

Depreciation Policy for RIIO-ED3

A report for the ENA

15 January 2025

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Scope of work and structure of this report

- We were commissioned by the ENA to examine Ofgem’s decision at RIIO-1 to extend regulatory asset lives to 45 years to reflect average expected economic life to ensure intergenerational equity and sustainable financeability.
- Through illustrative modelling of a notional DNO, we identify problems with the RIIO-1 depreciation policy, which creates a material “depreciation holiday” resulting in a build-up of RAV and increase in customer charges over time, as well as a deterioration in financeability.
- We conclude that Ofgem’s RIIO-1 policy fails on its own criteria – i.e. it creates intergenerational inequity and undermines financeability – which supports a compelling case for accelerating depreciation at ED3.
- Our report has the following structure:

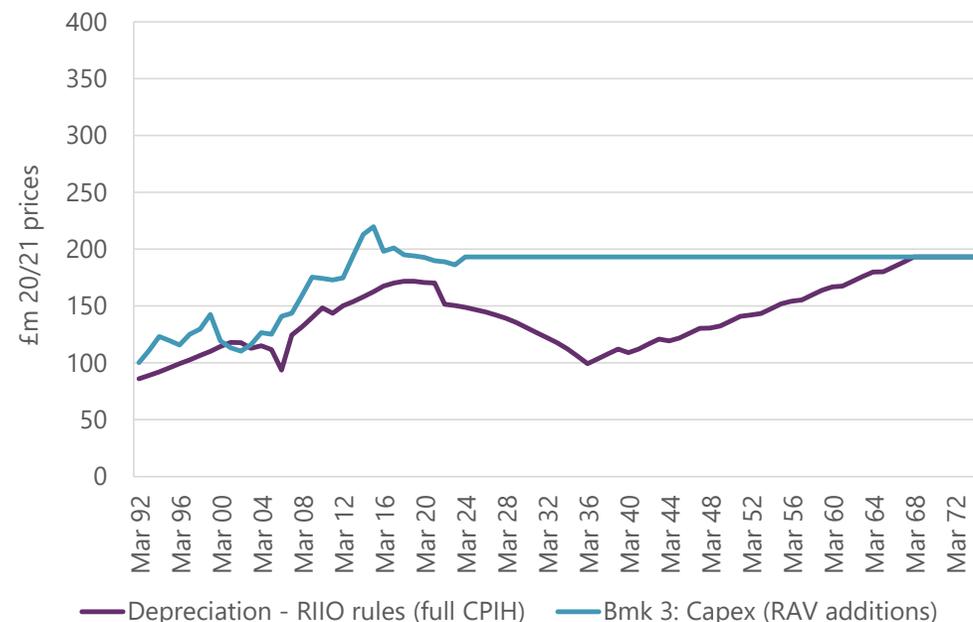
1. Summary	4
<hr/>	
2. Background	7
What are the factors to consider in setting depreciation asset lives? Was Ofgem’s RIIO-1 decision robust?	
<hr/>	
3. Illustrative modelling of depreciation under-recovery for ED3 and beyond	11
What is the level of under-recovery for a notional DNO in ED3 and beyond if RIIO-1 depreciation rules remain in place?	
<hr/>	
4. Illustrative modelling of impact of depreciation under-recovery for ED3 and beyond	18
What is the impact on allowed revenues, financeability and bills of the depreciation under-recovery for a notional DNO in ED3 and beyond?	
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1 | Summary

Summary (1): Ofgem’s RIIO-1 decision to extend assets lives to 45 years for new assets had perverse effect of undermining intergenerational equity, creating (in Ofgem’s words) a deep valley of depreciation and a risk to financeability. We estimate under-recovery of £2bn for a notional DNO, transferring costs to future consumers.

- At RIIO-1, Ofgem extended asset lives from 20 to 45 years for new assets to reflect average expected economic life to ensure intergenerational equity and sustainable financeability. Contrary to Ofgem’s aim, we show that the switch to 45-year asset lives had the perverse effect of materially reducing depreciation (“depn”) charges relative to any reasonable depreciation benchmark over ED3 and beyond.
- Holding totex constant at ED1 levels to remove the effect of totex ramp-up in energy transition on our estimates, we calculate the depreciation under-recovery under RIIO rules for a notional DNO relative to three benchmarks:
 - RIIO depn compared to a continuation of DPCR5 depn rules, i.e. 20-year depreciation life, indicates **£2.1bn under-recovery** (20/21 prices);
 - RIIO depn compared to a 45-year asset life (Ofgem’s assumed economic asset life) applied to all historical capex, our proxy for the economic depreciation charge, indicates **£1.6bn under-recovery** (20/21 prices); and
 - RIIO depn compared to capex (held constant at ED1 levels), an alternative proxy for the economic depreciation charge, also indicates **£2.1bn under-recovery** (20/21 prices) (see Figure).
- Although there is uncertainty around the magnitude of under-recovery arising from the RIIO-1 policy change, given uncertainty over the true level of economic depreciation, our benchmarks all point to under-recovery of around £2bn (20/21 prices) for a notional DNO over the period from ED3 up to late 2060s.
- Ofgem acknowledged that the RIIO-1 depreciation policy fails on its own criteria in the BGT CMA 2015 appeal. The policy creates intergenerational *inequity* – in Ofgem’s words it creates “a deep valley of depreciation” “a risk to financeability”, followed by a “material increase in asset value”.
 - Given the significant disadvantages with the policy as noted in BGT appeal, Ofgem committed to a review for ED2 but this did not take place.

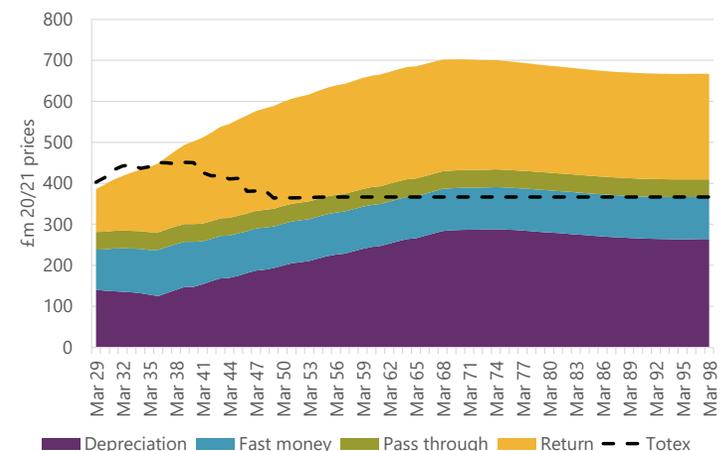
Comparing, RIIO depn to capex (held constant at ED1 levels), a proxy for the economic depreciation charge, indicates £2.1bn under-recovery (20/21 prices)



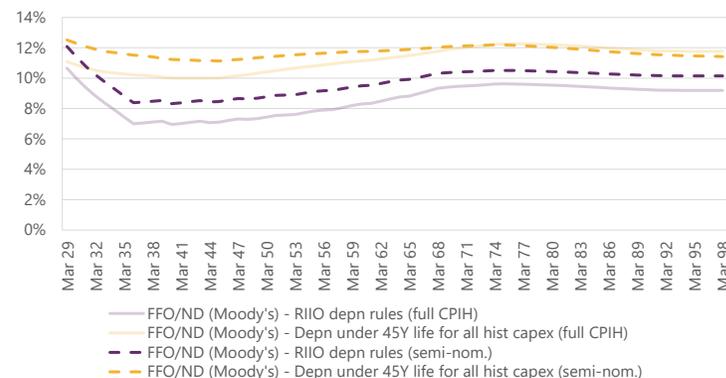
Summary (2): Continuing with RIIO depn rules at ED3+ has negative implications for intergenerational equity, financeability and long-term (“LT”) affordability. Adopting semi-nominal at ED3+ offsets at most half of the “depreciation holiday” gap. Other policy changes needed at ED3 to address current depreciation policy failings.

- If the current RIIO depn policy continues unchanged at ED3+, the “depreciation holiday” of around £2bn (20/21 prices) leads to issues with:
 - **Intergenerational equity:** Current customers receive a “discount” on network charges due to the “depn holiday”, but future customers (from around 2050) pay higher charges forever as a result of the permanently higher RAV and allowed return, relative to the scenario where our proxy for economic depn is applied in ED3+.
 - The increasing importance of the return element in charges may create issues of political acceptability (see Figure).
 - **LT affordability:** Average customer bills increase by around 10% in the mid-2060s and beyond under RIIO depreciation rules, compared to the scenario where economic depn is applied in ED3+.
 - The “depn holiday” compounds bill affordability pressures from energy transition.
 - **Financeability:** FFO-based ratios (Moody’s FFO/debt and RCF/debt and S&P FFO/debt) deteriorate by up to 320 bps during the “depn holiday” period and by 260 bps in the long run under the RIIO depn policy, relative to scenario where economic depn is applied in ED3+.
 - The “depn holiday” exacerbates pressure on financeability from energy transition.
- The adoption of semi-nominal WACC at ED3+ would offset at most half of the effects of the “depn holiday” gap on RAV/network charges and less than half of the effect on credit metrics. Other policy changes would therefore be needed to accelerate depreciation in ED3 and close the remaining “depn holiday” gap, to ensure intergenerational equity, as well as to support financeability and LT affordability of charges.

The “depreciation holiday” under RIIO depn rules leads to a permanently higher RAV, increasing return element in charges, and accentuates LT affordability



FFO-based ratios deteriorate by up to 320 bps during the “depn holiday” under RIIO rules – adoption of semi-nominal only in part offsets decline



2

Background

What are the factors to consider in setting depreciation asset lives?
Was Ofgem's RIIO-1 decision robust?

