

European Utilities & Renewables**German Utilities: An open letter to the President of BNETZA on the proposed cost of equity for energy networks**

In this note, we respond to the consultation issued by German regulator, Bundesnetzagentur (BNETZA) on the determination of the cost of equity for electricity network operators.

Low proposed cost of equity: We view the cost of equity set by BNETZA in the consultation document as low and incompatible with investor expectations. The proposed parameters result in a total market return (Risk-free rate plus Equity Risk Premium) of just 4.44% (having steadily dropped from 8.78% in 2008). This is well below cost of equity/equity return expectations of 6.5% to 7.5% from investors and corporates. The ERP used in BNETZA's calculations has fallen from 4.55% in 2008 to 3.7% in 2021 while risk-free rate has also fallen from 4.23% to 0.74% now. Other expectations of ERP (eg corporate and practitioner cost of capital assumptions, IDW, forward looking calculations including those of the ECB, equity strategists etc) have all increased over the same period.

Stemming from a flawed application of Equity Risk Premium: The ERP assumptions is based on an average of arithmetic mean and geometric mean of ERPs computed by LBS professors Dimson, Marsh & Staunton (DMS), based on global equity and bond returns from the year 1900. The ERP of 3.7% is derived from premium of equity returns (9% avg) over bond returns (5.2% avg) and is then applied to the historical 10 year average risk-free rate of 0.74% (as specified in Section 7(4) of the StromNEV). Thus, the wedge between the bond returns in the DMS series and the Rf rate is ~450 bps (increasing from a wedge of ~250 bps previously). The expert consortium commissioned by BNETZA recognise the need to make adjustments to correct differences in the bonds used in the ERP and Rf calculations; yet makes no attempt to acknowledge and therefore bridge this significant gap. We view the proposed adjustment of 0-25bps to address 'convenience yield' / 'maturity/credit yield' adjustments as a red herring; the forest is being missed for the trees. If BNETZA insists on using the DMS historical returns, we believe that the least distortive approach would be using DMS's own preferred method of ERP derived using T-Bills returns (instead of bonds) and using Arithmetic Mean (also endorsed by European telecom regulators). On this basis, at an ERP of 5.9% and Rf of 0.74%, the implied market return of 6.64% is more reasonable.

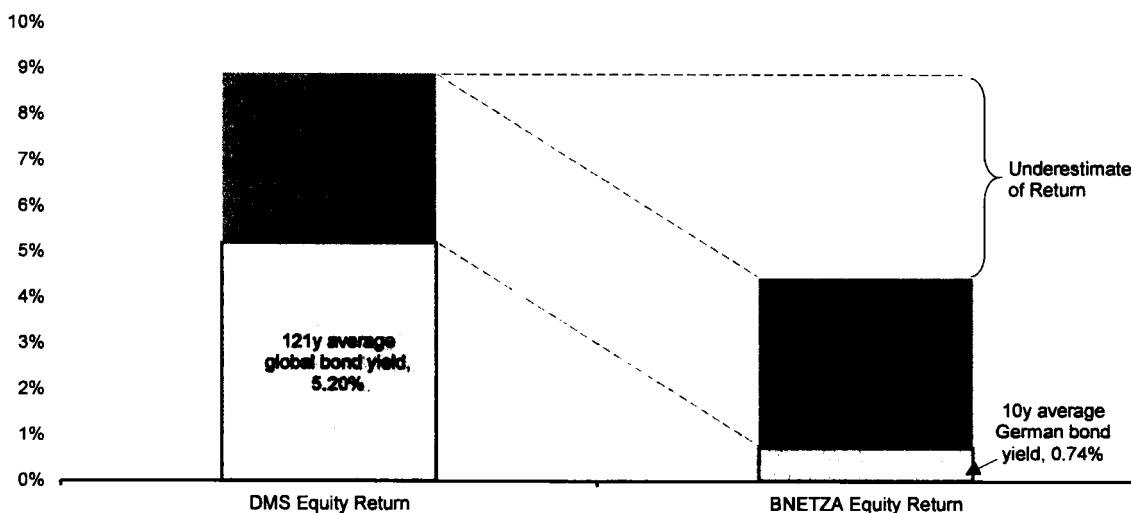
Significant investments needed to support Germany's decarbonisation ambitions are in jeopardy from the low proposed cost of equity: We estimate that electric T&D capex will rise by >40% in the next regulatory period to meet Germany's old targets of a 55% reduction of GHG emissions by 2030 and achieve a 65% renewables penetration in the electricity mix. These investments will have to increase to meet Germany's recently upgraded targets of 65% reduction by 2030. The proposed pre-tax cost of equity of 4.59% is at the bottom decile of a recent survey of investor expectations of 6-8%. As is widely acknowledged, the speed of network build-out to accommodate renewables is already lagging. Therefore, the flawed methodology for determining the allowed return on equity should be corrected to enable much needed investments in grids. The consumer bill impact of network expansion is modest (<2 % impact p.a. on bills) as we show in our analysis.



INVESTMENT IMPLICATIONS

We view the cost of equity set by BNETZA in the consultation document as low and incompatible with investor expectations; the proposed return is at the bottom decile of a recent survey of investor expectations. The low proposed return results from applying a low ERP of 3.7% (that is derived from 121 year bond returns of 5.2%) to a low risk-free rate of 0.74%, based on a 10 year history.

EXHIBIT 1: Using the trailing 10-year German debt yield and DMS' estimate of ERP underestimates the cost of equity significantly



Source: DMS, BNETZA, Bernstein analysis

As is widely acknowledged, the speed of energy network build-out in Germany to accommodate renewables and the energy transition is already lagging significantly. Investments in power grids need to increase significantly (>40% in the new regulatory period) to meet Germany's enhanced target of 65% GHG emission reduction by 2030. Therefore, we believe the flawed methodology for determining the allowed return on equity has to be corrected to enable much needed investments in German grids.

A possible adjustment, similar to the adjustments made in the 2nd regulatory period, where in light of capital market conditions and Germany's shift towards renewables, a decision was made to deviate from the mechanical derivation of ERP, could be to consider DMS's own preferred method of ERP derived using T-Bills returns (instead of bonds) and using the Arithmetic Mean (as is recommended by EU Commission and European telecom regulators). The alternative could be to shift to a Total Market Return, as has been done by several regulators.

DETAILS

Dear Mr Homann,

We are responding to the consultation¹ on the determination of the cost of equity for electricity network operators for the 4th regulatory period in Germany issued by Bundesnetzagentur (BNETZA), based on our role as equity analysts covering German utility stocks.

(1) THE PROPOSED COST OF EQUITY IS SET AT VERY LOW LEVELS...

We view the cost of equity set by BNETZA in the consultation document as low and incompatible with investor expectations. As we are not challenging the levered Beta of 0.81 used in the proposal, all our arguments in this response are centred around the assumptions of equity market risk premium (ERP), which we believe is too low, when viewed in the context of how it is applied with the trailing 10-year risk-free rate to arrive at a cost of equity.

We sense check the proposed cost of equity at the level of the market (at a beta of 1) and find that the implied total market return (Risk-free rate plus Equity Market Risk Premium) is extremely low at just 4.44% (nominal, post-tax). Over the past regulatory decisions, the implied total market return has steadily dropped from 8.78% to 4.44% (Exhibit 2). While implied total market returns were in the right of order of magnitude in the first two regulatory periods, the number was already low in the 3rd regulatory period and is extremely low in the consultation for the 4th regulatory period.

EXHIBIT 2: BNETZA's cost of equity decisions/ proposals over time

Parameter		Regulatory period			
		2009-2013	2014-2018	2019-2023	2024-28
		Regulatory Period 1	Regulatory Period 2	Regulatory Period 3	Regulatory Period 4 (proposal)
Year of calculation		2008	2011	2016	2021
Risk-free rate (10 year Rf trailing)	A	4.23%	3.80%	2.49%	0.74%
Equity Market Risk Premium	B	4.55%	4.55%	3.80%	3.70%
Implied total market return (at Beta = 1)	[A+B]	8.78%	8.35%	6.29%	4.44%
Levered Beta for networks	C	0.79	0.79	0.83	0.81
Equity Return post-tax	D = A+C*B	7.82%	7.39%	5.64%	3.74%
Equity Return pre-corp tax	E= Tax-factor * D	9.29%	9.05%	6.91%	4.59%

Source: BNETZA, Bernstein analysis * Same Equity Market Risk Premium as the first regulatory period was adopted rather than the updated Equity Market Risk Premium of 4.4% used at the consultation stage, in light of capital market conditions and Germany's shift towards renewables

