ENERGY REGULATORS
REGIONAL ASSOCIATION

Regulatory Approaches to Revenue Setting for Electricity Transmission and Distribution System Operators among ERRA Member Organizations

ANNEXES

Submitted to
ERRA by:

ECONOMIC
CONSULTING
ASSOCIATES

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Simple contents

ANNEXES

A1 WACC calculations

Table 17 - Table 20 below display WACC values and their sub-parameters for the TSOs and DSOs for the current and previous regulatory period. These are the values provided by participants in Part 2 of the survey.

In the survey, participants could provide these values in nominal or real terms. They could also provide the WACC value as a pre-tax, post-tax or vanilla rate. In the table, we convert nominal rates into real rates by using the standard Fisher equation:

$$r = \frac{1+R}{1+\pi} - 1,$$

where R is the nominal rate (eg the nominal risk-free rate), r is the real rate (eg the real risk-free rate), and π is the average annual inflation rate over which the rate under consideration applies (eg the average annual inflation over the period 2015-2018, if this is the period for which the risk-free rate under consideration applies). We convert rates into real terms for easier comparison across jurisdictions. In the caption of each table, we provide the years over which we calculate the average annual inflation.

Table 17 TSO WACC parameters (previous regulatory period)

	AL	AT	AZ	BG	CZ	EE	GE	HU	LT	LV	MD	MK	NG	OM	PE	PK	PL	SK	TR	XK
Parameters																				
Real risk-free rate	2.4%							3.7%				3.8%	4.0%							
(or nominal risk-free rate)			8.0%			1.9%	7.5%		4.0%	1.3%	2.3%			3.1%		9.0%		4.0%	12.1%	
Inflation	2.0%		2.7%		1.5%	0.1%	4.1%		1.6%	1.5%	6.6%		8.8%	2.7%		5.7%		0.9%	7.1%	3.0%
Gearing	46.3%					50.0%	60.0%	45.0%	70.0%	50.0%	50.0%	33.5%	30.0%	50.0%		70.0%		60.0%	50.0%	40.0%
Tax rate	15.0%		20.0%				15.0%	19.0%	15.0%	15.0%	12.0%	10.0%	32.0%	12.0%				19.0%	20.0%	
Equity risk premium	2.4%					5.0%	7.3%	4.0%	4.6%	5.1%		3.2%	10.0%	5.5%		7.0%		3.0%	8.1%	
Asset beta						0.35				0.39				0.38					0.34	
Equity beta						0.70	1.00	0.55	0.73	0.72		1.00		0.70		0.86		0.30	0.61	
Real cost of equity	2.4%							7.3%				7.0%	14.0%							
(or nominal cost of equity)			0.0%			6.1%	14.8%		7.2%	6.7%	9.1%			8.7%		15.0%		5.2%	17.1%	
Debt premium (%)			0.0%			1.1%		1.3%					5.7%						2.7%	
Real cost of debt	3.4%							5.0%				3.3%	9.7%							3.5%
(or nominal cost of debt)			2.3%			3.7%	11.0%		5.1%	2.5%	8.0%			5.3%		13.0%		5.1%	14.9%	
Real risk-free rate	**2.4%**		**5.2%**			**1.8%**	**3.3%**	**3.7%**	**2.3%**	**-0.2%**	**-4.0%**	**3.8%**	**4.0%**	**0.4%**		**3.1%**		**3.1%**	**4.7%**	
Real cost of equity	**2.4%**		**-2.6%**			**6.0%**	**10.2%**	**7.3%**	**5.5%**	**5.2%**	**2.3%**	**7.0%**	**14.0%**	**5.8%**		**8.8%**		**4.3%**	**9.3%**	
Real cost of debt	**3.4%**		**-0.4%**			**3.6%**	**6.6%**	**5.0%**	**3.4%**	**1.0%**	**1.3%**	**3.3%**	**9.7%**	**2.5%**		**6.9%**		**4.2%**	**7.2%**	**3.5%**
WACC value																				
Pre-tax, real WACC	2.9%							6.2%				6.3%	11.0%	4.8%					10.6%	5.1%
Pre-tax, nominal WACC					6.4%	4.9%	13.5%		6.1%		9.2%					13.6%		6.0%		
Post-tax, nominal WACC										4.4%										
Pre-tax, real WACC	**2.9%**				**4.9%**	**4.8%**	**9.1%**	**6.2%**	**4.5%**	**2.3%**	**2.4%**	**6.3%**	**11.0%**	**4.8%**		**7.4%**		**5.1%**	**10.6%**	**5.1%**

Source: Parameters taken from survey question 5.9. Inflation data up to 2019, inclusive, are taken from Eurostat. Forecasts are taken from Statistica.

CZ: Average annual inflation rate over 2010-2015. EE: Inflation rate is for 2015. LT: Average annual inflation rate over 2011-2015. LV: Average annual inflation rate over 2011-2015. SK: Average annual inflation rate over 2011-2016.

Table 18 TSO WACC parameters (current regulatory period)

	AL	AT	AZ	BG	CZ	EE	GE	HU	LT	LV	MD	MK	NG	OM	PE	PK	PL	SK	TR	XK
Parameters																				
Real risk-free rate	2.4%							1.9%				2.8%	4.0%							3.7%
(or nominal risk-free rate)		1.9%	8.0%		3.8%	1.5%	12.2%		3.5%	1.2%	2.9%			2.5%		9.2%	2.8%	3.0%	12.3%	
Inflation	1.5%	2.1%	2.7%		2.0%	2.6%	3.2%		2.3%	2.1%	3.0%		11.3%	2.9%		8.9%	2.5%	2.2%	8.6%	2.0%
Gearing	42.3%	60.0%			45.8%	50.0%	60.0%	51.0%	60.0%	50.0%	50.0%	22.0%	30.0%	55.0%		70.0%	50.0%	60.0%	50.0%	40.0%
Tax rate	15.0%	25.0%	20.0%		19.0%	20.0%	15.0%	19.0%	15.0%	20.0%	12.0%	10.0%	32.0%	1.0%			19.0%	22.0%	22.0%	10.0%
Equity risk premium	2.4%	5.0%			5.0%	5.0%	6.2%	4.3%	7.1%	5.0%		2.7%	10.0%	5.5%		6.5%	3.9%	4.5%	9.3%	4.5%
Asset beta		0.40			0.54	0.34				0.40				0.40			0.40		0.54	1.00
Equity beta		0.85			0.90	0.67	0.84	0.73	0.72	0.72		1.00		0.77		0.86	0.72	0.53	0.95	1.00
Real cost of equity	2.4%							5.0%				5.5%	14.0%							8.2%
(or nominal cost of equity)		6.1%	0.0%		8.3%	5.6%	18.4%		8.6%	4.8%	9.7%			10.5%		15.0%	5.8%	8.3%	21.2%	
Debt premium (%)			0.0%		1.4%	1.1%		1.4%					5.7%				4.2%		5.8%	3.5%
Real cost of debt	2.3%							3.2%				1.6%	9.7%							7.2%
(or nominal cost of debt)		2.7%	2.3%		5.2%	3.3%	12.9%		1.5%	2.5%	5.0%			5.5%		11.4%		3.7%	18.1%	
Real risk-free rate	**2.4%**	**-0.2%**	**5.2%**		**1.8%**	**-1.1%**	**8.7%**	**1.9%**	**1.2%**	**-0.9%**	**-0.1%**	**2.8%**	**4.0%**	**-0.4%**		**0.3%**	**0.3%**	**0.8%**	**3.5%**	**3.7%**
Real cost of equity	**2.4%**	**3.9%**	**-2.6%**		**6.2%**	**3.0%**	**14.7%**	**5.0%**	**6.2%**	**2.6%**	**6.5%**	**5.5%**	**14.0%**	**7.4%**		**5.6%**	**3.2%**	**6.0%**	**11.6%**	**8.2%**
Real cost of debt	**2.3%**	**0.6%**	**-0.4%**		**3.2%**	**0.8%**	**9.4%**	**3.2%**	**-0.7%**	**0.4%**	**2.0%**	**1.6%**	**9.7%**	**2.5%**		**2.3%**		**1.5%**	**8.8%**	**7.2%**
WACC value																				
Pre-tax, real WACC	2.4%							4.7%				5.2%	11.0%	5.1%			3.0%		13.3%	8.3%
Pre-tax, nominal WACC		4.9%			8.0%	4.5%	16.4%		4.9%	4.2%	8.0%					12.5%		6.5%		
Pre-tax, real WACC	**2.4%**	**2.7%**			**5.9%**	**1.9%**	**12.8%**	**4.7%**	**2.6%**	**2.1%**	**4.9%**	**5.2%**	**11.0%**	**5.1%**		**3.3%**	**3.0%**	**4.2%**	**13.3%**	**8.3%**

Source: Parameters taken from survey question 5.9. Inflation data up to 2019, inclusive, are taken from Eurostat. Forecasts are taken from Statistica.

AT: Inflation rate is for 2018. Nominal cost of equity is after tax. CZ: Average annual inflation rate over 2016-2020. EE: Average annual inflation rate over 2016-2019. LT: Average annual inflation rate over 2016-2020. LV: Average annual inflation rate over 2016-2019. SK: Average annual inflation rate over 2017-2021.

Table 19 DSO WACC parameters (previous regulatory period)

	AL	AT	AZ	BG	CZ	EE	GE	HU	LT	LV	MD	MK	NG	OM	PE	PK	PL	SK	TR	XK
Parameters																				
Real risk-free rate	1.3%							3.7%				3.8%	4.0%							
(or nominal risk-free rate)		3.3%	8.0%			1.9%	7.5%		4.0%	1.3%	1.8%			3.5%		9.0%		4.0%	10.1%	
Inflation	2.0%	1.5%	2.7%		1.5%	0.1%	4.1%		1.6%	1.5%	6.6%		8.8%	3.3%		5.7%		0.9%	7.8%	
Gearing	60.0%	60.0%				50.0%	60.0%	45.0%	70.0%	50.0%	35.0%	47.3%	70.0%	50.0%		70.0%		60.0%	50.0%	
Tax rate	0.0%	25.0%	20.0%			20.0%	15.0%	19.0%	15.0%	15.0%	12.0%	10.0%	32.0%	12.0%				19.0%	20.0%	
Equity risk premium	6.6%	5.0%				5.0%	7.3%	4.0%	4.6%	5.1%	7.1%	3.2%	10.0%	5.5%		7.0%		3.0%	9.4%	
Asset beta		0.33				0.63				0.39	0.47			0.38					0.59	
Equity beta	1.32	0.69				0.73	1.00	0.55	0.73	0.72	0.69	1.00		0.70		1.10		0.30	1.00	
Real cost of equity	9.9%							7.3%				7.0%	14.0%							
(or nominal cost of equity)		6.7%	0.0%			6.3%	14.8%		7.2%	6.7%	15.7%			10.1%		16.7%		5.2%	19.5%	
Debt premium (%)			0.0%			1.2%		1.3%					5.7%						3.8%	
Real cost of debt	1.2%							5.0%				5.2%	9.7%							
(or nominal cost of debt)		4.7%	9.8%			3.8%	11.0%		5.1%	2.5%	6.0%			5.5%		9.8%		5.1%	11.1%	
Real risk-free rate	**1.3%**	**1.7%**	**5.2%**			**1.8%**	**3.3%**	**3.7%**	**2.3%**	**-0.2%**	**-4.5%**	**3.8%**	**4.0%**	**0.2%**		**3.1%**		**3.1%**	**2.1%**	
Real cost of equity	**9.9%**	**5.1%**	**-2.6%**			**6.2%**	**10.2%**	**7.3%**	**5.5%**	**5.2%**	**8.5%**	**7.0%**	**14.0%**	**6.6%**		**10.4%**		**4.3%**	**10.8%**	
Real cost of debt	**1.2%**	**3.2%**	**6.9%**			**3.7%**	**6.6%**	**5.0%**	**3.4%**	**1.0%**	**-0.6%**	**5.2%**	**9.7%**	**2.1%**		**3.8%**		**4.2%**	**3.1%**	
WACC value																				
Pre-tax, real WACC	7.8%							6.2%				6.6%	11.0%	5.0%					10.5%	12.0%
Pre-tax, nominal WACC		6.4%			6.8%	5.0%	13.5%		6.1%		13.7%							6.0%		
Post-tax, nominal WACC										4.4%										
Vanilla nominal WACC																11.8%				
Real WACC (pre or van)	**7.8%**	**4.8%**			**5.2%**	**4.9%**	**9.1%**	**6.2%**	**4.5%**	**2.3%**	**6.7%**	**6.6%**	**11.0%**	**5.0%**		**5.8%**		**5.1%**	**10.5%**	**12.0%**

Source: Parameters taken from survey question 5.9. Inflation data up to 2019, inclusive, are taken from Eurostat. Forecasts are taken from Statistica.

AT: Average annual inflation rate over 2014-2018. CZ: Average annual inflation rate over 2010-2015. EE: Inflation rate is for 2015. LT: Average annual inflation rate over 2011-2015. LV: Average annual inflation rate over 2011-2015. SK: Average annual inflation rate over 2012-2016.

Table 20 DSO WACC parameters (current regulatory period)

	AL	AT	AZ	BG	CZ	EE	GE	HU	LT	LV	MD	MK	NG	OM	PE	PK	PL	SK	TR	XK
Parameters																				
Real risk-free rate	1.3%							1.9%				2.8%	4.0%							3.7%
(or nominal risk-free rate)		1.9%	8.0%		3.8%	1.5%	12.2%		3.5%	1.2%	2.3%			2.5%		9.0%	2.8%	3.0%	12.3%	
Inflation	1.5%	1.9%	2.7%		2.0%	2.6%	3.2%		2.3%	2.1%	3.0%		11.3%	3.0%		8.9%	2.5%	2.2%	8.3%	2.0%
Gearing	60.0%	60.0%			45.8%	50.0%	60.0%	51.0%	60.0%	50.0%	35.0%	13.3%	70.0%	55.0%		70.0%	50.0%	60.0%	50.0%	40.0%
Tax rate	0.0%	25.0%	20.0%		19.0%	20.0%	15.0%	19.0%	15.0%	20.0%	12.0%	10.0%	32.0%	15.0%			19.0%	22.0%	22.0%	10.0%
Equity risk premium	6.6%	5.0%			5.0%	5.0%	6.2%	4.3%	7.1%	5.0%	5.2%	2.7%	10.0%	5.5%		7.0%	3.9%	4.5%	9.3%	4.5%
Asset beta		0.40			0.54	0.33				0.40	0.19			0.40			0.40		0.59	1.00
Equity beta	1.32	0.85			0.90	0.67	0.84	0.73		0.72	0.28	1.00		0.89		1.10	0.72	0.53	1.06	1.00
Real cost of equity	9.9%							5.0%				5.5%	14.0%							8.2%
(or nominal cost of equity)		6.1%	0.0%		8.3%	5.6%	18.4%		8.6%	4.8%	11.3%			10.7%		16.7%	5.8%	8.3%	22.2%	
Debt premium (%)			0.0%		1.4%	1.2%		1.4%					5.7%				4.2%		7.4%	3.5%
Real cost of debt	1.2%							3.2%				3.6%	9.7%							7.2%
(or nominal cost of debt)		2.7%	9.8%		5.2%	3.4%	12.9%		1.7%	2.5%	5.0%			5.8%		9.8%		3.7%	19.7%	
Real risk-free rate	**1.3%**	**0.0%**	**5.2%**		**1.8%**	**-1.1%**	**8.7%**	**1.9%**	**1.2%**	**-0.9%**	**-0.7%**	**2.8%**	**4.0%**	**-0.5%**		**0.1%**	**0.3%**	**0.8%**	**3.8%**	**3.7%**
Real cost of equity	**9.9%**	**4.2%**	**-2.6%**		**6.2%**	**3.0%**	**14.7%**	**5.0%**	**6.2%**	**2.6%**	**8.1%**	**5.5%**	**14.0%**	**7.5%**		**7.1%**	**3.2%**	**6.0%**	**12.9%**	**8.2%**
Real cost of debt	**1.2%**	**0.8%**	**6.9%**		**3.2%**	**0.8%**	**9.4%**	**3.2%**	**-0.6%**	**0.4%**	**2.0%**	**3.6%**	**9.7%**	**2.7%**		**0.8%**		**1.5%**	**10.6%**	**7.2%**
WACC value																				
Pre-tax, real WACC	7.8%	3.0%						4.7%				5.8%	11.0%	5.6%			3.0%		14.6%	8.3%
Pre-tax, nominal WACC		4.9%			8.0%	4.5%	16.4%		5.0%	4.2%	10.1%							6.5%		
Vanilla nominal WACC																2.6%				
Real WACC (pre or van)	**7.8%**	**3.0%**			**5.9%**	**1.9%**	**12.8%**	**4.7%**	**2.7%**	**2.1%**	**6.9%**	**5.8%**	**11.0%**	**5.6%**		**2.6%**	**3.0%**	**4.2%**	**14.6%**	**8.3%**

Source: Parameters taken from survey question 5.9. Inflation data up to 2019, inclusive, are taken from Eurostat. Forecasts are taken from Statistica.

