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Networks Brazil

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November 2019

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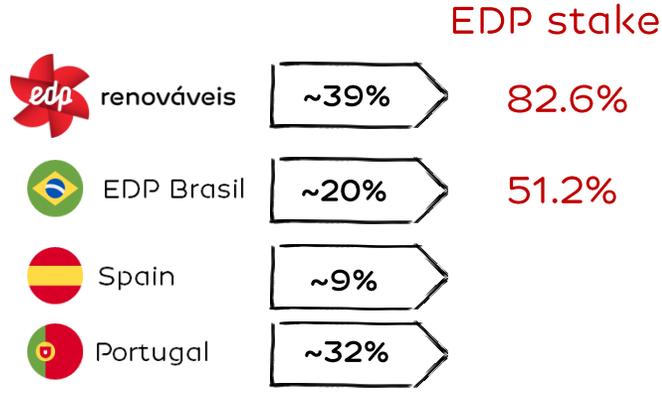
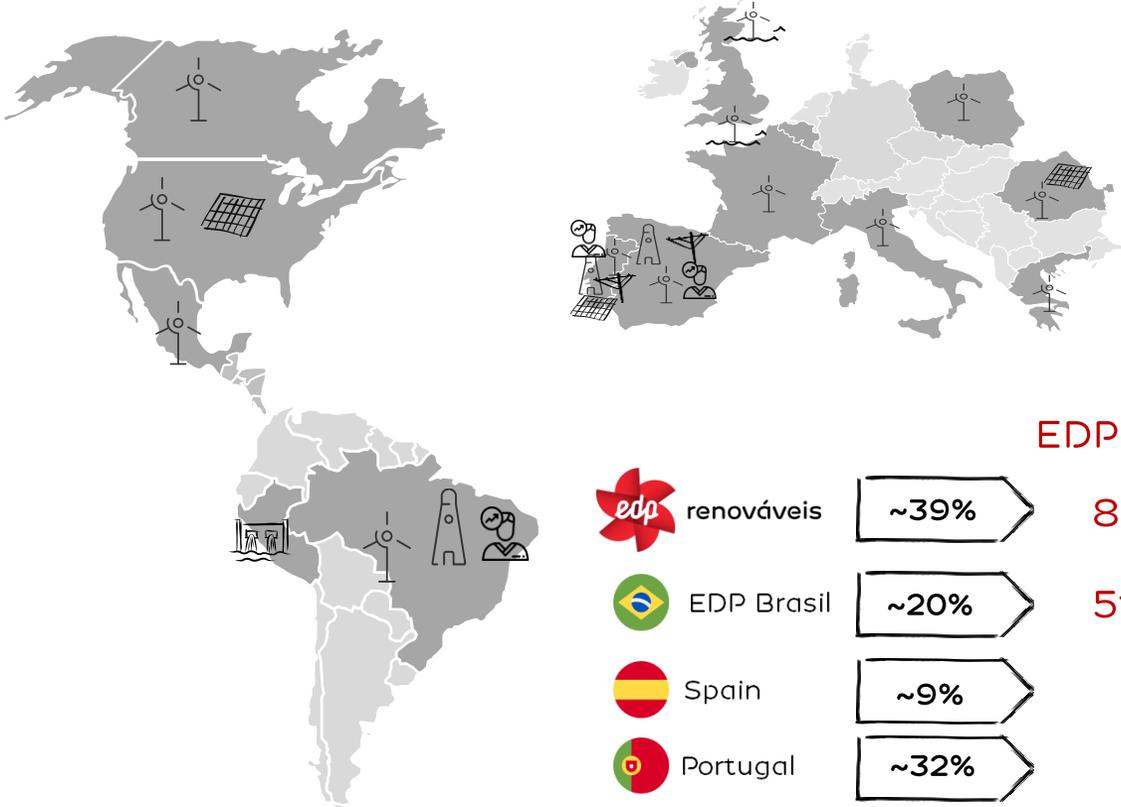
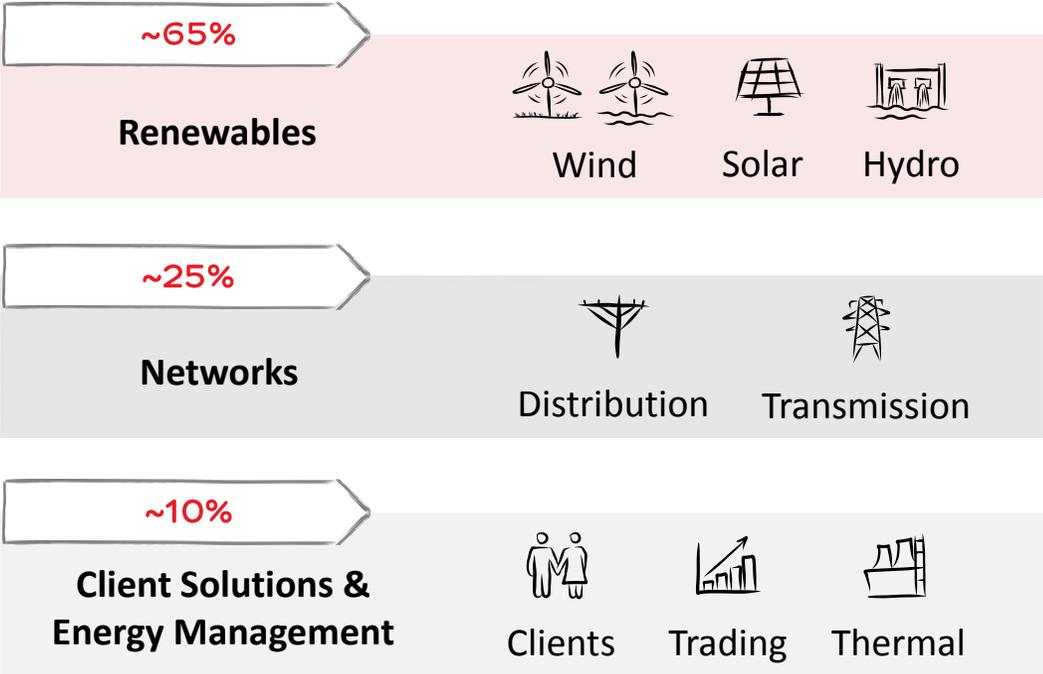
- 1 Context
- 2 Distribution
- 3 Transmission