At RIIO-1, Ofgem set asset lives for electricity networks of 45 years, based on assessment of expected economic life

- At RIIO-1, Ofgem decided to extend the lives of new electricity network assets for depreciation purposes. This decision was based on the principle that Ofgem adopted under its RIIO model that regulatory asset lives should reflect the average expected economic life of network assets.¹
- Ofgem commissioned CEPA and two engineering firms in 2010 to assess the economic lives of the assets for the different energy network sectors.
 - CEPA concluded that new electricity transmission and distribution assets would remain economically useful and technically viable at least until 2050, and therefore recommended an extension of asset lives to between 45 and 55 years, from the previous 20 years.²
 - CEPA report noted that any change in the policy could have a significant negative impact on cash-flows in the medium term, and set out some options to mitigate this effect, such as extending the depreciation life over a period of time or front-loaded depreciation.³
- In extending asset lives at RIIO-1, Ofgem considered a range of factors:
 - Intergenerational equity: Ofgem adopted the principle that regulatory asset lives should align with average expected economic life, as this “balances the interests of existing and future customers as it spreads the cost of network assets over the time they are in use”.¹
 - Price signals: Ofgem stated that extension of asset lives would provide better longer-term pricing signals. The CMA explains that Ofgem’s approach should in theory “result in prices being better aligned to true economic costs, with asset values and annual depreciation both representing economic values (i.e. values that would be consistent with a competitive market)”.²
 - Financeability: Ofgem considered that extending asset lives would “provide for sustainable financeability over the longer-term”, but recognised that in the short term, financeability concerns could arise as revenues decrease.
 - At RIIO-ED1 Ofgem therefore decided on an interim arrangement to improve financeability. Under this arrangement, asset lives increased from 20 to 45 years in equal steps over the eight years of RIIO-ED1.³
 - Uncertainty around useful economic life: Ofgem considered that using 45 years created a safety margin against any future reduction in average asset lives due to the increased prevalence of short-lived assets.⁴

Sources:

1. Ofgem (17 December 2010) Consultation on strategy for the next transmission and gas distribution price controls - RIIO-T1 and GD1 Financial issues, para 2.2.
2. CEPA, Sinclair Knight Merz (SKM) and GL Noble Denton (December 2010), The Economic Lives of Energy Network Assets, p. 3.
3. CEPA, Sinclair Knight Merz (SKM) and GL Noble Denton (December 2010), The Economic Lives of Energy Network Assets, p. 41.

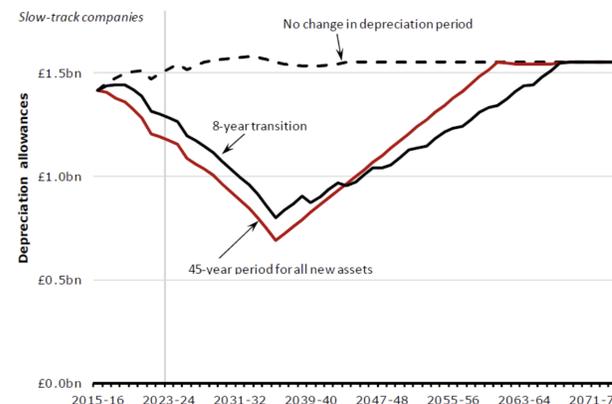
Sources:

1. Ofgem (17 December 2010) Consultation on strategy for the next transmission and gas distribution price controls - RIIO-T1 and GD1 Financial issues, para 2.2.
2. CMA (29 September 2015), BGT v GEMA – Final Determination, para 7.2.
3. Ofgem (30 July 2014), RIIO-ED1: Draft determinations consultation for the slow-track electricity distribution companies, para 3.52.
4. Ofgem (31 March 2011), Decision on strategy for the next transmission price control - RIIO-T1, para 2.24.

Ofgem's change to 45-year asset lives resulted in a "depreciation holiday", with lower charges over ED1+ and higher charges post 2050, only minimally offset by transitional arrangements

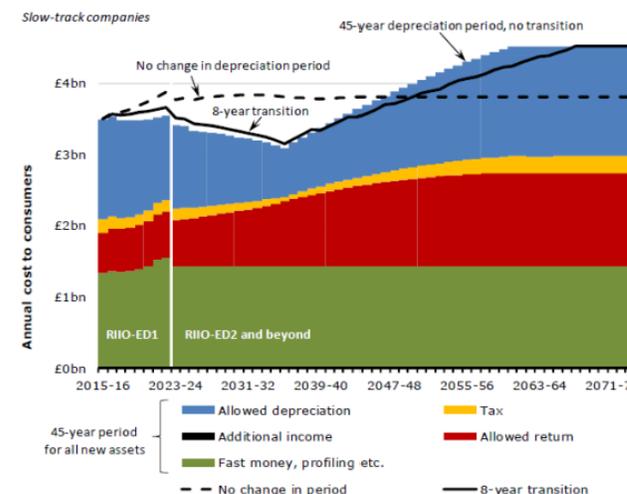
- The change from a 20-year to a 45-year asset life created a "depreciation holiday", as illustrated in the evidence submitted to the CMA as part of the British Gas Trading (BGT) appeal of RIIO-ED1.
 - For ED1, Ofgem allowed 20-year asset life for existing assets and 45-year asset life for new assets from RIIO-1.
 - By way of example, in year 21 of the new regime (i.e. 2036), all existing assets with a 20-year depreciation life would have been fully depreciated and the depreciation charge will comprise 20 years of new assets with a 45-year life.
 - In 2036, the depreciation charge will be only 20/45 relative to no change to the policy, creating a trough in the depreciation charge (see top Figure).
 - It is only 45-years after the end of ED1 (i.e. late 2060s) that the depreciation charge will return to the level if Ofgem had not implemented a change.
 - The transitional arrangements allowed by Ofgem – whereby the depreciation asset life was extended from 20 to 45 years in equal steps over the 8 years – only partially mitigate the effects of the transition (see top Figure).
- At appeal, Ofgem also provided evidence on the effect on charges: the depreciation holiday would result in a fall in DNO revenues in the coming price control periods offset by an increase in the longer term, as asset values increased due to slower depreciation (see bottom Figure).

Figure 7: GEMA's analysis of the long-term effects on depreciation of the change in asset lives



Source: First witness statement of Ian Rowson.

Figure 8: GEMA's analysis of the long-term effects on revenues of the change in asset lives



Source for Figures:
CMA (2015) BGT vs GEMA, Final determination, pp 125, 127-128.

Ofgem acknowledges that the RIIO-1 depn policy fails on its own criteria. It creates intergenerational *inequity* – “a deep valley of depreciation” and “risk to financeability” followed by a “material increase in asset value”.

- BGT appealed the RIIO-ED1 decision on the basis that the full change to 45-year asset life should be introduced, without the step increase over time (or transitional arrangements), as this would lower customer charges. The CMA upheld the Ofgem decision on transitional arrangements
- The adoption of 45-year asset life for new assets was not itself subject to appeal. However, the CMA decision makes clear that Ofgem (and the CMA) considered that the policy should be revisited given the effect on customer charges as well as financeability issues.
 - For example, CMA quotes Ofgem as saying that:²
 - *“It was becoming clearer to us [Ofgem] that it would not be in the consumer interest to [...] dive headlong into this deep valley of depreciation.”*
 - CMA further comments:²
 - *“[Ofgem’s analysis] demonstrated that there would be a sharp decline in revenues over ED2 and ED3. GEMA stated that it had concluded that there was a risk to financeability in the medium term [...].”*
- The CMA concludes:³
 - *“[...] there are some legitimate concerns about the underlying 45-year asset life policy and the rationale for it. This was brought into question by both the analysis within GEMA’s witness statement and also the oral hearing evidence. The change in asset life would potentially put companies under significant financial strain in the intervening periods, following by a material increase in equity and asset value.”*
- Given the “significant disadvantages with the policy”, the CMA decision makes it clear Ofgem intended to review the policy prior to ED2.⁴
- Although Ofgem and CMA acknowledge that the RIIO-1 policy fails on its own criteria, and Ofgem committed to a review prior to ED2, the review did not take place.

Sources:

1. CMA (2015) BGT vs GEMA, Final determination, p 130, para 7.32.
2. CMA (2015) BGT vs GEMA, Final determination, p 130, para 7.31.
3. CMA (2015) BGT vs GEMA, Final determination, p 133, para 7.47.
4. CMA (2015) BGT vs GEMA, Final determination, p 133, para 7.48&7.49.

3

Illustrative modelling of depreciation under-recovery for ED3 and beyond

What is the level of under-recovery for a notional DNO in ED3 and beyond if RIIO-1 depreciation rules remain in place?

Key assumptions for illustrative modelling of DNO revenues over ED3 and beyond

- To assess the implications of continuing with the existing RIIO depreciation policy, we constructed a simplified model for calculating allowed revenues for a notional DNO under illustrative assumptions for ED3 up to ED16 (2098).
- The model assumptions do not represent the view of ENA members and serve for illustrating the issues with the existing RIIO depreciation policy.
- The results presented in this report are for a hypothetical notional DNO and may not apply to any actual DNO's circumstances.

Category	Modelling Assumption
Historical RAV additions	Average of historical RAV additions across all 14 DNOs, taken from July 24 ED2 PCFM. For pre-vesting (pre-1991) capex, we solve for a historical spend profile which is consistent with 1991 opening RAV levels.
ED3+ totex and capitalisation rate projections	Informed by projections of totex and capitalisation rates from ENA members. Illustrative modelling assumes the following totex levels (expressed as multiple of ED2 average actual totex): 1.3x ED3, 1.4x ED4, 1.3x ED5, 1.2x ED6 and 1.1x ED7+. Illustrative capitalisation rates start at 75% in 2029, slightly increasing to 76% around 2033, falling to 72% in 2049.
Allowed return and notional financial structure	Allowed return on equity of 5.4% (real CPIH) and on debt of 3.6% (real CPIH), in line with mid-point of Ofgem's SSMD for RIIO-T3/GD3. Notional gearing of 60% and ILD share of 25%, as per ED2.
Other allowed revenue items	Assume pass through stays constant in real terms in line with ED2 levels (average for all 14 DNOs), taken from July 24 ED2 PCFM. Assume all other revenue elements (incentives, taxes etc.) are zero for simplicity.
Customer bill modelling	Calculated as total domestic revenues divided by number of domestic connections (average HH bill) and by average annual electricity consumption (per kWh price). Domestic revenues modelled based on current allocation %s and assuming all incremental revenues associated with totex growth for ED3+ are allocated to domestic customers. Connections projections based on the 2025/26 CDCM for current levels and the latest (i.e. 2018) ONS household growth projections for growth rates. Annual electricity consumption of domestic sector taken from FES 2024 Holistic Transition scenario.

