

QUANTITATIVE ANALYSIS ON THE FINANCIAL SITUATION OF AN AUSTRIAN GAS TSO

Analysis undertaken for Shell Energy Europe Ltd.

Shell Energy Europe Ltd. approached Frontier Economics Ltd. ("Frontier") seeking support in evaluating the remuneration of the Austrian gas transmission system operators (TSOs) and, more specifically, the Trans Austria Gasleitung GmbH (TAG).

This document presents a summary of our approach and our results. The document is accompanied by a spreadsheet which contains our detailed analysis.

Summary

We consider the profitability of TAG based on its statutory accounts, and future revenue risks.

TAG earns higher returns on Capital Employed (ROCE) than comparable TSOs

We consider TAG's Return on Capital Employed (ROCE)¹ as a measure for its profitability compared to the other Austrian TSO, GasConnect Austria GmbH (GCA), and five other TSOs from Germany, Belgium and the Czech Republic between 2014 and 2018².

We find that

- TAG's average ROCE (ca. 24%) is higher than that of GCA (ca. 18%) for the chosen reference period (2014-2018);
- based on this measure, TAG's and largely also GCA's profitability is above that of Fluxys Belgium SA (Fluxys BE³), Fluxys TENP GmbH (Fluxys TENP), GRTgaz Deutschland GmbH (GRTgaz DE) and NET4GAS Group (NET4Gas) (ca. 8 to 18% for the reference period).

We believe this is at least in part explained by reasons

¹ IRR analysis is usually the preferred method for profitability analysis over ROCE. Due to the limited time available we have used ROCE as a proxy measure. In case of a fuller formal investigation we recommend developing IRR analysis.

² For GCA, Fluxys TENP GmbH and GRTgaz Deutschland GmbH we only use data until 2017 due to a current lack of data for 2018. We do not expect that including data for 2018 would have a substantial impact on the results of the analysis.

³ The analysis considers financial performance of the gas transport business of the company.

- specific to the Austrian gas TSO regulation which (i) permits relatively short regulatory depreciation periods, e.g. 12 years for compressor stations, and (ii) grants TSOs an extra risk premium of 3.5%-points on their pre-tax costs of equity plus an additional individual risk compensation (which is not disclosed for TAG) to compensate them for potential volume risks associated with transits through the Austrian TSO grid; and
- specific to TAG which made investments in the past decade which are now being depreciated regulatorily (see before).

TAG faced very limited volume risk in the 2013 to 2020 regulatory periods (and up to the end of 2022)

TAG in particular may have benefited from the allowed additional risk premium (see above). This is because its actual volume risk in the recent past and up to the end of 2022 (and to a much lesser extent out to 2028) is limited due to the existence of long-term capacity bookings on TAG – so called “ship or pay” contracts. Even if the volume of gas actually transported on the TAG pipeline were to vary and even decline, pre-existing long-term capacity bookings would still ensure that TAG benefits from a steady stream of revenues and profits at least until 2022.

Furthermore, we understand investments in compressor stations constituted most investments by TAG in the more recent past. The regulatory depreciation period of 12 years for compressor stations also implies that TAG will have been able to refinance such investments (undertaken at least up to the end of the year 2011) before long-term contracts start to expire after 2022. The volume risk TAG faces as of 2023 would therefore not affect recovery of capital expenditure for compressors stations built before 2011 (and other infrastructure to the extent it is depreciated until 2022).

There is uncertainty around the actual revenue from the risk premium and individual risk compensation. Based on TAG’s statutory accounts, the risk premium and individual risk compensation for the current regulatory period (2017-20), seems to be worth ca. € 32m per year.⁴ However, due to limited transparency on this in TAG’s accounts, it is not possible to confirm these with certainty. The actual revenues from these risk compensations might be as low as ca. € 16m per year.⁵ Irrespective of this uncertainty, we understand that the revenue resulting from this risk premium and individual risk compensation fully contributed – and is expected to continue to contribute – to TAG’s relatively high profitability as indicated by the ROCE measure before.

