australia's submission on AGN's proposed access arrangement, SA Government, *Submission on Australian Gas Networks SA Access Arrangement Proposal 2016-2021*, 21 August 2015, p5.

17 Consumer Challenge Panel, *Advice to AER from Consumer Challenge Panel sub-panel 8 regarding Australian Gas Networks' (SA) Access Arrangement 2016-2021 Proposal*, 25 August 2015, p. 15; Business South Australia, *Submission to AER on proposed Australian Gas Networks Access Arrangement (2016-21)*, August 2015, p. 8; Energy Consumers Coalition of South Australia, *Submission on Australian Gas Networks (South Australia) Access Arrangement Proposal 2016-21*, 16 August 2015, p. 48; South Australian Council of Social Service (SACOSS) *Submission on Australian Gas Networks (South Australia) Access Arrangement Proposal 2016-21*, 8 August 2015, p. 8.

18 Origin Energy, *Submission on Australian Gas Networks (South Australia) Access Arrangement Proposal 2016-21*, 10 August 2015, p. 6.

19 AGL, Australian Gas Networks (South Australia), Access Arrangement Proposal (2016-21).

savings for an additional five years through the opex forecast for the following access arrangement period. The impact of this treatment results in AGN's share of the efficiency gains increasing to a value closer to 75 per cent for recurrent savings made after the base year.

We also consider that substantive changes to our regulatory approach, such as altering the balance of efficiency gains received by customers and business, or adopting a different mechanism/type of incentive scheme best considered through a consultative, informed and industry-wide process and in a process that takes into account interrelationships with our forecasting approach. For example the process to develop the Expenditure Forecast Assessment Guideline recognised any incentive scheme design process must be compatible with the relevant forecasting approaches in order to promote outcomes consistent with the long terms interest of end-users. Substantive revisions to the efficiency carryover mechanism for service providers has wide ranging implications requiring input from a wider group of stakeholders than we have in this access arrangement review.

Revised equations consistent with the AER's EBSS

While we agree that AGN should be subject to an efficiency carryover mechanism, we do not agree with the equations AGN proposed. As noted above, the mechanism that AGN proposes is substantively different to the Efficient Benefit Sharing Scheme that we released in November 2013.

AGN's proposed equations provide an incentive for it to increase expenditure in the base year, rewarding it for efficiency losses. Further, AGN's proposed mechanism would provide a reward for non-recurrent efficiency gains made in the final year that is greater than the value of the efficiency gain, making network customers worse off. As outlined previously, this is because AGN's equations do not recognise efficiency gains after the base year and forecast opex does not reflect these efficiency gains.

As a result, AGN's proposed scheme is not consistent with the revenue pricing principles. It does not provide a continuous incentive to make efficiency gains and rather than mitigating the incentive for AGN to increase opex in the expected base year, it increases this incentive. Further, the information provided as part of AGN's supporting document does not adequately consider and address the interactions that their proposed incentive mechanism has with our revealed opex forecasting approach.

Our revisions apply equations that are consistent with the Efficient Benefit Sharing Scheme for electricity network service providers we released in November 2013. [20]

Exclusions from the operation of the efficiency carryover mechanism

AGN proposed a number of adjustments and exclusions to forecast and actual opex when calculating carryover amounts. We accept most but not all of the proposed

[20] AER, *Efficient Benefit Sharing Scheme for Electricity Network Service Providers*, November 2013.

excluded cost categories and adjustments. Our decisions are consistent with the EBSS for electricity distribution network service providers.[21]

Costs associated with complying with RoLR requirements

AGN has proposed that costs associated with an impost or complying with any retailer of last resort (RoLR) requirements be excluded from the operation of the efficiency carryover mechanism.