Our approach to modelling the depreciation under-recovery in ED3 and beyond considers a number of illustrative “benchmarks” against which under-recovery is measured

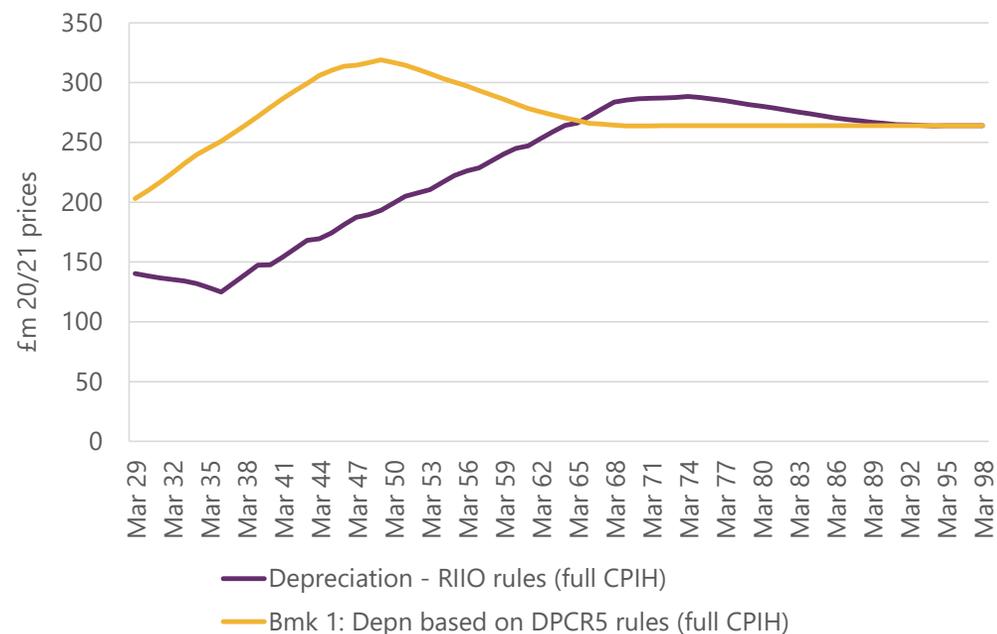
- The depreciation under-recovery or “depreciation holiday” exists as depreciation of pre-RIIO RAV additions based on a 20-year asset life falls out of allowed revenues, but depreciation of RIIO RAV additions based on 45 years is not yet fully built up (as explained on page 9).
- We assess the extent of depreciation under-recovery under the RIIO rules relative to three illustrative benchmarks:
 1. DPCR5 policy (“Bmk 1”): First, we compare depreciation assuming a continuation of existing RIIO rules (“depreciation under RIIO rules”) with depreciation calculated assuming a continuation of the rules applied in DPCR5, i.e. 20-year asset life.
 - Asset life assumption is generally irrelevant for the purpose of calculating the depn charge in steady state.* But in an environment of growing totex, there is a risk that a 20-year asset life is shorter than the useful economic life and therefore should not be applied to incremental capex associated with energy transition. To remove this effect, we also calculate depn under-recovery assuming no capex growth after ED1 (removing the impact of energy transition).
 - Assuming DPCR5 policy continuation is a useful starting point, as it eliminates the “depreciation holiday” introduced by the RIIO-1 policy change by design.
 2. Economic depreciation proxy (“Bmk 2”): Second, we compare depreciation under RIIO rules with a proxy for capital consumption, i.e. an economic depreciation charge.
 - We proxy the economic depreciation charge by applying a 45-year asset life to all historical capex and assuming a straight-line profile, as per Ofgem’s RIIO assumption.
 - The true economic depreciation charge is uncertain, in terms of the asset life, depreciation profile, and to what extent if at all it should be indexed. We illustrate some of this uncertainty by modelling a 10-year sensitivity around Ofgem’s 45-year asset life assumption.
 3. Capex (“Bmk 3”): Third, we compare depreciation under RIIO rules with capex over time.
 - We look at depreciation relative to capex, as capex provides an alternative proxy for economic depreciation or capital consumption, without having to make explicit assumptions about asset lives, depreciation profile or indexation. We should expect depreciation to broadly track capex over long periods of time, if depreciation is a good measure of capital consumption.
- For the purpose of our calculations of depn under-recovery, we assume full CPIH indexation of the RAV when calculating the depreciaton under RIIO rules as well as for all the illustrative benchmarks. We consider the impact of semi-nominal in the next section.

Note: *The specific asset life assumption does not make any difference to the depreciation charge when a DNO is in steady state, i.e. when capex is constant over time. This is because n years of identical historical capex values are depreciated using an asset life equal to n, which results in depreciation always being equal to the capex itself in steady state.

Bmk 1: Using “DPCR5 policy” as a benchmark, we calculate a notional DNO would under-recover depreciation by £2.1bn (20/21 prices) over ED3 and beyond, if RIIO depn rules remain unchanged. Under-recovery calculation considers only “steady state” capex, removing the impact of energy transition.

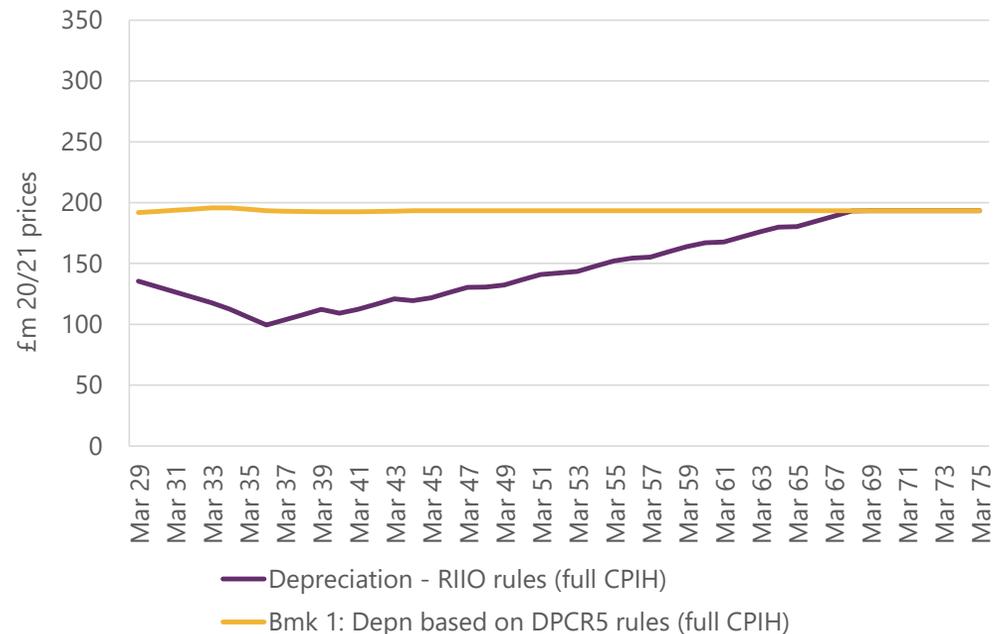
A notional DNO under-recovers depn by £3.0bn (20/21 prices)* when measured against “DPCR5 policy” benchmark,** if full totex projections are used

- Part of our depn under-recovery estimate is driven by incremental totex associated with energy transition, for which 20Y asset life (assumed for the bmk) may be too short. The £3.0bn estimate therefore likely overstates the impact of the “depn holiday” introduced at RIIO-1.



Removing totex growth after ED1 to remove effect of energy transition, we calculate under-recovery of £2.1bn (20/21)* prices for a notional DNO

- To remove effect of totex ramp-up in energy transition, we calculate under-recovery by assuming totex after ED1 is held constant at ED1 levels. This brings us close to a “steady state” scenario, where the asset life assumption is irrelevant and the DPCR5 policy provides a proxy for economic depn benchmark.



Notes:

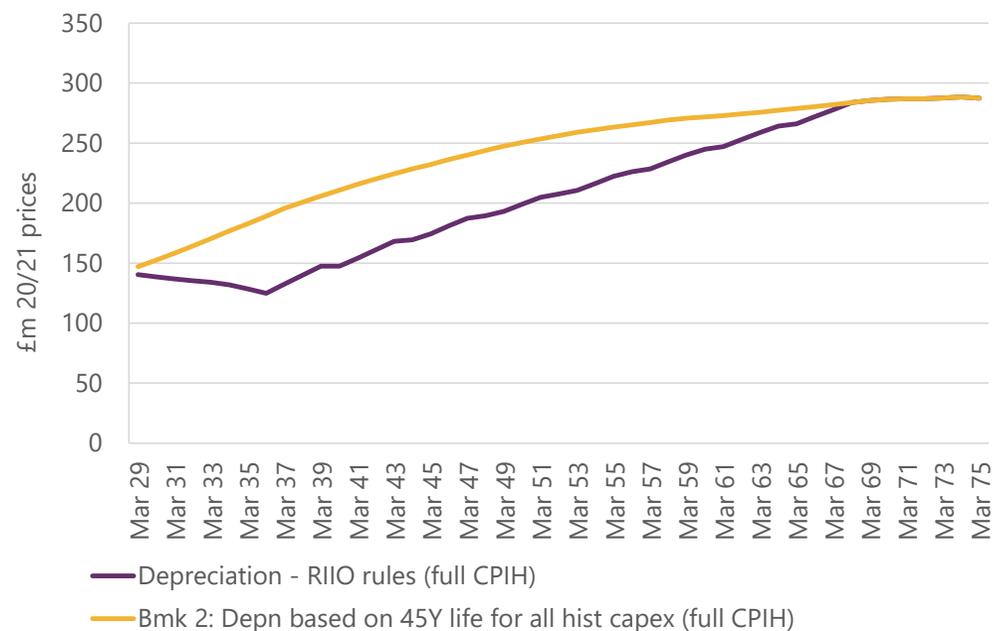
* The estimates only include under-recovery in ED3 and beyond and do not reflect any under-recovery from ED1 and ED2.