Providing more clarity on the performance of TAG is not possible due to a lack of transparency in particular around the risk premium and individual risk compensation (calculation method for both and level of the latter) as well as parameters of regulation (e.g. RAB) for the time up to 2016 (including 2013-16 regulatory period).

⁴ This is based on the accumulation of “free reserve” of ca. € 16m per year in accordance with regulatory requirements as reported in TAG’s financial statements (see TAG 2017 financial statements, Annex 3, page 11/23; TAG 2018 financial statements, Annex 3, page 11/24). Assuming that TAG allocated only 50% of the revenue from the risk premium and individual risk compensation to free reserves (as is stated in the regulatory requirements), total revenues from these should be ca. € 32m per year.

⁵ This is what TAG has accumulated in the “free reserves” with reference to regulatory requirements and hence can be assumed to be the minimum revenue that TAG received from the risk premium and individual risk compensation.

Analysis of TAG's profitability

Methodological background: ROCE as a measure of financial performance

Different measures can be applied to investigate financial performance. Common ones are:

- **IRR (Internal Rate of Return).** IRR is the interest rate at which the net present value of all free operating cash flows (both positive and negative) from a project or investment equal zero. IRR analysis requires a valuation of the investment at the start and at the end of the analysed period.
- **ROCE (Return on Capital Employed).** ROCE is a profitability ratio that measures how efficiently a company can generate profits from its capital employed by comparing net operating profit to capital employed;⁶

The results from ROCE or IRR analysis may be compared against the

- **WACC (Weighted Average Cost of Capital).** The WACC is a calculation of a firm's cost of capital in which each category of capital is proportionately weighted. If ROCE or the IRR exceeds the WACC, then this is an indication that the company has been able to earn a super normal return (over the analysed period).

While IRR analysis is the theoretically preferred approach, ROCE analysis is admissible as a proxy when key information required for IRR analysis (in particular opening and closing valuations of the business) are not readily or reliably available. For practical and data availability reasons we therefore evaluate TAG's financial performance relative to that of other European gas TSOs using ROCE.⁷ This measure allows easy and replicable assessment of a company's (historic) profitability:

- the necessary data is available in statutory accounts (which are approved by independent auditors);
- the calculations do not require the calculation of opening and closing values of assets which may sometimes bias results if these valuations cannot be undertaken reliably;
- when calculated over a reasonably long period of time ROCE provides a sensible indication of how a company performs.

We calculate ROCE for the investigated companies over a period of five to six years (2013-2018, where data for 2018 is not available 2013-2017). We then calculate the average ROCE over our reference period 2014-2018 (or 2014-2017

⁶ There are different ways to calculate ROCE. We calculate it by dividing the Earnings Before Interest and Taxes (EBIT) by the Difference between Total Assets and Short-Term Liabilities (correct for the effects of shareholdings). For more details we refer to Annex 2.

⁷ We note that for the type of analysis to potentially be used in formal proceedings, it may be advisable to refine them and to also develop an IRR analysis. This will require an opening and closing valuation for each of the entities in the analysis.

where data for 2018 is not available).⁸ We also show average ROCE for timeframes starting in 2013 and 2015 as a sensitivity check.⁹

This approach addresses specifics of the ROCE measure which limit its reliability for comparisons in single years or over a short period of time. More specifically:

- ROCE is susceptible to one-off movements in accounts and, in particular, statutory provisions. If in one year a company sets aside provisions, this decreases ROCE in that year. If it in the next year it reverses these provisions it increases ROCE in that year.¹⁰ One-off costs, such as depreciation of goodwill, can also lead to non-representative ROCE in a single year. Other accounting policies such as depreciation policies could further lead to a distortion in ROCE results. We improve comparability between the companies by investigating the longest possible period since the entry-exit regime was introduced in Austria in 2013.
- ROCE can be susceptible to arrangements between related companies where a parent company owns assets used for the operation of the investigated company. The impact of such arrangements on ROCE is ambivalent. For example the mother company (here: GCA before 2014) may own some of the assets and lease them to the company under investigation (here: TAG before 2014). Not owning the pipeline reduces the asset base and thus the denominator for the ROCE calculations of the daughter company (TAG). This alone tends to inflate the nominal ROCE. On the other hand, clauses in the leasing agreement can result in higher operating costs, and thus reduce the numerator (in itself lowering ROCE). TAG used to lease its assets from GCA until the middle of 2014. To avoid any impact of the asset move from GCA to TAG in our reference timeframe we calculate the average ROCE by using only data after the unbundling (i.e. from 2014 to 2018).¹¹ The ROCE for 2013 is included in sensitivity calculations with an alternative timeframe.

Any comparison of TSOs' profitability further requires that the compared companies do not (to a significant extent) perform activities other than gas transportation. If a company earns substantial revenues from other activities, then at least part of a more positive (or negative) financial performance could be due to the financial performance on that other activity. With the exception of Gascade and Fluxys Belgium, the companies considered in the following comparisons do not perform significant other activities.

- During the investigated period Gascade incurred significant revenues and costs in relation to its investment in the EUGAL-pipeline. These are likely to affect

⁸ This addresses leasing arrangements between TAG and GCA until the middle of 2014 as explained below.

⁹ Including data from 2013 considers the longest possible time frame. Excluding data for 2013 and 2014 takes into account that TAG had untypically high short term liabilities during that period associated with TAG's acquisition by GCA (from ENI). This results in untypically high ROCE.

¹⁰ The exact impact in both cases depends on whether the provisions are short-term, i.e. for costs expected in the next year, or long-term. ROCE analysis may distort the assessment of ROCE in cases where provisions are formed in the reference period, but later reversed outside the reference period, or when provisions were formed in a previous year and reversed inside the reference period.

¹¹ We understand that the comparator gas TSOs also lease the pipelines from affiliated companies during the entire period of the analysis. As they owned (or co-owned) the company to which the pipeline belonged, the value of the pipeline would be reflected (at the respective share, where they are co-owners) in their asset base. The impact on ROCE of such arrangements should be negligible.

Gascade's annual results and may explain the huge variation in Gascades ROCE between 2014 and 2018.¹²

- Fluxys Belgium owns and operates storages, LNG terminals and a re-insurance company. That is why to calculate the ROCE we only used the total assets and current liabilities for the segment *gas transmission*. The specific numbers for the segments are reported in the segmented income statement and segmented balance sheet, respectively.¹³

We have refrained from using an IRR analysis and a benchmarking against the estimated WACC because of extensive data and information requirements, e.g. regarding original and retrofit investments, residual values, discount rates (WACC). Such information would not only be required for TAG but also for all of the potential comparators. As such information is not publicly available, calculating these indicators would need to rely on a number of crucial assumptions. The ROCE measure calculated below does not require such assumptions.

Overall, we deem ROCE to be a reasonable indicator for understanding and illustrating the financial performance based on publicly available data. We do not expect the key findings to change if a different measure were to be used.

TAG's and GCA's historic profitability higher than that of comparable gas TSOs

Table 1 below shows that TAG has on average a higher ROCE than GCA and all five of the investigated TSOs from Germany, Belgium and the Czech Republic. GCA has higher ROCE than four of the other TSOs. In calculating ROCE averages we use the years 2014-2018 as the reference period. We thereby omit 2013 as a year in the reference period as it constitutes the year before the TAG assets were transferred from GCA into the TAG company. We also calculate averages over alternative time frames (2013-2018, 2015-2018). Results do not change materially when considering averages over the alternative periods. (Detailed results are made available to Shell Energy Europe Ltd. as a spreadsheet.)

In particular, the average ROCE of 23.7% for TAG over the reference period (2014-2018) is high if compared to a ROCE of the five non-Austrian gas TSOs which were in the range of 8.1% to 17.9% and with an average over this five-company sample of 12.0% (see Table 3 in Annex 2 for annual ROCE 2013-2018).