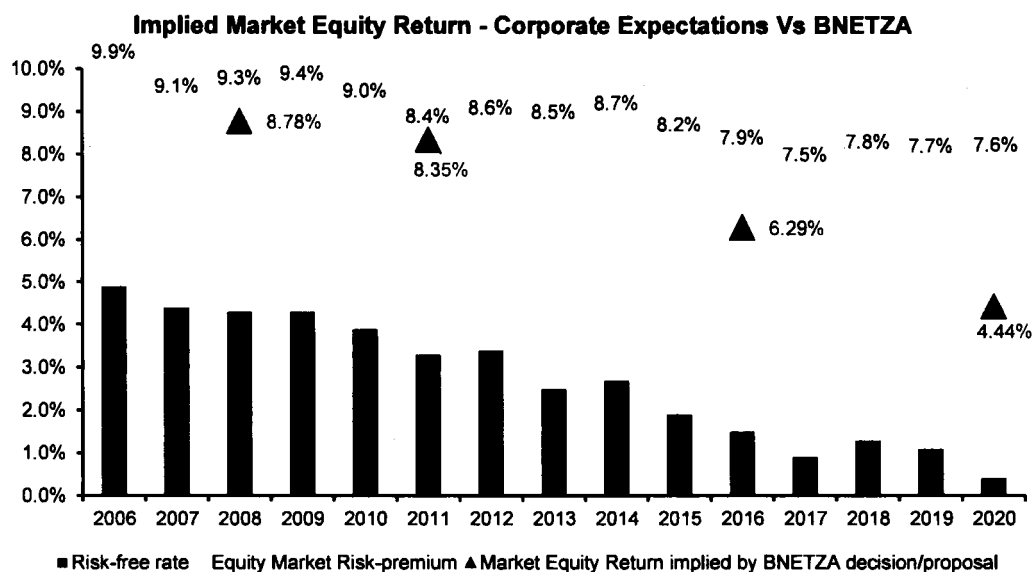
We compare the 4.44% with a few other estimates on corporate/investor expectations from equity markets in Germany/ Euro area:

KPMG Germany conducts an annual survey on cost of capital expectations of companies based in Germany, Austria and Switzerland. The latest survey² includes 242 German corporates including 77% of the DAX companies and 54% of the MDAX companies. KPMG Germany's annual corporate survey shows that while risk-free assumptions have reduced significantly over the past 15 years, the cost of equity (Exhibit 2) has reduced only slightly and the ERP has gone-up significantly.

¹ https://www.bundesnetzagentur.de/DE/Beschlusskammern/1_GZ/BK4-GZ/2021/BK4-21-0055/BK4-21-0055_Verfahrenseinleitung_Konsult.html?nn=358956

² <https://home.kpmg/de/en/home/insights/2020/10/cost-of-capital-study-2020.html>

EXHIBIT 3: KPMG Germany's annual corporate survey shows that while risk-free assumptions have reduced significantly, cost of equity has reduced only slightly, as ERP has gone-up

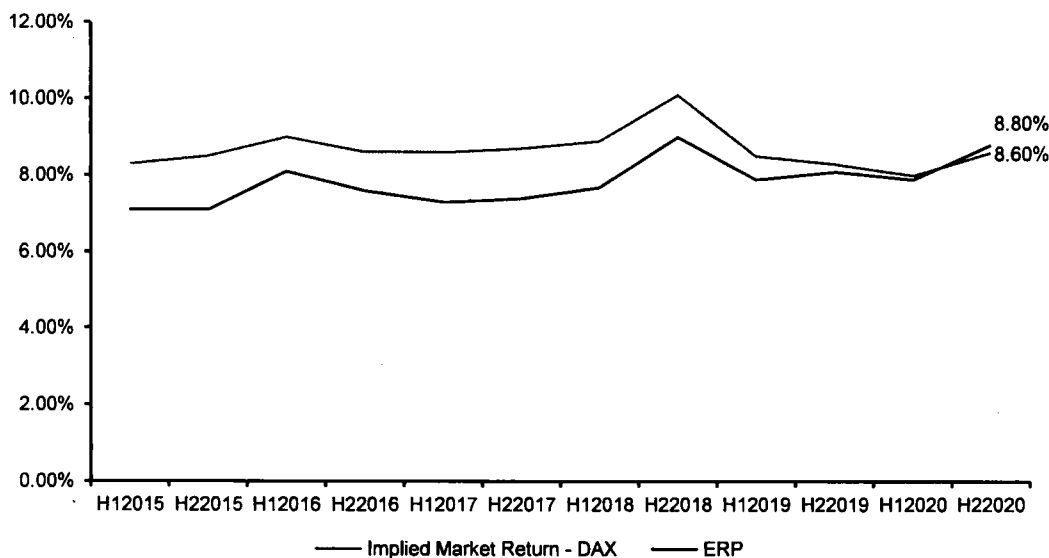


Source: KPMG Germany -Cost of Capital Study 2020, Bernstein analysis. Data pre-2012 includes Swiss, German and Austrian corporates (for risk-free & MRP) and data post 2012 includes German and Austrian corporates for ERP and German corporates for Rf

Value Trust also publishes a semi-annual assessment of cost of capital³ for companies in Germany, Austria and Switzerland. In Exhibit 4, we shown Value Trust's calculations of the implied cost of equity (and ERP) for the German DAX from 2015. The most recent expectation of equity market return is 8.6% and the overall market return has been fairly stable and is not falling.

³ https://www.value-trust.com/wp-content/uploads/2021/07/DACH-Capital-Market-Study_December-2020.pdf

EXHIBIT 4: Value Trust's implied return on equity and ERP for the DAX



Source: Value-trust DACH Capital Market Study, December 2020, Bernstein analysis

To compare the 4.44% implied total market equity return with investor expectations from European equity markets, we cite a few examples from long-term investors:

- + BlackRock's Long-Term Capital Market Assumption⁴ is a 6.5% (post-tax) nominal equity return for European large-cap stocks.
- + Robeco's long-term developed market equity return expectation is 7%⁵; incidentally Robeco factor DMS ERPs in their calculations and arrive at a significantly higher estimate of equity market returns than is implied in the BNETZA calculations.

⁴ <https://www.blackrock.com/institutions/en-us/insights/charts/capital-market-assumptions#assumptions>

⁵ <https://www.robeco.com/docm/docu-long-terms-expected-returns-en-202009.pdf?cldee=ZGVlcGFAYmVybnNOZWluLmNvbO%3d%3d&recipientid=lead-e166bdf727f5eb1194ef000d3ab2d090-4cfde625ef3849a2a7531a788c36f4a3&esid=14d25a77-559c-4965-9ae3-689995037983>

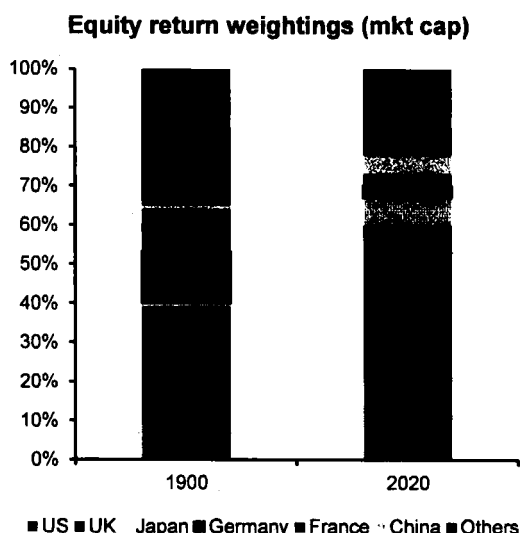
(2) ...DUE TO FLAWED APPLICATION OF COMBINING ERP BASED CALCULATED BASED ON 120+ HISTORY GLOBAL BOND RETURNS WITH 10 YEAR AVERAGE OF THE GERMAN RISK-FREE RATE

The reason the cost of equity is underestimated is the flawed application of combining an ERP calculated based on 120+ history global equity and bond returns with 10 year average of the German risk-free rate, as we explain in this section.

The Equity Risk Premium assumptions in the consultation as well as prior determinations is based on an average of arithmetic mean and geometric mean of equity risk premiums computed by London Business School professors Dimson, Marsh & Staunton (DMS), based on global equity and bond returns from the year 1900.

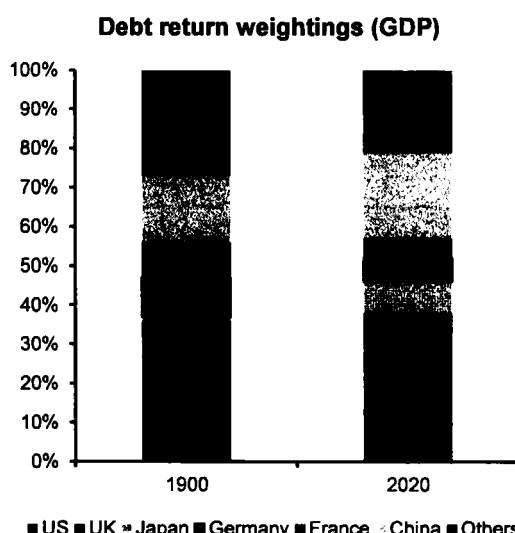
For the ERP calculations, the bond returns for the constituent countries are GDP weighted (Exhibit 9) and that of equity returns are market cap weighted (Exhibit 8) and are significantly influenced by the US market. Germany, on the other hand is a relatively smaller constituent, including on the debt weighting.

