

# The cost of capital in the energy and water sectors in Italy

Workshop "The cost of capital: a cross-country and cross-industry perspective"

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### AGENDA

- General framework for tariff setting
- Cost of capital in the energy sector: the reform of the WACC methodology 2016-2021
- Cost of capital in the water sector



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#### **REGULATORY PROCESS: TARIFF SETTING**





#### TARIFF SETTING IN THE ENERGY SECTOR

Combined model of price cap (OPEX) and rate of return (CAPEX)

Allowed revenues cover operative costs and capital costs for the service provided through **regulated assets**.

**Regulatory Asset Base (RAB)**: the assets are evaluated on the basis of a 'historical revaluated cost' approach and updated yearly using the Gross Investment Deflator index (GID). The value of assets (net invested capital) is net of the corresponding depreciation fund and net of private and public grants.

**Return on RAB** is defined as Weighted Average Cost of Capital (WACC) real pre tax

The RAB is updated on a yearly basis taking into account:

- GID variations
- new investments and divestitures
- increase of depreciation fund
- changes in private and public grants

**Depreciation** is based on regulatory assets useful life (straight-line depreciation)



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#### **REASONS FOR A REVIEW OF THE WACC METHODOLOGY**

- The previous WACC methodology adopted by AEEGSI was first introduced in the second electricity transmission and distribution regulatory period (2004).
- At the time, yields on Italian government bonds were a reasonable proxy for risk-free rates and it was generally assumed that market risk premium and interest rates were non correlated.
- Over the last six years, since the start of the global financial crisis, a number of unusual events have affected capital markets and macroeconomic condition across the globe, including the Eurozone countries.
- AEEGSI found it necessary to review the previous WACC methodology also to avoid that different market conditions at the time of the tariff revision could lead to unjustified differentiations of allowed returns among regulated services.



#### PROCEEDING

- Decision 4 December 2014, 597/2014/R/сом (beginning of the proceeding)
- Consultation paper 9 January 2015, 275/2015/R/сом (initial proposals)
- Consultation paper 29 October 2015, 509/2015/R/сом (final proposals)
- Decision 2 December 2015, 583/2015/R/сом (final decision, definition of the WACC for gas sector services)
- Decision 23 December 2015, 654/2015/R/EEL (definition of the WACC for electricity sector services)



#### **GENERAL APPROACH**

Decision 597/2014/R/COM stated the general approach to be followed in the WACC calculation methodology review:

- the allowed rate of return is calculated as a **weighted average** cost of capital
- the allowed rate of return is calculated as *real* and *pre-tax*
- the cost of equity is calculated according to the Capital Asset Pricing Model (CAPM)

Decision 583/2015/R/COM confirmed the general approach indicated in decision 597/2014/R/COM.



### WACC FORMULATION





## WACC REGULATORY PERIOD (PWACC)

AEEGSI intended to unify the WACC parameters, except  $\beta$  and gearing, for all the regulated activities of electricity and gas sectors.

Unified WACC parameters are set by AEEGSI for a period of time, called **WACC regulatory period** (*PWACC*).

The length of the 'WACC regulatory period' is **six years**. The *PWACC* consists of **two sub-periods**, each one lasting three years.

In the middle of the *PWACC* (2018) the following parameters will be reviewed (interim review):

- risk-free rate
- Country Risk Premium
- inflation rate
- fiscal parameters.

Also the gearing relative to different services will be reviewed in 2018



### WACC REGULATORY PERIOD (PWACC)

	2016	2017	2018	2019	2020	2021	2022	2023
			Interim					
PWALL			review			Review		
					1			
Electricity transmission								Review
Electricity distribution								
and motoring								Poviow
and metering								
Storage								
0			Review					
LING		Review						
Gas transport		Review						
Cas distribution and				<u></u> T				
Gas distribution and				Deview				
metering				Review				

On the occasion of specific tariff regulation revision, the asset beta is reviewed



#### **COST OF EQUITY**

The cost of equity is calculated adding to the traditional CAPM formulation a specific term reflecting the *Country Risk Premium* (*CRP*)

 $K_e = RF + \beta \cdot ERP + CRP$ 

where:

- RF is the risk-free rate
- $\beta$  is a measure of the systematic risk of an activity
- ERP is the equity risk premium

The introduction of parameter *CRP* allows to explicitly capture the impact of the fiscal crisis on required returns for regulated utilities in Italy



## POST TAX RETURN ON EQUITY



where:  $isr_p$  is the expected inflation rate.