- 1 Context
- 2 Distribution
- 3 Transmission

# EDP is a leading integrated energy utility, with networks representing 25% of EBITDA



## 2018 FY



**Key figures**<sup>(1)</sup>: Installed Capacity | 28.1 GW    EBITDA | €3.3 Bn    Net Profit | €0.5 Bn    Employees | 11.6k    Customers | 9.8 Mn

% Weight EBITDA as of YE2018

1 All figures reported as of YE2018

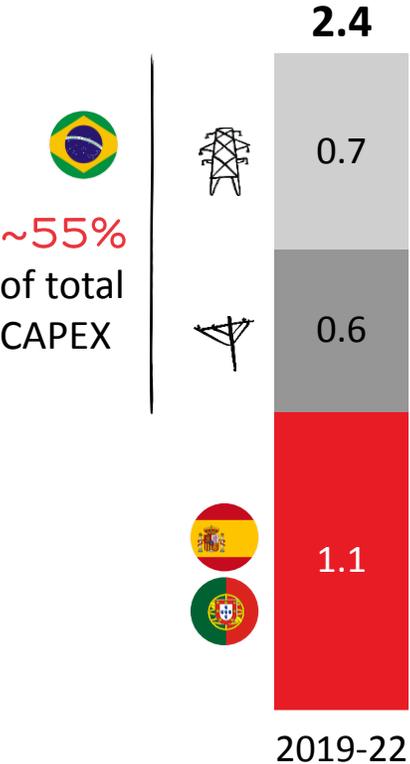
# EDP networks: Brazil will be the engine of growth, representing 40% of EBITDA by 2022