** The depreciation for the “DPCR5 policy” benchmark is calculated by applying the DPCR5 rules to all historical RAV additions from ED3 onwards, i.e. a 20-year asset life applied to all historical (and future) Rav additions from ED3 onwards.



Bmk 2: Using 45Y straight line depn applied to all historical capex (proxy for economic depn charge) as a benchmark, a notional DNO would under-recover depreciation by £1.6bn (20/21 prices) over ED3 and beyond, if RIIO depn rules remain unchanged

A notional DNO under-recovers depn by £1.6bn (20/21 prices)* when measured against benchmark based on 45Y applied to all historical capex**



- We calculate the proxy for the economic depreciation charge by applying a 45-year asset life and straight-line depreciation to all historical capex.*** The calculation requires us to assume historical capex prior to 1991, which we derive based on 1991 opening RAV and an assumed MEAV discount.
 - Assumptions for pre-1991 capex/MEAV discount are not a material driver of our results, given the pre-1991 capex falls out of the benchmark depreciation charge in the early 2030s (i.e. 45 years after 1991).
- We also consider a 10-year sensitivity around the 45-year asset life assumption (i.e. applying straight line depreciation between 35 and 55 years to all historical capex). This sensitivity shows a notional DNO would under-recover depn by £0.7-2.3bn (20/21 prices).
- Our estimate of the depreciation under-recovery is not particularly sensitive to assumptions around future totex (e.g. if we assume totex stays constant at ED2 levels, under-recovery becomes £0.9–2.1bn (20/21 prices) for straight line depreciation between 35 and 55 years applied to all historical capex).
 - Our under-recovery estimate is independent of totex assumptions for ED2 onwards under the 45-year life assumption, as depn under RIIO rules as well as our proxy of the economic depn charge both apply a 45-year asset life to RAV additions over this period.

Notes:

* The estimate only includes under-recovery in ED3 and beyond and does not reflect any under-recovery from ED1 and ED2.

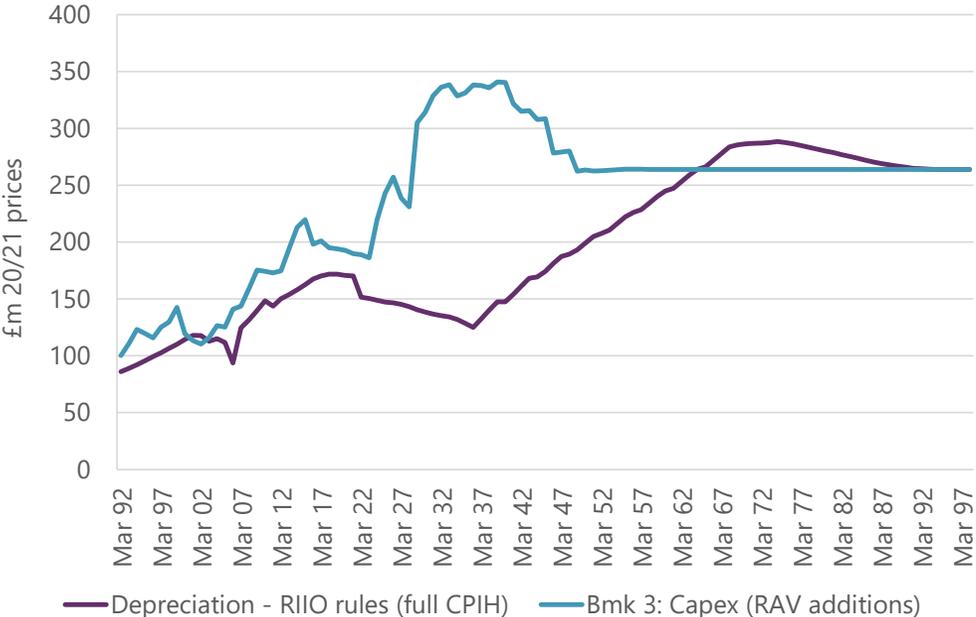
** The depn under RIIO rules (purple line) and our economic depn proxy calculated based on 45Y asset life applied to all historical capex (yellow line) have broadly similar values in the first year of ED3. This is coincidental and not by design (and indeed is not the case for the other two benchmarks).

*** Applying a 45-year asset life to all historical capex, including to capex that has “already been depreciated”, would not lead to the notional DNO over-recovering depreciation (or over-recovering twice). Generally, depreciation can be calculated under any approach, and this would not constitute a double count, as long as this depreciation is deducted from the opening RAV accumulated to date.

Bmk 3: If a good measure of capital consumption, depn charge should broadly reflect capex over long time periods. Prior to RIIO-1, depn charge broadly reflected capex, but then falls below. Gap is £2.1bn (20/21 prices) measured against capex held constant at ED1 level (to remove totex step-up from energy transition).

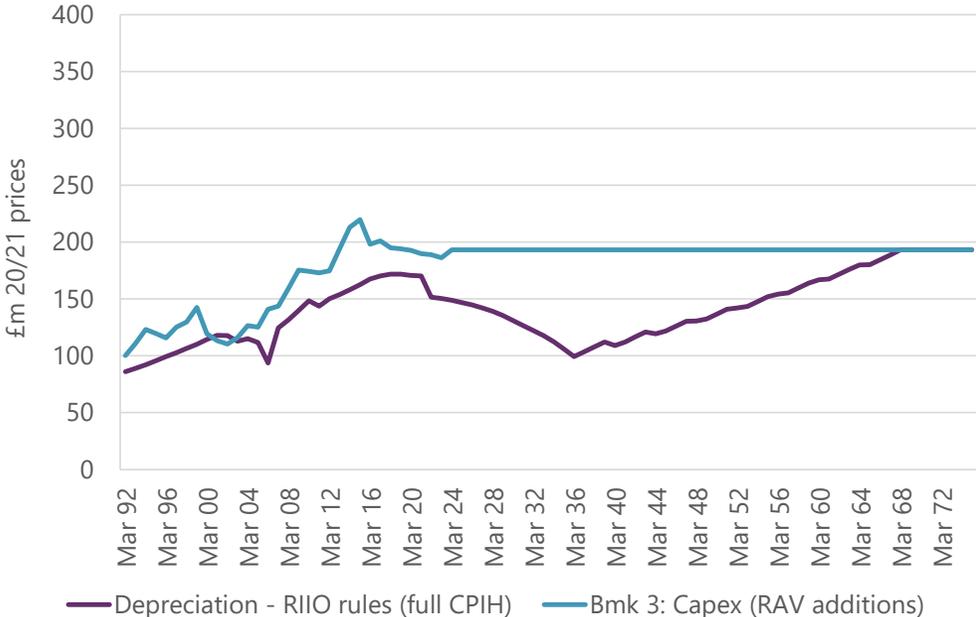
Depn broadly reflected capex prior to RIIO-1, suggesting pre-RIIO depreciation charges broadly in line with capital consumption. Then falls below, revealing "depreciation holiday" gap.

- The comparison of capex and depn after ED1 is part affected by the assumed growth in totex associated with energy transition, and would therefore overstate the magnitude of the depreciation under-recovery.



Assuming totex is held constant at ED1 levels to remove effect of energy transition, the "depn holiday" gap is £2.1bn (20/21 prices)*

- To remove the effect of totex ramp-up in energy transition, we compare depn under RIIO rules to capex by assuming totex after ED1 is held constant at ED1 levels. This brings us close to a "steady state" scenario, where the comparison of depn and capex can provide a direct estimate of the depreciation under-recovery.



Note: * The estimate only includes under-recovery in ED3 and beyond and does not reflect any under-recovery from ED1 and ED2.

Conclusion: The change in depn policy at RIIO-1 results in substantial depreciation under-recovery in the region of £2bn (20/21 prices) for a notional DNO over the period ED3 up to late 2060s. The “depreciation holiday” for customers over this period comes at the expense of future customers.

- Our calculations show that the change in asset lives in RIIO-1 from 20 to 45 years had the effect of materially reducing depreciation charges over the period ED3 up to around late 2060s relative to all benchmarks considered:
 - When measured against depn charges calculated under the previous DPCR5 depn rules and assuming totex after ED1 is held constant at ED1 levels to remove the effect of totex ramp-up in energy transition (“steady state” proxy), we calculate depreciation under-recovery of £2.1bn (20/21 prices) for a notional DNO under RIIO depn rules.
 - When measured against our proxy for the economic depreciation charge, 45Y straight line (same as Ofgem RIIO assumptions) depn applied to all historical capex, we calculate under-recovery of £1.6bn (20/21 prices) for a notional DNO under RIIO depn rules.
 - When compared to capex and assuming totex after ED1 is held constant at ED1 levels to remove the effect of totex ramp-up in energy transition (“steady state” proxy), we calculate depreciation under-recovery of £2.1bn (20/21 prices) for a notional DNO under RIIO depn rules.
- Although there is uncertainty around the magnitude of depreciation under-recovery arising from RIIO-1 policy change, given the true economic depreciation charge is uncertain, our range of benchmarks as set out above all point to under-recovery in the region of £2bn (20/21 prices) over the period ED3 up until the late 2060s.
- In principle, material depreciation under-recovery should be expected, given the change in depreciation policy means that the depreciation of pre-RIIO assets fully falls out of allowed revenues after 20 years, but the depreciation of RIIO assets under the longer 45-year rule does not fully build up until the late 2060s.
- As a result of the depreciation holiday, customers over the period ED3 to the late 2060s will not pay the full economic depreciation if the RIIO rules remain in place, at the expense of future customers.
 - Our comparison of capex and depreciation for the period since privatisation until the start of RIIO reveals depn broadly tracked capex over time, which indicates that prior to RIIO, customers broadly paid depn charges in line with the underlying level of capital consumption. The depreciation holiday introduced at RIIO-1 therefore comes at the expense of future customers.

4

Illustrative modelling of impact of depreciation under-recovery for ED3 and beyond

What is the impact on allowed revenues, financeability and bills of the depreciation under-recovery for a notional DNO in ED3 and beyond?