AT: Average annual inflation rate over 2019-2023. CZ: Average annual inflation rate over 2016-2020. EE: Average annual inflation rate over 2016-2019. LT: Average annual inflation rate over 2016-2020. LV: Average annual inflation rate over 2016-2019. PL: Aggregation of five DSOs. SK: Average annual inflation rate over 2017-2021.

A2 Country fact sheets

A2.1 Albania

Variable	Response	
Regulator details		
Name of regulatory authority	Energy Regulatory Authority (ERE)	
Regulatory governance		
Governance position of regulatory authority	Independent regulator reporting to legislature.	
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.	
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by legislature through an open call.	
Entity that develops the allowed revenue methodology	Regulator.	
Entity that approves the allowed revenue methodology	Regulator.	
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology
		Stakeholder comments on determination
	✓	Decision on allowed revenues
	✓	Tariff calculation models
		Tariff proposal consultation papers
	✓	Decision on approved tariffs
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?
	✓	Submit regulatory accounting statements?
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?
	Who may appeal:	
	✓	End users
	✓	Network users
	✓	Government
	✓	Utility
	Appeals body:	
		Government
		Board of commissioners
		Tribunal
		A court, only for procedural breaches

Variable	Response		
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
	✓	✓	Price cap
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	1	1	
Price resets	x	x	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	✓	✓	Is an X-efficiency factor used?
	0%	0%	Factor adopted
	More information: The regulatory rules foresee the use of an efficiency factor based on TSO benchmarking and information furnished by TSO, but this is still pending. Therefore, the factor has been set to zero in the interim.		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓	✓	Bottom-up
			Top-down
			Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	✓	✓	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
	✓	✓	Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
	✓	✓	Inflation rate
			Discount rate
	x	x	Distinction of controllable and uncontrollable?

Variable	Response		
Controllable vs uncontrollable	Opex classified as uncontrollable:		
			Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	x	Opex efficiency factor?
			Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
	✓	✓	Financial aspects
			Impact on tariffs

Variable	Response		
	Means for assessing capex efficiency ex-ante:		
	✓	✓	Unit cost of project
			TFP
			Payback periods
			CBA
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
	✓	✓	Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	✓	✓	Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
			Utility bears impact
	✓	✓	Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
			When commissioned
	✓	✓	When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
	✓	✓	No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
	Calculation approach:		

Variable	Response		
Working capital calculation	✓	✓	Formula approach
			Lead-lag
			Balance sheet method
			Other
	More information:		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
	✓	✓	Other
	More information: Working capital is added to the RAB value and is calculated as 1/12 of opex.		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
			Overhead lines/wires
			Underground lines/wires
			Switchgear
			Transformers
			Sub-stations
			Meters
			Buildings

Variable	Response		
			SCADA, telecom
Capex in law			Detailed provisions in tariff method
			Broad principles in tariff method
	✓	✓	Separate regulation
			Framework does not address capex method
Tendering capex			Mandatory for all projects
			Mandatory for projects above a certain cost
	✓	✓	Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
	✓	✓	Pre-tax real
			Other
	More information:		
Gearing ratio			Notional
	✓	✓	Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
	✓	✓	Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta	?	?	Volatility of TSO/DSO's stock against market volatility
	?	?	Volatility of comparator TSO/DSO's stock against market volatility
	?	?	Betas of other power TSOs/DSOs
	?	?	Benchmark similar industries
	?	?	Other
	More information: While Albania claims to use a CAPM approach for the determination of the cost of equity, they state that 'there is no beta predicted in the methodology'; it is unclear what value they use for the beta in their CAPM equation.		
Equity risk premium			Historical data on investment returns in international markets

Variable	Response		
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
	✓	✓	Level needed to ensure cash flow needed for capex
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
		?	Utility bears impact
	✓	?	Utility and customers share impact
		?	Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
			LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
			Harmonic voltage
		✓	Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time

Variable	Response		
		✓	Supply interruption notice
		✓	Restoration time following supply failure
			Complaints process
		✓	Reconnection time
		✓	Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment			To reconcile allowed and actual revenues
			Adjustment for inflation
	✓	✓	To reconcile allowed and actual passthrough costs

A2.2 Austria

Variable	Response		
Regulator details			
Name of regulatory authority	Energie-Control Austria		
Regulatory governance			
Governance position of regulatory authority	Independent energy regulator reporting directly to executive.		
Organisational structure of regulatory authority	Regulatory authority consists of four bodies: an Executive Board with two members; a Regulatory Commission with five members and five alternates; a Supervisory Board with four members; and a Regulatory Advisory Council with representatives of federal states, social partners, and associations.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by executive.		
Entity that develops the allowed revenue methodology	Regulator		
Entity that approves the allowed revenue methodology	Regulator		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
		Stakeholder comments on determination	
		Decision on allowed revenues	
	✓	Tariff calculation models	
		Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
		End users	
		Network users	
		Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method		✓	Revenue cap

Variable	Response		
			Price cap
	✓		Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	1	5	
Price resets	x	✓	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	✓	Is an X-efficiency factor used?
		0.95%	Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
			Top-down
			Yardstick
			Historical outturn opex
			Investment opex
	✓	✓	Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity

Variable	Response		
	✓	✓	System loss
			Ancillary services
			Force majeure
		✓	Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	✓	Opex efficiency factor?
	?	?	Factor
	Method for determining opex efficiency factor:		
	✓	✓	External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
	✓	✓	Data envelopment analysis
			Partial productivity indices
			Total factor productivity
		✓	Ordinary least squares
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
			Ex-ante (before the regulatory / plan period)
			Annually ex-ante
	✓	✓	Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
	✓	✓	Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
			Unit cost of project

Variable	Response		
			TFP
			Payback periods
			CBA
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
			Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
			Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
	✓	✓	As spent, if approved
			When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag

Variable	Response		
			Balance sheet method
			Other
	More information:		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
	✓	✓	Current or replacement cost
			LRAIC
		✓	Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
			Overhead lines/wires
			Underground lines/wires
			Switchgear
			Transformers
			Sub-stations
			Meters
			Buildings
			SCADA, telecom
Capex in law	✓	✓	Detailed provisions in tariff method

Variable	Response		
			Broad principles in tariff method
			Separate regulation
			Framework does not address capex method
Tendering capex			Mandatory for all projects
	✓	✓	Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type	✓	✓	Pre-tax nominal
			Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt	✓	✓	Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
	✓	✓	Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium	✓	✓	Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market

Variable	Response		
Risk-free rate	✓	✓	Government borrowing rate as a proxy
	✓	✓	Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	x	x	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
			Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
			LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
		✓	MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
		✓	Harmonic voltage
		✓	Unbalance
		✓	Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time

Variable	Response		
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment			To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
	✓	✓	To reconcile allowed and actual passthrough costs

A2.3 Azerbaijan

Variable	Response		
Regulator details			
Name of regulatory authority	Azerbaijan Energy Regulatory Agency (AERA)		
Regulatory governance			
Governance position of regulatory authority	Agency under the Ministry of Energy.		
Organisational structure of regulatory authority	A board of commissioners and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by executive.		
Entity that develops the allowed revenue methodology	Tariff Council.		
Entity that approves the allowed revenue methodology	Government. However, the Regulatory Agency informs us that the strategy of Azerbaijan Government will empower the Agency to create its own methodology in future.		
Public availability of allowed revenue and tariff documents		Allowed revenue methodology	
		Stakeholder comments on determination	
		Decision on allowed revenues	
		Tariff calculation models	
		Tariff proposal consultation papers	
		Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
		End users	
		Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
	✓	Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
			Price cap

Variable	Response		
	✓	✓	Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	1	1	
Price resets	x	x	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	x	Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
			Top-down
			Yardstick
			Historical outturn opex
			Investment opex
	✓	✓	Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
			Force majeure
			Upstream network costs
	✓		Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	✓	Opex efficiency factor?
	?	?	Factor
	Method for determining opex efficiency factor:		
	?	?	External benchmarking
	?	?	Internal benchmarking
	?	?	Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
			Economic aspects
	✓	✓	Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	✓	✓	Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
	✓	✓	No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	?	?	Remove allowed depreciation or returns for deferrals
	?	?	Time-value adjustments
	?	?	Adjust in the next review, without time-value adjustment
	?	?	Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
	✓	✓	When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
	✓	✓	No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method
			Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	30	30	Overhead lines/wires
	50	50	Underground lines/wires
	10	10	Switchgear
	20	20	Transformers
	40	40	Sub-stations
	8	8	Meters
	60	60	Buildings
	10	10	SCADA, telecom
Capex in law			Detailed provisions in tariff method
	✓	✓	Broad principles in tariff method
			Separate regulation
			Framework does not address capex method

Variable	Response		
Tendering capex			Mandatory for all projects
			Mandatory for projects above a certain cost
	✓	✓	Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
			Pre-tax real
	✓	✓	Other
	More information: Nominal cost of debt		
Gearing ratio			Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
	✓	✓	Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
	✓	✓	Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity			CAPM
	✓	✓	Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium			Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate			Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy

Variable	Response		
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	x	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	✓		Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
			MV
			LV
		✓	None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
			Supply interruption notice
			Restoration time following supply failure
		✓	Complaints process
			Reconnection time
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time

Variable	Response		
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment			To reconcile allowed and actual revenues
	✓		Adjustment for inflation
			To reconcile allowed and actual passthrough costs

A2.4 Bulgaria

Variable	Response		
Regulator details			
Name of regulatory authority	Energy and Water Regulatory Commission (EWRC)		
Regulatory governance			
Governance position of regulatory authority	Independent energy regulator reporting directly to legislature.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by legislature through an open call.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Legislature.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
	✓	Decision on allowed revenues	
		Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
		End users	
	✓	Network users	
		Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method		✓	Revenue cap
			Price cap

Variable	Response		
			Cost plus
	✓		Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	1	2-5	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted: ▪ Legislative changes ▪ Deviation in the market price by ±5%		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor			Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
			Top-down
			Yardstick
			Historical outturn opex
			Investment opex
	✓	✓	Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	x	x	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
			Taxes and fees
			Salaries
			Network charges for outsourced electricity

Variable	Response		
			System loss
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	x	Opex efficiency factor?
			Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓		Economic aspects
	✓	✓	Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
			Unit cost of project
	✓	✓	TFP
			Payback periods

Variable	Response		
			CBA
			Discretion of regulator
			Efficiency not assessed
	✓	✓	DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
	✓	✓	No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	✓	✓	Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
	✓	✓	Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
	✓	✓	As spent, if approved
			When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
	✓	✓	Balance sheet method
			Other

Variable	Response		
	More information:		
	Rate at which working capital is remunerated:		
	✓	✓	Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	15	25	Overhead lines/wires
	15	30	Underground lines/wires
	10	10	Switchgear
	10	15	Transformers
	10	15	Sub-stations
	10	10	Meters
	25	50	Buildings
	10	10	SCADA, telecom
Capex in law			Detailed provisions in tariff method
	✓	✓	Broad principles in tariff method
			Separate regulation

Variable	Response		
			Framework does not address capex method
Tendering capex	✓	✓	Mandatory for all projects
			Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
	✓	✓	Pre-tax real
			Other
	More information:		
Gearing ratio			Notional
			Actual
	✓	✓	Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
	✓	✓	Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity			CAPM
			Not included in WACC
	✓	✓	Other
	More information: Benchmarking		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium			Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate			Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy

Variable	Response		
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	?	?	Utility bears impact
	?	?	Utility and customers share impact
	?	?	Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Connection time
			Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
			Reconnection time
		✓	Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time

Variable	Response		
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
			To reconcile allowed and actual passthrough costs

A2.5 Czechia

Variable	Response		
Regulator details			
Name of regulatory authority	Energy Regulatory Office (ERO)		
Regulatory governance			
Governance position of regulatory authority	Independent energy regulator reporting directly to legislature.		
Organisational structure of regulatory authority	A board of commissioners and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by executive.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
		Decision on allowed revenues	
		Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	x	Can regulatory decisions be appealed?	
	Who may appeal:		
		End users	
		Network users	
		Government	
		Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
		A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method	✓	✓	Revenue cap
			Price cap

Variable	Response		
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	5	5	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted: ▪ Legislative changes related to a licensed activity ▪ Exceptional changes to electricity market or national company ▪ Parameters were determined based on incorrect, incomplete, or false data		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	x	Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
			Top-down
			Yardstick
	✓	✓	Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	x	x	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
			Taxes and fees
			Salaries

Variable	Response		
			Network charges for outsourced electricity
			System loss
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
			Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
	✓	✓	Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	✓	Opex efficiency factor?
	1%	1%	Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
	✓	✓	Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
			Ex-ante (before the regulatory / plan period)
			Annually ex-ante
	✓	✓	Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
			Economic aspects
			Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
			Unit cost of project
			TFP

Variable	Response		
			Payback periods
			CBA
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
			Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
			Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
	✓	✓	When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
			Deducted from RAB
	✓	✓	Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
			Only recover interest during construction
	✓	✓	Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method

Variable	Response		
			Other
	More information:		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	40	40	Overhead lines/wires
	40	40	Underground lines/wires
	50	50	Switchgear
	25	25	Transformers
	30	30	Sub-stations
	10	10	Meters
	50	50	Buildings
	10	10	SCADA, telecom
Capex in law			Detailed provisions in tariff method
	✓	✓	Broad principles in tariff method

Variable	Response		
			Separate regulation
			Framework does not address capex method
Tendering capex			Mandatory for all projects
			Mandatory for projects above a certain cost
	✓	✓	Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type	✓	✓	Pre-tax nominal
			Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt	✓	✓	Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
	✓	✓	Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium	✓	✓	Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy

Variable	Response		
			Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	x	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
			Utility bears impact
		✓	Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
		✓	Harmonic voltage
		✓	Unbalance
		✓	Flicker
			Frequency
		✓	Voltage swells
		✓	Voltage dips
		✓	Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time

Variable	Response		
		✓	Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
		✓	Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
		✓	Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
			To reconcile allowed and actual passthrough costs

A2.6 Estonia

Variable	Response		
Regulator details			
Name of regulatory authority	Energy Regulatory Division of the Estonian Competition Authority		
Regulatory governance			
Governance position of regulatory authority	Agency within the Ministry of Justice.		
Organisational structure of regulatory authority	A managing director responsible for approving decisions and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed by the civil service through an open call and appointed by the executive.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
		Stakeholder comments on determination	
		Decision on allowed revenues	
	✓	Tariff calculation models	
		Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	x	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
			Price cap

Variable	Response		
			Cost plus
	✓	✓	Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)			
Price resets	x	x	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor			Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓		Bottom-up
			Top-down
		✓	Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	x	Opex efficiency factor?
			Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
		✓	Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
			Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	✓	✓	Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
	✓	✓	Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
			Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	✓	✓	No adjustments
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
	✓	✓	As spent, if approved
			When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method
	✓	✓	Other

Variable	Response		
	More information: Slope of working capital is 5% of arithmetic average of the last three years' revenue		
	Rate at which working capital is remunerated:		
	?	?	Short-term borrowing rate
	?	?	WACC
	?	?	Allowed cost of debt
	?	?	Rate set in law
	?	?	Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	45	32	Overhead lines/wires
	45	32	Underground lines/wires
	16	32	Switchgear
	16	32	Transformers
	33	32	Sub-stations
	16	15	Meters
	33	35	Buildings
	4	5	SCADA, telecom
Capex in law	✓	✓	Detailed provisions in tariff method
			Broad principles in tariff method