+XX Growth, 2019-22

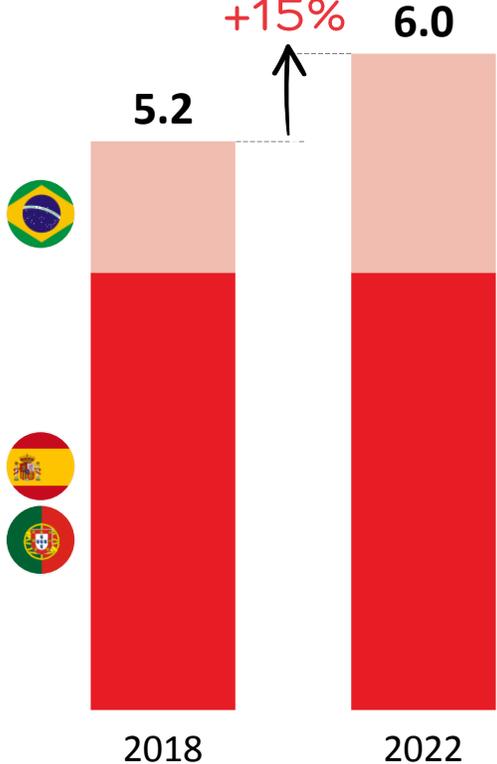
## ~€0.6 Bn annual CAPEX in Networks

CAPEX, € Bn



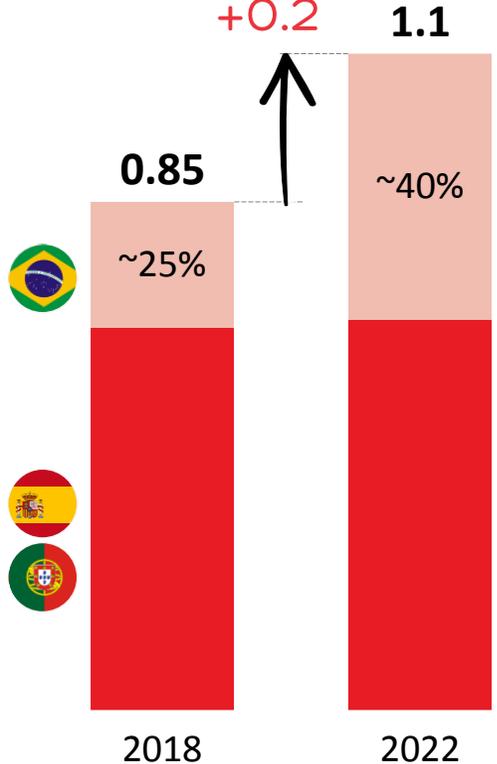
## Regulated Asset Base to increase 15%

RAB<sup>1</sup>, € Bn



## EBITDA to grow driven by investments in Brazil

EBITDA, € Bn<sup>2</sup>

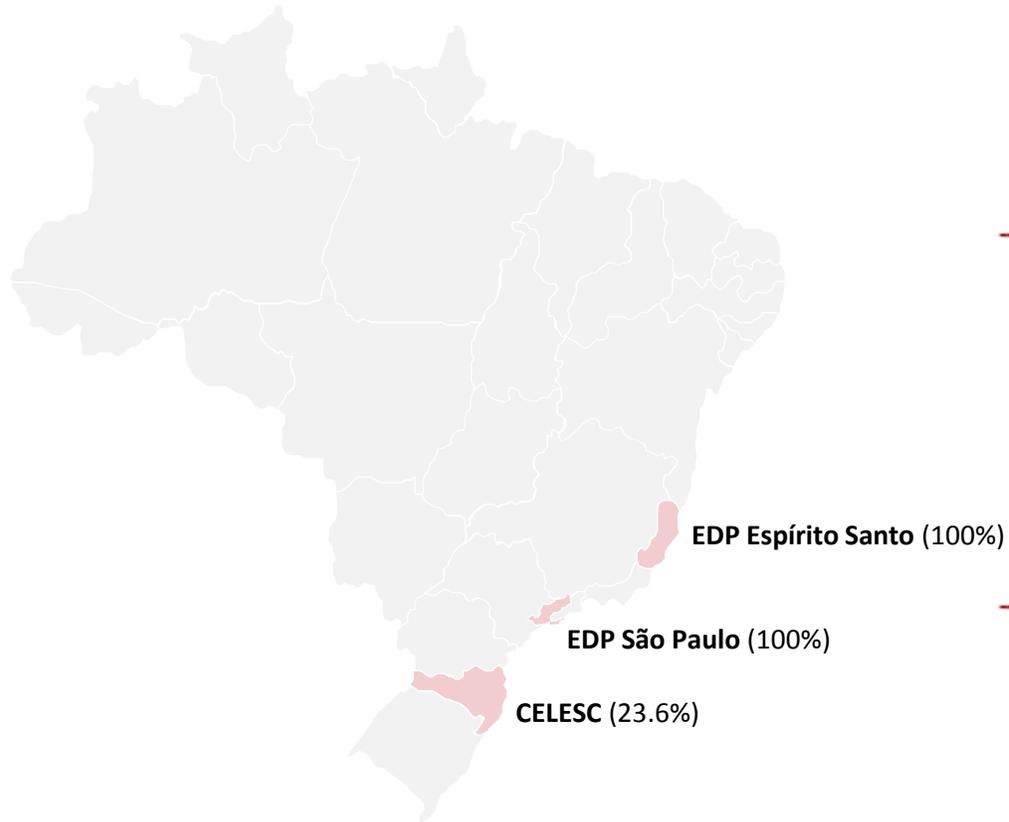


Note: figures as of Mar-18 (at Strategic Update presentation)

<sup>1</sup> Includes 23.56% of CELESC and invested capital in Transmission in Brazil (RAB valued under different economic model than distribution) | <sup>2</sup> Disposals included in proportion of EBITDA of each platform