EXHIBIT 5: Country weights for equity returns



Source: DMS, Bernstein analysis

EXHIBIT 6: Country weights for debt returns

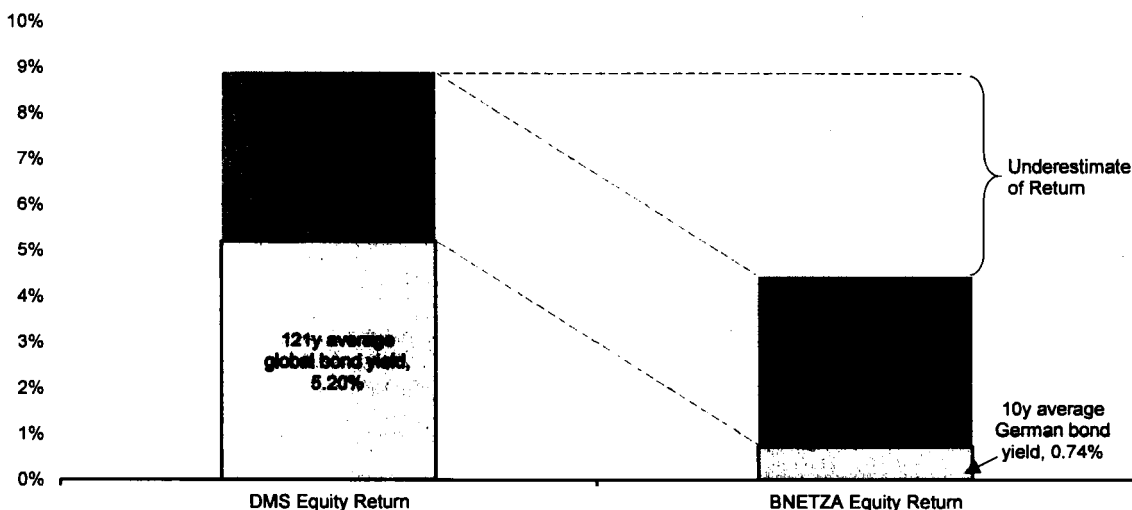


Source: DMS, Bernstein analysis

The expert consortium (Frontier Economics, Prof. Randl and Prof. Zechner) commissioned by BNETZA refer to the principle of consistency to compute the Equity Risk Premium - for example, they state "it would be inconsistent to use a market risk premia of Bills (short-term government bonds) when the prime rate is determined on the basis of Bonds (long-term government bonds)." (translated from German). However, they have failed to recognize and address the most glaring inconsistency in their approach of applying an equity risk premium calculated on the basis of 121 year (global) bond returns to a regulatory construct that uses a 10 year average German bond yield.

We believe that mixing and matching DMS ERP estimates derived from 121 return averages with 10 year historical average of domestic risk-free rates underestimates the cost of equity significantly as we visually illustrate in Exhibit 7. The ERP of 3.7% used in the consultation is based on an average of arithmetic and geometric mean of the premium of equity returns (9%) over bond-returns (5.2%) and is applied to the historical 10 year average German risk-free rate of 0.74%.

EXHIBIT 7: Using the trailing 10-year German debt yield and DMS' estimate of ERP underestimates the cost of equity significantly



Source: DMS, BNETZA, Bernstein analysis

A number of regulators including the UK's Ofgem, Ofwat and CMA have now moved to using the Total Market Return (TMR) approach, to precisely address the issue highlighted in Exhibit 7 above. Under this approach, the TMR is assumed to be fixed while the ERP is derived as a difference between the TMR and the Rf rate. This methodology is particularly suitable in the German context as the Rf rate calculation is fixed by ordinance. We believe that the expert consortium have not fully engaged in the merits of moving to a TMR approach including considering the wealth of academic literature⁶ that support that the TMR is constant while the ERP fluctuates depending on the risk-free rate used.

Overtime, the use of the DMS ERP has resulted in an ever widening wedge, stemming primarily from a significant divergence in the bond returns used in the ERP calculations and in the BNETZA calculations. While the differences were not significant in the first two regulatory periods, the difference now is almost 450bps (Exhibit 8) which is similar to the proposed pre-tax cost of equity of 4.59%.

⁶ See reports by [NERA](#) and [Oxera](#) that elaborate on the academic evidence in favour of a constant Total Market Return

EXHIBIT 8: Underlying DMS ERP variables vs BNETZA variables

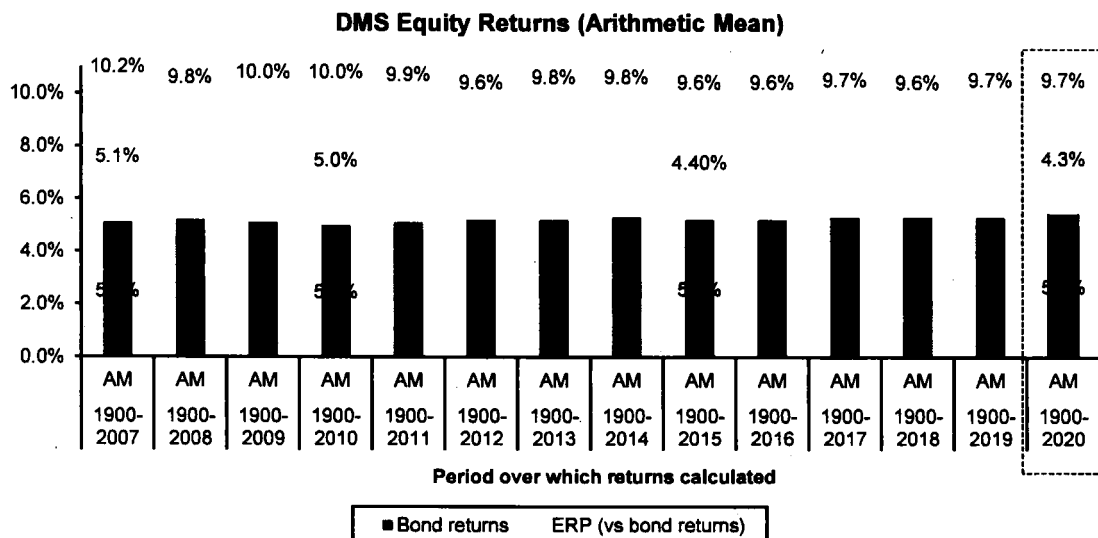
Period of ERP calculations		1900-2007	1900-2007	1900-2015	1900-2020
		Regulatory Period 1	Regulatory Period 2*	Regulatory Period 3	Regulatory Period 4 (proposal)
Arithmetic Mean Returns (Nominal)					
Equities	A	10.3%	10.3%	9.5%	9.7%
Bond	B	5.1%	5.1%	5.2%	5.4%
ERP - Arithmetic Mean	C=A-B	5.2%	5.2%	4.3%	4.3%
Geometric Mean Returns (Nominal)					
Equities	D	9.0%	9.0%	8.1%	8.3%
Bond	E	4.7%	4.7%	4.8%	5.0%
ERP - Geometric Mean	F= D-E	4.1%	4.1%	3.1%	3.1%
Average of bond return in DMS equity premia	(B+E)/2	4.90%	4.90%	5.00%	5.20%
Bond return used in BNETZA calculations	G	4.23%	3.80%	2.49%	0.74%
Difference between DMS & BNETZA		0.67%	1.10%	2.51%	4.47%
Average of equity return in DMS equity premia	(A+D)/2	9.65%	9.65%	8.80%	9.00%
Implied equity return in BNETZA calculations	G+(C+F)/2	8.78%	8.35%	6.29%	4.44%
Difference between DMS & BNETZA		0.87%	1.30%	2.51%	4.57%

Source: DMS publications, Bernstein analysis * In the final decision for Regulatory Period 2, BNETZA assumed the same ERP which was used in Regulatory Period 1

This inconsistency in approach is not visible to a casual reader of the consultation document (or the expert consortium report), as underlying data such as details of nominal equity and bond returns data used by DMS to arrive at the ERP estimates are not summarized in these documents, which masks the extent of inconsistency in the application of the approach. Moreover, this information is also not available in the free public version summarising DMS' analysis of global returns and is only available in the paid version of the report.