Variable	Response		
			Separate regulation
			Framework does not address capex method
Tendering capex	✓	✓	Mandatory for all projects
			Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type	✓	✓	Pre-tax nominal
			Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt	✓	✓	Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
	✓	✓	Benchmark similar industries
			Other
	More information:		
Equity risk premium	✓	✓	Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate			Government borrowing rate as a proxy

Variable	Response		
	✓	✓	Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	x	x	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
			Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
			MV
			LV
		✓	None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
			Complaints process
		✓	Reconnection time
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality

Variable	Response		
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment			To reconcile allowed and actual revenues
			Adjustment for inflation
			To reconcile allowed and actual passthrough costs

A2.7 Georgia

Variable	Response		
Regulator details			
Name of regulatory authority	Georgian National Energy and Water Supply Regulatory Commission		
Regulatory governance			
Governance position of regulatory authority	Independent energy regulator reporting directly to legislature.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed by executive and appointed by legislature.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
	✓	Decision on allowed revenues	
	✓	Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
		Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method	✓	✓	Revenue cap
			Price cap

Variable	Response		
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	3	3	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted: For a given tariff year, correction factor exceeds ±10% of allowed revenue		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	x	Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓	✓	Bottom-up
			Top-down
			Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
			Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
	✓	✓	Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	✓	Opex efficiency factor?
	1.5%	1.5%	Factor
	Method for determining opex efficiency factor:		
	✓	✓	External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
	✓	✓	Financial aspects
	✓	✓	Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	✓	✓	Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
	✓	✓	Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
			Remove allowed depreciation or returns for deferrals
	✓	✓	Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
			Utility bears impact
			Utility and customers share impact
	✓	✓	Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
	✓	✓	When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
	✓	✓	Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
	✓	✓	Lead-lag
			Balance sheet method
			Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
	✓	✓	Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	45	35	Overhead lines/wires
		35	Underground lines/wires
	30	30	Switchgear
	30	30	Transformers
	30	30	Sub-stations
	20	15	Meters
	60	60	Buildings
	25	25	SCADA, telecom
Capex in law	✓	✓	Detailed provisions in tariff method
			Broad principles in tariff method
			Separate regulation
			Framework does not address capex method

Variable	Response		
Tendering capex			Mandatory for all projects
			Mandatory for projects above a certain cost
			Not mandatory
	✓	✓	Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type	✓	✓	Pre-tax nominal
			Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
	✓	✓	Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
	✓	✓	Betas of other power TSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium	✓	✓	Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy

Variable	Response		
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality

Variable	Response		
		✓	Metering node installation time
		✓	Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
	✓		To reconcile allowed and actual passthrough costs

A2.8 Hungary

Variable	Response		
Regulator details			
Name of regulatory authority	Hungarian Energy Office		
Regulatory governance			
Governance position of regulatory authority	Independent energy regulator reporting directly to legislature.		
Organisational structure of regulatory authority	A managing director responsible for approving decisions and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by executive.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
		Stakeholder comments on determination	
		Decision on allowed revenues	
		Tariff calculation models	
		Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements		Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	x	Can regulatory decisions be appealed?	
	Who may appeal:		
		End users	
		Network users	
		Government	
		Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
		A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
			Price cap
			Cost plus

Variable	Response		
			Rate-of-return
	✓	✓	Hybrid
	More information: Combines a revenue and price cap; the prices are capped, but there is a correction if actual revenue has more than 2% difference from the required revenue.		
Duration of regulatory period (years)	4	4	
Price resets	x	x	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	x	Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓	✓	Bottom-up
			Top-down
		✓	Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
			Unregulated opex not in allowed revenues
	✓	✓	Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	✓	Opex efficiency factor?
	1.5%	1.5%	Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
	✓	✓	Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
		✓	Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
			Ex-ante (before the regulatory / plan period)
			Annually ex-ante
	✓	✓	Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
			Economic aspects
			Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
			Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
			Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
			Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
	✓	✓	When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
	✓	✓	No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method
			Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
			Historical cost
	✓	✓	Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
	✓	✓	Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
			Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	40	40	Overhead lines/wires
	40	40	Underground lines/wires
			Switchgear
		30	Transformers
	30	30	Sub-stations
	14	14	Meters
	50	50	Buildings
			SCADA, telecom
Capex in law	✓	✓	Detailed provisions in tariff method
			Broad principles in tariff method
			Separate regulation
			Framework does not address capex method

Variable	Response		
Tendering capex	✓		Mandatory for all projects
		✓	Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
	✓	✓	Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt	✓	✓	Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
	✓	✓	Benchmark similar industries
			Other
	More information:		
Equity risk premium	✓	✓	Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate			Government borrowing rate as a proxy
	✓	✓	Foreign government borrowing rate as a proxy

Variable	Response		
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
		✓	MAIFI
			ENS
		✓	Outage rate[18]
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
		✓	Harmonic voltage
		✓	Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time

[18] The ratio of the amount of energy not supplied due to unplanned long interruptions to amount of available energy.

Variable	Response		
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
	✓	✓	To reconcile allowed and actual passthrough costs

A2.9 Kosovo

Variable	Response		
Regulator details			
Name of regulatory authority	Energy Regulatory Office		
Regulatory governance			
Governance position of regulatory authority	Independent regulator reporting to legislature.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed by executive and appointed by legislature.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
	✓	Decision on allowed revenues	
		Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
			Price cap

Variable	Response		
			Cost plus
			Rate-of-return
	✓	✓	Hybrid
	More information:		
Duration of regulatory period (years)	5	5	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted: ▪ Force majeure. ▪ Materiality threshold, excess of 5% of the Maximum Allowed Revenues.		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	✓	✓	Is an X-efficiency factor used?
	1.5%	1.5%	Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
			Top-down
	✓	✓	Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	✓	✓	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
	✓	✓	Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
	✓	✓	Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity

Variable	Response		
			System loss
	✓		Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
			Unregulated opex not in allowed revenues
	✓	✓	Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	✓	Opex efficiency factor?
	1.5%	1.5%	Factor
	Method for determining opex efficiency factor:		
	✓	✓	External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
	✓	✓	Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
			Economic aspects
	✓	✓	Financial aspects
	✓	✓	Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	✓	✓	Unit cost of project
			TFP
			Payback periods

Variable	Response		
	✓	✓	CBA
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
	✓	✓	Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	✓	✓	Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
		✓	Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
	✓	✓	When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
		✓	No return
			Return on asset value
	✓		Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
	?	?	Formula approach
	?	?	Lead-lag
	?	?	Balance sheet method

Variable	Response		
	?	?	Other
	More information:		
	Rate at which working capital is remunerated:		
	?	?	Short-term borrowing rate
	?	?	WACC
	?	?	Allowed cost of debt
	?	?	Rate set in law
	?	?	Other
	More information:		
Asset value	Determination of opening asset value:		
			Historical cost
	✓	✓	Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	40	28	Overhead lines/wires
	40	28	Underground lines/wires
	30	30	Switchgear
	30	30	Transformers
	30	30	Sub-stations
	10	10	Meters
	50	50	Buildings
	8	5	SCADA, telecom
Capex in law			Detailed provisions in tariff method
			Broad principles in tariff method

Variable	Response		
	✓	✓	Separate regulation
			Framework does not address capex method
Tendering capex	✓	✓	Mandatory for all projects
			Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
	✓	✓	Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt	✓	✓	Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
			Benchmark similar industries
	✓	✓	Other
	More information: Sets its TSO and DSO equity beta at one, based on the regulator's own judgement.		
Equity risk premium			Historical data on investment returns in international markets
			Historical data on investment returns in the national market
	✓	✓	Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market

Variable	Response		
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
			MAIFI
		✓	ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
		✓	Harmonic voltage
			Unbalance
		✓	Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time

Variable	Response		
		✓	Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
	✓	✓	To reconcile allowed and actual passthrough costs

A2.10 Latvia

Variable	Response		
Regulator details			
Name of regulatory authority	Public Utilities Commission		
Regulatory governance			
Governance position of regulatory authority	Independent energy regulator reporting directly to legislature.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff		
Appointment of board of commissioners of the regulatory authority	Proposed by executive and appointed by legislature.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
	✓	Decision on allowed revenues	
		Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
			Price cap

Variable	Response		
	✓	✓	Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)			
Price resets	x	x	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	?	?	Building blocks
	?	?	Accounting
	?	?	Cash-based
	?	?	Totex
X-efficiency factor	x	x	Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓	✓	Bottom-up
			Top-down
			Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	x	x	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
			Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	?	?	Unregulated opex not in allowed revenues
	?	?	Unregulated revenues deducted from opex allowance
	?	?	Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
	?	?	Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
	?	?	50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	x	Opex efficiency factor?
			Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
		✓	Ex-ante (before the regulatory / plan period)
	✓		Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
			Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
			Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
	✓	✓	Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
	✓	✓	No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	?	?	Remove allowed depreciation or returns for deferrals
	?	?	Time-value adjustments
	?	?	Adjust in the next review, without time-value adjustment
	?	?	Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
			When commissioned
	✓	✓	When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
	✓	✓	No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method
	✓	✓	Other
	More information:		

Variable	Response		
	In Latvia, they set working capital equal to the value of items in stock; they claim this approach ensures continuity of service.		
	Rate at which working capital is remunerated:		
	✓	✓	Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
	✓	✓	Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
			Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	25	40	Overhead lines/wires
	25	40	Underground lines/wires
	25	25	Switchgear
	25	25	Transformers
	25	25	Sub-stations
	10	10	Meters
	40	40	Buildings
	8	8	SCADA, telecom
Capex in law	✓	✓	Detailed provisions in tariff method
			Broad principles in tariff method
			Separate regulation

Variable	Response		
			Framework does not address capex method
Tendering capex			Mandatory for all projects
	✓	✓	Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type	✓	✓	Pre-tax nominal
			Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
	✓	✓	Other
	More information: Average interest rate issued to non-financial corporations in Latvia in the last ten years.		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
	✓	✓	Betas of other power TSOs/DSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium			Historical data on investment returns in international markets
			Historical data on investment returns in the national market
	✓	✓	Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy

Variable	Response		
			Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	x	x	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
			Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time
		✓	Restoration time following voltage disturbance

Variable	Response		
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment			To reconcile allowed and actual revenues
			Adjustment for inflation
			To reconcile allowed and actual passthrough costs

A2.11 Lithuania

Variable	Response		
Regulator details			
Name of regulatory authority	National Control Commission for Prices and Energy in Lithuania		
Regulatory governance			
Governance position of regulatory authority	Independent energy regulator reporting directly to legislature.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed by executive and appointed by legislature.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
	✓	Decision on allowed revenues	
	✓	Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
	✓	✓	Price cap

Variable	Response		
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	5	5	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted: Strategic projects needed.		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	x	Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
	✓	✓	Top-down
			Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	x	x	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
			Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	✓	Opex efficiency factor?
	1.0%	1.0%	Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
	✓	✓	Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
			Ex-ante (before the regulatory / plan period)
	✓	✓	Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
			Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
			Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
			Discretion of regulator
	✓	✓	Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
	✓	✓	Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	?	?	Remove allowed depreciation or returns for deferrals
	?	?	Time-value adjustments
	?	?	Adjust in the next review, without time-value adjustment
	?	?	Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
	✓	✓	As spent, if approved
			When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method
			Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
			Historical cost
			Current or replacement cost
	✓	✓	LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
	✓	✓	Optimised replacement
			Historical cost indexed to inflation
			Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	55	40	Overhead lines/wires
	55	40	Underground lines/wires
	35	35	Switchgear
	35	35	Transformers
	35	35	Sub-stations
	13	13	Meters
	65	65	Buildings
	4	4	SCADA, telecom
Capex in law	✓	✓	Detailed provisions in tariff method
			Broad principles in tariff method
			Separate regulation
			Framework does not address capex method

Variable	Response		
Tendering capex	✓	✓	Mandatory for all projects
			Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type	✓	✓	Pre-tax nominal
			Pre-tax real
			Other
	More information:		
Gearing ratio			Notional
			Actual
			Actual, if it lies in a 'reasonable' range
	✓	✓	Whichever produces the lowest WACC value
			Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
	✓	✓	Other
	More information: Actual cost of debt for the utility, capped at the market interest rate.		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
	✓	✓	Betas of other power TSOs/DSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium			Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
	✓	✓	MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy

Variable	Response		
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
		✓	MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality

Variable	Response		
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
	✓	✓	To reconcile allowed and actual passthrough costs

A2.12 Moldova

Variable	Response		
Regulator details			
Name of regulatory authority	National Agency for Energy Regulation		
Regulatory governance			
Governance position of regulatory authority	Independent regulator reporting to legislature.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by legislature through an open call.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
		Stakeholder comments on determination	
		Decision on allowed revenues	
	✓	Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method	✓	✓	Revenue cap
			Price cap

Variable	Response		
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	5	5	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted: For a given tariff year, correction factor exceeds ±5% of allowed revenue.		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	✓	✓	Is an X-efficiency factor used?
	1%	1%	Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓	✓	Bottom-up
			Top-down
			Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
	✓	✓	Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	x	Opex efficiency factor?
			Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
			Ex-ante (before the regulatory / plan period)
	✓	✓	Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
			Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	✓	✓	Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
	✓	✓	No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	✓	✓	Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
			Utility bears impact
			Utility and customers share impact
			Customer bears impact
	✓	✓	Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
	✓	✓	When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
	✓	✓	Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
	✓	✓	Lead-lag
			Balance sheet method
			Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
	✓	✓	WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
			Historical cost
	✓	✓	Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	37.5	37.5	Overhead lines/wires
	39.5	39.5	Underground lines/wires
	10	10	Switchgear
	17.5	17.5	Transformers
	15	15	Sub-stations
	9	9	Meters
	40	40	Buildings
	10	10	SCADA, telecom
Capex in law			Detailed provisions in tariff method
			Broad principles in tariff method
	✓	✓	Separate regulation
			Framework does not address capex method

Variable	Response		
Tendering capex			Mandatory for all projects
	✓	✓	Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type	✓	✓	Pre-tax nominal
			Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
	✓	✓	Other
	More information: Determines the cost of debt annually, equating it to the average rate on credits granted in foreign currency in the year of the tariff calculation, based on the figures published by the central bank.		
Cost of equity		✓	CAPM
			Not included in WACC
	✓		Other
	More information: For TSO, it is the risk-free rate plus the country-risk premium.		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
		✓	Benchmark similar industries
			Other
	More information:		
Equity risk premium		✓	Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate			Government borrowing rate as a proxy

Variable	Response		
	✓	✓	Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
		✓	Utility bears impact
			Utility and customers share impact
	✓		Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
			Complaints process
		✓	Reconnection time
		✓	Restoration time following voltage disturbance

Variable	Response		
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
			Adjustment for inflation
			To reconcile allowed and actual passthrough costs

A2.13 Nigeria

Variable	Response		
Regulator details			
Name of regulatory authority	Electricity Regulatory Commission		
Regulatory governance			
Governance position of regulatory authority	Independent regulator reporting to legislature.		
Organisational structure of regulatory authority	A board of commissioners and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed by executive and appointed by legislature.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
	✓	Decision on allowed revenues	
	✓	Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
	✓	Board of commissioners	
		Tribunal	
	✓	A court, only for procedural breaches	
		A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap

Variable	Response		
	✓	✓	Price cap
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	5	5	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted: ▪ 'Exceptional changes' to the electricity market or national economy. ▪ Inflation rate, foreign exchange rate, or generation capacity change ±5%. ▪ These are triggers for a bi-annual minor review.		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	x	Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓	✓	Bottom-up
			Top-down
	✓	✓	Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	x	x	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
			Taxes and fees
			Salaries

Variable	Response		
			Network charges for outsourced electricity
			System loss
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	x	Opex efficiency factor?
	4%		Factor
	Method for determining opex efficiency factor:		
	?		External benchmarking
	?		Internal benchmarking
	?		Expert opinion
	Method for statistical benchmarking:		
	✓	✓	Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
	✓	✓	Financial aspects
	✓		Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	✓	✓	Unit cost of project
			TFP

Variable	Response		
			Payback periods
			CBA
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
	✓	✓	Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	✓	✓	Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
	✓	✓	As spent, if approved
			When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
			Deducted from RAB
	✓	✓	Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
	✓	✓	Formula approach
			Lead-lag
			Balance sheet method

Variable	Response		
			Other
	More information:		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
	✓	✓	Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
			Historical cost
	✓	✓	Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
	✓	✓	Optimised replacement
			Historical cost indexed to inflation
			Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	20	20	Overhead lines/wires
	20	20	Underground lines/wires
	20	20	Switchgear
	20	20	Transformers
	20	20	Sub-stations
	10	10	Meters
	40	40	Buildings
	20	20	SCADA, telecom
Capex in law			Detailed provisions in tariff method
	✓	✓	Broad principles in tariff method