- 1 Context
- 2 Distribution
- 3 Transmission

# Distribution Portfolio

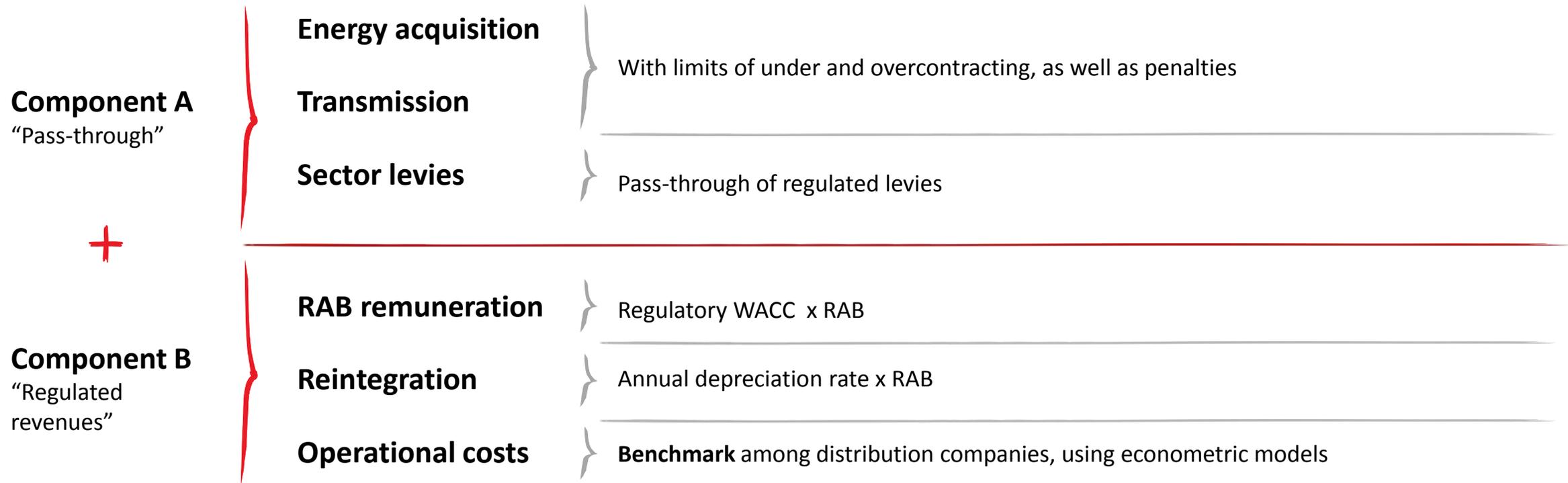


<b>Espírito Santo</b>	<b>1.5</b> Mn clients	<b>Concession</b> Concession term: July 2025	<b>State qualitative data</b> 11 <sup>th</sup> highest nominal household income per capita in Brazil <b>R\$ 1,295</b> 2018*
	<b>9.8</b> TWh	Revision: every 3 years Net RAB: R\$2,581 million	7 <sup>th</sup> highest HDI in Brazil <b>0.740</b> 2010*
<b>São Paulo</b>	<b>1.8</b> Mn clients	<b>Concession</b> Concession term: October 2028	<b>State qualitative data</b> 2 <sup>nd</sup> largest nominal household income per capita in Brazil <b>R\$ 1,898</b> 2018*
	<b>15.2</b> TWh	Revision: every 4 years Net RAB: R\$2,423 million	2 <sup>nd</sup> highest HDI in Brazil <b>0.783</b> 2010*
<b>Santa Catarina</b>	<b>3.0</b> Mn clients	<b>Concession</b> Concession term: July 2045	<b>State qualitative data</b> 5 <sup>th</sup> largest nominal household income per capita in Brazil <b>R\$ 1,660</b> 2018*
	<b>24.4</b> TWh	Revision: every 5 years Net RAB: R\$3,007 million	3 <sup>rd</sup> highest HDI in Brazil <b>0.774</b> 2010*