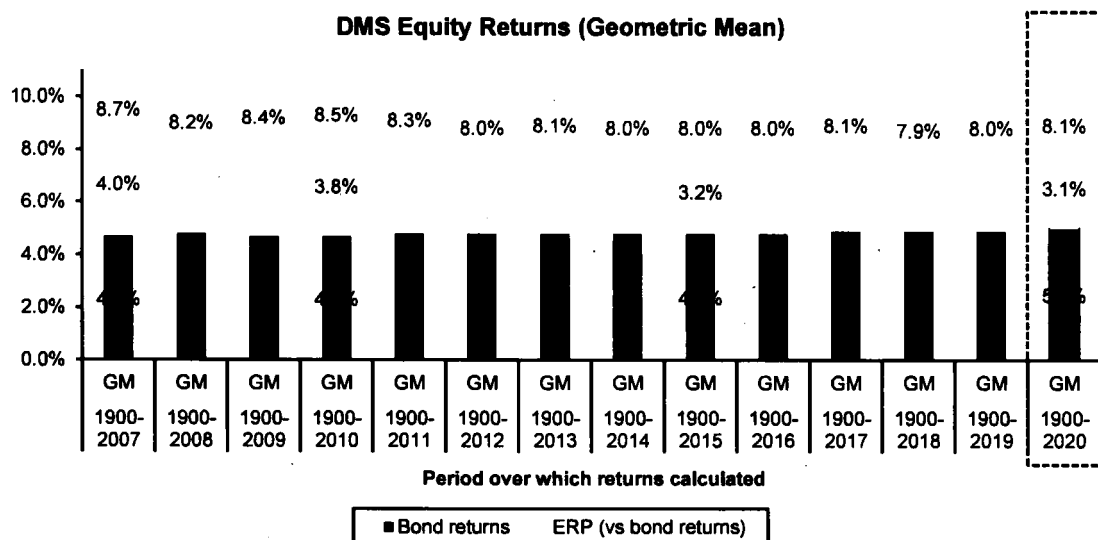
We have analysed DMS Global source data publications from 2008-2021 and summarise below the ERP and the underlying equity and bond returns over time on an Arithmetic (Exhibit 9) and Geometric mean (Exhibit 10) basis.

EXHIBIT 9: DMS's equity returns calculations have been stable on an Arithmetic Mean basis ...



Source: DMS annual return yearbooks, Bernstein analysis

EXHIBIT 10: ... as well as a Geometric Mean basis



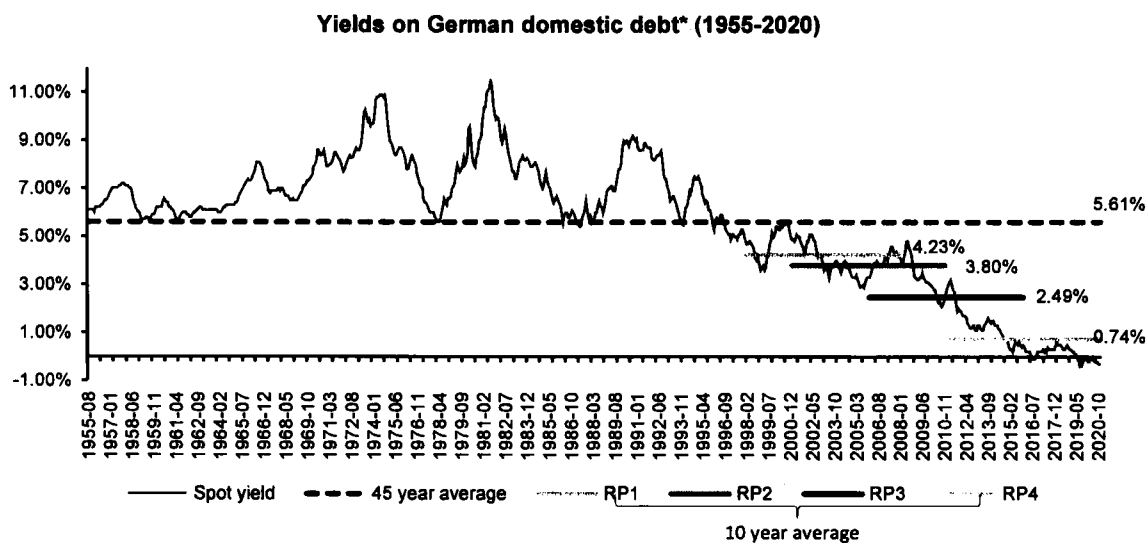
Source: DMS annual return yearbooks, Bernstein analysis

As the DMS calculations are based on very long-term data, bond returns have averaged around 5%, including the latest calculations at 5.2% (average of 5% geometric mean and 5.4% arithmetic mean); in fact the average AM and GM bond returns have gone-up since 2008 from 4.9% to 5.2%, contrary to actual risk-free yield progression.

When we analyse German domestic debt yield data from 1955 (earliest the said data is available), the long-term arithmetic mean of 5.6% is not different to the bond returns in the DMS calculations of 5.4% (Exhibit 9). However, as the risk-free rate is

specified by Section 7 (4) StromNEV as the average of only the last 10 years and cannot be adjusted, the ERP calculations will need to be adjusted. We believe that the DMS ERP has to be adjusted significantly to account for the difference between the bond-return of 5.2% used in the DMS ERP calculations and the 0.74%, as the numbers are ~450 bps apart.

EXHIBIT 11: The Risk-free return used in determining cost of equity is significantly lower than the long-term average of 5.6%



Source: Bundesbank, Bernstein analysis *Current yields on domestic bearer bonds monthly values - BBSIS.MIUMR.RD.EUR.ABAARAA_Z_Z.A

The expert opinion states (in page 29) that *"If the prime rate does not exactly match the characteristics of the bonds used to determine the market risk premium, quantifying the differences, and at best possibly adjusting the prime rate or market risk premia, would seem to be appropriate"* (translated from German).

The expert opinion then looks at possible adjustments and concludes that the range of adjustments should just be 0-25bps (Exhibit 12) – the upper end is derived by comparing Euro AAA bond yields over the German 10 year yields (15bps) to adjust for the 'convenience yield' associated with German debt (compared to the rest of Euro zone) and a 10bps as the adjustment between the yield of the 10 year German bond vs the risk-free rate as per Section 7(4) of StromNEV to adjust for a maturity/credit risk.

EXHIBIT 12: Adjustments proposed by Frontier et al

Maturity/credit risk	0.74%	0.84%	0%	0.10%		Upper end is difference between the 10 year average from 2011-20 of Risk-free rate under StromNEV and German bund, to adjust for maturity and credit risk differences. Since the difference fluctuates over time and was recently even negative, a value of 0 is recommended by the experts at the lower end.
Convenience yield	0.84%	0.99%	0%	0.15%		Upper end is difference between German Bund and AAA rated Eurozone bonds to reflect 'convenience yield' of German bunds. Since there are considerable uncertainties in this estimate, a value of 0 is recommended as the lower limit for the adjustment.

Source: Report for BNETZA by Frontier Economics/Zechner /Randl, Bernstein analysis

The experts have not acknowledged and scrutinised the bond returns in the DMS calculations and therefore made no attempt to bridge the significant wedge between the bond returns of 5.2% used in deriving the ERP based on 121 year global bond returns and the 0.74% risk-free rate used for computing the cost of equity.

We view the 'convenience yield' / 'maturity/credit yield' adjustments discussed above as a red herring and a minor technicality in the scheme of things. The forest (wedge between 5.2% and 0.74%) is being missed for the trees (convenience yield).

We believe therefore the expert opinion and the consultation proposal has failed to consider the appropriate level of adjustments to the assumption of ERP to correct the material inconsistencies discussed in this response, arising from the bond returns used to derive the ERP.

As discussed earlier, the use of DMS Equity premium over T-Bills has been rejected by the expert consortium, on the basis of inconsistency but the more significant inconsistency of the base bond return has not been discussed and addressed.

We believe that using DMS ERP derived from T-Bills could be more appropriate. In fact, DMS themselves prefer using ERP derived using returns on treasury bills. They state in the Credit Suisse Global Investment Sourcebook 2016 (pg 23-24) that "Our preferred benchmark for the risk-free return is treasury bills i.e. very short-term, default-free, fixed income securities "

Another area for adjustment is the use of Arithmetic Mean than the average of Geometric Mean (GM) and Arithmetic Mean (AM), as the GM is lower than the AM. In the context of European Telecoms regulation, the Brattle Group, an expert appointed by the European Commission has recommended⁷ that National Telecom Regulators should base their ERP estimates on the arithmetic average of the historical excess returns. "Financial experts have explained that the correct approach is to use the arithmetic mean of historical returns to estimate the ERP. For example, Annin and Falaschetti note that "[o]ne area regarding the equity risk premium that is not disputed in academic circles is whether the arithmetic or geometric mean equity risk premium should be used. The arithmetic mean should always be used in evaluating projected cash flows." Financial experts agree that the ultimate aim is to derive an estimate of the arithmetic mean return, because this corresponds to investor's true expectation. However, there is some debate as to whether the historic arithmetic mean or the historic geometric mean provides the best forward looking estimate of the arithmetic mean. However, we find the balance of the evidence recommends the use of the arithmetic average of the historical excess return to estimate the ERP."

The Body of European Regulators for European Communication (BEREC) recommended⁸ in June 2021 that National Telecom Regulators the use an Arithmetic Mean based ERP of 5.5%. While BEREC also rely on DMS data to compute the ERP, they rely on historic return information for EU countries rather than global data and apply different country weightings, in addition to using the Arithmetic Mean data. The reasoning in the context of telecom networks is equally valid in the context of energy networks, particularly given that the average of arithmetic mean and geometric mean result in dampening of an already depressed cost of equity calculation due to the low risk-free rate used.