Variable	Response		
			Separate regulation
			Framework does not address capex method
Tendering capex	✓	✓	Mandatory for all projects
			Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
	✓	✓	Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt	✓	✓	Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
			Benchmark similar industries
	✓	✓	Other
	More information: Fixes the equity beta for its TSO and DSO at zero, stating a lack of benchmarking data for similar industries; this effectively sets the cost of equity equal to the RFR.		
Equity risk premium	✓	✓	Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market

Variable	Response		
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time

Variable	Response		
		✓	Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment			To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
			To reconcile allowed and actual passthrough costs

A2.14 North Macedonia

Variable	Response		
Regulator details			
Name of regulatory authority	Energy and Water Services Regulatory Commission		
Regulatory governance			
Governance position of regulatory authority	Independent regulator reporting to legislature.		
Organisational structure of regulatory authority	A board of commissioners and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed by independent commission through an open call by executive and appointed by legislature.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
		Stakeholder comments on determination	
	✓	Decision on allowed revenues	
		Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements		Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method	✓	✓	Revenue cap
			Price cap

Variable	Response		
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	3	3	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	x	Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
	✓	✓	Top-down
			Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
	✓	✓	Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	x	Opex efficiency factor?
			Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
	✓	✓	Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	✓	✓	Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
	✓	✓	Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
			Remove allowed depreciation or returns for deferrals
			Time-value adjustments
	✓	✓	Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
			When commissioned
	✓	✓	When purchased or constructed
	Capital contributions and grants in the RAB:		
			Deducted from RAB
	✓	✓	Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
	✓	✓	Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method
			Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	30	30	Overhead lines/wires
	20	20	Underground lines/wires
	20	20	Switchgear
	20	20	Transformers
	40	40	Sub-stations
	15	15	Meters
	40	40	Buildings
	12	12	SCADA, telecom
Capex in law	✓	✓	Detailed provisions in tariff method
			Broad principles in tariff method
			Separate regulation
			Framework does not address capex method

Variable	Response		
Tendering capex			Mandatory for all projects
	✓	✓	Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
	✓	✓	Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
	✓	✓	Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
			Benchmark similar industries
	✓	✓	Other
	More information: Fixes its TSO's equity beta at one, citing a lack of benchmarking data; they state that they use this value because expected return should equal the market return.		
Equity risk premium			Historical data on investment returns in international markets
	✓	✓	Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy

Variable	Response		
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Supply voltage variation
		✓	Harmonic voltage
		✓	Unbalance
		✓	Flicker
		✓	Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
		✓	Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
			Restoration time following supply failure
		✓	Complaints process
			Reconnection time
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality

Variable	Response		
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
			Adjustment for inflation
			To reconcile allowed and actual passthrough costs

A2.15 Oman

Variable	Response		
Regulator details			
Name of regulatory authority	Authority for Electricity Regulation		
Regulatory governance			
Governance position of regulatory authority	Independent regulator reporting to legislature.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by legislature through an open call.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
		Stakeholder comments on determination	
		Decision on allowed revenues	
		Tariff calculation models	
		Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
		End users	
		Network users	
		Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method	✓	✓	Revenue cap
			Price cap

Variable	Response		
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	4	4	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted: An uncontrollable cost shock that has led the company to be unfinanceable.		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	✓	✓	Is an X-efficiency factor used?
	-2%	-2%	Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓	✓	Bottom-up
		✓	Top-down
		✓	Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
	✓	✓	Force majeure
			Upstream network costs
			Fuel costs
	✓	✓	Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
		✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
	✓		50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	✓	Opex efficiency factor?
	1%	1%	Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
	✓	✓	Expert opinion
	Method for statistical benchmarking:		
	✓	✓	Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
			Economic aspects
	✓	✓	Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	✓	✓	Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
			No
	✓	✓	Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	?	✓	Remove allowed depreciation or returns for deferrals
	?		Time-value adjustments
	?		Adjust in the next review, without time-value adjustment
	?		Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	?	Utility bears impact
		?	Utility and customers share impact
		?	Customer bears impact
		?	Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
	✓	✓	As spent, if approved
			When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method
			Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
	✓	✓	Historical cost indexed to inflation
		✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	35	35	Overhead lines/wires
	35	35	Underground lines/wires
	35	35	Switchgear
	35	35	Transformers
	35	35	Sub-stations
	35	15	Meters
	35	35	Buildings
	35	35	SCADA, telecom
Capex in law			Detailed provisions in tariff method
			Broad principles in tariff method
	✓	✓	Separate regulation
			Framework does not address capex method

Variable	Response		
Tendering capex			Mandatory for all projects
	✓	✓	Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
	✓	✓	Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt	✓	✓	Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
	✓	✓	Betas of other power TSOs/DSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium			Historical data on investment returns in international markets
			Historical data on investment returns in the national market
	✓	✓	Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy
	✓	✓	Foreign government borrowing rate as a proxy

Variable	Response		
Other revenue determinants	**TSO**	**DSO**	
Technical losses	x	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
			Utility bears impact
		✓	Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
			LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
		✓	CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
			Restoration time following supply failure
		✓	Complaints process
			Reconnection time
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time

Variable	Response		
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
		✓	Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
	✓		To reconcile allowed and actual passthrough costs

A2.16 Pakistan

Variable	Response		
Regulator details			
Name of regulatory authority	National Electric Power Regulatory Authority		
Regulatory governance			
Governance position of regulatory authority	Government body separate from energy ministry, but reporting to government or ministry.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by executive.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
	✓	Decision on allowed revenues	
		Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
	✓	Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
			Price cap

Variable	Response		
			Cost plus
			Rate-of-return
	✓	✓	Hybrid
	More information: Combines rate of return for capex with elements of a revenue cap for opex.		
Duration of regulatory period (years)	1	1	
Price resets	x	x	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	✓	Is an X-efficiency factor used?
		0-5.8%	Factor adopted
	More information: The factor differs across DSOs.		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓	✓	Bottom-up
			Top-down
		✓	Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
	✓	✓	Taxes and fees
	✓	✓	Salaries
			Network charges for outsourced electricity

Variable	Response		
			System loss
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	✓	Opex efficiency factor?
		<3%	Factor
	More information: 30% of the CPI inflation rate. However, the factor cannot exceed 3%.		
	Method for determining opex efficiency factor:		
		✓	External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
		✓	Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
	✓	✓	Economic aspects
	✓	✓	Financial aspects
	✓	✓	Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
			Unit cost of project

Variable	Response		
			TFP
	✓	✓	Payback periods
	✓	✓	CBA
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
			No
	✓	✓	Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	✓	✓	Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	?	✓	Utility bears impact
	?		Utility and customers share impact
	?		Customer bears impact
	?		Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
	✓	✓	As spent, if approved
	✓	✓	When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓	✓	Deducted from RAB
			Recover depreciation but not return
			Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
			No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag

Variable	Response		
			Balance sheet method
	✓		Other
	More information: Working capital for the TSO is the product of the rate of capital and the sum of 3% gross fixed assets, one-month revenue requirement, and monthly average cash balance.		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
	✓		Other
	More information: Historical cost of debt.		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	30	30	Overhead lines/wires
	30	30	Underground lines/wires
	30	30	Switchgear
	30	30	Transformers
	30	30	Sub-stations
	30	30	Meters
	50	50	Buildings
			SCADA, telecom

Variable	Response		
Capex in law			Detailed provisions in tariff method
	✓	✓	Broad principles in tariff method
			Separate regulation
			Framework does not address capex method
Tendering capex	✓	✓	Mandatory for all projects
			Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
			Pre-tax real
	✓	✓	Other
	More information: For the TSO, they use a post-tax nominal RoE with financial charges as pass-through. For the DSO, they use a vanilla nominal WACC.		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt		✓	Sum of risk-free rate and debt risk premium
	✓		Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
	✓		Volatility of comparator TSO/DSO's stock against market volatility
	✓	✓	Betas of other power TSOs/DSOs
		✓	Benchmark similar industries
			Other
	More information:		
Equity risk premium			Historical data on investment returns in international markets
	✓	✓	Historical data on investment returns in the national market

Variable	Response		
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
		✓	MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
			Harmonic voltage
			Unbalance
			Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
			Supply interruption notice
		✓	Restoration time following supply failure

Variable	Response		
		✓	Complaints process
			Reconnection time
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment			To reconcile allowed and actual revenues
	✓		Adjustment for inflation
	✓	✓	To reconcile allowed and actual passthrough costs

A2.17 Peru

Variable	Response		
Regulator details			
Name of regulatory authority	Regulatory Agency for Investment in Energy and Mining		
Regulatory governance			
Governance position of regulatory authority	Government body separate from energy ministry, but reporting to government or ministry.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by executive.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
	✓	Decision on allowed revenues	
	✓	Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
		End users	
		Network users	
		Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
	✓	A court, only for procedural breaches	
		A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
		✓	Price cap

Variable	Response		
			Cost plus
	✓		Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	4	4	
Price resets	x	x	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓		Building blocks
			Accounting
			Cash-based
		✓	Totex
X-efficiency factor			Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
			Top-down
		✓	Yardstick
			Historical outturn opex
	✓		Investment opex
			Totex
	More information:		
Allowed vs actual	✓	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
	✓		Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
	✓		Discount rate
Controllable vs uncontrollable	x	x	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
			Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	x	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
			Unregulated opex not in allowed revenues
	✓		Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	x	Opex efficiency factor?
			Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	?	Technical necessity
		?	Economic aspects
		?	Financial aspects
		?	Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	✓	?	Unit cost of project
		?	TFP
		?	Payback periods
		?	CBA

Variable	Response		
		?	Discretion of regulator
		?	Efficiency not assessed
		?	DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
	✓	?	Yes, but prove it is equal or better value
		?	No
		?	Yes, and justify at end of regulatory or plan period
		?	Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
		?	Remove allowed depreciation or returns for deferrals
	✓	?	Time-value adjustments
		?	Adjust in the next review, without time-value adjustment
		?	Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	?	Utility bears impact
		?	Utility and customers share impact
		?	Customer bears impact
		?	Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
		?	As spent, if approved
		?	When commissioned
	✓	?	When purchased or constructed
	Capital contributions and grants in the RAB:		
	✓		Deducted from RAB
			Recover depreciation but not return
		✓	Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
	✓	?	No return
		?	Return on asset value
		?	Only recover interest during construction
		?	Return on asset value in big projects
		?	Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
	?		Formula approach
	?	✓	Lead-lag
	?		Balance sheet method
	?		Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
	?		Short-term borrowing rate
	?		WACC
	?		Allowed cost of debt
	?	✓	Rate set in law
	?		Other
	More information:		
Asset value	Determination of opening asset value:		
			Historical cost
	✓	✓	Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
		✓	Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓		Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	30	30	Overhead lines/wires
	30	30	Underground lines/wires
	30	30	Switchgear
	30	30	Transformers
	30	30	Sub-stations
	30	23	Meters
	30	*	Buildings
	30		SCADA, telecom
	More information: *At market value.		
Capex in law			Detailed provisions in tariff method
		✓	Broad principles in tariff method

Variable	Response		
	✓		Separate regulation
			Framework does not address capex method
Tendering capex	✓		Mandatory for all projects
			Mandatory for projects above a certain cost
		✓	Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
			Pre-tax real
	✓	✓	Other
	More information: Both the TSO and DSO use a real rate set in law.		
Gearing ratio			Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity			CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium			Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate			Government borrowing rate as a proxy

Variable	Response		
			Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
		✓	Utility bears impact
	✓		Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
			LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
		✓	Harmonic voltage
			Unbalance
		✓	Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
			Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time
			Restoration time following voltage disturbance

Variable	Response		
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	?	To reconcile allowed and actual revenues
		?	Adjustment for inflation
		?	To reconcile allowed and actual passthrough costs

A2.18 Poland

Variable	Response		
Regulator details			
Name of regulatory authority	Energy Regulatory Office		
Regulatory governance			
Governance position of regulatory authority	Independent regulator reporting to legislature.		
Organisational structure of regulatory authority	A managing director responsible for approving decisions and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by executive.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
		Stakeholder comments on determination	
		Decision on allowed revenues	
	✓	Tariff calculation models	
		Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
		End users	
		Network users	
		Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method		✓	Revenue cap
			Price cap

Variable	Response		
			Cost plus
			Rate-of-return
	✓		Hybrid
	More information: For the TSO, it uses a hybrid of the revenue cap and cost-plus.		
Duration of regulatory period (years)	1	5	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	x	Is an X-efficiency factor used?
			Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination	✓	✓	Bottom-up
			Top-down
			Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	x	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
		?	Taxes and fees
		?	Salaries
		?	Network charges for outsourced electricity
		?	System loss

Variable	Response		
		?	Ancillary services
		?	Force majeure
		?	Upstream network costs
		?	Fuel costs
		?	Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	✓	✓	Opex efficiency factor?
	1.5%	1.5%	Factor
	Method for determining opex efficiency factor:		
		?	External benchmarking
		?	Internal benchmarking
	✓	?	Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
			Economic aspects
	✓	✓	Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
	?	?	Unit cost of project
	?	?	TFP
	?	?	Payback periods
	?	?	CBA

Variable	Response		
	?	?	Discretion of regulator
	?	?	Efficiency not assessed
	?	?	DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
	✓	✓	Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	✓		Remove allowed depreciation or returns for deferrals
			Time-value adjustments
	✓	✓	Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
			When commissioned
	✓	✓	When purchased or constructed
	Capital contributions and grants in the RAB:		
	?	?	Deducted from RAB
	?	?	Recover depreciation but not return
	?	?	Recover depreciation and return
	?	?	Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
	?	?	No return
	?	?	Return on asset value
	?	?	Only recover interest during construction
	?	?	Return on asset value in big projects
	?	?	Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method
			Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
	✓	✓	Historical cost
	More information:		
Depreciation	Method of depreciation:		
	?	?	Straight-line
	?	?	Units-of-production
	Average asset life (years):		
			Overhead lines/wires
			Underground lines/wires
			Switchgear
			Transformers
			Sub-stations
			Meters
			Buildings
			SCADA, telecom
Capex in law		✓	Detailed provisions in tariff method
			Broad principles in tariff method
			Separate regulation
	✓		Framework does not address capex method

Variable	Response		
Tendering capex	✓	?	Mandatory for all projects
		?	Mandatory for projects above a certain cost
		?	Not mandatory
		?	Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
	✓	✓	Pre-tax real
			Other
	More information:		
Gearing ratio	?	?	Notional
	?	?	Actual
	?	?	Actual, if it lies in a 'reasonable' range
	?	?	Whichever produces the lowest WACC value
			Not applicable
Cost of debt	✓	✓	Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
			Benchmark similar industries
			Other
	More information:		
Equity risk premium			Historical data on investment returns in international markets
	✓	✓	Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy

Variable	Response		
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	?	?	Utility bears impact
	?	?	Utility and customers share impact
	?	?	Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
		✓	MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
		✓	Harmonic voltage
			Unbalance
		✓	Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
			Supply interruption notice
			Restoration time following supply failure
		✓	Complaints process
			Reconnection time
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality

Variable	Response		
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment		?	To reconcile allowed and actual revenues
		?	Adjustment for inflation
		?	To reconcile allowed and actual passthrough costs

A2.19 Slovakia

Variable	Response		
Regulator details			
Name of regulatory authority	Regulatory Office for Network Industries		
Regulatory governance			
Governance position of regulatory authority	Independent regulator reporting to legislature.		
Organisational structure of regulatory authority	A managing director responsible for approving decisions and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by executive.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
	✓	Stakeholder comments on determination	
		Decision on allowed revenues	
	✓	Tariff calculation models	
	✓	Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
		End users	
		Network users	
		Government	
	✓	Utility	
	Appeals body:		
		Government	
	✓	Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method			Revenue cap
	✓	✓	Price cap

Variable	Response		
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	5	5	
Price resets	✓	✓	Price re-openers permitted?
	Re-opener triggers, if permitted: ‘Significant change’ of economic parameters applied in determination of the price.		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	✓	✓	Is an X-efficiency factor used?
	3.5%	3.5%	Factor adopted
	More information:		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
	✓	✓	Top-down
			Yardstick
			Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	x	x	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
			Taxes and fees
			Salaries
			Network charges for outsourced electricity
			System loss