# Regulatory model of distribution



## Economic Revenue of distribution activities

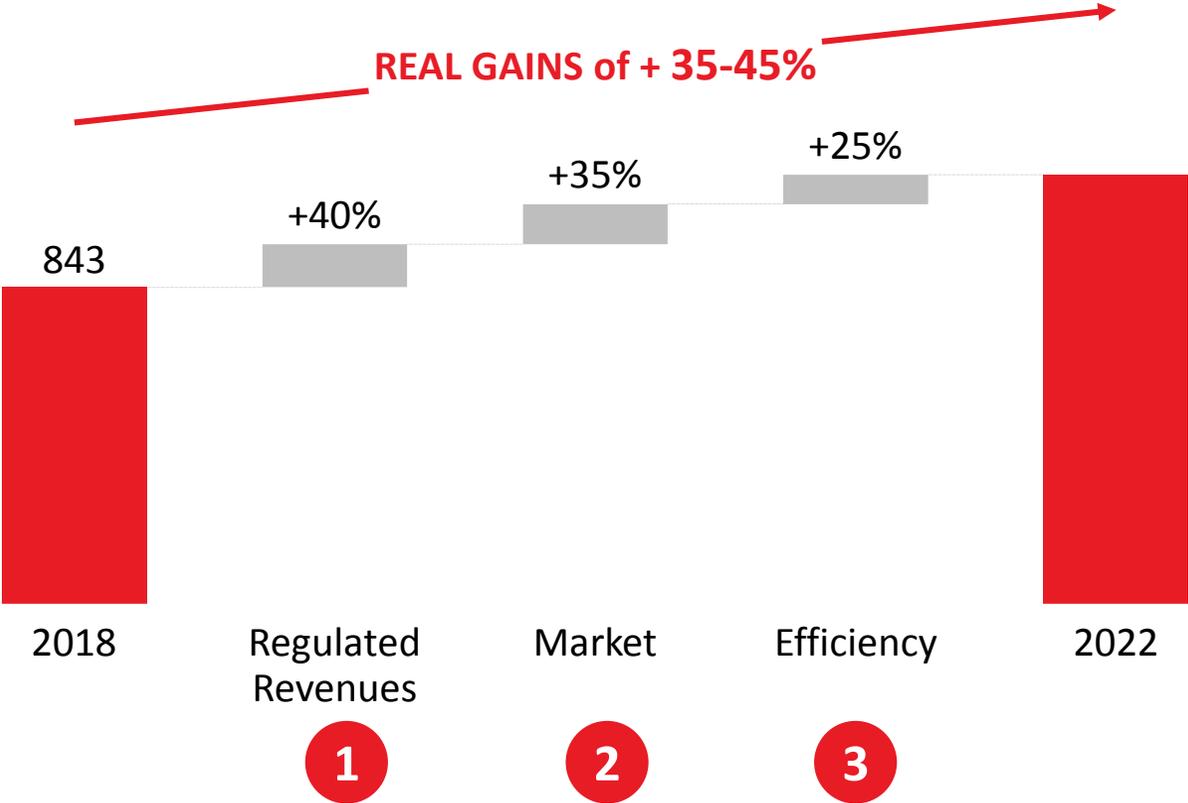


# Strong EBITDA growth in distribution, supported by efficient investments and operational drivers

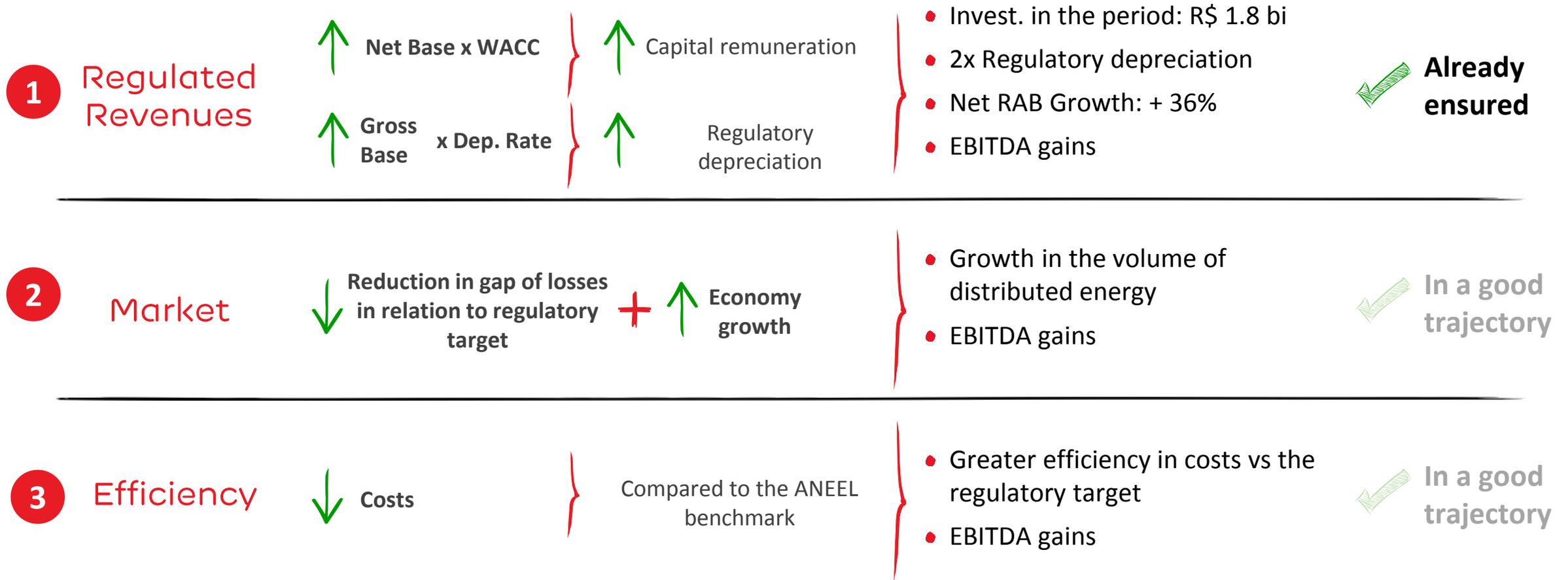


## EBITDA

R\$ Mn



# Value added in the tariff cycle: Improvement in all levers of value creation



30.7% growth in Regulated EBITDA (2015-2019)