⁷ <https://op.europa.eu/en/publication-detail/-/publication/da1cbe44-4a4e-11e6-9c64-01aa75ed71a1/language-en>

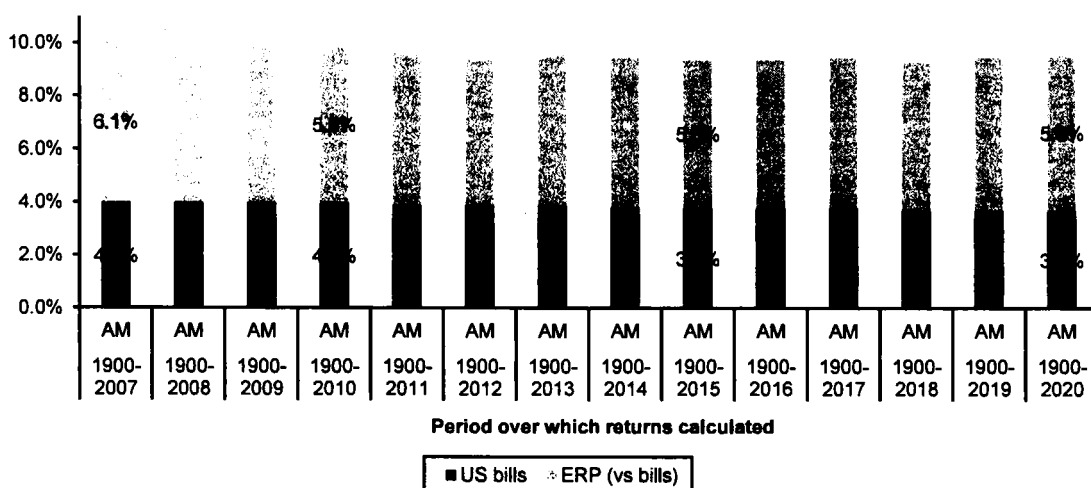
⁸ https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/9977-berec-report-on-wacc-parameter-calculations-according-to-the-european-commissions-wacc-notice-of-6-november-2019

There is also support from DMS themselves who write "This [the arithmetic mean risk premium] is our estimate of the expected longrun equity risk premium for use in asset allocation, stock valuation, and corporate budgeting applications" in Credit Suisse Investment Returns Sourcebook 2016, p. 34.

Therefore, if BNETZA insists on using the DMS historical returns, we believe that the least distortive method would be using ERP derived using T-Bills returns and using Arithmetic Mean (Exhibit 13), which are both DMS' own preferred method. At an ERP of 5.9% and Rf of 0.74%, the implied market return of 6.64% is more reasonable than the proposals on the table.

EXHIBIT 13: DMS ERP based on treasuries and using arithmetic mean results in a more sensible ERP of 5.9%

DMS Equity Returns (Arithmetic Mean)



Source: DMS annual return yearbooks, Bernstein analysis

We also share the view of a number of experts on trends on ERP which show that ERPs when applied to current Risk-free rates, have been rising (and not falling) and are significantly above the 3.7% used in the consultation, which itself is a sharp reduction versus the 'pre-crisis' ERP of 4.55% used in the first regulatory period. We have find no evidence for a falling risk premium from pre-crisis levels:

- + **IDW:** Technical Committee for Company Valuation and Business Administration (FAUB) of the Institute of Public Auditors in Germany (IDW - Institut Der Wirtschaftsprufer) increased its recommendation in October 2019⁹ for equity risk premium to 6%-8% from its recommendations issued in 2012 of 5.5 - 7%. Among other applications, the ERP recommendations of IDW are regularly used by courts (and court appointment valuers) as inputs to judge the appropriateness of compensation paid to minority share-holders of dominated German companies or in the case of a minority squeeze-out. For example, in the recent minority squeeze-out of German network operator innogy by E.ON, an ERP of 7.25%¹⁰ was used for the purpose of IDW S1 valuation.
- + **ECB:** The ECB's estimate of the euro area ERP has, based on a Dividend Discount Model (DDM), since 2014 fluctuated at a level of slightly above 8%, i.e. around 3-4 percentage points higher compared to pre-crisis years. In a recent working paper¹¹, the ECB has triangulated (Exhibit 14) its DDM estimates of ERP with other methods such the Fed Spread method which is based on $1/CAPE - R_f$ where CAPE is the 10 year cyclically adjusted price-earnings ratio and R_f the 10 year

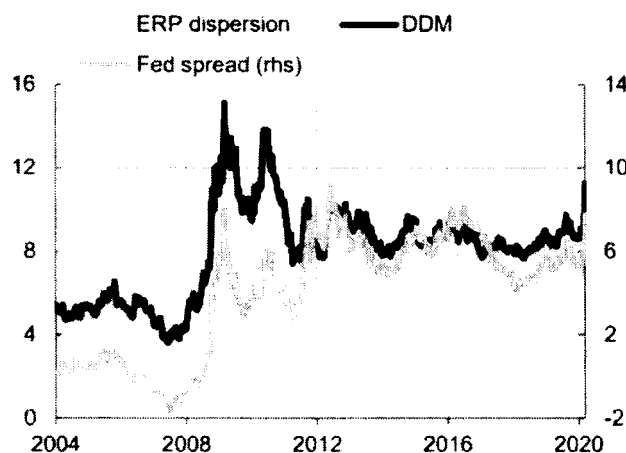
⁹ <https://www.idw.de/idw/idw-aktuell/neue-kapitalkostenempfehlungen-des-faub/120158>

¹⁰ Corresponding to an ERP of 5.75% after personal taxes

¹¹ <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2535~a236a0a5fe.en.pdf>

Overnight Indexed Swap and the Gordon Growth model and H model. We note that Stehle and Betzer (2021) provide a detailed analysis to BNETZA of the use of dividend growth models to estimate market risk and point out that the central banks' approaches are only suitable for measuring the time path of market risk premia, but not for measuring its magnitude. The result of the ECB's modelling clearly indicates an elevated level of risk equity risk premia since the financial crisis rather than falling or flat ERP and is therefore a helpful data-point for triangulating and backed by experts Stehle and Betzer's views for the BNETZA.

EXHIBIT 14: **ECB and other estimates of euro area equity risk premium**

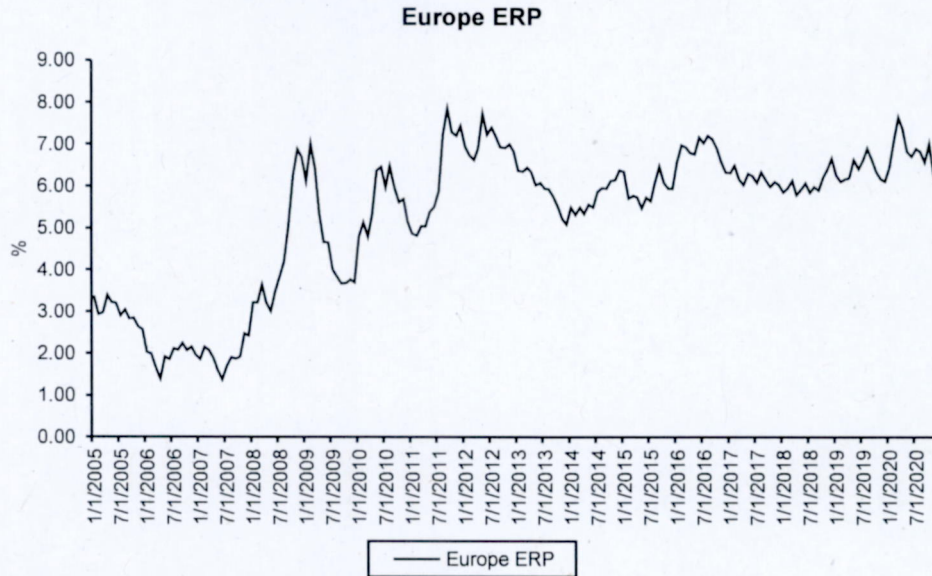


Sources: Bloomberg, IBES, Consensus Economics, Refinitiv, ECB. Estimates of the euro area equity risk premium are based on the Gordon Growth model, the H-model, a Goldman Sachs estimate, the Fed spread and the DDM outlined in the paper. Latest observation: 13 March 2020.

Source: ECB Working Paper - Euro area equity risk premia and monetary policy: a longer-term perspective (2021)

- + **Bernstein Strategy Team:** As an example of investor expectations of ERP and total market return, we show in Exhibit 15, estimates from the Bernstein strategy team who arrive at an ERP of ~6% at the end of 2020 for the European equity market, using earnings yield (using 10 year average MSCI Europe EPS) minus the European market-cap weighted 10-year real bond yield. As can be seen the ERP has risen significantly since the financial crisis.