## TOTAL MARKET RETURN (TMR)

In the new approach a greater weight was placed on the concept of total equity market return, to ensure a consistent set of assumptions for the risk-free rate and the equity risk premium, rather than estimating them separately

TMR was estimated on the basis of long term evidences:

- time horizon: 1900-2014
- countries considered in the calculation: Belgium, France, Germany and Netherlands (rated at least "AA")
- weighted average of the arithmetic (6,6%) and geometric (3,5%) averages





#### **REAL RISK-FREE RATE**

#### Nominal risk-free rate:



In order to avoid negative yields, not consistent with economic expectations, AEEGSI introduced a *floor* for the real risk-free rate. On this basis, the real risk-free rate was set equal to 0,5% for years 2016-2018.



### EQUITY RISK PREMIUM (ERP)

AEEGSI adopted a 'TMR constant' approach, according to which the ERP is calculated as the difference between TMR and RF.



The approach followed for the setting of the risk-free rate and of the equity risk rate allows to reflect "normal" market conditions, before considering the impact of the fiscal crisis in Italy on required returns



#### **COUNTRY RISK PREMIUM**

**CRP** reflects the compensation investors require to operate in a certain country.

Rating differentials among countries affect also companies ratings. *CRP* affects both cost of debt and cost of equity.

Two approaches to estimate *CRP* can be followed:

- evidence from corporate debt markets
- evidence from equity markets

According to initial evaluations *CRP* was estimated to vary between 0,5% and 1,0%.

In the final decision AEEGSI set *CRP* equal to 1,0% for years 2016-2018 for both equity and debt.



#### COST OF DEBT

From a theoretical point of view, cost of debt can be estimated adding to RF a spread determined on the basis of debt  $\beta$ . The implementation of this approach, however, presents some practical difficulties.

AEEGSI examined the structure and the stratification of regulated companies' medium and long term debt.

AEEGSI set the cost of debt in order to reflect the cost of efficiently incurred debt, considering the economic sustainability, giving incentive to define efficient debt portfolios and taking into account evidences from capital markets.





#### FISCAL PARAMETERS





#### FISCAL PARAMETERS

Fiscal parameters in the WACC formulation allow to take into consideration:

- the effect of the tax rate on the return on equity and on the cost of debt (parameter T)
- the effect of tax shield on the cost of debt (parameter tc)
- the fact that taxes are paid on nominal returns (tax adjustment factor)



#### ACTIVITY SPECIFIC PARAMETERS

AEEGSI decided to estimate specific  $\beta$  for each regulated activity, considering evidences coming from the Eurozone equity markets related to companies with high credit rating, in a period of at least two years.

In AEEGSI's opinion  $\beta$  estimate cannot be considered as a pure mechanistic exercise. It is necessary to analyse the results and evaluate the coherence with the general regulatory framework evolution.

AEEGSI decided to set the *gearing* level taking into account the actual levels for regulated companies and considering the perspective of a gradual alignment towards the average levels adopted by other regulators.



#### GEARING

AEEGSI confirmed for the first three years of the *PWACC* (2016-2018) the current levels of gearing for all regulated activities.

	D/E	Gearing (D/(D+E))
Electricity transmission	80%	0,444
Electricity distribution and metering	80%	0,444
Storage	80%	0,444
LNG	80%	0,444
Gas transport	80%	0,444
Gas distribution	60%	0,375
Gas metering	60%	0,375



#### **GEARING: INTERIM REVIEW**

For the second sub-period beginning in year 2019 AEEGSI, in the perspective of a gradual convergence towards the levels adopted by other european regulators, envisaged a revision of gearing level for all regulated activities, with a maximum level of 0,5.

The revision of gearing implies, as a consequence, also a revision of beta levered, on the basis of the following formula:

$$\boldsymbol{\beta}^{levered} = \boldsymbol{\beta}^{asset} \cdot \left(1 + (1 - tc) \cdot \frac{D}{E}\right)$$



#### **BETA LEVERED**

The asset beta for the calculation of beta levered is reviewed on the occasion of service specific tariff reviews.