We note that AGN has proposed a category of pass through event relating to a Network User Failure Event. The event covers costs incurred by AGN when a user becomes insolvent or is unable to supply gas to its customers. In our assessment of pass through events (attachment 11) we consider including the proposed event in the 2016–21 access arrangement, if appropriately defined, would support the National Gas Objective and the Revenue and Pricing Principles. However, for a number of reasons we do not accept the AGN's proposed definition of this event and require amendments to reflect changes in the NGR and the introduction of the NERL.

If a Network User Failure Event is included in the access arrangement, we consider that costs of complying with RoLR requirements approved for pass through under this event would be excluded from the efficiency carryover mechanism. This is because clause 5.1(k) of the revised access arrangement indicates the forecast operating expenditure amount for each year of the Applicable Access Arrangement Period will be adjusted to include any Determined Pass Through Amounts.

Amounts for approved cost pass through events

We agree that amounts for approved cost pass through events should be excluded from the operation of the efficiency carryover mechanism.

We consider that adjusting the opex forecast ex post rather than removing the costs from actual opex is the most straightforward way to apply the efficiency carryover mechanism when accounting for changes to a service provider's forecast opex. For clarity, we have included a specific clause in our revisions (revision clause 5.1(k) that addresses this issue).

Debt raising costs

We agree debt raising costs should be excluded from the efficiency carryover mechanism. The efficiency carryover mechanism is designed to work in conjunction with a single year revealed expenditure approach. If a service provider reduces its opex in one period, consumers pay for efficiency carryover amounts in the next period but receive the benefits through a lower opex forecast for the next period. Where we use this forecasting approach for opex, the benefits to consumers of a lower opex forecast will always outweigh the efficiency carryover payments it will pay for.

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[21] AER, *Efficiency Benefit Sharing Scheme for Electricity Network Service Providers*, November 2013.

Where a different forecasting approach is used, there is a risk that consumers will not benefit. For instance, we forecast debt raising costs using a benchmark. If AGN reduces its actual debt raising costs in an access arrangement period and we applied the efficiency carryover mechanism, consumers will end up paying for efficiency carryover amounts but will not receive the benefits of a lower opex forecast.

We accept debt raising costs should be excluded from the efficiency carryover mechanism. We consider that debt raising costs would fall within the exclusion set out in the clause that excludes all costs not forecast using a single year revealed cost approach in the access arrangement period following the 2016–21 access arrangement. As a result, we have removed the specific debt raising cost exclusion as we do not consider it should be repeated.

Insurance and superannuation costs

We do not accept that insurance and superannuation costs should be excluded from the operation of the efficiency carryover mechanism, notwithstanding their inclusion in the 2011–16 access arrangement efficiency carryover mechanism.

When opex is forecast, superannuation and insurance are taken into account, including expected changes (increases and decreases) in costs for superannuation and insurance.[22] The risk that these forecasts are too high or low is symmetrical. We consider this risk should be shared between AGN and its customers through the operation of the efficiency carryover mechanism in the same way other forecasting risks are shared.

Specific uncontrollable costs which the AER considers should be excluded in accordance with the NGL and NGR

We agree that we should have some discretion to exclude a category of costs from the efficiency carryover mechanism where we consider excluding these costs is in accordance with the National Gas Objectives. This approach is consistent with the discretion we have to adjust the carryover amounts in our electricity network EBSS (revision clause 5.1(j)(i)b)).

Costs of any other activity that AGN and the AER agree to exclude

We do not accept AGN's proposal that 'costs of any other activity that AGN and the AER agree to exclude from the operation of the EBSS' should be excluded from the efficiency carryover mechanism.

When opex is forecast, it takes into account expected changes (increases and decreases) in costs that are outside the control of AGN. The risk that the forecasts are too high or low is symmetrical. We consider should this risk should be shared between

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[22] Attachment 7 contains our total opex forecast that complies with the opex criteria. Insurance and superannuation costs have been forecast using a single year approach.

AGN and its customers through the operation of the efficiency carryover mechanism in the same way other forecasting risks are shared.

Changes in scope of activities

We do not accept that the efficiency carryover mechanisms should take into account changes in scope of the activities where the scope changes arise from exogenous factors and impose material additional costs on AGN.