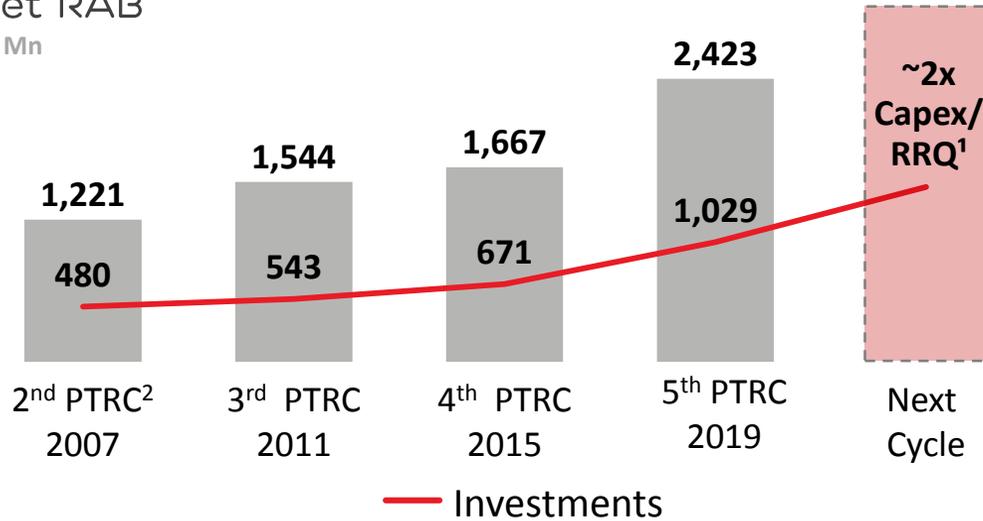
# RAB growth supported by recognition of value-added investment