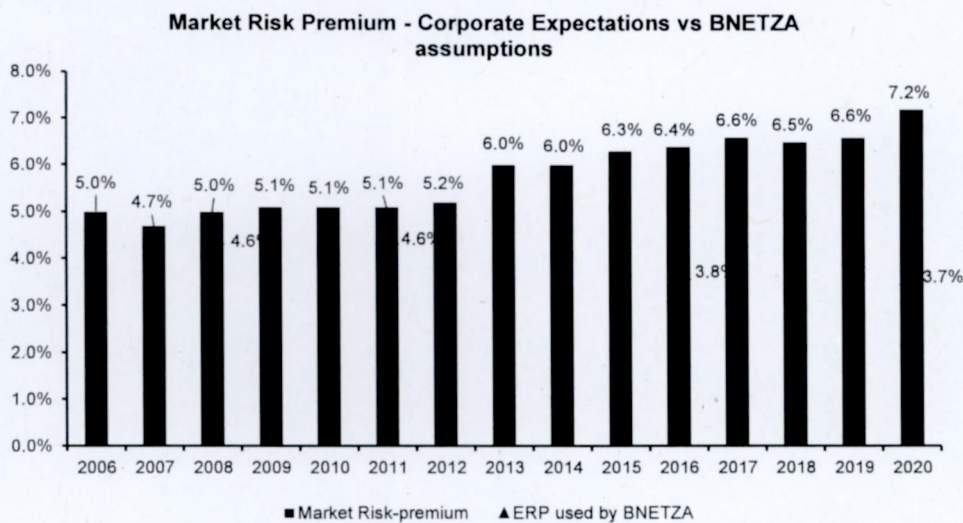
EXHIBIT 15: **Bernstein Strategy Team's estimate of ERP of 6%**



Source: MSCI, IBES, Bloomberg, Bernstein Analysis

+ **Cost of capital surveys:** Additionally, as highlighted by the KPMG Corporate survey earlier, market participants view of the ERP has been rising (as the Rf rate has been falling) while the BNETZA assumptions have been reducing (Exhibit 16). While the numbers were similar in 2008, over the years, the falling 10 year Rf rate has meant that the gap has kept increasing and is now implausible. The wedge, compared to the latest survey is 3.5%, which is almost the same number as the proposed post-tax cost of equity of 3.74%.

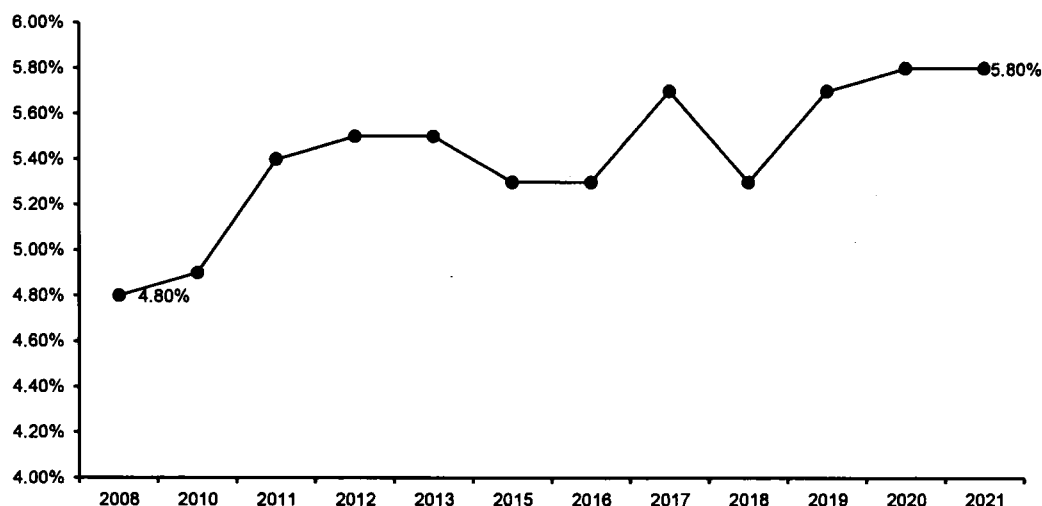
EXHIBIT 16: **German corporates assumptions of market risk premium vs BNETZA**



Source: KPMG Cost of Capital 2020 study, Bernstein analysis

Professor Pablo Fernandez of IESE Business School has been conducting an annual surveys¹² of ERP assumptions made by academics, analysts, investors and corporates to calculate the required return to equity in different countries. In Exhibit 17, we summarise the results of ERP expectations for Germany since 2008. Once again there is a clear trend of rising ERPs evident in his surveys too.

EXHIBIT 17: **Survey of ERP expectations for Germany over time**



Source: Annual surveys by Professor Pablo Fernandez (IESE Business School), Bernstein analysis

- + **Analyst expectations:** We assume a WACC of 4.5% and a post-tax cost of equity of 6.7% for valuing E.ON's German network division, with an implied total market return of 7.5%.

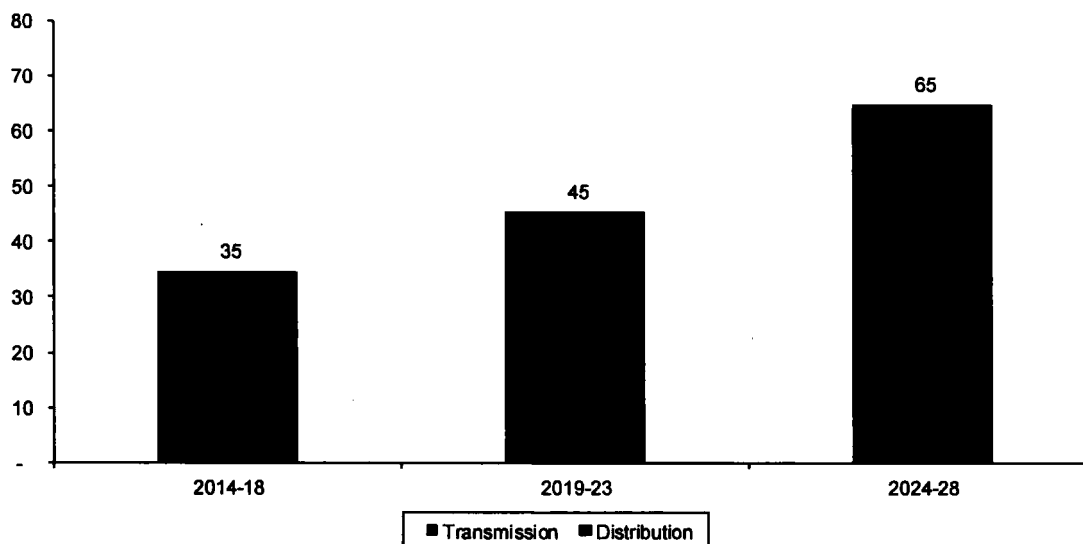
In conclusion, we believe that the experts and BNETZA have barely scrutinised the underpinnings of the DMS data to check for stability and consistency and the conclusions run contrary to expectations of a steep increase in ERP post financial crisis. As the regulatory cost of equity is intended to ensure an appropriate return, it must reflect capital market conditions and be consistent with the risk-free rate used.

¹² https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3861152

(3) SIGNIFICANT INVESTMENTS NEEDED TO SUPPORT GERMANY'S DECARBONISATION AMBITIONS ARE IN JEOPARDY FROM THE LOW PROPOSED COST OF EQUITY

We estimate that electric T&D capex will rise by >40% in the next regulatory period (Exhibit 18) to meet Germany's old targets of a 55% reduction of GHG by 2030 and achieve a 65% renewables penetration in the electricity mix. These investment levels have to increase to meet Germany's recently upgraded targets of 65% emission reduction by 2030. Therefore, the flawed methodology for determining the allowed return on equity has to be revisited to enable the much needed investments in grids.

EXHIBIT 18: German Power T&D capex is expected to increase by at least 43% in the new regulatory period, Eur Bn



























Source: BNETZA, DENA, E.ON, TSO statements, Bernstein analysis and estimates Note: Distribution investments in this chart assume DENA estimates rather than the new Eurelectric/E.DSO estimates discussed in this note

The expert commission¹³ on energy transition appointed by the German Government has concluded that transmission grid development and renewables re-dispatch measures are already lagging 2020 targets. Therefore, we highlight that the significant investments needed to enable Germany's energy transition are in significant jeopardy with the proposed low cost of equity.