¹² In 2018, Gascade generates almost half of its revenues from compensation payments from affiliated companies in the context of the EUGAL pipeline investment. This is reported under "other business-typical activities" where Gascade reports 396,5 Mio EUR in 2018 (reportedly, revenues in this category come mainly from these compensation payments). In 2014, Gascade reports in the same category revenues of only about 11,2 Mio EUR. We have not investigated the magnitude of the impact of these revenues and associated costs.

¹³ Current liabilities associated with the gas transmission segment are not published separately. We assume the share of total current liabilities relating to the transmission segment to be equal to the share of assets of the transmission segment relative to all assets. Further, we also include a share of assets which are not allocated to a specific operating segment to the transmission segment based on the share of assets of the transmission segment relative to all assets.

Table 1 Average ROCE of Austrian and selected other European gas TSOs for investigated periods

	Avg. 2014-18	Avg. 2013-18	Avg. 2015-18
TAG	23.7%	24.6%	21.5%
GCA*	17.9%	16.2%	17.3%
Fluxys BE (Belgium)	8.1%	8.4%	7.3%
Fluxys Tenp (Germany)*	9.9%	8.5%	11.1%
GASCADE (Germany)	17.7%	18.5%	19.4%
GRTgaz DE (Germany)*	13.8%	17.7%	12.9%
Net4Gas Czech Republic)	10.7%	10.2%	11.0%

Source: Frontier Economics based on financial statements.

Notes: * Data for 2018 not available. Averages have been calculated until 2017 (excluding 2018).

The relatively strong financial performance of the Austrian TSOs, and TAG in particular, may be driven by the following factors:¹⁴

- **Significant recent and planned investments.** We understand that TAG has been conducting and is still making investments in refurbishment and improvements of its pipeline and compressors in recent years.¹⁵ In particular, new investments in the current regulatory period (2017-2020) increase the tariffs through the regulatory asset base (RAB)¹⁶ but are not immediately and fully reflected in the book value reported in the balance sheet, and thus the capital employed. This leads to higher than usual ROCE. More specifically, between 2017 and 2020 alone, TAG's approved capital expenditure (new investments) amounts to € 255m, of which € 24m relate to "pipelines", € 231m relate to "compressors and other assets".¹⁷ All of this investment is considered in the RAB for the whole regulatory period (2017-2020).

At the same time, the investment is still ongoing and not fully reflected in the (statutory) asset base. For example, on the balance sheet TAG's assets increase by a mere € 22m in 2017 and € 51m in 2018¹⁸ (against planned investment included in the RAB equal to € 99m and € 73m, respectively).¹⁹ If TAG carries out all investments approved by the regulator and already reflected in its RAB in the 2017-20 regulatory period, they can be expected to appear in the statutory asset base over time. It remains to be seen if all of these investments have taken or will take place.

- **Depreciation period.** In Austria, regulatory depreciation periods are short relative to statutory depreciation periods. For example, the regulatory depreciation period for "compressors and other assets" (which, as noted above,

¹⁴ We note that this list may not be exhaustive and there may be other factors contributing to TAG's strong financial performance. The ROCE of the other companies may be influenced by specifics of the national regulation or the company's organisation which have not been investigated in our analysis.

¹⁵ Partially in relation with a program to reduce carbon footprint of gas transmission.

¹⁶ The RAB is considered in the allowed revenue through the allowed return. The allowed revenue in turn determines the allowed tariffs.

¹⁷ E-Control: Information according to the Tariff Network Code (TAR NC)1 for the current tariff period (2017-2020) for Austria, Section 2.4.

¹⁸ See balance sheet in TAG's financial statements for 2017 and 2018.