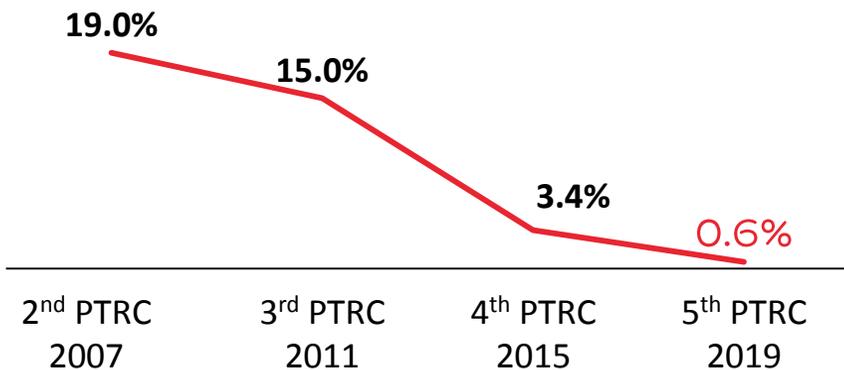
1

## EDP São Paulo

Net RAB  
R\$ Mn

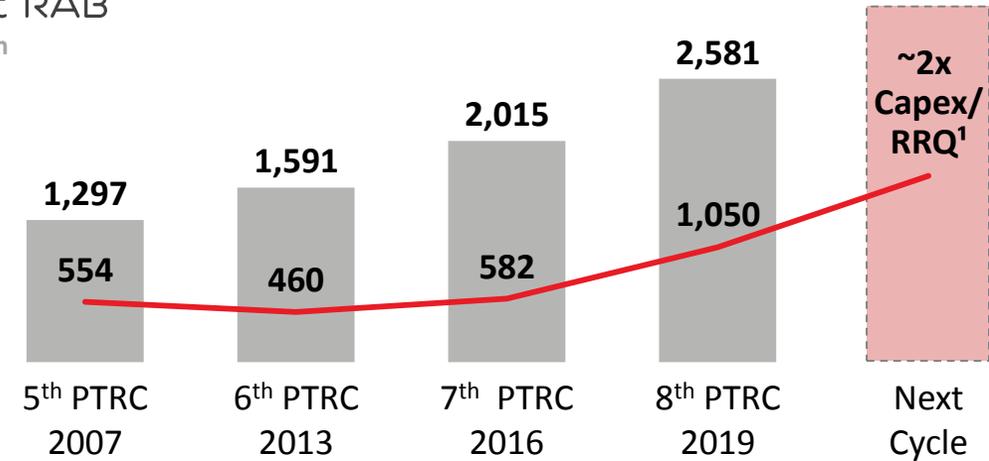


Regulatory haircut over investments

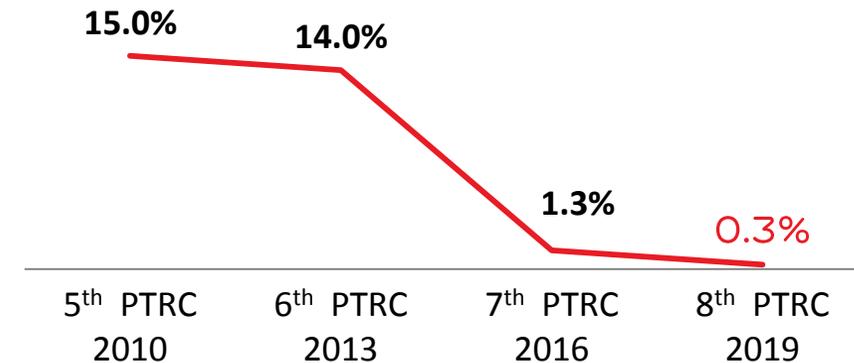


## EDP Espírito Santo

Net RAB  
R\$ Mn



Regulatory haircut over investments



<sup>1</sup> Regulatory Reintegration Quota. <sup>2</sup> Periodic Tariff Review Cycle.

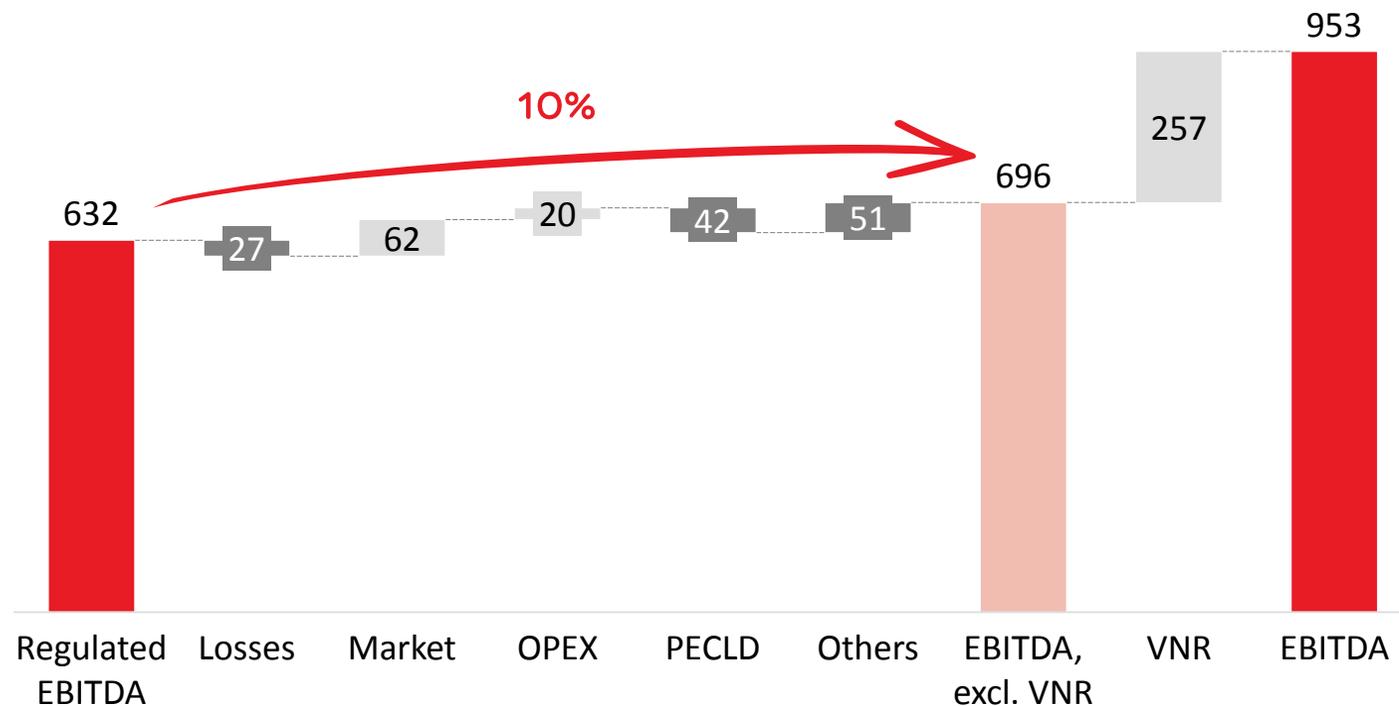
# EBITDA in 9M19 grew 10% excluding VNR, due to market expansion and OPEX savings