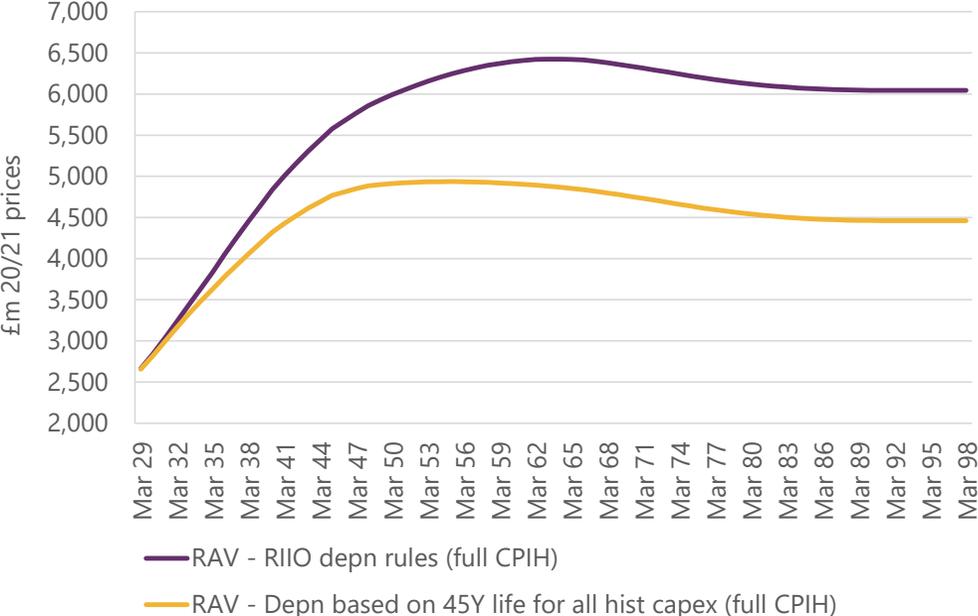
Overview of impact on RAV, allowed revenues, financeability and customer bills of the depreciation under-recovery if the RIIO depreciation policy continues unchanged in ED3 and beyond

- In the previous section, we explained that a notional DNO under-recovers depreciation by around £2bn (20/21 prices) over ED3 until late 2060s under the RIIO depreciation policy. This is a material depreciation gap, when compared to projected ED2 closing RAV of £2.5bn (20/21 prices, average across all DNOs).
- In this section, we explain that if this depreciation gap is not addressed and the RIIO depreciation policy continues unchanged in ED3 and beyond, then:
 - Depreciation under-recovery translates 1:1 into a permanent increase in RAV over time. This permanently increases allowed returns over time.
 - Current customers receive a “discount” on network charges while the depreciation under-recovery outweighs the increase in allowed returns. But future customers pay the cost of this discount, as the depn under-recovery amount remains embedded in the RAV forever.
 - Credit ratios (FFO-based) suffer in the short term due to the drop in depreciation which reduces cash flows. Ratios remain weaker forever as a result of the permanent increase in RAV.
- This creates issues with: inter-generational equity (future customers bear the cost of current service provision), financeability (ratios are weaker in both the short and long term), and long-term affordability (bills are higher in the long run which puts even greater pressure on affordability in the context of energy transition).
- In the following slides, we quantify the impact on RAV, allowed revenues, ratios and bills of continuing the current RIIO depreciation policy versus what RAV, allowed revenues, ratios and bills would be if the depreciation gap was closed and customers paid full economic depreciation from ED3 onwards.
 - To illustrate the effects, we use the proxy of economic depreciation which applies a straight line 45-year asset life to all historical capex (this matches Ofgem’s RIIO assumptions on asset life and speed of recovery, although we note that the true economic depn is uncertain).
 - We also show how the effect of the “depreciation holiday” would be impacted by the adoption of semi-nominal WACC/indexation at ED3.

If RIIO depn policy unchanged, the depreciation under-recovery of around £2bn (20/21 prices) will directly translate into a permanent increase in RAV and allowed returns over time, relative to scenario where economic depreciation is applied in ED3+

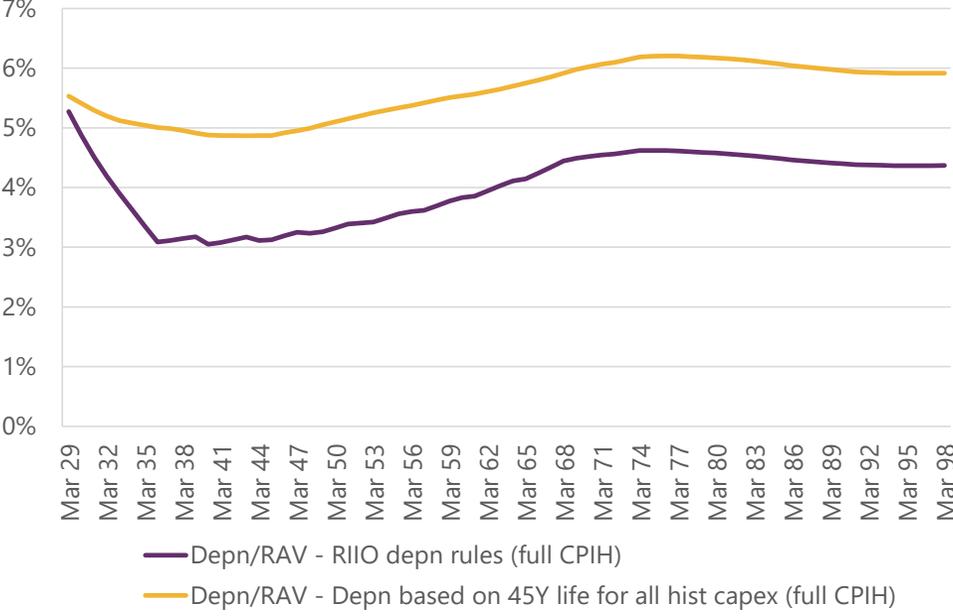
If current RIIO depn policy continues, the depreciation under-recovery translates 1:1 into a permanent increase in RAV and a higher allowed return over time as a result

- Even after depn under RIIO rules fully builds up in the late 2060s under the 45Y rule (see slide 15), the stock of historical under-recovery that has accumulated up until then (approx. £2bn in 20/21 prices) will remain permanently embedded in the RAV.



The permanent increase in RAV under RIIO depn rules depresses the Depn/RAV ratio over ED3 and in the long run, with negative impact on composition of allowed revenues and ratios

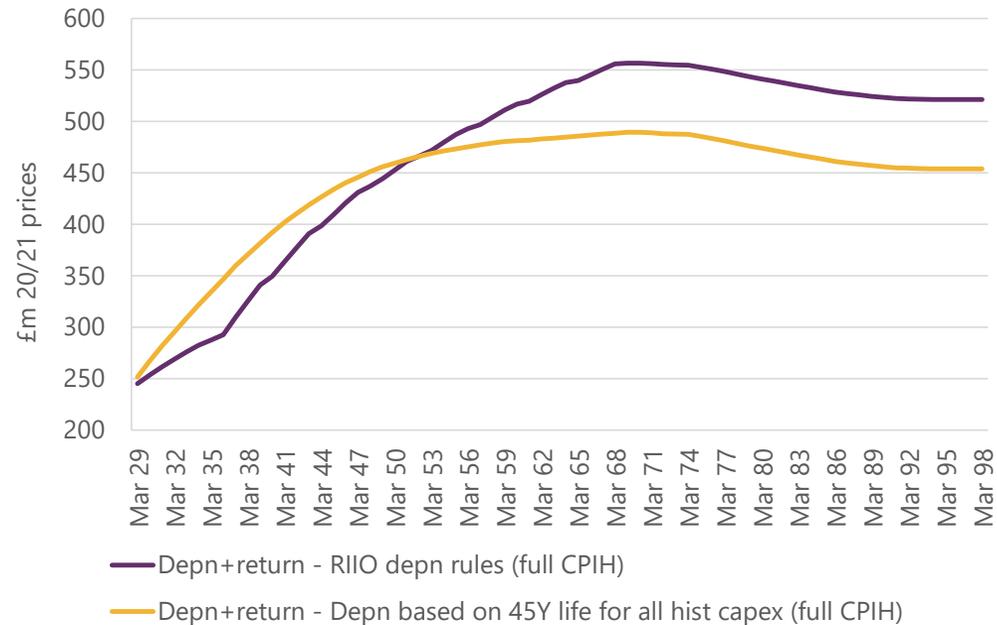
- The Depn/RAV ratio is depressed not only during the “depn holiday” period (due to lower depn) but also after depn under RIIO rules fully builds up under the 45Y rule in the late 2060s (due to the permanent increase in RAV). This has important implications for the composition of allowed revenues (increase in allowed return component) as well as credit ratios (FFO-based ratios permanently weakened), as we discuss in detail on slides 22 and 25.



Note: On slide 15, we show that the RIIO depreciation lies below the economic depn charge, as proxied by 45-year asset life, from ED3 to late 2060s– i.e. the depreciation holiday. The respective depreciation charges are subtracted from opening RIIO-ED3 RAV, and therefore mathematically the RAV under RIIO rules remains higher by the amount of the depreciation holiday (as per Figure above).