¹⁹ E-Control: Information according to the Tariff Network Code (TAR NC)1 for the current tariff period (2017-2020) for Austria, Section 2.4.

made up the overwhelming majority of TAG's recent investments) is 12 years (regulatory)²⁰ against up to 40 years of accounting depreciation (as reported in TAG's financial statements). This allows TSOs to recover their costs over a timespan shorter than what statutory depreciation periods suggest (and indeed reduces TSO's risk of not recovering capital cost, by allowing early recovery of investment in a period where revenues are still effectively guaranteed through legacy capacity bookings). For comparison: In Germany, for example, the regulatory depreciation period for compression stations is 25 years.²¹ Longer depreciation periods would result in much lower allowed revenue and a longer period to recover capital costs (assuming statutory depreciation is also 25 years), which would result in lower ROCE.

- **Risk premium.** TAG and GCA are granted a risk premium on top of recovering their pre-tax cost of equity equal to 3.5%-points annually plus an undisclosed individual risk compensation.²² This is to compensate the TSOs for the potential volume risks associated with transits through the Austrian TSO grid (and actual capacity sales deviating from the assumptions when the tariffs are set). As of 2017, 50% of the revenue from the 3.5% risk premium and the individual risk compensation is to be allocated to statutory reserves.²³ In any case, the extent to which this risk premium and individual risk compensation increased TAG's measured profitability thus depends on the extent to which TAG was and is actually exposed to the risk which the premium is meant to compensate TAG for – we consider this in the following.

Analysis of volume risk faced by TAG

Risks to be addressed by the regulatory risk premium

The regulatory WACC in the previous (2013-2016) and in the current (2017-2020) regulatory period includes a risk premium of 3.5%-points. This is added on top of the real, pre-tax cost of equity.²⁴ Additionally, TSOs receive an undisclosed individual risk compensation.²⁵

Conceptually, the risk premium plus individual risk compensation can be considered to compensate for two kinds of risks potentially faced by TSOs:

²⁰ E-Control: Information according to the Tariff Network Code (TAR NC)1 for the current tariff period (2017-2020) for Austria, Section 2.4.2.

²¹ See Gasnetzentgeltverordnung (GasNEV), Anlage 1 (zu § 6 Abs. 5 Satz 1).

²² See E-Control, Description of the cost establishment and rate calculation method according to section 82 Gaswirtschaftsgesetz (Natural Gas Act) 2011 for the transmission lines of Gas Connect Austria GmbH, TAG GmbH and BOG GmbH, upon which basis approval by the regulatory authority was granted, Section III.3 and II.5; E-Control, Methodology pursuant to Section 82 Gaswirtschaftsgesetz (Natural Gas Act, GWG) 2011 for Transmission systems of Austrian Gas Transmission System Operators (TSO's), Section II.3 and II.6.

²³ See E-Control: Beschreibung der Kosten- und Tarifmethode gem § 82 GWG 2011 - Gültig ab 01.01.2017, Section III.2.

²⁴ See Description of the cost establishment and rate calculation method according to section 82 Gaswirtschaftsgesetz (Natural Gas Act) 2011 for the transmission lines of Gas Connect Austria GmbH, TAG GmbH and BOG GmbH, upon which basis approval by the regulatory authority was granted, Section III.3; Methode gem. § 82 GWG 2011 für die Fernleitungen Österreichischer Fernleitungsnetzbetreiber, Section II.3.

²⁵ See E-Control: Beschreibung der Kosten- und Tarifmethode gem § 82 GWG 2011 - Gültig ab 01.01.2017, Section III.2, p. 15 („+3,5% Punkte Aufschlag auf den Eigenkapitalzinssatz und eine individuelle Risikoabgeltung“).

- **Risk 1: Deviation of actual capacity booking within regulatory period.** Tariffs within a regulatory period are set based on assumed capacity bookings during that regulatory period before the start of the regulatory period. TSOs face the risk of actual capacity bookings being different from assumed capacity bookings.
- **Risk 2: Significant future declines in capacity bookings (beyond current regulatory period).** As Austrian gas TSOs depend on transits, there is some risk that in future regulatory periods – according to E-Control – capacity bookings might decline to an extent that the TSO's revenue shortfalls 'endanger the financial stability of the company'. The mark-up can then serve to build a financial reserve for later years when capacity bookings actually decline.²⁶

As of 2017, regulation foresees:

- that 50% of the additional revenue from the risk premium and individual risk compensation must be allocated to reserves for future requirements, which can be read to imply that these funds are meant to cover Risk 2.
- no specific requirements exist for the remaining 50% of revenue arising from the risk premium and individual risk compensation – which again implies that these additional revenues are meant to compensate risks within the 2017 to 2020 period.