¹³ https://www.bmwi.de/Redaktion/DE/Downloads/S-T/stellungnahme-der-expertenkommission-zum-achten-monitoring-bericht-zusammenfassung.pdf?__blob=publicationFile&v=12

EXHIBIT 19: Germany's expert commission on monitoring progress of Germany's energy transition has highlighted the slow progress of network expansion

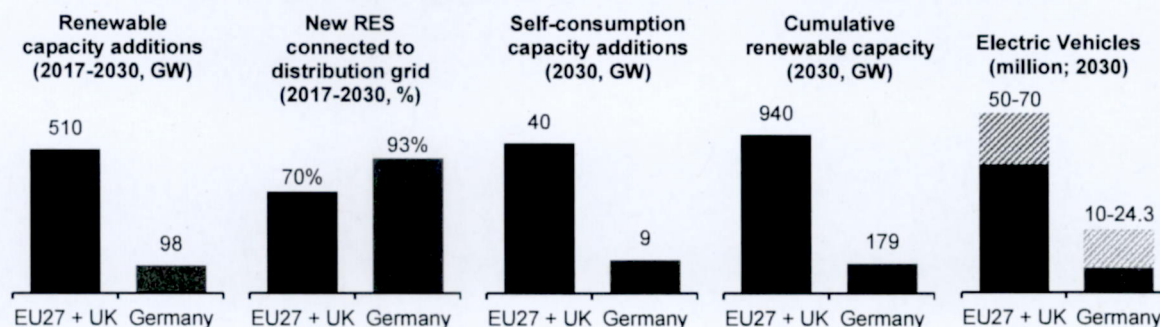
Dimension	Indicator	
Climate action	Greenhouse gas emissions reduction (lead indicator)	
Nuclear phase-out	Shutdown of nuclear power plants according to phase-out path (lead indicator)	
Renewable energy	Increase renewables share in gross final energy consumption (lead indicator)	
	Increase renewables share in gross power consumption	
	Increase renewables share in final energy consumption for heating/cooling	
Energy efficiency	Increase renewables share in transport sector	
	Reduce primary energy consumption (lead indicator)	
	Final energy productivity	
	Reduce heat demand in buildings	
Supply security	Reduce final energy consumption in transport sector	
	Transmission grid development (lead indicator)	
	Amount of necessary re-dispatch measures	
Price	System Average Interruption Duration Index - power and gas	
	Final consumer expenditure for power (of GDP) (lead indicator)	
	Final consumer expenditure for heating services	
	Final consumer expenditure in road traffic	
	Power unit costs for industry compared internationally	
Acceptance	Energy cost burden on households	
	General approval of the goals of the energy transition (lead indicator)	
	Approval of the implementation of the energy transition	
	Approval based on how energy transition personally affects citizens	
Target fulfilment		 likely  not guaranteed  unlikely

Source: CLEW based on expert report

More recent studies point to an even higher level of investments needed in grids. For example, a recent study¹⁴, by Eurelectric/ E.DSO has examined the investments required in the distribution grids in Germany (and rest of EU and UK). Key modelling assumptions made in the study are summarised in Exhibit 20 and Exhibit 21.

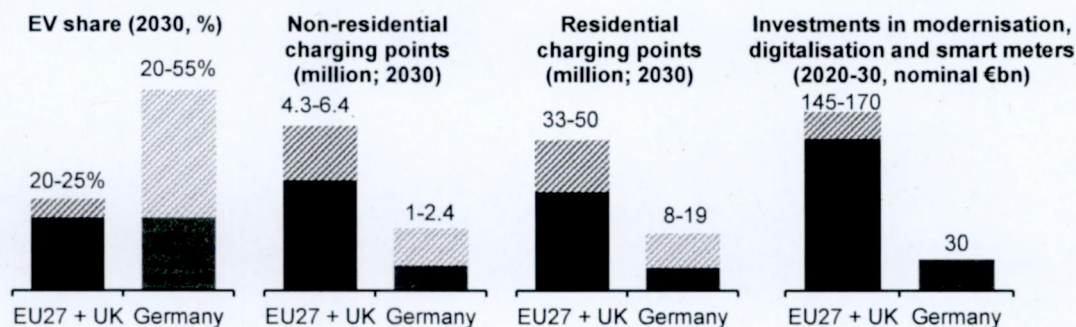
¹⁴ <https://cdn.eurelectric.org/media/5140/eurelectric-connecting-the-dots-full-study-h-175EEC3B.pdf>

EXHIBIT 20: Germany accounts for a 20-25% of Europe's distribution grid connected renewable capacity ...



Source: Eurelectric/E.DSO, Monitor Deloitte, Bernstein analysis

EXHIBIT 21: ... EV and associated charging point additions



Source: Eurelectric/E.DSO, Monitor Deloitte, Bernstein analysis

As per the study, Germany will see a significant increase in distribution network spend driven by decarbonisation, modernisation and digitalisation driven by the following specifics:

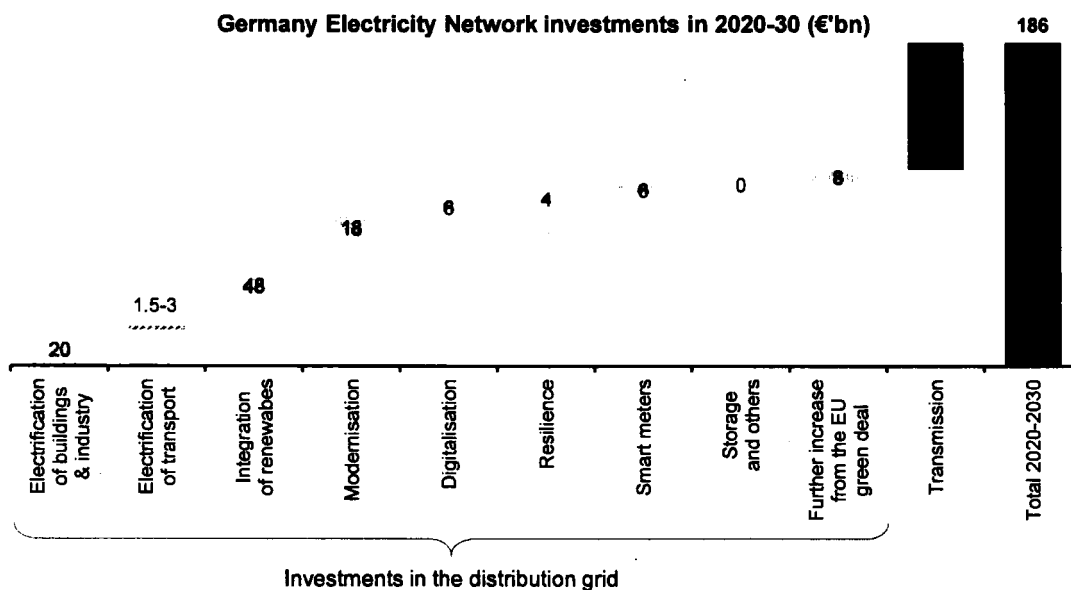
- + 90-95% of new renewable capacity in Germany will be connected to distribution grids including a significant proportion of small solar PV installations of <2MW connected to the rural grid. Rural grids have strong modernization needs to integrate variable renewable sources.
- + Significant increase in EV penetration is expected: 10-24.3 million of EVs (BEV and PHEV) vs 0.4m in 2020.
- + Germany will see a full deployment of smart meters by 2030 (currently ~0%)
- + High share of underground lines (>90% of new grid lines are underground)
- + Compared to overall EU-27+UK capex split of 50% from renewables and electrification, 33% from modernisation and 17% from digitalisation, Germany's investment drivers are skewed more to renewables and electrification (67%) than to modernisation (21%) and digitalisation (12%).

At a distribution capex estimate of €105-113bn over 2020-2030 (Exhibit 21), the numbers are 2.3X what is implied by the 2019 capex run-rate of €4.4bn p.a. The numbers are also 1.8X higher than prior estimates of capex based on a 2018 study¹⁵ by the German Energy Agency, DENA which implies a distribution network spend of €62bn from 2020 to 2030, as developments

¹⁵ <https://www.dena.de/en/newsroom/publication-detail/pub/dena-study-integrated-energy-transition/>

such as 100% smart meter penetration are not considered and EV deployment ambitions are also lower. In addition, we estimate that transmission investments of ~€75bn is also required.

EXHIBIT 22: Germany Electricity Networks need significant investments in this decade to enable the energy transition

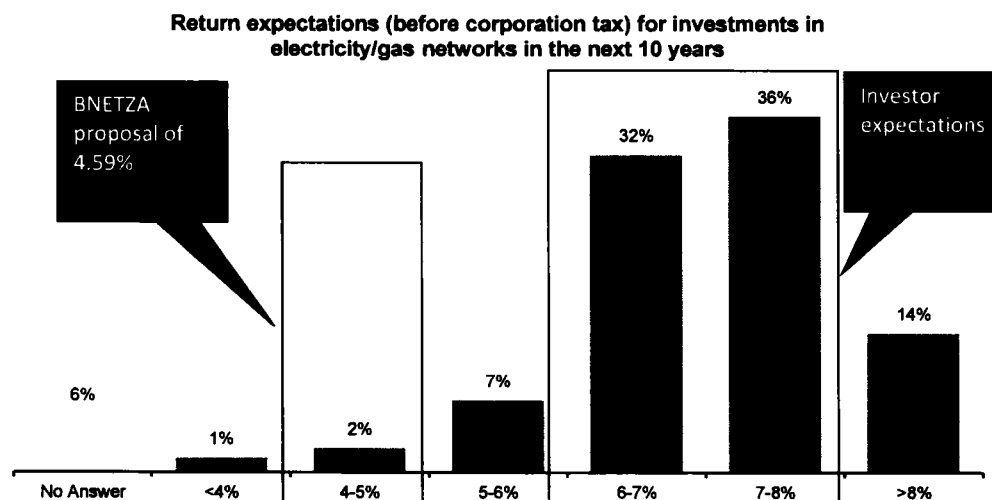


Source: Eurelectric/E.DSO, Monitor Deloitte, DENA, TSOs, Bernstein analysis and estimates

To put investor returns for network investments into context, we cite the results of a survey¹⁶ carried out by Prof Schwetzler, Chair of Financial Management at the HHL Leipzig Graduate School of Management, among existing and potential investors in the German energy networks, showing that a majority views the current cost of equity as already insufficient and that on average, across all respondents, the expectation was that the cost of equity must not be significantly below 7% before corporate taxes. The current proposal of 4.59% falls at the bottom decile of investor expectations.