When opex is forecast, it takes into account expected changes (increases and decreases) in costs that are outside the control of AGN. The risk that the forecasts are too high or low is symmetrical. We consider this risk should be shared between AGN and its customers through the operation of the efficiency carryover mechanism in the same way other forecasting risks are shared.

Changes in capitalisation policy

We propose that the efficiency carryover mechanism should take into account any changes in AGN's capitalisation policy, particularly given that we will not apply a capital expenditure incentive mechanism to AGN. We have reinserted a standard clause which allows these changes to be taken into account, subject to conditions, following the provision of detailed information from AGN to the AER.[23]

9.5 Revisions to AGN's proposed access arrangement

We require the following revisions to make the access arrangement proposal acceptable:

Revision 9.1:

Remove clause 5.1 of the proposed access arrangement and replace it with the following text:

5.1 Efficiency carryover mechanism

An efficiency carryover mechanism will apply to operating expenditure.

The incentive mechanism will operate in the following way:

i. AGN will retain the benefit of actual operating expenditure being lower, or incur the cost of actual operating expenditure being higher, than forecast operating expenditure included in the Total Revenue in each Financial Year of the Access Arrangement Period;

[23] This clause was included in the efficiency carryover mechanism provisions contained in AGN's 2011–16 access arrangement.

ii. the mechanism carries forward AGN's incremental efficiency gains (or losses) for five Financial Years from the Financial Year those gains (or losses) occur;

iii. annual carryover amounts accrue in each Financial Year of the subsequent access arrangement period as the summation of the incremental efficiency gains (or losses) in the immediately prior access arrangement period that are carried forward for five years or less into the Financial Year; and

iv. the annual carryover amounts are added to AGN's total revenue in each Financial Year of the subsequent access arrangement period. If necessary, the annual efficiency gain (or loss) is carried forward into the access arrangement period commencing 1 July 2021 until it has been retained by the Service Provider for a period of five years.

(a) The incremental efficiency gain (loss) for financial year 2016–17 will be estimated using calculated using:

$$E_{2016\text{-}17} = (F_{2016\text{-}17}\text{-}A_{2016\text{-}17}) - (F_{2015\text{-}16} - A_{2015\text{-}16}) + (F_{2014\text{-}15} – A_{2014\text{-}15}) - \text{non-recurrent efficiency gains}_{2014\text{-}15}$$

where

$E_{2016\text{-}17}$ is the incremental efficiency gain (loss) for financial year 2016-17.

$F_{2016\text{-}17}$ is the forecast operating expenditure for financial year 2016-17.

$A_{2016\text{-}17}$ is the actual operating expenditure for financial year 2016-17.

$F_{2015\text{-}16}$ is the forecast operating expenditure for financial year 2015-16.

$A_{2015\text{-}16}$ is the actual operating expenditure for financial year 2015-16.

$F_{2014\text{-}15}$ is the forecast operating expenditure for financial year 2014-15.

$A_{2014\text{-}15}$ is the actual operating expenditure for financial year 2014-15.

Non-recurrent efficiency $\text{gains}_{2014\text{-}15}$ is the adjustment made to base year (2014–15) opex used to forecast opex for the 2016–21 access arrangement period to account for opex associated with one-off factors.

(b) The incremental efficiency gain (or loss) for financial years 2017-18 to 2019-20 (inclusive) will be calculated using:

$$E_i = (F_i\text{-}A_i) - (F_{(i\text{-}1)} – A_{(i—1)})$$

where

E_i is the incremental efficiency gain in financial year i of the access arrangement period.

F_i is the forecast operating expenditure in financial year i of the access arrangement period.

A_i is the actual operating expenditure in financial year i of the access arrangement period.

F_{i-1} is the forecast operating expenditure in financial year i-1 of the access arrangement period.

A_{i-1} is the actual operating expenditure in financial year i-1 of the access arrangement period.