Variable	Response		
			Ancillary services
			Force majeure
			Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	✓	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
	✓	✓	Unregulated opex not in allowed revenues
			Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	x	Opex efficiency factor?
			Factor
	Method for determining opex efficiency factor:		
			External benchmarking
			Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
			Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
			Ex-ante (before the regulatory / plan period)
			Annually ex-ante
	✓	✓	Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
			Economic aspects
			Financial aspects
			Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
			Unit cost of project
			TFP
			Payback periods
			CBA

Variable	Response		
			Discretion of regulator
			Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
			Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
			Remove allowed depreciation or returns for deferrals
			Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
			Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
	✓	✓	When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
			Deducted from RAB
			Recover depreciation but not return
	✓	✓	Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
	✓	✓	No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method
			Other
	More information:		

Variable	Response		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓	✓	Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
	More information:		
	Periodical revaluation of asset value:		
	✓	✓	Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
			Historical cost indexed to inflation
			Historical cost
	More information:		
Depreciation	Method of depreciation:		
			Straight-line
	✓	✓	Units-of-production
	Average asset life (years):		
	32.5	32.5	Overhead lines/wires
	32.5	32.5	Underground lines/wires
	20	20	Switchgear
	25	25	Transformers
	30	30	Sub-stations
	8	8	Meters
	65	65	Buildings
	4	4	SCADA, telecom
Capex in law			Detailed provisions in tariff method
			Broad principles in tariff method
			Separate regulation
	✓	✓	Framework does not address capex method

Variable	Response		
Tendering capex	✓	✓	Mandatory for all projects
			Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type	✓	✓	Pre-tax nominal
			Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt			Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
	✓	✓	Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
			Betas of other power TSOs/DSOs
	✓	✓	Benchmark similar industries
			Other
	More information:		
Equity risk premium	✓	✓	Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators
			MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy

Variable	Response		
Other revenue determinants	**TSO**	**DSO**	
Technical losses	✓	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
			MV
		✓	LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
			MAIFI
			ENS
			Outage rate
		✓	ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
		✓	Harmonic voltage
		✓	Unbalance
			Flicker
		✓	Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process
		✓	Reconnection time
		✓	Restoration time following voltage disturbance
		✓	Restoration time following reduced voltage quality

Variable	Response		
			Metering node installation time
			Subscription time
			Metered data sharing time
		✓	Meter replacement time
		✓	Keeping to planned duration of interruption
		✓	Meter testing
		✓	Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
			Adjustment for inflation
	✓	✓	To reconcile allowed and actual passthrough costs

A2.20 Turkey

Variable	Response		
Regulator details			
Name of regulatory authority	Energy Market Regulatory Authority of Turkey		
Regulatory governance			
Governance position of regulatory authority	Independent regulator reporting to legislature.		
Organisational structure of regulatory authority	A board of commissioners, supported by a managing director and technical staff.		
Appointment of board of commissioners of the regulatory authority	Proposed and appointed by executive.		
Entity that develops the allowed revenue methodology	Regulator.		
Entity that approves the allowed revenue methodology	Regulator.		
Public availability of allowed revenue and tariff documents	✓	Allowed revenue methodology	
		Stakeholder comments on determination	
	✓	Decision on allowed revenues	
	✓	Tariff calculation models	
		Tariff proposal consultation papers	
	✓	Decision on approved tariffs	
Regulatory accounting statements	✓	Regulatory accounting statements subject to an audit?	
	✓	Submit regulatory accounting statements?	
Appealing regulatory decisions	✓	Can regulatory decisions be appealed?	
	Who may appeal:		
	✓	End users	
	✓	Network users	
	✓	Government	
	✓	Utility	
	Appeals body:		
		Government	
		Board of commissioners	
		Tribunal	
		A court, only for procedural breaches	
	✓	A court, including for regulatory judgment	
Overall tariff framework	**TSO**	**DSO**	
Tariff regulation method	✓	✓	Revenue cap
			Price cap

Variable	Response		
			Cost plus
			Rate-of-return
			Hybrid
	More information:		
Duration of regulatory period (years)	3	5	
Price resets	x	x	Price re-openers permitted?
	Re-opener triggers, if permitted:		
Allowed revenue calculation method	✓	✓	Building blocks
			Accounting
			Cash-based
			Totex
X-efficiency factor	x	✓	Is an X-efficiency factor used?
		0 - 11.15 %	Factor adopted
	More information: The factor differs across DSOs.		
Opex	**TSO**	**DSO**	
Allowed opex determination			Bottom-up
			Top-down
		✓	Yardstick
	✓	✓	Historical outturn opex
			Investment opex
			Totex
	More information:		
Allowed vs actual	x	x	Adjustment in next period for allowed opex deviation?
	Method for addressing deviation from allowed opex:		
			Share savings only
			Share savings and overruns symmetrically
	Method for compensating time value of deviation:		
			Inflation rate
			Discount rate
Controllable vs uncontrollable	✓	✓	Distinction of controllable and uncontrollable?
	Opex classified as uncontrollable:		
		✓	Taxes and fees
			Salaries
			Network charges for outsourced electricity

Variable	Response		
	✓		System loss
	✓		Ancillary services
			Force majeure
		✓	Upstream network costs
			Fuel costs
			Connection charges
Regulated vs unregulated	x	✓	Distinction of regulated and unregulated?
	Method for dealing with unregulated opex:		
			Unregulated opex not in allowed revenues
		✓	Unregulated revenues deducted from opex allowance
			Major unregulated costs not in allowed revenue. Minor unregulated revenues deducted from opex allowance.
			Separable unregulated opex not in allowed revenues. Revenue from inseparable deducted from opex allowance.
			50% of unregulated opex deducted from allowed revenues
Opex efficiency factors	x	✓	Opex efficiency factor?
			Factor
	Method for determining opex efficiency factor:		
			External benchmarking
		✓	Internal benchmarking
			Expert opinion
	Method for statistical benchmarking:		
			Frontier shift
		✓	Data envelopment analysis
			Partial productivity indices
			Total factor productivity
Capex and RAB	**TSO**	**DSO**	
Allowed capex determination	Ex-ante or ex-post approval?		
	✓	✓	Ex-ante (before the regulatory / plan period)
			Annually ex-ante
			Ex-post
	Means for approving capex:		
	✓	✓	Technical necessity
			Economic aspects
	✓	✓	Financial aspects
	✓	✓	Impact on tariffs
	Means for assessing capex efficiency ex-ante:		
		✓	Unit cost of project
			TFP

Variable	Response		
			Payback periods
			CBA
			Discretion of regulator
	✓		Efficiency not assessed
			DEA
Allowed vs actual	Is deviation from ex-ante approved capex allowed?		
	✓	✓	Yes, but prove it is equal or better value
			No
			Yes, and justify at end of regulatory or plan period
			Yes, but prove it is reasonable and acceptable
	Adjustment if capex deviates from ex-ante approved:		
	✓	✓	Remove allowed depreciation or returns for deferrals
	✓	✓	Time-value adjustments
			Adjust in the next review, without time-value adjustment
			Unit-cost adjustments if outside of licensee's control
	Sharing of capex efficiency gains or losses:		
	✓	✓	Utility bears impact
			Utility and customers share impact
			Customer bears impact
			Utility bears losses above inflation
Capex in the RAB	When capex enters the RAB:		
			As spent, if approved
	✓	✓	When commissioned
			When purchased or constructed
	Capital contributions and grants in the RAB:		
			Deducted from RAB
			Recover depreciation but not return
	✓	✓	Recover depreciation and return
			Grants treated as deferred income and amortised
	Construction work in progress in the RAB:		
	✓	✓	No return
			Return on asset value
			Only recover interest during construction
			Return on asset value in big projects
			Accumulated interest during construction is added to commissioned asset value
Working capital calculation	Calculation approach:		
			Formula approach
			Lead-lag
			Balance sheet method

Variable	Response		
			Other
	More information:		
	Rate at which working capital is remunerated:		
			Short-term borrowing rate
			WACC
			Allowed cost of debt
			Rate set in law
			Other
	More information:		
Asset value	Determination of opening asset value:		
	✓		Historical cost
			Current or replacement cost
			LRAIC
			Privatisation value
		✓	Other
	More information: For the DSO, the opening asset value for the DSO was set to zero (so the network businesses were only permitted a return on forward investment).		
	Periodical revaluation of asset value:		
			Modern equivalent asset
			Like-for-like replacement
			Optimised replacement
	✓	✓	Historical cost indexed to inflation
			Historical cost
	More information:		
Depreciation	Method of depreciation:		
	✓	✓	Straight-line
			Units-of-production
	Average asset life (years):		
	30	30	Overhead lines/wires
	30	30	Underground lines/wires
	30	30	Switchgear
	30	30	Transformers
	30	30	Sub-stations
	10	10	Meters
	50	50	Buildings
	15	15	SCADA, telecom

Variable	Response		
Capex in law			Detailed provisions in tariff method
	✓		Broad principles in tariff method
		✓	Separate regulation
			Framework does not address capex method
Tendering capex			Mandatory for all projects
	✓	✓	Mandatory for projects above a certain cost
			Not mandatory
			Mandatory only for government-owned utilities
WACC	**TSO**	**DSO**	
WACC type			Pre-tax nominal
	✓	✓	Pre-tax real
			Other
	More information:		
Gearing ratio	✓	✓	Notional
			Actual
			Actual, if it lies in a 'reasonable' range
			Whichever produces the lowest WACC value
			Not applicable
Cost of debt	✓	✓	Sum of risk-free rate and debt risk premium
			Actual cost of debt for the regulated utility
			Market lending rate for comparable companies
			Other
	More information:		
Cost of equity	✓	✓	CAPM
			Not included in WACC
			Other
	More information:		
Equity beta			Volatility of TSO/DSO's stock against market volatility
			Volatility of comparator TSO/DSO's stock against market volatility
	✓	✓	Betas of other power TSOs/DSOs
	✓	✓	Benchmark similar industries
			Other
	More information:		
Equity risk premium	✓	✓	Historical data on investment returns in international markets
			Historical data on investment returns in the national market
			Precedents set by other regulators

Variable	Response		
			MRP in the country plus the ERP in a developed capital market
Risk-free rate	✓	✓	Government borrowing rate as a proxy
			Foreign government borrowing rate as a proxy
Other revenue determinants	**TSO**	**DSO**	
Technical losses	x	✓	Regulator sets allowed losses?
	Incentive mechanism for allowed technical losses:		
		✓	Utility bears impact
			Utility and customers share impact
			Customers get gains, and utility bears losses
Quality of supply	Voltage level monitored for supply voltage reliability:		
		✓	MV
			LV
			None
	Supply reliability KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	SAIFI
		✓	SAIDI
			CAIDI
			MAIFI
			ENS
			Outage rate
			ISS
	Voltage quality KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
		✓	Supply voltage variation
		✓	Harmonic voltage
		✓	Unbalance
		✓	Flicker
			Frequency
			Voltage swells
			Voltage dips
			Mains signalling voltage
			Sinusodial form of the voltage power factor
	Customer service KPIs monitored and reported on regularly (bold tick if the KPI has a target set over a specified period):		
			Connection time
		✓	Supply interruption notice
		✓	Restoration time following supply failure
		✓	Complaints process

Variable	Response		
		✓	Reconnection time
			Restoration time following voltage disturbance
			Restoration time following reduced voltage quality
			Metering node installation time
			Subscription time
			Metered data sharing time
			Meter replacement time
			Keeping to planned duration of interruption
			Meter testing
			Metering and billing
Revenue adjustment	**TSO**	**DSO**	
Revenue adjustment	✓	✓	To reconcile allowed and actual revenues
	✓	✓	Adjustment for inflation
	✓	✓	To reconcile allowed and actual passthrough costs

A3 Glossary of terms

Term	Definition
45-day approach	A method of calculating working capital for regulatory purposes. Under this convention, the utility is allowed a cash working capital allowance equal to one-eighth (1/8 of a year ≈ 45 days) of the utility's annual operating and maintenance expenses.
Accelerated depreciation	A method of depreciation under which the allocation of the cost of an asset is higher in the earlier periods than in the later periods of the asset's useful life
Accounting approach (to calculating revenues)	The setting of allowed revenues based on recognized costs under the relevant accounting standards and therefore by mapping revenues to audited financial statements. The set revenues are therefore closely linked to operating expenditure, depreciation and interest costs as appearing in the statutory accounts.
Asset beta	See the definition for 'Beta, levered/unlevered'
Audit	A process whereby a regulated company's costs and asset base are determined, usually by a disinterested third party appointed by the regulator.
Balance sheet method	A method of calculating working capital. It is equal to current assets minus current liabilities, usually excluding interest-bearing short-term deposits and liabilities.
Benchmarking	Typically refers to a range of statistical techniques employed to assess the cost efficiency of the regulated firm compared to other similar or comparator firms.
Beta (levered/unlevered)	Beta is the measure of an asset's or a stock's risk in relation to the market (benchmark). In the Capital Asset Pricing Model, the higher a company's beta, the greater the systematic risk of an investment in that company's shares (a beta coefficient of 1.0 implies that the company is of average risk. A beta above 1.0 means that a stock or asset is above average risk. A beta below 1.0, implies the asset or stock is below average risk). Levered beta (or the 'equity beta') reflects both the operating or business risks and the financial risks of a company. Unlevered beta (or the 'asset beta') is the beta for the asset or firm after removing the effect of leverage or debt. That is, unlevered beta attempts to capture business risks alone and is commonly (although not exclusively) calculated as: Unlevered Beta = Levered Beta / (1 + (1- tax rate) (Debt/Equity Ratio)).
Bottom-up approach (of setting operating and maintenance costs or capital expenditure)	A regulatory approach by which the regulator sets the allowed O&M or capex costs the utility is allowed to recover by analysing individual cost items.
Building block approach/ framework	A method that calculates the revenue requirement as the sum of individual building blocks (that are typically separately assessed and determined ex ante). The blocks comprise of operating and maintenance costs, and the cost of investments that are recovered through depreciation ('return of capital') and return ('return on capital') building blocks.
Capex	Capital expenditure. The purchase, construction or improvement of fixed assets, eg plant and equipment.
Capital Asset Pricing Model (CAPM)	An asset pricing model for valuing equity by relating risk and expected return. Based on the idea that investors demand additional expected return (called the risk premium) if asked to accept additional risk. That is, under this model, return on equity is estimated as the sum of the return that investors could obtain on a 'risk-free' investment and a premium for the risk of the asset or firm being evaluated.
Capital expenditure	Cash investments to acquire, construct or improve an asset that will have a life of more than one year, as distinguished from cash outlays for expense items normally considered as part of current operations. If an expense is a

Term	Definition
	capital expenditure, it needs to be capitalized; this requires the company to allocate the cost of the expenditure over the useful life of the asset.
Cash-based approach (to calculating revenues)	An approach that focuses solely on the cash outlays of the regulated entity (including its debt repayments and interest costs).
Construction Work in Progress (CWIP)	Money spent on an asset that has at the relevant time not been commissioned.
Cost-benefit analysis (CBA)	Sometimes called benefit–cost analysis (BCA), is a systematic approach to quantifying the costs and benefits of alternatives that satisfy the transactions, activities or functional requirements of a business. It is a technique that is used to determine the best option among the available alternatives in terms of benefits in labour, time and cost savings, etc.
Cost of capital	Generally means the cost, measured as a rate of interest, of the capital employed by a business, weighted according to the proportions of different sources of capital (debt and equity) used. In the regulatory context, the term "rate of return (on assets)" is sometimes used synonymously with that of "cost of capital".
Cost of debt	Generally means the cost, measured as a rate of interest, of a company's (intermediate and long-term) debt. In the regulatory context, the term, "(rate of) return on debt" is sometimes used synonymously with the term, cost of debt.
Cost of equity	Generally means the cost, measured as a rate of interest, of a company's equity, and is determined with reference to the return shareholders require for investing equity in the business and to reimburse them for the risk they undertake. In the regulatory context, the term, "(rate of) return on equity" is sometimes used synonymously with the term, cost of equity.
Cost plus regulation	A tariff framework whereby the revenues or tariffs of the regulated utility are adjusted frequently to match the actual (ie realized or outturn) cost of providing the regulated services.
Customers (& consumers)	Essentially refer to the same people but in different contexts. The term customer refers to the client of an energy service provider and is used when the client-provider relationship is important for the context. The term consumer is used in reference to all those who use energy.
Current assets	Assets that will normally be turned into cash within a year and can include material stock, accounts receivable and cash deposits.
Current liabilities	Liabilities that will normally be repaid within a year and include accounts payable.
Depreciation	A non-cash expense that reduces the value of a tangible asset as a result of wear and obsolescence.
Distribution line losses	The term refers to the difference between the amount of energy delivered to the distribution system from the transmission system and the amount of energy customers are billed. Distribution line losses are comprised of two types: technical (waste of electrical energy due to inherent inefficiencies or defects in the distribution system) and non-technical or commercial losses (that are unrelated to the physical characteristics of the network and represent energy delivered and consumed, but not accounted for due to theft, the absence of metering or other factors)
Distribution system (or network)	The system of wires, switches, and transformers that serve neighbourhoods and business. A distribution system reduces power from high-voltage transmission lines to a level that can be used in homes or businesses.
Distribution System Operator (DSO)	The company/organization responsible for operating, ensuring the maintenance of and, if necessary, developing the electricity distribution network in a given area and, where applicable, its interconnections with other systems to ensure the long-term ability of the system to meet reasonable demands for the distribution of electricity.
Equity	The value of assets that are owned by a company's shareholders.