¹⁶ https://www.bdew.de/media/documents/Investorenumfrage_Prof._Schwetzler_mgmt_summary_engl_2020.pdf

EXHIBIT 23: Investor expectations on Return on Equity (before corporate taxes) are above the current 6.9% and significantly above the proposed 4.59%

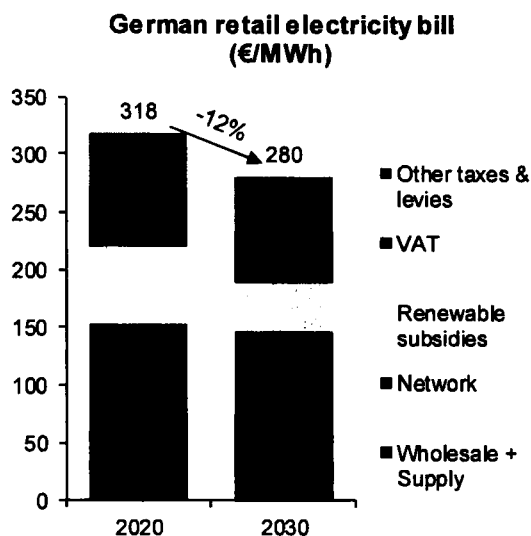


Source: Prof Schwetzler's investor survey, Bernstein analysis

We believe that similar to the 2nd regulatory period, where in light of capital market conditions and Germany's shift towards renewables, a decision was made to deviate from the mechanical derivation of ERP proposed during the consultation stage, a significant shift is required to enable Germany's steep decarbonisation agenda.

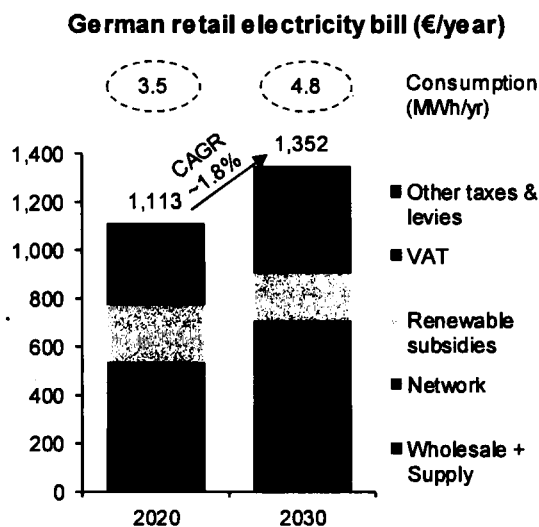
Finally, we believe that the consumer bill impact of network expansion is manageable. We have done an analysis on the impact on consumer retail bills in Germany, considering distribution investments outlined above of €113bn as well as transmission investments of €74bn from 2020-2030; a total network investment of ~€190bn and forecast the German annual retail electricity bill to only increase at ~1.8% p.a. through 2030 (see Exhibit 25), primarily driven by rising consumption (due to electrification of heat and electricity) while the amount paid per MWh falls 12% over the period (see Exhibit 24). The network element of the bill stays around 25% of the total bill; we have assumed no reduction in allowed returns to network operations in our assumptions.

EXHIBIT 24: German retail electricity bill will fall on a MWh basis...



Source: BDEW, Eurelectric, Bernstein analysis and estimates

EXHIBIT 25: ...and increases slowly at -1.8% p.a. in absolute terms due to rising power consumption



Source: BDEW, Eurelectric, Bernstein analysis and estimates

Should you have any questions or wish to discuss any of our analyses, please do not hesitate to contact me at deepa@bernstein.com

Deepa Venkateswaran

DISCLOSURE APPENDIX

BERNSTEIN TICKER TABLE

Ticker	Rating	6 Aug 2021 Closing Price	Target Price	TTM Rel. Perf.	EPS Adjusted			P/E Adjusted		
					2020A	2021E	2022E	2020A	2021E	2022E
EOAN.GR	O	EUR 10.42	13.30	(22.4)%	EUR 0.63	0.71	0.92	16.60	14.82	11.27
RWE.GR	O	EUR 30.64	45.00	(35.1)%	EUR 1.90	1.41	1.60	16.10	21.73	19.12
MSDLE15		1,875.10			73.37	99.06	112.83	25.56	18.93	16.62

O - Outperform, M - Market-Perform, U - Underperform, N - Not Rated

VALUATION METHODOLOGY

European Utilities & Renewables

We value our European utilities and renewables coverage using a sum of the parts DCF methodology.

RISKS

E.ON SE

Key downside risks to our target price include:

- + Adverse regulatory intervention in the UK energy supply market over and above our base case
- + Further regulatory burdens on nuclear - additional contributions to nuclear decommissioning reserves
- + Failure to deliver on cost efficiency programme/ synergies in the deal with RWE

RWE AG

Key downside risks to our price target include:

- + Execution risk in the renewables division
- + Lower than expected power price (falling coal prices and continued renewables build-out);
- + Higher than expected carbon price in the long-term;
- + Credit downgrade could result in higher costs of funding and/or restrict access to debt markets
- + Further regulatory burdens (e.g. additional contribution to nuclear decommissioning reserves, limitations on lignite fleet or increased regulatory burdens)

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12-Month Bernstein Rating History as of 08/05/2021

Ticker Rating Changes

EOAN.GR O (IC) 05/08/14

RWE.GR O(RC)01/09/18

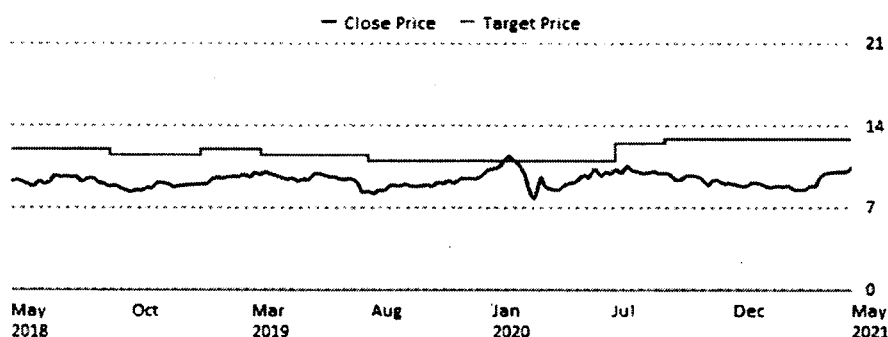
Rating Guide: O - Outperform, M - Market-Perform, U - Underperform, N - Not Rated

Rating Actions: IC - Initiated Coverage, DC - Dropped Coverage, RC - Rating Change

EOAN.GR / E.ON SE (EUR)

Date	Rating	Target
01-Nov-2017	O	12.00
11-Sep-2018	O	11.50
09-Jan-2019	O	12.00
26-Mar-2019	O	11.50
16-Aug-2019	O	11.00
03-Jul-2020	O	12.50
07-Sep-2020	O	12.90
06-May-2021	O	13.30

O - Outperform
M - Market-Perform
U - Underperform
N - Not Rated

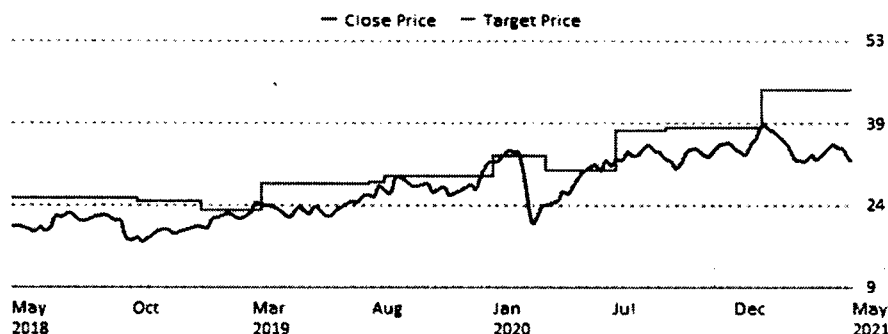


Source: Bernstein - As of 13-May-2021

RWE.GR / RWE AG (EUR)

Date	Rating	Target
29-Mar-2018	O	25.00
19-Oct-2018	O	24.50
09-Jan-2019	O	23.00
26-Mar-2019	O	27.50
16-Aug-2019	O	28.00
06-Sep-2019	O	29.00
24-Jan-2020	O	32.50
02-Apr-2020	O	30.00
03-Jul-2020	O	37.00
07-Sep-2020	O	37.50
06-Jan-2021	O	44.50

O - Outperform
M - Market-Perform
U - Underperform
N - Not Rated



Source: Bernstein - As of 13-May-2021

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