In both cases, revenue from the risk premium and individual risk compensation would lead to higher EBIT and thus higher ROCE.

According to TAG's statutory accounts, the respective funds allocated to reserves (as specified in the relevant regulation) were € 16.3m in 2017 and € 16.0m in 2018.²⁷ This suggests that TAG's annual revenue from the risk premium and individual risk compensation is ca. € 32m for these years (as the reserve allocation should equal 50% of the revenue from the risk premium and individual risk compensation)²⁸.

However, when we estimate the total risk premium based on TAG's RAB published according to TAR NC²⁹ and assuming an equity share of 40%³⁰, a risk premium of 3.5 % on equity alone would result in total revenues of ca. € 16.7m p.a. over the 3rd regulatory period. This would only account for approximately half of the € 32m revenues calculated based on TAG's statutory accounts. The discrepancy could be explained by a variety of factors:

- The individual risk compensation that TAG receives is so high that it accounts entirely for this gap. This would suggest that TAG's total revenue from the risk premium and individual risk compensation is (indeed) ca. € 32m p.a.

²⁶ See E-Control (2016): Methode gem. § 82 GWG 2011 für die Fernleitungen Österreichischer Fernleitungsnetzbetreiber, Section III.2: "Otherwise, materialising capacity risks could put the company's financial stability in jeopardy."

²⁷ See TAG 2017 financial statements, Annex 3, page 11/23; TAG 2018 financial statements, Annex 3, page 11/24.

²⁸ See E-Control: Beschreibung der Kosten- und Tarifmethode gem § 82 GWG 2011 - Gültig ab 01.01.2017, Section III.2.

²⁹ See E-Control: Information according to the Tariff Network Code (TAR NC)¹ for the current tariff period (2017-2020) for Austria, page 3.

³⁰ This is the „target equity share“ of the regulator (see E-Control: Information according to the Tariff Network Code (TAR NC)¹ for the current tariff period (2017-2020) for Austria, page 5).

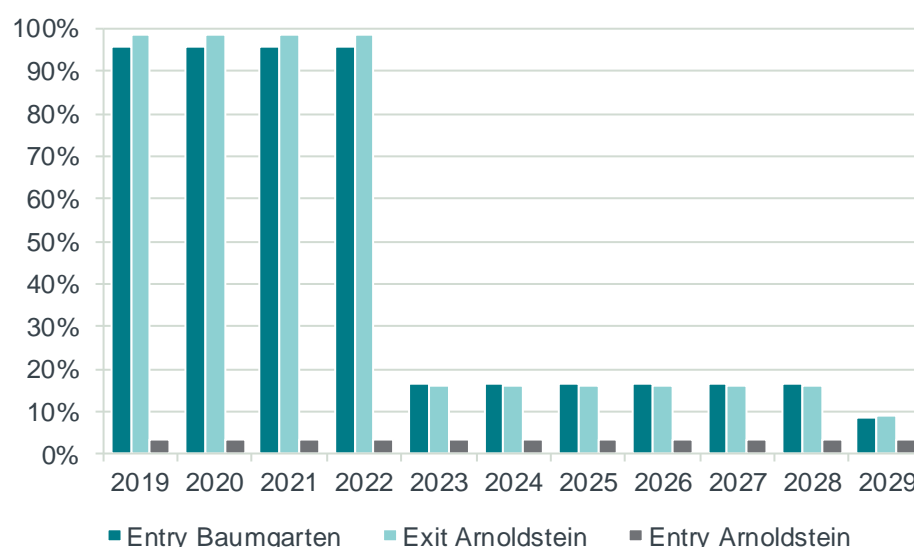
- TAG has allocated more than 50% of the revenues from the risk premium and individual risk compensation to its reserve. This would suggest that TAG's total revenue from the risk premium is lower than the €32m calculated above, and that it might be as low as ca. € 16m (if TAG allocated all revenue to reserves).
- There are other aspects within the regulation that we are not aware of, that render our result based on the TAR NC RAB incorrect. This would suggest that TAG's total revenue from the risk premium and individual risk compensation is (indeed) ca. € 32m p.a.