	2016	2017	2018
Electricity transmission	0,553	0,553	0,553
Electricity distribution and metering	0,616	0,616	0,616
Storage	0,800	0,800	0,800
LNG	0,828	0,828	(*)
Gas transport	0,575	0,575	(**)
Gas distribution	0,630	0,630	0,630
Gas metering	0,720	0,720	0,720

(\*) the value will be reviewed on the occasion of the fifth revision of the tariff regulation for the LNG service.

(\*\*) the value will be reviewed on the occasion of the fifth revision of the tariff regulation for the gas transport service.



#### WACC

	2016	2017	2018
Electricity transmission	5,3%	5,3%	5,3%
Electricity distribution and metering	5,6%	5,6%	5,6%
Storage	6,5%	6,5%	6,5%
LNG	6,6%	6,6%	(*)
Gas transport	5,4%	5,4%	(**)
Gas distribution	6,1%	6,1%	6,1%
Gas metering	6,6%	6,6%	6,6%

(\*) the value will be reviewed on the occasion of the fifth revision of the tariff regulation for the LNG service.

(\*\*) the value will be reviewed on the occasion of the fifth revision of the tariff regulation for the gas transport service.



### **MID-PERIOD REVIEW**

## AEEGSI decided to adopt a mid-period review, based on transparent and predictable review mechanisms.

In particular, the parameters that will be reviewed are:

- Risk-free rate (and ERP, as a consequence)
- Country Risk Premium
- inflation rates ( $isr_p$  and  $ia_p$ )
- fiscal parameters  $(T_p \text{ and } tc_p)$



### **MID-PERIOD REVIEW: CRP**

In the final decision AEEGSI adopted a trigger approach for the review of the CRP, based on the following formula:

$$CRP_{II} = CRP_{I} \cdot \left[1 + \left(\frac{Spread^{corr}}{Spread^{base}} - 1\right) \cdot SC\right]$$

where:

- Spread<sup>corr</sup> is the average spread between the Italian ten-year BTP benchmark and the German ten-year Bund in the period 1 October 2017 - 30 September 2018
- Spread<sup>base</sup> is the average spread between the Italian ten-year BTP benchmark and the German ten-year Bund in the period 1 October 2014 - 30 September 2015
- SC is a dummy variable equal to 0 if the difference between Spread<sup>corr</sup> and Spread<sup>base</sup> (in absolute terms) is ≤ 20% and equal to 1 else



#### MID-PERIOD REVIEW: OTHER PARAMETERS

Other parameters will be reviewed as follows:

• the risk-free rate will be calculated on the basis of the following formula:

$$RF_{II}^{real} = \max\left(\frac{RF_{II}^{no\min al} - isr_{II}}{1 + isr_{II}};0,005\right)$$

where:

 $RF_{II}^{no \min al}$  is the average of yields on government bonds issued by Eurozone countries rated at least "AA" in the period 1 October 2017 – 30 September 2018  $isr_{II}$  is the average of ten-year inflation linked swap rates in the Eurozone in the period 1 October 2017 – 30 September 2018

- the parameter ERP<sub>p</sub> will be recalculated as the difference between the TMR (set equal to 6,0%) and the risk-free rate
- the parameter ia<sub>p</sub> will be defined on the basis of the most recent forecasts of the ECB
- parameters T<sub>p</sub> and tc<sub>p</sub> will be defined on the basis of a detailed analysis in order to estimate taxation levels.



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#### Authority approach to water regulation

#### Piecemeal activity within a comprehensive strategy

- Local decision making process
- Empowerment: self determination at decentralized level
- Coherency

#### **Cost reimbursement rules**

- Constrains on Operating Costs (endogenous vs. exogenous)
- Priority to investments
- Price Cap and Full Cost Recovery

#### **Pricing to end-users**

- Tariff multiplier
- Reorganise tariff structure applied to consumers

#### Rebalancing past disequilibria

- Past credit billing
- Investigation on above-the-cap proposals

#### Measures to avoid default

Urgent equalisation



#### Impact of Aeegsi regulation

(New) Water Tariff Method - MTI (2014-15) AEEGSI approved tariffs for <u>1.961 operators</u> regarding <u>49.8 mn population</u>. The new tariffs had an average yearly increase of <u>4,04% in</u> <u>2014 and 4,46% in 2015</u>