Term	Definition
Equity beta	See the definition for 'Beta, levered/unlevered'.
Ex-ante assessment	An assessment before the expenditure occurs, based on forecasts.
Ex-post assessment	An assessment of expenditure, after it occurs, based on actual data usually for the purposes of assessing its reasonableness and efficiency. This usually happens when tariffs or revenues are set before the start of a regulatory period and it refers to the assessment of the expenditure in the then current regulatory period, which is coming to its end.
Fixed assets	Physical assets such as land, buildings, plant, machinery, vehicles and furniture.
Frontier shift	This refers to utility productivity growth and represents the expected movement of the 'efficiency frontier' over time, for example, as innovative technologies and work practices become available.
Gearing	A company's net debt expressed as a percentage of its total capital. UK regulators use net debt as a percentage of the regulatory capital value (or asset base). Other common measures include the ratio of net debt to net debt plus the market value of equity expressed as a percentage.
Historical cost asset valuation	A method of valuing assets that values them at their original purchase or construction price/cost.
Incentive regulation	Regulation by means of economic incentives. In the context of utility regulation, it is sometimes used to mean price or revenue cap regulation and/or performance-based regulation.
Indexation	The procedure for adjusting the value of the assets for the effect of inflation, where the value of the assets is adjusted (increased or decreased) to reflect changes in an underlying index.
Investment planning (or capital expenditure or capex planning)	Long-term planning of load growth related investment, reinforcements and replacement investments.
Lead-lag method	A method of calculating working capital for regulatory purposes. It is calculated as the average time difference between when expenses must be paid and when revenue is collected, expressed in days, and multiplied by average daily operating expenses.
Market operation	A discrete electricity sector function, entailing the management and/or operation of the wholesale (and, where relevant, the retail) electricity market so that supply and demand are efficiently balanced and financially settled between the relevant market players.
Modern Equivalent Asset Value (MEAV)	The cost of replacing the existing assets with assets that serve the same function, and which a new entrant might be expected to employ as of today. Such assets are likely to incorporate the latest available (proven) technology.
Network replacement investment	All investment related to replacement of aged (technically or economically) equipment or infrastructure.
Non-controllable cost	Cost not subject to influence at a given level of managerial responsibility, eg allocated overheads from another part of the organization.
Operation and maintenance (O&M) expenses	Costs that relate to the normal operating, maintenance and administrative activities of a business.
Opex	Operating expenditure. Fixed and variable operating and maintenance costs; in the regulatory context, depreciation is usually specified separately.
Optimized replacement cost	The replacement cost of an "optimized" system. It incorporates engineering optimization of the utility's asset. An optimized system is a reconfigured system designed to serve the current load plus expected growth over a specified period using modern technology.
Performance-Based Regulation (PBR)	See 'incentive regulation'.

Term	Definition
Price cap regulation	A method of setting a utility 's tariffs whereby a maximum allowable average tariff level is established by regulators. Flexibility in individual pricing of services or customers might be allowed, and the average tariff may also be restricted by a price index with or without an offset for productivity improvements. However, volume risk resides with the utility (as tariffs are not adjusted for differences between forecasted and out-turn volumes or sales).
Price control period	See “Regulatory Period”.
Rate of Return	The profit a firm earns expressed as a percentage of the assets a firm owes.
Rate-of-Return Regulation (RoRR)	A method of setting a regulated utility’s tariffs. Under RoRR utilities are allowed to recover their operating expenses, taxes and depreciation, plus a ‘fair’ rate of return on the assets utilized (ie the rate base or asset base) in providing service to their customers. The regulator monitors the rate of return and may reset the tariff if the actual rate of return is outside a certain range.
Regulatory Asset Base (RAB)	In the context of utility regulation, a measure of the net value of the company’s regulated assets. The company’s regulated assets are usually defined as the tangible assets involved in the provision of the regulated service. Sometimes they also include a measure of working capital.
Regulatory period	In the context of price control regulation, the period (normally a number of years) for which some control on tariffs or revenues is set in advance. Also referred to as a “price or tariff control period”.
Replacement cost valuation	A method of valuing assets that values an asset using the cost of replacing the asset with another asset (not necessarily the same) that will provide the same services and capacity as the existing asset.
Revenue cap	A revenue setting methodology that fixes the total or maximum revenue the utility is permitted to earn – that is, tariffs are adjusted for differences between forecasted and realized volumes; the revenue may also be restricted by a price index with or without an offset for productivity improvements.
Revenue requirement	A revenue level allowed to be earned by the company to cover the costs of operating and maintaining the business, costs of depreciation and an allowed return.
Risk premium on equity	Risk premium in general is the expected rate of return above the risk-free interest rate. In the equity market it is the returns of a company stock, a group of company stock, or all stock market company stock (in which case it is termed the ‘equity risk premium’ or ‘market risk premium’), minus the risk-free rate. The return from equity comprises both the dividend yield and capital gains.
Straight-line depreciation	A method of depreciation under which the allocation of the cost of the asset to accounting periods is constant.
Tariff	A rate approved by the regulatory authority which may be applied to the volume of energy consumed by a customer and/or their connected capacity and which corresponds to the recovery of revenues allowed by the regulator.
Top-down approach (of setting operating and maintenance costs or capital expenditure)	A regulatory approach by which the regulator sets the allowed O&M or capex costs the utility is allowed to recover by analysing costs based on summarized categories.
Totex approach (to setting allowed revenues)	Refers to a regulatory approach to setting the revenues that a regulated company is allowed to recover by calculating the operating and capital expenditures together (that is, the regulatory focus is on total and lifecycle costs thereby accounting for trade-offs between capital and operating and maintenance costs).
Transmission losses	The energy lost in the process of transmitting power via the Transmission Network.
Transmission system operator	Means a natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the transmission system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long term ability of the system to meet reasonable demands

Term	Definition
	for the transmission of electricity. In some countries, the Market Operation function may also reside with the TSO.
Variable cost	Production expenses that are dependent on the level of output.
Weighted average cost of capital (WACC)	Refers to the cost of capital of a regulated utility calculated according to the weight of the cost of each category of capital.
X-efficiency factor	The expected productivity parameter used in RPI-X regulation, and in other similar schemes, originally inspired to UK-style local loop call charges (in telecoms) regulation from the mid-1980s.

A4 Questionnaire

A4.1 Part 1

Part 1 of the survey issued to participants was a document in Microsoft Word. Participants were asked to answer questions by selecting the correct option from the choices available, or by typing an alternative answer beneath 'other', if applicable. The questions posed to participants in this document are shown in the subsections below.

A4.1.1 Regulatory governance

1.1 Which of the options to the right best describes the governance position of your regulatory authority?

- ☐ An independent energy regulator reporting directly to the Parliament/Assembly
- ☐ A government body separate from the Ministry responsible for Energy but reporting to the Government
- ☐ An agency within the Ministry responsible for Energy
- ☐ A department of the Ministry responsible for Energy
- ☐ Other (please explain):

[For all 'Other' explanations, insert text in these boxes]

1.2 Which of the options to the right best describes the organizational structure of your regulatory authority?

- ☐ A board of commissioners, supported by a Managing Director and technical staff
- ☐ A board of commissioners and technical staff
- ☐ A Managing Director responsible for approving decisions and technical staff
- ☐ Other (please explain):

1.3 Where relevant, how are members of the Board of Commissioners appointed?

- ☐ A public call by the Parliament, appointed by the Parliament
- ☐ Proposed by the Minister, appointed by the Parliament
- ☐ Appointed by the Minister/Government
- ☐ Other (please explain):

1.4 Who develops the methodology governing the allowed revenues?

- ☐ Regulator
- ☐ Utilities
- ☐ Government
- ☐ Other (please specify):

1.5	Who approves the methodology governing the allowed revenues?	☐ Regulator ☐ Utilities ☐ Government ☐ Parliament/Assembly ☐ Other (please specify):
1.6	Is the tariff methodology publicly available?	☐ Available to public ☐ Available to sector stakeholders ☐ Only available to utilities ☐ Other (please specify):
1.7	Which of the following tariff documents is made publicly available?	☐ Model used to calculate allowed revenues and tariffs ☐ Consultation paper providing the regulator's proposal ☐ Comments received by stakeholders ☐ Decision on allowed revenues ☐ Decision on approved tariffs ☐ Other (please specify):
1.8	Are regulated entities required to submit regulatory accounting statements?	☐ Yes, it is a binding requirement ☐ No ☐ Other (please specify):
1.9	Are regulatory accounting statements subject to an audit?	☐ Yes, it is a binding requirement ☐ No ☐ Other (please specify):
1.10	Can regulatory decisions be appealed?	☐ Yes ☐ No
1.11	If regulatory decisions can be appealed, who can appeal the decisions?	☐ The utility (or its private or public owners) ☐ Network users ☐ End-use consumers of electricity ☐ Government (eg the supervising Ministry) ☐ Others (please specify):

1.12	If regulatory decisions can be appealed, which is the appeal body?	☐ A court, but only if there are procedural breaches ☐ A court, including for reasons which are within the domain of regulatory judgment ☐ Government ☐ Parliament/Assembly ☐ Other (please specify):
1.13	Other comments *(Please add any other comments you think are necessary or helpful for describing the regulatory governance framework and procedures)*	

A4.1.2 Transmission System Operator Revenues

Methodological approach to setting allowed revenues

2.1 What regulation method (for controlling tariffs) does your regulatory authority apply?

☐ Cost plus
☐ Rate-of-return
☐ Revenue cap
☐ Price cap
☐ Other (please specify):

2.2 If revenue or price cap regulation is used, is an X-efficiency factor used at the general level of the price or revenue control?

☐ Yes
☐ No

(NOTE: please include only if used to set the revenue or price cap eg in the form of 'CPI-X', not for adjusting costs or setting expenditure allowances in the first place, which is addressed later in the questionnaire)

If you answered yes above, please state the X-efficiency factor (% real) used in the most recent regulatory period:

2.3 Which of the following best describes the methodology used to calculate allowed revenues?[19]

☐ Building-block approach
(Revenues = Depreciation + allowed return + O&M)
☐ Accounting approach
☐ Cash-based approach
☐ Totex approach
☐ Other (please specify):

2.4 What is the duration of the Regulatory Period?

☐ 1 year
☐ 2 years
☐ 3 years
☐ 4 years
☐ 5 years
☐ Other (please specify):

[19] Note that the focus of this question is on how revenues are determined and set (usually at the beginning or prior to the commencement of the regulatory period). How these revenues might be adjusted to account for realised expenditure and outputs is addressed separately in subsequent sections.

2.5	Are price or revenue resets permitted within a regulatory period if there are large unforeseen cost shocks or other material events or changes?	☐ Yes ☐ No If yes, are there formal predetermined triggers? (Please explain the circumstances permitted for revenue 'reopeners' and associated triggers, including any materiality thresholds):
2.6	Other comments *(Please add any other comments you think necessary or helpful for describing the overall regulatory approach employed)*	

Methodological approach to operating expenditures

3.1 How does the regulatory authority set the allowable operating and maintenance expenditures?

- ☐ Using a bottom-up approach
- ☐ Using a top-down approach
- ☐ Using a totex approach
  (ie they are assessed together with capex)
- ☐ By benchmarking against comparable companies
- ☐ Other (please specify):

3.2 If benchmarking is used, please specify the technique(s) employed

- ☐ Total-factor productivity
- ☐ Data Envelopment Analysis
- ☐ Ordinary Least Squares (OLS)
- ☐ Corrected Ordinary Least Squares (COLS)
- ☐ Stochastic Frontier Analysis (SFA)
- ☐ Reference network
- ☐ Based on realized costs or benchmarked entities, but also considering the 'frontier shift'
- ☐ Other (please specify):

3.3 Is there a distinction made between controllable and uncontrollable operating expenditure?

- ☐ Yes
- ☐ No

If yes, please specify the O&M costs that are considered uncontrollable:

3.4 If a distinction for uncontrollable expenditure is made, how are such costs treated for revenue setting purposes?

- ☐ They are fully passed through to network users
- ☐ They are partially passed through to network users
- ☐ Other (please specify):

3.5 Is there a distinction made between operating expenditure incurred for (regulated) network services and unregulated activities?

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

3.6	If the answer above is 'yes', how is operating expenditure for unregulated activities treated when determining allowed revenues for regulated services?	☐ Opex for unregulated activities is excluded altogether from allowed revenues (note that that this requires separation of unregulated costs) ☐ Estimated or actual revenues from unregulated activities are deducted from the opex allowance ☐ Other (please specify):
3.7	Do the operating cost forecasts or allowed expenditures factor in efficiency or productivity improvements? (These would usually be embedded in the cost forecasts/allowances themselves. This contrasts with applying an X-efficiency factor at the level of the overall price or revenue control eg in the form of 'CPI-X')	☐ Yes ☐ No
3.8	If the answer to the above is 'yes', how are these efficiency factors determined?	Please describe the method employed (eg benchmarking) and specify the efficiency factor (% real) used in the most recent regulatory period:
3.9	Are adjustments made in the subsequent years or regulatory period for deviations between allowed and realized O&M costs during the current regulatory period (ie are cost savings and overspends shared between the utility and network users in some way)?	☐ No - efficiency savings/losses are borne entirely by the utility ☐ Yes - efficiency savings/losses are shared between the utility and customers
3.10	Where adjustments are made for realized operating expenditure, do these apply to both overspending and	☐ Adjustments apply only to underspending (cost savings) ☐ Adjustments apply only to overspending (cost overruns)

Method:	
Efficiency factor (% real):	

	underspending against allowances?	☐ Adjustments apply to both cost savings and overruns, symmetrically ☐ Adjustments apply to both cost savings and overruns, asymmetrically
3.11	Where adjustments are made for realized operating expenditure, please specify the sharing rate applied or describe the methodology used, if something other than a sharing rate is used	☐ Sharing rate for cost savings: [Insert % here] ☐ Sharing rate for cost overruns: [Insert % here] ☐ Other methodology (please describe):
3.12	If adjustments are allowed, how are these carried forward into future allowed revenues to account for the time value of money?	☐ Using the allowed WACC ☐ Using the allowed cost of debt ☐ Using a short-term borrowing rate ☐ Using the inflation rate (eg CPI) ☐ There is no adjustment for the time value of money ☐ Other (please specify):
3.13	Other comments *(Please add any other comments you think necessary or helpful for describing the approach to setting efficient operating expenditure levels)*	

Methodological approach to capital expenditures and RAB

4.1 Does your regulatory authority have a regulation on how to review, assess and approve capital expenditures?

- ☐ Yes, a separate detailed regulation on capex review and approval
- ☐ Yes, detailed provisions within the general tariff regulation
- ☐ No, only broad principles in the tariff regulation
- ☐ The tariff framework does not specifically address capital expenditures
- ☐ Other (please specify):

4.2 When does the regulatory authority approve capital expenditures for a regulatory period?

- ☐ Capital expenditures are approved ex-ante (ie before the start of the regulatory period)
- ☐ Capital expenditures are only approved ex-post