Under RIIO depn rules, current customers receive a “discount” on network charges due to “depn holiday”, but future customers (from around 2050) pay higher charges forever as a result of the associated increase in RAV and allowed return, relative to scenario where economic depreciation is applied in ED3+

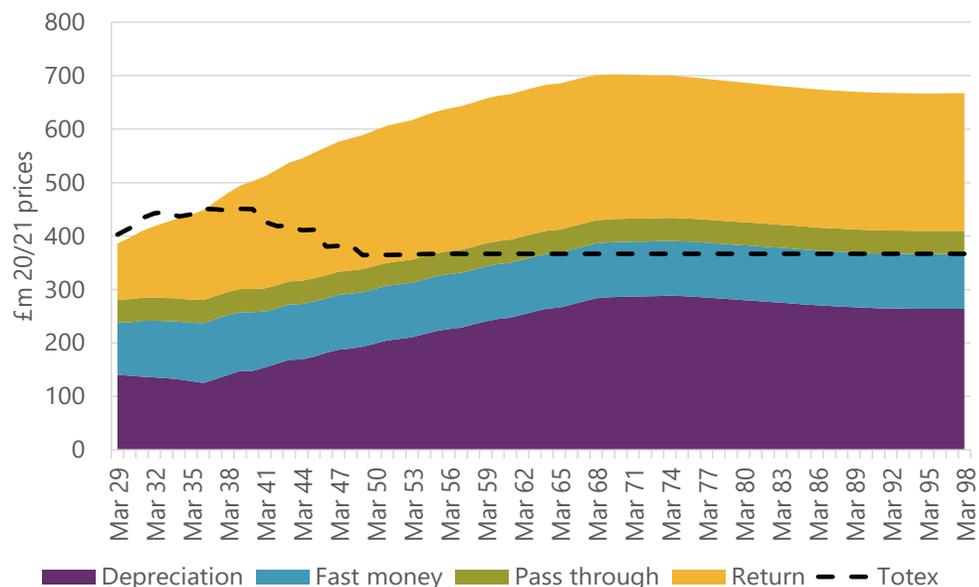
Under RIIO depn rules, at first customers pay lower charges due to “depn holiday”, but from 2050s the higher RAV and return element dominates and charges are higher



- We proxy network charges by considering the depreciation and allowed return components together, which are the two components affected by the depreciation policy.
- At first, lower depreciation under the RIIO depn rules outweighs the increase in returns from increasing RAV, resulting in lower network charges compared to charges based on our proxy for economic depreciation applied in ED3+.
- Around 2050, the effect reverses and the increase in return dominates, increasing network charges above those based on economic depreciation.
- Given RAV remains higher forever by the amount of accumulated depreciation under-recovery, network charges remain higher forever compared to charges based on economic depreciation.

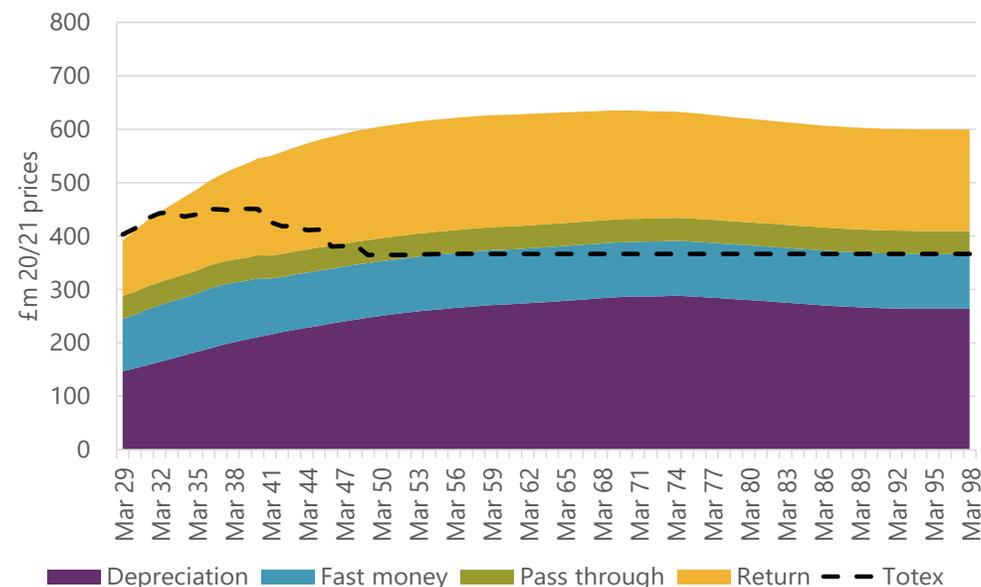
DNO revenues under RIIO depn rules grow materially after 2050 due to the effect of the “depn holiday”. The sustained long-term increase in the return element – dividends and debt interest costs – may create issues of political acceptability

Allowed revenues and composition under RIIO depreciation rules and full CPIH indexation



- Allowed revenues under RIIO depn rules increase materially after 2050, due to depn slowly building up under the new 45-year asset life and RAV/returns increasing due to accumulated historical under-recovery.
- The sustained increase in the allowed return component of revenues as a % of revenues may create issues of political acceptability.

Allowed revenues and composition assuming economic depreciation is applied in ED3+ and full CPIH indexation

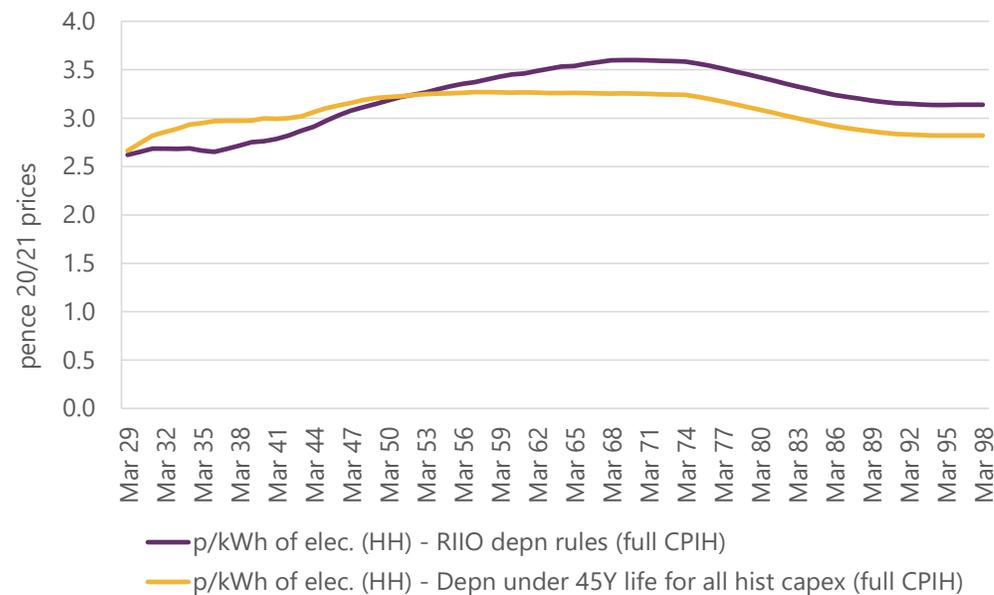
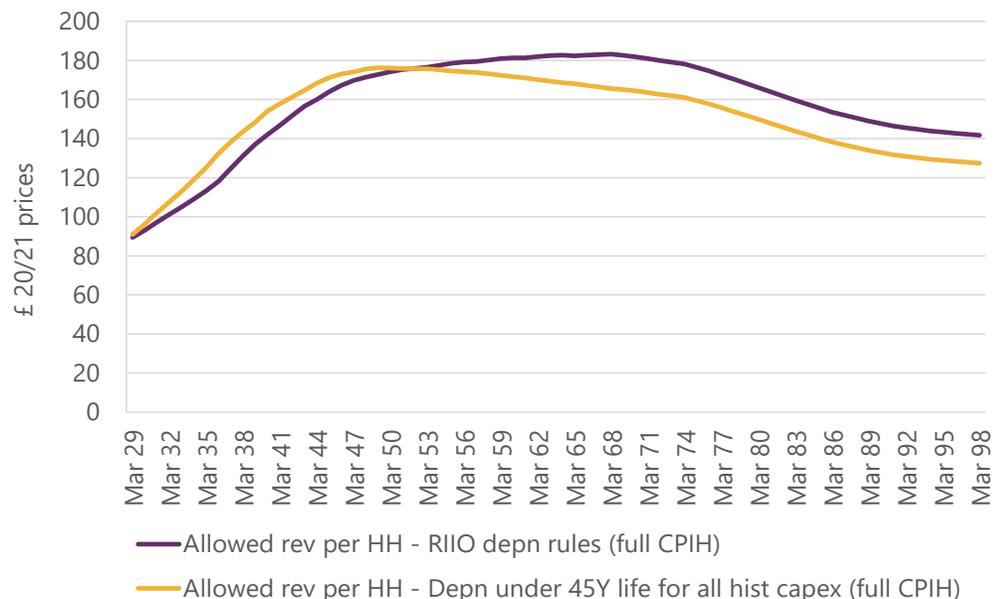


- If customers pay economic depn from ED3 onwards and the depreciation holiday gap is closed, revenue increases post 2050 are relatively modest.
- The return element also remains a relatively constant and smaller proportion of allowed revenues.

Under RIIO depn rules, current customers receive a “discount” on their bills, with future customers paying for this discount in the form of permanently higher charges, relative to scenario where economic depn is applied in ED3+. The “depn holiday” negatively contributes to LT bill affordability pressures from energy transition.

Under RIIO depn rules, allowed revenue per domestic connection is lower in short run, but increases in the long-run by ca. 10% compared to where our proxy for economic depn is applied in ED3+

Per unit electricity charges follow the same profile: lower in the short run but increasing by approx. 11% compared to scenario where economic depn is applied in ED3+



- Our illustrative modelling of domestic bills depends on two critical assumptions: i) the cost and profile of energy transition and ii) our assumption that all incremental cost of transition (relative to ED2 totex levels) are allocated to the domestic sector. The above charts therefore merely illustrate the likely incremental impact of continuing the RIIO depn policy relative to the scenario where economic depreciation is applied in ED3+.