#### FINANCIAL & FISCAL COST FOR THE PERIOD 2016-2019

Financial & Fiscal costs (*OF* and *OFisc*) are calculated on the Net Invested Capital (*CIN*), evaluated ex post, according to the "historical cost" principle:

 $CIN^{a} = IMN^{a} + CCN^{a} + LIC^{a} - FAcc - FoNI_{non_{inv}}$ 

Financial & Fiscal costs are determined according to the following *criteria*:

- Monetary revaluation of assets
- Standardized financial cost
- Standardized Debt/Equity ratio

Effects:

- Ceiling on the bilateral bargaining process between the service provider and the financial institution, to reduce financial costs
- It is not ensured the effective return on investment, rather taking into account a standard ratio between debt and equity (CS/CnS=1)



#### FINANCIAL COST FOR THE PERIOD 2016-2019

• Financial cost is calculated on the basis of the following formula:

$$OF^{a} = (K_{m} + \alpha) * \left(1 - \frac{CIN_{fp}^{a}}{CIN^{a}}\right) * CIN^{a}$$

where:





#### FISCAL COST FOR THE PERIOD 2016-2019

• Fiscal cost is calculated on the basis of the following formula:

$$OFisc^{a} = t_{c} * Rai^{a}$$

where:





#### FINANCIAL & FISCAL PARAMETERS

		MTI-2
		2016-2019
	Т	0,342
NPUT DATA	tc	0,275
	CS/CnS	1,000
e <i>tc</i> = Tax rates	WRP	0,015
	rf	0,005
CNS - Dobt/Equity ratio	K <sub>d</sub>	0,028
MS = Debl/Equity failo	Beta	0,800
real risk free rate	ERP	0,040
Water Utility Risk Premium	rpi	0,015
ate of return on debt capital	K <sub>m</sub>	0,021
sure of the risk of er sector	alfa	0,016
	k <sub>m</sub> +alfa	0,037
k premium		
	Tasso Rai	0,063
tion rate		
	(k <sub>m</sub> +alfa)+tc(Tasso Ra	ui) (0,054



## **CONCLUSION - Cost of capital: synthesis**

Energy sector	2016
Electricity transmission	5,3%
Electricity distribution and metering	5,6%
Storage	6,5%
LNG	6,6%
Gas transport	5,4%
Gas distribution	6,1%
Gas metering	6,6%

Water sector	2016
Rate for the recovery of Financial and Fiscal Costs	5,4%



## **BACK UP**



#### TAX RATE AND TAX SHIELD

An accurate estimate of the taxation levels was carried out on the occasion of the tariff revision for the electricity sector in 2011. In particular, AEEGSI estimated:

- parameter T = 35,7% (tax rate)
- parameter tc = 27,5% (tax shield)

The impact of fiscal reforms after 2011 was examined during the consultation, in order to assess the T level.



In the final decision AEEGSI defined T = 34,4% and confirmed the level of tc = 27,5% for years 2016-2018.



### TAX ADJUSTMENT FACTOR

In the WACC formulation AEEGSI introduced a tax adjustment factor to reflect the fact that taxes are paid on nominal returns



The parameter was set equal to **1,5%** for years 2016-2018 on the basis of data reported in the ECB Economic Bulletin 7/2015



#### Water regulation in Italy: general aspects

- □ Water sector: 60 mln inhabitants, more than 2500 operators (mainly local municipalities and publicly owned/controlled companies)
- ❑ AEEGSI: independent Authority created in November 1995 (Law 481/95), that regulates electricity, gas and water network services. The Authority formulates its own procedures for the adoption of provisions and enjoys autonomy to lay down the regulations governing its internal organisation, functioning and accounting procedures.
- AEEGSI independent powers extended to water services in December 2011 (Law 201/11)
- □ First regulatory period (2012 2015): consultation with stakeholders, from transitional to stable tariff methodology (MTI dec. 643/2013/R/idr)
- □ Main regulatory decisions in 2015:
  - New regulatory period and tariff methodology MTI-2 (dec. 664/2015/R/idr)
  - o Regulation of commercial quality (dec. 655/2015/R/idr)
  - Standard management agreement to govern relationships between the contracting authority and the service(s) operator (dec. 656/2015/R/idr)