4.3 What are the main criteria used to determine the necessity of a capex plan/program or investment projects ie whether the capex project is justified? (check any that apply)

- ☐ Technical necessity (security of supply, accommodating load, etc.)
- ☐ Financial justification (eg net present value, internal rate of return, benefit-cost ratio, payback period)
- ☐ Economic justification (broader socio-economic impacts of a particular project)
- ☐ Whether or not the investment has a net impact on the price/revenue cap[20]
- ☐ Other (please specify):

4.4 Is the utility allowed to change the approved capital expenditure plan during the regulatory period?

- ☐ No
- ☐ Yes, if it provides satisfactory evidence to the regulator that the alternative plan provides equal or better value to customers than the original plan
- ☐ Yes, and it can provide a justification at the end of the regulatory period
- ☐ Yes, and it does not need to provide a justification
- ☐ Other (please specify):

4.5 If the regulatory authority approves capital expenditures ex-ante, how does the

- ☐ Unit costs of individual projects
- ☐ Total-factor productivity

[20] Net impact on price/revenue cap' in this instance refers to a situation where, taking all costs and benefits into consideration, the addition of the capital expenditure plan would require an increase in the price/revenue cap.

	regulatory authority assess the efficiency of capital expenditures? (check any that apply)	☐ Data Envelopment Analysis ☐ Ordinary Least Squares (OLS) ☐ Corrected Ordinary Least Squares (COLS) ☐ Stochastic Frontier Analysis (SFA) ☐ Reference network ☐ Others (please specify):
4.6	Are regulated utilities required to tender capital expenditure competitively?	☐ Yes, it is mandatory for all projects ☐ Yes, it is mandatory for all projects above a certain cost ☐ No, it is not mandatory
4.7	What types of adjustments does the regulator make to allowed revenues (that were approved for the current regulatory period), in the event that forecasted or approved capital expenditure differs from realized expenditures? (check any that apply)	☐ Adjusting for capex deferrals[21] (eg by 'clawing back' the depreciation and allowed return on these investments) ☐ Adjusting for the time value of money for the difference between the planned and actual spend or commissioning year of a project ☐ Adjusting for unit cost differences (gains or losses) when these occur for reasons outside of the control of the licensee ☐ Other (please specify):
4.8	How are differences between forecast and actual controllable capex costs treated by the regulator?[22]	☐ Regulated utility bears the full impact of any losses (overspends) or gains (underspends) that may result from a cost difference within their control ☐ Regulated utility and customers share, based on a pre-set sharing factor, any losses or gains that may result from a cost difference within the regulated utility's control ☐ Other (please specify):
4.9	Where revenue adjustments are made for differences between planned and realized	☐ The adjustment rate is the WACC ☐ The adjustment rate is the allowed cost of debt

[21] This refers to investments that were approved at the start of the regulatory period, and return and depreciation on these were incorporated in the allowed revenues, but are subsequently postponed or delayed.

[22] As with the preceding question, the focus in this question is on whether the revenues that were allowed in the current period are adjusted for capex differences, as opposed to the investments that are recognised and rolled into the RAB to determine depreciation and return for the next regulatory period.

	expenditures, how does the regulator compensate for the time-value of money?	☐ The adjustment rate is the short-term lending rate in the country ☐ The adjustment rate is the rate of inflation ☐ No time value of money adjustment is made ☐ Other (please specify): [ ]
4.10	When are assets included in the Regulatory Asset Base (RAB) (and are therefore eligible to recover associated depreciation and allowed return costs)	☐ Capital expenditure enters the RAB as spent, provided it has been approved ☐ When the assets are purchased or constructed ☐ When the assets are 'used and useful' (ie when they are commissioned) ☐ Other (please specify): [ ]
4.11	Other than a scenario where capex enters the RAB as spent, how does the regulator treat Construction Work in Progress (CWIP)?	☐ The utility is not allowed any allowed return for CWIP ☐ The utility is allowed to recover the full allowed return on the value of the asset ☐ The utility is allowed to recover (debt) interest during construction, but not the full allowed return ☐ Other (please specify): [ ]
4.12	How was the opening asset value determined (ie at the time that the existing regulatory framework or methodology was established)? (*Note that this refers to the asset value established when the current revenue methodology was adopted, not the value determined at the beginning of the most recent regulatory period*)	☐ The historical cost of the assets such as the depreciated book value of the assets as per the utility's statutory accounts at the time ☐ A value derived from a current cost valuation methodology (eg replacement cost, modern equivalent assets, etc.) for the underlying fixed assets of the utility ☐ A value set or implied by the privatization of the regulated entity ☐ Other (please specify): [ ]
4.13	How does the regulator periodically value the Regulatory Asset Base?	☐ Historical cost-based approach, ie the value paid when the capex is undertaken, or of the asset commissioned ☐ Historical cost indexed to inflation ☐ The replacement cost of the assets ☐ The optimized replacement cost of the assets

☐ The cost of assets with the same capability (ie Modern Equivalent Asset Valuation)
☐ Economic or deprival value (value generated by the asset or that would be foregone without the asset)
☐ Other (please specify):

4.14	How does the regulator treat capital contributions/grants from third parties?	☐ Capital contributions are fully deducted from the RAB ☐ Regulated utility is allowed to recover depreciation expense (to replace the asset) but not allowed return ☐ Regulated utility is allowed to recover depreciation expense and allowed return ☐ Other (please specify):
4.15	Is working capital included in the RAB?	☐ Yes ☐ No, working capital is excluded from the RAB and is not recognized for revenue setting purposes ☐ No, working capital is excluded from the RAB but is treated as operating expenditure
4.16	If working capital is included in the RAB (or treated as operating expenditure), what methodology is used for calculating the working capital amount?	☐ Lead-lag method ☐ 45-day approach ☐ Balance sheet method ☐ Other (please specify):
4.17	If working capital is included in the RAB (or treated as operating expenditure), at what rate is the working capital amount remunerated?	☐ Allowed WACC ☐ The allowed cost of debt (as used in the WACC calculation) ☐ A short-term borrowing rate ☐ Other (please specify):
4.18	What is the depreciation method used in your jurisdiction?	☐ Straight-line method ☐ Units-of-production ☐ Accelerated/deferred depending on financing needs ☐ Other (please specify):

4.19 Please specify the average asset lives (in years) assumed for regulatory purposes for the major asset groupings shown (if different lives are assumed for sub-categories, please provide the weighted average for the category)

Overhead lines/wires	Underground lines/wires	Switchgear	Transformers	Sub-stations	Meters	Buildings	SCADA, telecom

4.20 Other comments
(Please add any other comments you think necessary or helpful for describing the approach to setting efficient capital expenditure levels, valuing the RAB and calculating the depreciation allowance)

Cost of capital

5.1 On what basis does the regulator set the WACC?

- ☐ Pre-tax, real WACC
- ☐ Pre-tax, nominal WACC
- ☐ Post-tax, real WACC
- ☐ Post-tax, nominal WACC
- ☐ Pre-tax, vanilla
- ☐ Post-tax, vanilla
- ☐ Other (please specify):

5.2 How does the regulator set the cost of debt?

- ☐ Sum of risk-free rate and debt risk premium
- ☐ Actual cost of debt for the regulated utility
- ☐ Prevailing market lending rate for comparable companies
- ☐ Other (please specify):

5.3 How does the regulator determine the risk-free rate, where this is used for calculating the cost of debt?

- ☐ Use the government borrowing rate as a proxy
- ☐ Use a foreign government borrowing rate with an inflation differential
- ☐ Other (please specify):

5.4 How does the regulator set the gearing ratio?

- ☐ Notional or 'optimal' gearing
- ☐ Actual gearing
- ☐ Actual gearing, so long as it lies within a 'reasonable' range
- ☐ Other (please specify):

5.5 How does the regulator set the cost of equity?

- ☐ Capital Asset Pricing Model (CAPM)
- ☐ Dividend Growth Model (DGM)
- ☐ Benchmarking
- ☐ Investor survey
- ☐ Other (please specify):

5.6 If CAPM is used, how does the regulator set the beta value

- ☐ Measuring the volatility of the relevant regulated company's stock against the volatility of the market

		☐ Measuring the volatility of comparator TSO companies' stock against the volatility of the market ☐ Relying on beta parameters used by other regulators for electricity transmission ☐ Benchmarking/comparing to similar industries ☐ Other (please specify):
5.7	If CAPM is used for calculating the cost of equity, how does the regulator determine the risk-free rate? (Note that this may be, and often is, the same as the risk-free rate used for calculating the cost of debt)	☐ Use the government borrowing rate as a proxy ☐ Use a foreign government borrowing rate with an inflation differential ☐ Other (please specify):
5.8	If CAPM is used, how is the market (or equity) risk premium (MRP/ERP) established?	☐ Historical data reflecting actual investment returns in international markets ☐ Historical data reflecting actual investment returns in the national market ☐ Precedents set by other regulators ☐ Other (please specify):
5.9	Please provide the requested data regarding the WACC and its parameters for the current and previous regulatory period (RP)	*Please answer this question in the accompanying Excel file*
5.10	Other comments *(Please add any other comments you think necessary or helpful for describing the approach used to setting the cost of capital)*	

Losses and adjustments

6.1	Does the regulator set the level of allowed losses	☐ Yes ☐ No ☐ Other (please specify):
6.2	Please provide the level of network allowed and actual losses for the given years, expressed in percentage terms as a proportion of incoming energy to the transmission system	*Please answer this question in the accompanying Excel file*
6.3	How does the regulator treat differences between allowed and actual losses?	☐ Utility is fully liable for all losses or gains incurred as a result of under or overachieving the loss target ☐ Losses/gains shared between utility and customers based on a pre-set sharing factor ☐ Other (please specify):
6.4	What other revenue adjustments does the regulator allow? (mark any that apply)	☐ Adjustment to reconcile the difference between allowed and actual revenues ☐ Adjustment to reconcile the difference between allowed and actual pass-through costs ☐ Adjustments for inflation ☐ Other (please specify):
6.5	Please provide the requested data on revenue (state all values in EUR m)	*Please answer this question in the accompanying Excel file*
6.6	Other comments *(Please add any other comments you think necessary or helpful for describing the approach used for losses and adjustments)*	

A4.1.3 Distribution System Operator Revenues

This section need only be completed if and to the extent that the approach differs to that of TSOs. Note that there is an additional section for DSOs on quality of supply regulation

Methodological approach to setting allowed revenues

2.1 What regulation method (for controlling tariffs) does your regulatory authority apply?

☐ Cost plus
☐ Rate-of-return
☐ Revenue cap
☐ Price cap
☐ Other (please specify):

2.2 If revenue or price cap regulation is used, is an X-efficiency factor used at the general level of the price or revenue control?

☐ Yes
☐ No

(NOTE: please include only if used to set the revenue or price cap eg in the form of 'CPI-X', not for adjusting costs or setting expenditure allowances in the first place, which is addressed later in the questionnaire)

If you answered yes above, please state the X-efficiency factor (% real) used in the most recent regulatory period:

2.3 Which of the following best describes the methodology used to calculate allowed revenues? [23]

☐ Building-block approach
(Revenues = Depreciation + allowed return + O&M)
☐ Accounting approach
☐ Cash-based approach
☐ Totex approach
☐ Other (please specify):

2.4 What is the duration of the Regulatory Period?

☐ 1 year
☐ 2 years
☐ 3 years
☐ 4 years

[23] Note that the focus of this question is on how revenues are determined and set (usually at the beginning or prior to the commencement of the regulatory period). How these revenues might be adjusted to account for realised expenditure and outputs is addressed separately in subsequent sections.

☐ 5 years

☐ Other (please specify):

2.5	Are price or revenue resets permitted within a regulatory period if there are large unforeseen cost shocks or other material events or changes?	☐ Yes ☐ No If yes, are there formal predetermined triggers? (Please explain the circumstances permitted for revenue 'reopeners' and associated triggers, including any materiality thresholds):
2.6	Other comments *(Please add any other comments you think necessary or helpful for describing the overall regulatory approach employed)*	

Methodological approach to operating expenditures

3.1 How does the regulatory authority set the allowable operating and maintenance expenditures?

- ☐ Using a bottom-up approach
- ☐ Using a top-down approach
- ☐ Using a totex approach
  (ie they are assessed together with capex)
- ☐ By benchmarking against comparable companies
- ☐ Other (please specify):

3.2 If benchmarking is used, please specify the technique(s) employed

- ☐ Total-factor productivity
- ☐ Data Envelopment Analysis
- ☐ Ordinary Least Squares (OLS)
- ☐ Corrected Ordinary Least Squares (COLS)
- ☐ Stochastic Frontier Analysis (SFA)
- ☐ Reference network
- ☐ Based on realized costs or benchmarked entities, but also considering the 'frontier shift'
- ☐ Other (please specify):

3.3 Is there a distinction made between controllable and uncontrollable operating expenditure?

- ☐ Yes
- ☐ No

If yes, please specify the O&M costs that are considered uncontrollable:

3.4 If a distinction for uncontrollable expenditure is made, how are such costs treated for revenue setting purposes?

- ☐ They are fully passed through to network users
- ☐ They are partially passed through to network users
- ☐ Other (please specify):

3.5 Is there a distinction made between operating expenditure incurred for (regulated) network services and unregulated activities?

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

3.6	If the answer above is 'yes', how is operating expenditure for unregulated activities treated when determining allowed revenues for regulated services?	☐ Opex for unregulated activities is excluded altogether from allowed revenues (note that that this requires separation of unregulated costs) ☐ Estimated or actual revenues from unregulated activities are deducted from the opex allowance ☐ Other (please specify): [ ]
3.7	Do the operating cost forecasts or allowed expenditures factor in efficiency or productivity improvements? (These would usually be embedded in the cost forecasts/allowances themselves. This contrasts with applying an X-efficiency factor at the level of the overall price or revenue control eg in the form of 'CPI-X')	☐ Yes ☐ No
3.8	If the answer to the above is 'yes', how are these efficiency factors determined?	Please describe the method employed (eg benchmarking) and specify the efficiency factor (% real) used in the most recent regulatory period: Method: [ ] Efficiency factor (% real): [ ]
3.9	Are adjustments made in the subsequent years or regulatory period for deviations between allowed and realized O&M costs during the current regulatory period (ie are cost savings and overspends shared between the utility and network users in some way)?	☐ No - efficiency savings/losses are borne entirely by the utility ☐ Yes - efficiency savings/losses are shared between the utility and customers
3.10	Where adjustments are made for realized operating expenditure, do these apply to both overspending and	☐ Adjustments apply only to underspending (cost savings) ☐ Adjustments apply only to overspending (cost overruns)

	underspending against allowances?	☐ Adjustments apply to both cost savings and overruns, symmetrically ☐ Adjustments apply to both cost savings and overruns, asymmetrically
3.11	Where adjustments are made for realized operating expenditure, please specify the sharing rate applied or describe the methodology used, if something other than a sharing rate is used	☐ Sharing rate for cost savings: [Insert % here] ☐ Sharing rate for cost overruns: [Insert % here] ☐ Other methodology (please describe):
3.12	If adjustments are allowed, how are these carried forward into future allowed revenues to account for the time value of money?	☐ Using the allowed WACC ☐ Using the allowed cost of debt ☐ Using a short-term borrowing rate ☐ Using the inflation rate (eg CPI) ☐ There is no adjustment for the time value of money ☐ Other (please specify):
3.13	Other comments *(Please add any other comments you think necessary or helpful for describing the approach to setting efficient operating expenditure levels)*	

Methodological approach to capital expenditures and RAB

4.1 Does your regulatory authority have a regulation on how to review, assess and approve capital expenditures?

- ☐ Yes, a separate detailed regulation on capex review and approval
- ☐ Yes, detailed provisions within the general tariff regulation
- ☐ No, only broad principles in the tariff regulation
- ☐ The tariff framework does not specifically address capital expenditures
- ☐ Other (please specify):

4.2 When does the regulatory authority approve capital expenditures for a regulatory period?

- ☐ Capital expenditures are approved ex-ante (ie before the start of the regulatory period)
- ☐ Capital expenditures are only approved ex-post

4.3 What are the main criteria used to determine the necessity of a capex plan/program or investment projects ie whether the capex project is justified? (check any that apply)