Actual risk exposure of TAG is very limited before 2022

We understand TAG's capacity has traditionally been largely reserved under long-term capacity bookings with multi-year terms.

As of 2019, based on ENTSG's transparency platform, capacity at the entry and exit points of TAG was almost fully booked up to 31/12/2022 on its two main interconnection points. For the time period 2023 to 2028, about 16% of capacity are already booked (Figure 1).

Figure 1 Existing capacity bookings on TAG as of October 2019



Source: Frontier based on ENTSG (<https://transparency.entso.eu/>)

Note: Transits to Slovenia are marketed through GCA, but we expect part of the revenue to be shared with TAG. Capacity bookings at the respective interconnection point decline from 60% in 2019 to ca. 10% in 2021 – but because of the relatively low capacity, such transits should have only a small impact on the total volume of bookings on TAG.

We are not aware of the expected bookings which were used as a basis to determine the tariffs during the 2013-2016 regulatory period. We presume that at the time the capacity booking assumptions for that regulatory period was determined, TAG's capacity was almost completely booked up to the end of 2022.

For the ongoing regulatory period (2017-2020), we have compared expected bookings, which were used to determine the tariffs, with actual firm bookings. Actual bookings in 2017 and 2018 are on average higher than the bookings used to determine the tariffs (Table 2). This means that in these two years TAG is actually overcompensated through both, higher than planned bookings and a capacity risk premium on the cost of equity plus the individual risk compensation.

Table 2 Forecast and actually booked firm capacity on TAG in 2017 and 2018, MWh/h

	Entry Baumgarten	Exit Arnoldstein
Forecast capacity considered in tariffs	57,643	48.559
Actual booked capacity (average across 2017 and 2018)	57.668	49.314
Capacity firmly booked in addition to forecast (benefit for TAG)	+25	+755

Source: Frontier Economics, based on data from <https://transparency.entsog.eu/> and E-Control, Information according to the Tariff Network Code (TAR NC)1 for the current tariff period (2017-2020) for Austria.

Note: TAG receives additional revenue from transit of gas to the SOL pipeline, which exits the Austrian gas system at the border with Slovenia.

This has the following implications on the actual risks faced by TAG and, thus, the impact of the additional risk premium and individual risk compensation on profitability:

- **2013 to 2020 regulatory periods.** TAG is unlikely to have faced any substantial volume risk as TAG's long-term capacity bookings protect it from a decline in bookings until at least 2022. In fact, in the current regulatory period, TAG may have actually benefited from bookings in excess of the assumptions used when tariffs were set – in addition to the allowed a risk premium and individual risk compensation. As of 2017, TAG is required to reserve half of the risk premium and individual risk compensation for future revenue shortfalls. During the entire period, the risk premium and individual risk contribution contributed to TAG's relatively high ROCE.
- **Future regulatory periods beyond 2020.** Current capacity bookings on TAG will largely expire at the end of the year 2022 and almost fully at the end of 2028. There is a risk that capacity will not be fully booked in the future and the funds allocated to reserves today might then be required to 'ensure the financial stability of TAG'.

We note that the relatively short regulatory depreciation period for “compressors and other assets” (i.e. largely anything other than pipelines) of 12 years implies that TAG may not be exposed to a risk around recovery of capital expenditure for compressors built up to ca. 2011 (12 years before long-term contracts expire). There remain risks to TAG around the full recovery of capital expenditure for pipeline (to the extent they are not also depreciated by end of 2022) and compressor investments (after 2011), as well as recovery of future operating and other costs.