Using Green Book methodology, we estimate a real cost to customers of around £200-500 million for the notional DNO from the deferral of depreciation under RIIO policy

- The RIIO depreciation rules involve a deferral of depreciation or “depreciation holiday” of around £2bn for the notional DNO (see slide 17), which leads to a permanently higher RAV over time, and higher customer charges given the higher $WACC \times RAV$ return component of charges (see slide 21).
- Not only does the RIIO depreciation policy result in unreasonably higher charges to future customers, the policy also results in a real cost to customers, following the Green Book guidance published by HMT for the appraisal of public policy on social or customer welfare.¹
- The Green Book requires the use of a social time preference rate (STPR) of 3.5% to be used in all public sector appraisals (declining to 3.0% after 30 years and 2.5% after 75 years). The guidance explains that the use of STPR contrasts with the private sector discount rate, typically based on the weighted average cost of capital (WACC), which incorporates allowances for the cost of raising capital and compensation for risk.² For example, in our modelling we have assumed a WACC of 4.35% real CPIH, based on Ofgem’s SSMD for T3.
- The lower STPR means that customers prefer to pay depreciation charges today rather than deferring them into the future via a higher RAV, at the cost of $WACC \times RAV$ return.
- We have calculated the cost of RIIO depreciation relative to our benchmarks of retaining 20-year depreciation charge and a 45-year depreciation charge for all historical capex. Drawing on these counterfactuals, we estimate a cost to customers of a notional DNO of around £200 million (cost of RIIO depn relative to 45Y rule) to £500 million (cost of RIIO relative to retaining 20Y life) in present value terms (20/21 prices) or around £5-11.5 per domestic customer (PV, 20/21 prices).*

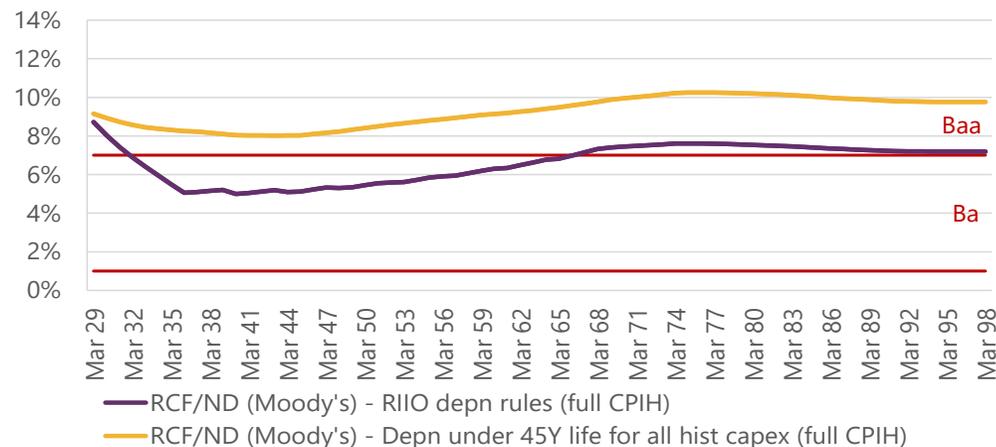
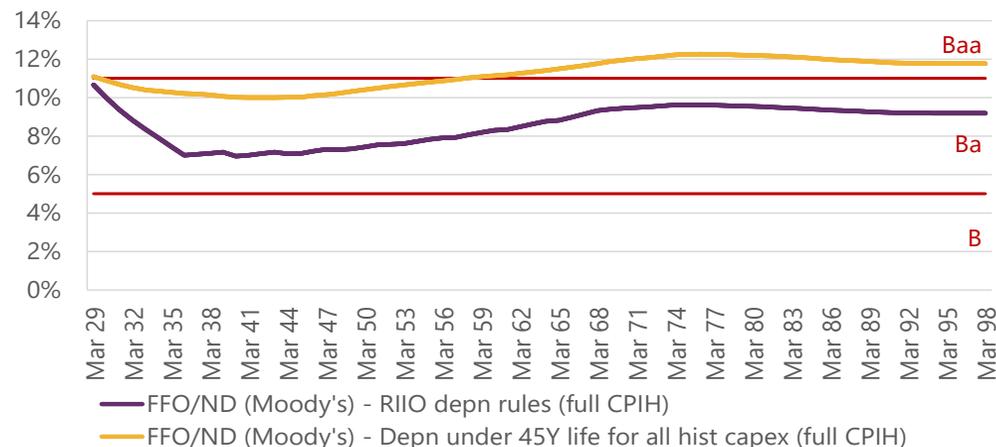
Note: * In this analysis, we do not hold capex constant at ED1 levels but instead consider the full totex projections associated with energy transition. The difference in the estimates of cost to consumers for the two benchmarks therefore broadly reflects the differences in depreciation under-recovery estimates under RIIO depn rules against these benchmarks (£1.6bn 20/21 prices for 45 years applied to all historical capex and £3.0bn 20/21 prices for 20 years applied to all historical capex).

Sources:

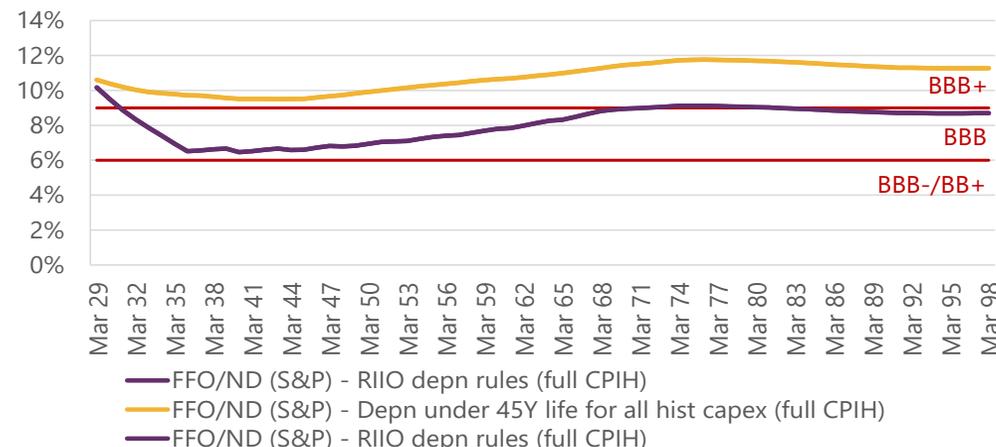
1. HMT (2022) The Green Book.
2. HMT (2022) The Green Book, para A6.2.

Under RIIO depn rules, financeability is negatively impacted by the “depn holiday”, with FFO-based ratios falling by up to 320 bps during “depn holiday” period and by 260 bps in the long run, relative to scenario where economic depn is applied in ED3+

Under RIIO depn rules, two Moody’s ratios (FFO/debt & RCF/debt) decrease by up to 320 bps during “depn holiday” and by 260 bps in long run compared to scen where economic depn applied in ED3+



Under RIIO depn rules, S&P’s key ratio FFO/debt also decreases by up to 320 bps during “depn holiday” period and by 260 bps in long run, compared to scen where economic depn applied in ED3+

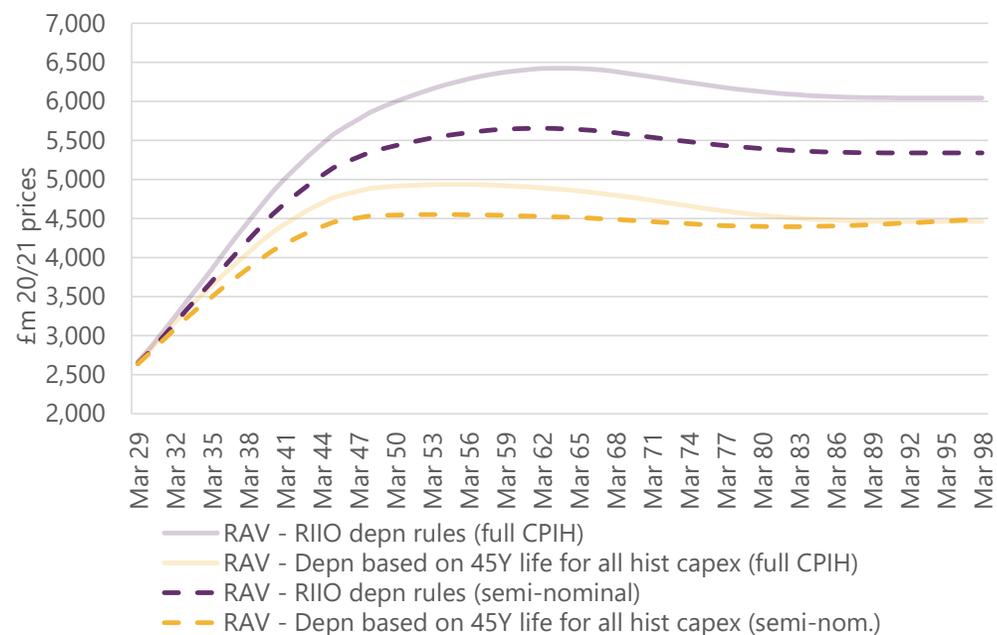


- We focus on the incremental impact of “depn holiday” on ratios, rather than absolute levels, which depend on other regulatory assumptions which are not yet known (e.g. allowed return).
- Ratios deteriorate during “depn holiday” period as a result of loss of cash-flows from lower depn allowance under RIIO rules. Ratios remain depressed even after depn fully builds up under the 45Y rule, due to the increase in RAV. Higher RAV leads to a lower Depn/RAV ratio which in turn depresses FFO/net debt, given FFO broadly calculated as depn+equity return.
- Two of Moody’s credit ratios affected (FFO/debt and RCF/debt, 17.5% combined weight in overall rating), while the remaining two (AICR and gearing, 22.5% combined weight) unaffected. S&P’s key ratio FFO/debt affected.