- ☐ Technical necessity (security of supply, accommodating load, etc.)
- ☐ Financial justification (eg net present value, internal rate of return, benefit-cost ratio, payback period)
- ☐ Economic justification (broader socio-economic impacts of a particular project)
- ☐ Whether or not the investment has a net impact on the price/revenue cap[24]
- ☐ Other (please specify):

4.4 Is the utility allowed to change the approved capital expenditure plan during the regulatory period?

- ☐ No
- ☐ Yes, if it provides satisfactory evidence to the regulator that the alternative plan provides equal or better value to customers than the original plan
- ☐ Yes, and it can provide a justification at the end of the regulatory period
- ☐ Yes, and it does not need to provide a justification
- ☐ Other (please specify):

4.5 If the regulatory authority approves capital expenditures ex-ante, how does the

- ☐ Unit costs of individual projects
- ☐ Total-factor productivity

[24] Net impact on price/revenue cap' in this instance refers to a situation where, taking all costs and benefits into consideration, the addition of the capital expenditure plan would require an increase in the price/revenue cap.

	regulatory authority assess the efficiency of capital expenditures? (check any that apply)	☐ Data Envelopment Analysis ☐ Ordinary Least Squares (OLS) ☐ Corrected Ordinary Least Squares (COLS) ☐ Stochastic Frontier Analysis (SFA) ☐ Reference network ☐ Others (please specify):
4.6	Are regulated utilities required to tender capital expenditure competitively?	☐ Yes, it is mandatory for all projects ☐ Yes, it is mandatory for all projects above a certain cost ☐ No, it is not mandatory
4.7	What types of adjustments does the regulator make to allowed revenues (that were approved for the current regulatory period), in the event that forecasted or approved capital expenditure differs from realized expenditures? (check any that apply)	☐ Adjusting for capex deferrals[25] (eg by 'clawing back' the depreciation and allowed return on these investments) ☐ Adjusting for the time value of money for the difference between the planned and actual spend or commissioning year of a project ☐ Adjusting for unit cost differences (gains or losses) when these occur for reasons outside of the control of the licensee ☐ Other (please specify):
4.8	How are differences between forecast and actual controllable capex costs treated by the regulator?[26]	☐ Regulated utility bears the full impact of any losses (overspends) or gains (underspends) that may result from a cost difference within their control ☐ Regulated utility and customers share, based on a pre-set sharing factor, any losses or gains that may result from a cost difference within the regulated utility's control ☐ Other (please specify):
4.9	Where revenue adjustments are made for differences between planned and realized	☐ The adjustment rate is the WACC ☐ The adjustment rate is the allowed cost of debt

[25] This refers to investments that were approved at the start of the regulatory period, and return and depreciation on these were incorporated in the allowed revenues, but are subsequently postponed or delayed.

[26] As with the preceding question, the focus in this question is on whether the revenues that were allowed in the current period are adjusted for capex differences, as opposed to the investments that are recognised and rolled into the RAB to determine depreciation and return for the next regulatory period.

	expenditures, how does the regulator compensate for the time-value of money?	☐ The adjustment rate is the short-term lending rate in the country ☐ The adjustment rate is the rate of inflation ☐ No time value of money adjustment is made ☐ Other (please specify): [ ]
4.10	When are assets included in the Regulatory Asset Base (RAB) (and are therefore eligible to recover associated depreciation and allowed return costs)	☐ Capital expenditure enters the RAB as spent, provided it has been approved ☐ When the assets are purchased or constructed ☐ When the assets are 'used and useful' (ie when they are commissioned) ☐ Other (please specify): [ ]
4.11	Other than a scenario where capex enters the RAB as spent, how does the regulator treat Construction Work in Progress (CWIP)?	☐ The utility is not allowed any allowed return for CWIP ☐ The utility is allowed to recover the full allowed return on the value of the asset ☐ The utility is allowed to recover (debt) interest during construction, but not the full allowed return ☐ Other (please specify): [ ]
4.12	How was the opening asset value determined (ie at the time that the existing regulatory framework or methodology was established)? (*Note that this refers to the asset value established when the current revenue methodology was adopted, not the value determined at the beginning of the most recent regulatory period*)	☐ The historical cost of the assets such as the depreciated book value of the assets as per the utility's statutory accounts at the time ☐ A value derived from a current cost valuation methodology (eg replacement cost, modern equivalent assets, etc.) for the underlying fixed assets of the utility ☐ A value set or implied by the privatization of the regulated entity ☐ Other (please specify): [ ]
4.13	How does the regulator periodically value the Regulatory Asset Base?	☐ Historical cost-based approach, ie the value paid when the capex is undertaken, or of the asset commissioned ☐ Historical cost indexed to inflation ☐ The replacement cost of the assets ☐ The optimized replacement cost of the assets

☐ The cost of assets with the same capability (ie Modern Equivalent Asset Valuation)
☐ Economic or deprival value (value generated by the asset or that would be foregone without the asset)
☐ Other (please specify):

4.14	How does the regulator treat capital contributions/grants from third parties?	☐ Capital contributions are fully deducted from the RAB ☐ Regulated utility is allowed to recover depreciation expense (to replace the asset) but not allowed return ☐ Regulated utility is allowed to recover depreciation expense and allowed return ☐ Other (please specify):
4.15	Is working capital included in the RAB?	☐ Yes ☐ No, working capital is excluded from the RAB and is not recognized for revenue setting purposes ☐ No, working capital is excluded from the RAB but is treated as operating expenditure
4.16	If working capital is included in the RAB (or treated as operating expenditure), what methodology is used for calculating the working capital amount?	☐ Lead-lag method ☐ 45-day approach ☐ Balance sheet method ☐ Other (please specify):
4.17	If working capital is included in the RAB (or treated as operating expenditure), at what rate is the working capital amount remunerated?	☐ Allowed WACC ☐ The allowed cost of debt (as used in the WACC calculation) ☐ A short-term borrowing rate ☐ Other (please specify):
4.18	What is the depreciation method used in your jurisdiction?	☐ Straight-line method ☐ Units-of-production ☐ Accelerated/deferred depending on financing needs ☐ Other (please specify):

4.19 Please specify the average asset lives (in years) assumed for regulatory purposes for the major asset groupings shown (if different lives are assumed for sub-categories, please provide the weighted average for the category)

Overhead lines/wires	Underground lines/wires	Switchgear	Transformers	Sub-stations	Meters	Buildings	SCADA, telecom

4.20 Other comments
(Please add any other comments you think necessary or helpful for describing the approach to setting efficient capital expenditure levels, valuing the RAB and calculating the depreciation allowance)

Cost of capital

5.1 On what basis does the regulator set the WACC?

- ☐ Pre-tax, real WACC
- ☐ Pre-tax, nominal WACC
- ☐ Post-tax, real WACC
- ☐ Post-tax, nominal WACC
- ☐ Pre-tax, vanilla
- ☐ Post-tax, vanilla
- ☐ Other (please specify):

5.2 How does the regulator set the cost of debt?

- ☐ Sum of risk-free rate and debt risk premium
- ☐ Actual cost of debt for the regulated utility
- ☐ Prevailing market lending rate for comparable companies
- ☐ Other (please specify):

5.3 How does the regulator determine the risk-free rate, where this is used for calculating the cost of debt?

- ☐ Use the government borrowing rate as a proxy
- ☐ Use a foreign government borrowing rate with an inflation differential
- ☐ Other (please specify):

5.4 How does the regulator set the gearing ratio?

- ☐ Notional or 'optimal' gearing
- ☐ Actual gearing
- ☐ Actual gearing, so long as it lies within a 'reasonable' range
- ☐ Other (please specify):

5.5 How does the regulator set the cost of equity?

- ☐ Capital Asset Pricing Model (CAPM)
- ☐ Dividend Growth Model (DGM)
- ☐ Benchmarking
- ☐ Investor survey
- ☐ Other (please specify):

5.6 If CAPM is used, how does the regulator set the beta value

- ☐ Measuring the volatility of the relevant regulated company's stock against the volatility of the market

		☐ Measuring the volatility of comparator DSO companies' stock against the volatility of the market ☐ Relying on beta parameters used by other regulators for electricity distribution ☐ Benchmarking/comparing to similar industries ☐ Other (please specify):
5.7	If CAPM is used for calculating the cost of equity, how does the regulator determine the risk-free rate? (Note that this may be, and often is, the same as the risk-free rate used for calculating the cost of debt)	☐ Use the government borrowing rate as a proxy ☐ Use a foreign government borrowing rate with an inflation differential ☐ Other (please specify):
5.8	If CAPM is used, how is the market (or equity) risk premium (MRP/ERP) established?	☐ Historical data reflecting actual investment returns in international markets ☐ Historical data reflecting actual investment returns in the national market ☐ Precedents set by other regulators ☐ Other (please specify):
5.9	Please provide the requested data regarding the WACC and its parameters for the current and previous regulatory period (RP)	*Please answer this question in the accompanying Excel file*
5.10	Other comments *(Please add any other comments you think necessary or helpful for describing the approach used to setting the cost of capital)*	

Losses and adjustments

6.1	Does the regulator set the level of allowed losses	☐ Yes ☐ No ☐ Other (please specify):
6.2	Please provide the level of network allowed and actual losses for the given years, expressed in percentage terms as a proportion of incoming energy to the distribution system	*Please answer this question in the accompanying Excel file*
6.3	How does the regulator treat differences between allowed and actual losses?	☐ Utility is fully liable for all losses or gains incurred as a result of under or overachieving the loss target ☐ Losses/gains shared between utility and customers based on a pre-set sharing factor ☐ Other (please specify):
6.4	What other revenue adjustments does the regulator allow? (mark any that apply)	☐ Adjustment to reconcile the difference between allowed and actual revenues ☐ Adjustment to reconcile the difference between allowed and actual pass-through costs ☐ Adjustments for inflation ☐ Other (please specify):
6.5	Please provide the requested data on revenue (state all values in EUR m)	*Please answer this question in the accompanying Excel file*
6.6	Other comments *(Please add any other comments you think necessary or helpful for describing the approach used for losses and adjustments)*	

Quality of supply

7.1 Which voltage levels are monitored for supply and voltage reliability

- ☐ Medium voltage (MV)
- ☐ Low voltage (LV)
- ☐ None

7.2 Which of the reliability of supply indicators to the right are regularly monitored and reported on?

- ☐ SAIDI - system average interruption duration index
- ☐ SAIFI - system average interruption frequency index
- ☐ CAIDI - customer average interruption duration index
- ☐ MAIFI - momentary average interruption frequency index
- ☐ None
- ☐ Other (please specify):

7.3 Which of the voltage quality indicators to the right are regularly monitored and reported on?

- ☐ Supply voltage variation
- ☐ Flicker
- ☐ Unbalance
- ☐ Harmonic voltage
- ☐ Mains signalling voltage
- ☐ Other (please specify):

7.4 Which of the customer service parameters to the right are regularly monitored and reported on?

- ☐ Restoration time, following supply failure
- ☐ Restoration time, following voltage disturbance
- ☐ Time to reconnect (after outstanding debt is extinguished)
- ☐ Time taken to investigate and address customer queries and complaints
- ☐ Length of time for connecting new customers to the network
- ☐ Whether sufficient notice is given to customers for planned interruptions
- ☐ Other (please specify):

7.5	Are annual targets set for the indicators that are monitored?	☐ No ☐ Yes, for all ☐ Yes, for some of these (please specify which indicators below):
7.6	If targets are set for supply reliability and voltage quality, how are extreme events accounted for?	☐ Not included in targets ☐ Capped at a maximum value ☐ Included in targets uncapped ☐ Other (please explain):
7.7	If targets are used, are these set differently: (check any that apply)	☐ Per indicator monitored? ☐ For planned versus unplanned events? ☐ For separate regions/DSO areas?
7.8	What financial incentives are set against these targets?	☐ No financial incentive ☐ Penalties only ☐ Reward only ☐ Both penalties and rewards
7.9	If there are financial incentives, are rewards/penalties fixed amounts or relative to performance?	☐ Fixed amounts ☐ Relative to performance (better performance = higher reward, vice versa) ☐ Other (please specify):
7.10	If financial incentives are set relative to performance, are maximum reward/penalties set?	☐ Maximum reward and penalty ☐ Maximum penalty only ☐ Maximum reward only ☐ No limits
7.11	*Other comments* *(Please add any other comments you think necessary or helpful for describing the quality of supply regulatory framework)*	

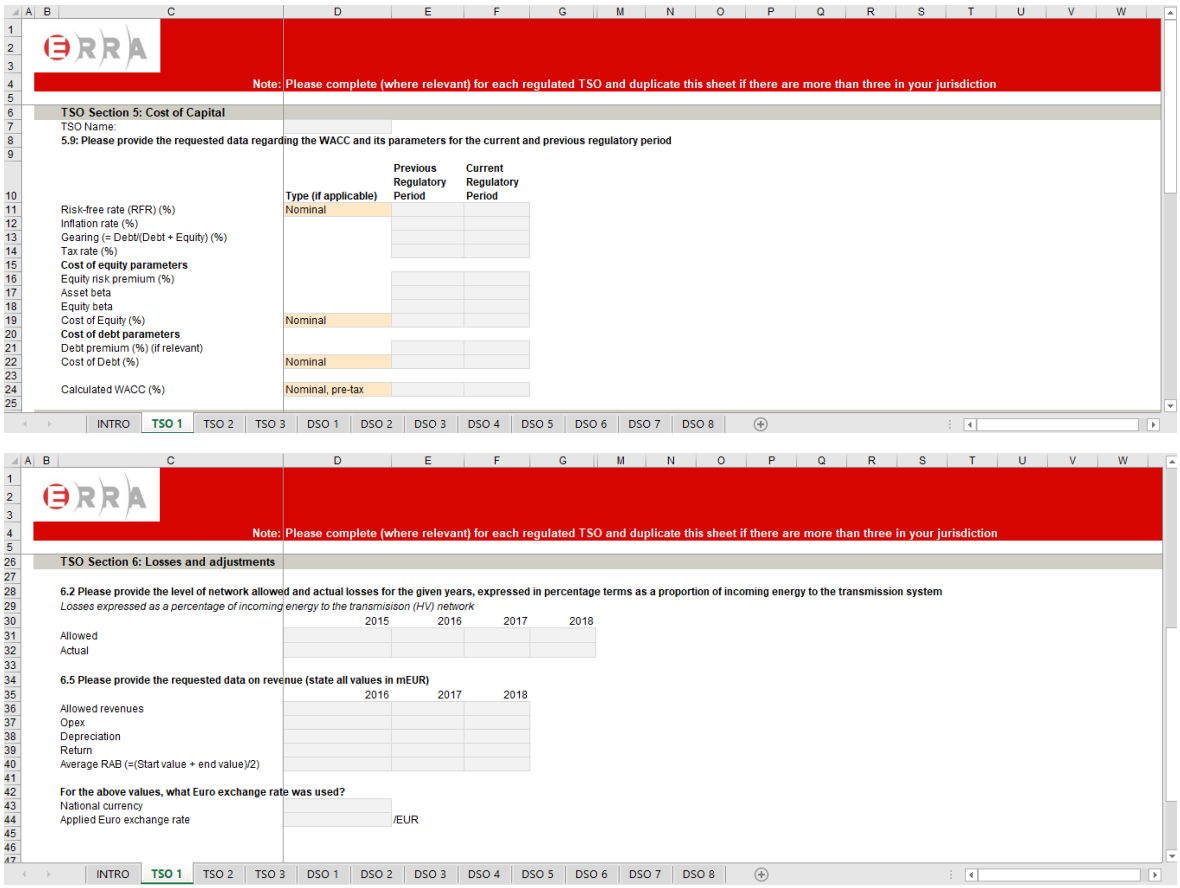
A4.2 Part 2

Questions 5.9, 6.2 and 6.5 in Part 1 of the survey request participants to answer the question 'in the accompanying Excel file'. This Excel file is referred to as Part 2 of the survey. In the Excel file, participants provided:

- their WACC values and parameters for the current and previous regulatory period (for question 5.9)
- their allowed and actual losses (for question 6.2)
- the components of their allowed revenues (for question 6.5).

Screenshots for the questions posed to the TSO are shown in Figure 63. The questions posed to DSOs were similar.

Figure 63 Screenshot of survey Part 2



Source: ECA and ERRA