The approach adopted in Austria is thus in strong favour of TAG and amounts to a stranded cost recovery mechanism without stranded cost either having been demonstrated prospectively nor having arisen in actual fact. This redistribution works to the detriment of shippers.

We do not have information on either the 2013-2016 or 2020+ RAB of TAG to understand the magnitude of the (expected) surplus revenue during these periods. In the 2017-2020 regulatory period, we understand (see above) that the risk premium contributed between ca. € 16m and € 32m of additional revenue to TAG.

- When € 16m are excluded from TAG's net operating revenue, TAG's ROCE in decreases by 3.5%-points in 2017 and 2.8%-points in 2018 (compared to the figures reported in Table 3 in Annex 2).
- When € 32m are excluded from TAG's net operating revenue, TAG's ROCE in decreases by 7.0%-points and 5.6%-points in 2017 and 2018 respectively (compared to the figures reported in Table 3 in Annex 2).

Annex 1: More transparency about basic regulatory parameters would allow for more detailed quantifications

With the publicly available data it is not possible to fully understand to what extent exactly TAG's financial remuneration is "deserved" (i.e. due to outperforming regulatory parameters) or simply due to favourable regulatory decisions or other circumstances.

In particular, the following aspects may be worth considering:

- Considering revenue from the allowed risk compensations TAG has received in earlier regulatory periods and what this implies for the risks to the recovery of capital expenditure after the termination of long-term contracts;
- Insights on the extent to which TAG's older assets (which may be fully or almost fully depreciated from a statutory perspective) contribute to TAG's RAB and therefore its allowed revenue and tariffs; and
- a full IRR analysis of TAG's investments.

More information about the following parameters in particular would allow a more detailed and accurate analysis considering the above:

- opening and closing RAB for 2013-2016 and information about how it was determined
- details (including figures) about how the opening RAB in 2013 was determined, more specifically about revaluation of existing assets
- planned and actual investment as RAB for 2013-2016;
- equity used to determine the cost of equity in 2013-2016;
- planned and actual bookings and revenues from the transport activity for 2013-2016; and
- details about how the level of the capacity risk premium and individual risk compensation was determined in both regulatory periods.

Annex 2: Method for calculating ROCE

To calculate ROCE we have in general applied the following formula:

$$ROCE (\%) = \frac{EBIT}{Capital\ Employed} * 100$$

where the *Capital Employed* is calculated as the difference between *Total Assets* and *Current Liabilities*.

For the TSOs which own shares in other companies³¹ we have also removed the value of shareholdings (in affiliated companies) from the asset base. This ensures that ROCE is calculated as a ratio of the operating profit from the gas transport activity to the assets associated with the gas transport activity. If the value of shareholdings was included in the Capital Employed, the ROCE from operating activity would appear lower than its true value. The formula is thus:

$$ROCE (\%) = \frac{EBIT}{Total\ Assets - Current\ Liabilities - Shareholdings} * 100$$

The annual ROCE values underlying the averages in Table 1 are reported in the following.

Table 3 Annual ROCE of Austrian and selected other European gas TSOs, 2013-2018

	2013	2014	2015	2016	2017	2018
TAG	29.5%	32.2%	19.5%	22.0%	25.8%	18.8%
GCA	9.7%	19.6%	18.7%	18.8%	14.3%	N/A
Fluxys BE (Belgium)	9.7%	11.3%	10.1%	3.7%	4.2%	11.3%
Fluxys Tenp (Germany)	2.8%	6.4%	8.1%	16.3%	8.9%	N/A
GASCADE (Germany)	22.1%	10.9%	16.7%	26.6%	20.2%	14.3%
GRTgaz DE (Germany)	33.4%	16.4%	18.9%	6.4%	13.5%	N/A
Net4Gas (Czech Republic)	8.0%	9.3%	11.0%	13.0%	9.7%	10.4%

Source: Frontier Economics based on financial statements.

³¹ All analysed TSOs except Fluxys Belgium own shares.