(c) Actual operating expenditure in the final financial year of the access arrangement period is to be estimated using:

$A^*_f = F_f - (F_b – A_b) + \text{non recurrent efficiency gains}_b$

where

A^*_f is the estimate of opex for the final year of the access arrangement.

F_f is the forecast opex for the final year of the access arrangement period.

F_b is the forecast opex for the base year used to forecast opex in the access arrangement period following this access arrangement.

A_b is the actual opex for the base year used to forecast opex in the access arrangement period following this access arrangement.

Non-recurrent efficiency gains_b is the adjustment made to base year opex used to forecast opex for the access arrangement period expected to commence 1 July 2021 to account for opex associated with one-off factors.

(d) The carryover amount for final financial year of the access arrangement period, is to be estimated using the following equation:

$E_f = (F_f – A^*_f) – (F_{f-1} – A_{f-1})$

where

E_f is the incremental efficiency gain for the final year of the access arrangement, expected to be the financial year 2020–21.

F_f is the forecast opex for the final year of the access arrangement.

A^*_f is the estimate of opex for the final year of the access arrangement period.

(e) The carryover amount for the first year of the subsequent access arrangement period, expected to commence 1 July 2021, is to be estimated using:

$E_{1,t+1} = (F_{1,t+1} – A_{1,t+1}) – (F_f – A_f) + (F_b – A_b) - \text{non-recurrent efficiency gains}_b$

where

$E_{1,t+1}$ is the incremental efficiency gain (loss) for the first financial year of the access arrangement following this access arrangement.

$F_{1, t+1}$ is the forecast operating expenditure for the first financial year of the access arrangement following this access arrangement.

$A_{1, t+1}$ is the actual operating expenditure for the first financial year of the access arrangement following this access arrangement.

F_f is the forecast operating expenditure for the final year of the 2016–21 access arrangement period.

A_f is the actual operating expenditure for the final year of the 2016–21 access arrangement period.

F_b is the forecast operating expenditure for the base year used to forecast opex in the access arrangement period following this access arrangement.

A_b is the actual operating expenditure for the base year used to forecast opex in the access arrangement period following this access arrangement.

Non-recurrent efficiency gains$_b$ is the adjustment made to base year opex used to forecast opex for the access arrangement period following this access arrangement to account for opex associated with one-off factors.

(f) For the avoidance of doubt the incremental efficiency gains (or losses) are carried over from financial year to financial year in real dollars to ensure that these gains (or losses) are not eroded by inflation. The price indices used in this calculation are to be consistent with those used in the access arrangement.

(g) Increments or decrements from the summation of incremental efficiency gains or losses calculated in accordance with the approved incentive mechanism in the Access Arrangement Period will give rise to an additional 'building block' in the calculation of the Total Revenue amounts for each Financial Year of the subsequent access arrangement period.

(h) The following costs will be excluded from the operation of the efficiency carryover mechanism:

i. any cost category that

a. is not forecast using a single year revealed cost approach in the access arrangement period following this Access Arrangement Period (intended to commence 1 July 2021); and

b. the AER determines, as part of a decision on revisions to apply to this Access Arrangement, to exclude from the operation of the efficiency carryover mechanism because it is satisfied that it would not promote the National Gas Objective.

(i) The forecast operating expenditure amount for each year of the Applicable Access Arrangement Period will be adjusted to include any Determined Pass Through Amounts or other AER approved expenditure arising from Cost Pass Through Events which apply in respect of that year

(j) Where the AGN changes its approach to classifying costs as either capital expenditure or operating expenditure during the access arrangement period, AGN

will adjust the forecast operating expenditure in the access arrangement information so that the forecast expenditures are consistent with the capitalisation policy changes.

(k) If there is a change in AGN's approach to classifying costs as either capital expenditure or operating expenditure, AGN must provide to the AER a detailed description of the change and a calculation of its impact on forecast and actual operating expenditure.