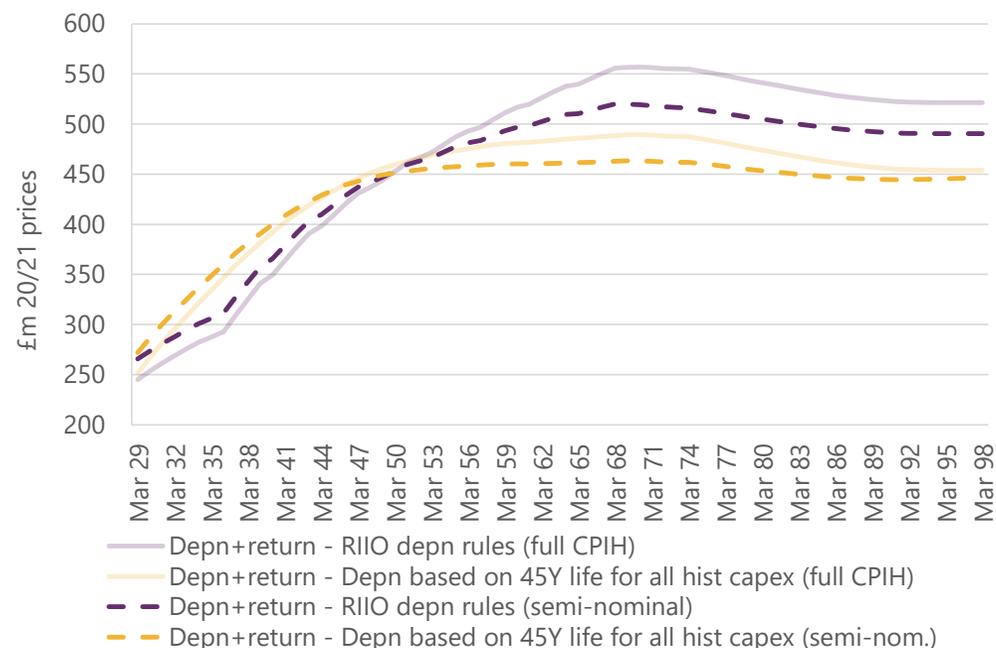


Adopting semi-nominal (S-N) WACC at ED3+ would offset part of the increase in RAV/network charges driven by the RIIO “depn holiday”, closing around half the gap towards RAV/network charges based on econ. depn applied in ED3+. But material “depn holiday” gap remains (and widens if S-N assumed for economic depn bmk).

Adoption of semi-nominal WACC at ED3+ results in lower indexation of RAV over time, which offsets part of the RAV increase associated with the accumulation of depn under-recovery under RIIO rules



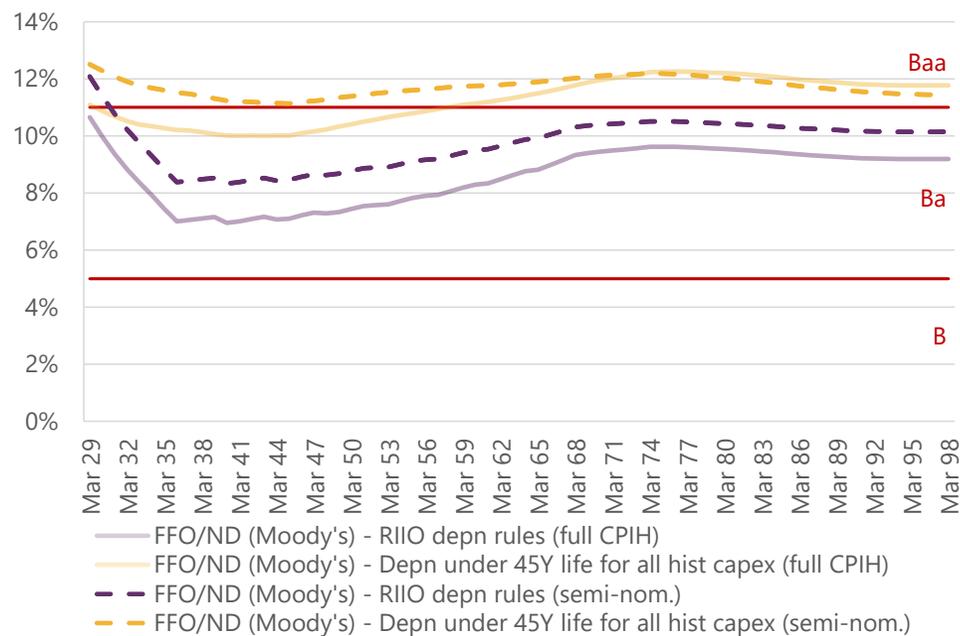
Charges under semi-nominal move closer to those based on economic depn applied in ED3+, but around half of the gap remains. Gap widens even further if S-N also applied to economic depn bmk*



* The RAV/charges calculated using the economic depreciation benchmark proxy (yellow full lines above) would change if semi-nominal indexation was applied, as shown by yellow dashed lines above. This is because under semi-nominal, the RAV is indexed less, reducing RAV growth over time compared to full CPIH indexation. Network charges (proxied by depn+return above) increase at first, due to an immediate increase in allowed return as a result of the unindexed element of the RAV earning a higher nominal return. But subsequent slower RAV growth under semi-nominal leads to network charges eventually falling below the level under CPIH indexation.

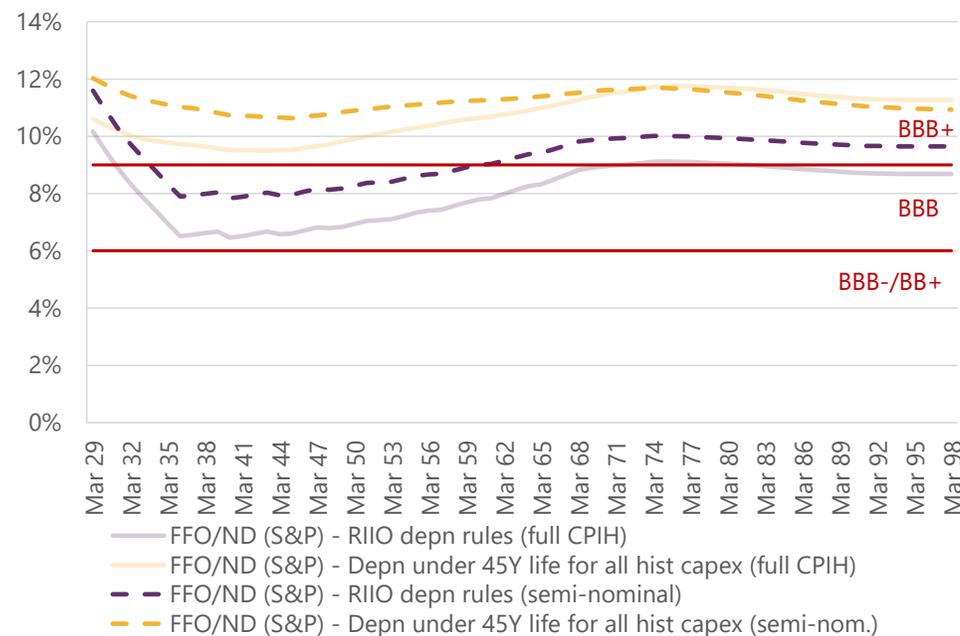
Adopting S-N WACC at ED3+ improves financeability, offsetting part of the deterioration in ratios caused by “depn holiday”. But FFO-based ratios remain depressed by up to 180 bps during “depn holiday” and 160 bps in LR relative to scenario where economic depn is applied in ED3+ (and by more if S-N assumed for benchmark).

Adopting S-N offsets part of the deterioration in Moody’s FFO/debt due to the RIIO “depn holiday”, but FFO/debt remains depressed during “depn holiday” period and in the long-run



- Adopting S-N improves Moody’s FFO/debt by 90-140 bps. But ratio remains depressed by up to 180 bps during “depn holiday” and 160 bps in the long run relative to when economic depreciation is applied in ED3+ (gap increases up to 310 bps during “depn holiday” if S-N indexation assumed also for the economic depn benchmark). Similar incremental impact on RCF/debt. S-N also improves Moody’s AICR (by around 0.3), which is otherwise unaffected by depn policy.

S&P FFO/debt shows similar evolution as Moody’s FFO/debt: part of the deterioration caused by RIIO “depn holiday” is offset, but sizeable gap remains



- Similarly, S-N indexation improves S&P FFO/debt by 90-140 bps. But ratio remains depressed by up to 180 bps during “depn holiday” and 160 bps in the long run relative to scenario where economic depreciation is applied in ED3+ (gap increases up to 310 bps during “depn holiday” if S-N indexation assumed also for the economic depn benchmark).



Conclusion: Continuing with RIIO depn rules at ED3+ has negative implications for intergenerational equity, financeability and LT affordability. Adopting semi-nominal at ED3+ offsets at most half of the “depn holiday” gap. Other policy changes needed at ED3 to accelerate depreciation and close gap.

- Our calculations show that if current RIIO depreciation policy continues unchanged at ED3, the associated “depreciation holiday” gap of around £2bn (20/21 prices) will lead to issues with:
 - Intergenerational equity: Current customers receive a “discount” on network charges due to “depn holiday”, but future customers (from around 2050) pay higher charges forever as a result of the associated increase in RAV and allowed return, relative to scenario where economic depn is applied in ED3+. The increase in charges under RIIO depn rules after 2050 – and the increasing importance of the return element in charges – may create issues of political acceptability.
 - LT affordability of charges: We calculate that average HH bills increase by around 10% in the mid-2060s and beyond if RIIO depreciation rules remain in place, compared to the scenario where economic depn is applied in ED3+. The “depn holiday” therefore further accentuates LT bill affordability pressures from energy transition.
 - Financeability: FFO-based ratios (Moody’s FFO/debt and RCF/debt and S&P FFO/debt) deteriorate by up to 320 bps during the “depn holiday” period and by 260 bps in the long run under the RIIO depn policy, relative to scenario where economic depn is applied in ED3+. The pressure on financeability during the “depn holiday” period exacerbates any pressures on financeability from energy transition.
 - Green book: Using Green Book’s social time preference rate (STPR) as the discount rate, customers prefer to pay depreciation charges today rather than deferring them into the future via a higher RAV, at the cost of $WACC \times RAV$ return. We estimate a real cost to customers of around £200-500 million (PV, 20/21 prices) for the notional DNO from the deferral of depreciation under the current RIIO policy.
- The adoption of semi-nominal WACC at ED3+ would offset at most half of the effects of the “depn holiday” gap on RAV/network charges and less than half of the effect on credit metrics. Other policy changes would therefore be needed to accelerate depreciation in ED3 and close the remaining “depn holiday” gap, to ensure intergenerational equity, as well as to support financeability and LT affordability of charges.
 - For example, policy solutions at ED3 could include bringing forward depreciation charges, e.g. through front-loaded profiles such as sum-of-years’-digits or shortening asset lives.

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