1

## EBITDA of EDP distribution activities in Brazil in 9M19

R\$ Mn



## VNR

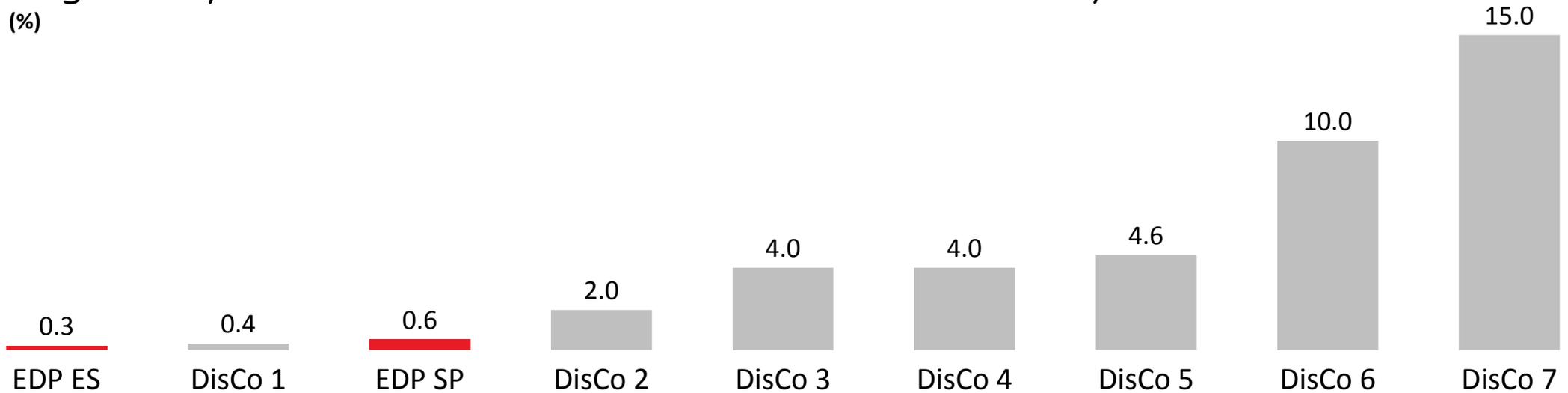
- EDP SP and EDP ES have a **credit to be received at the end of the concession** related to investment in fixed assets that were not recovered
- These financial assets are valued based on **Asset Replacement Value (VNR)**, which is revised every 3/4 years based on RAB
  - In this quarter, we had the revision for both of our concessions
- In this method, each **asset is valued at current prices, for all needed expenses to replace it for a similar one**

# High efficiency regarding regulatory acceptance of investments



1

Regulatory haircut over investments in the last tariff cycle (%)



## Main initiatives

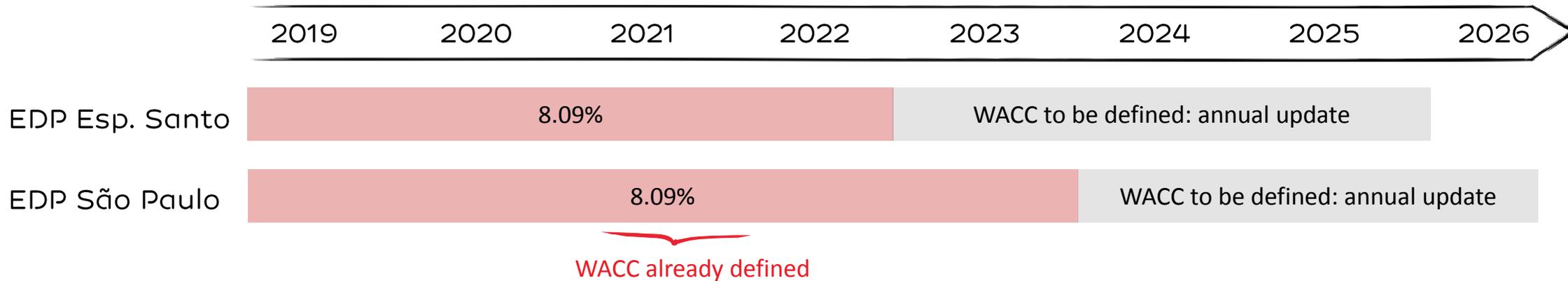
- Careful evaluation of investments concluded
- Consistency of technical, regulatory and accounting basis
- Previous inspection of Fixed Assets in Service
- Training of business teams
- Harnessing of electrical assets

# Visibility on WACC up to 2022/23



1

## Regulatory WACC



### WACC revision

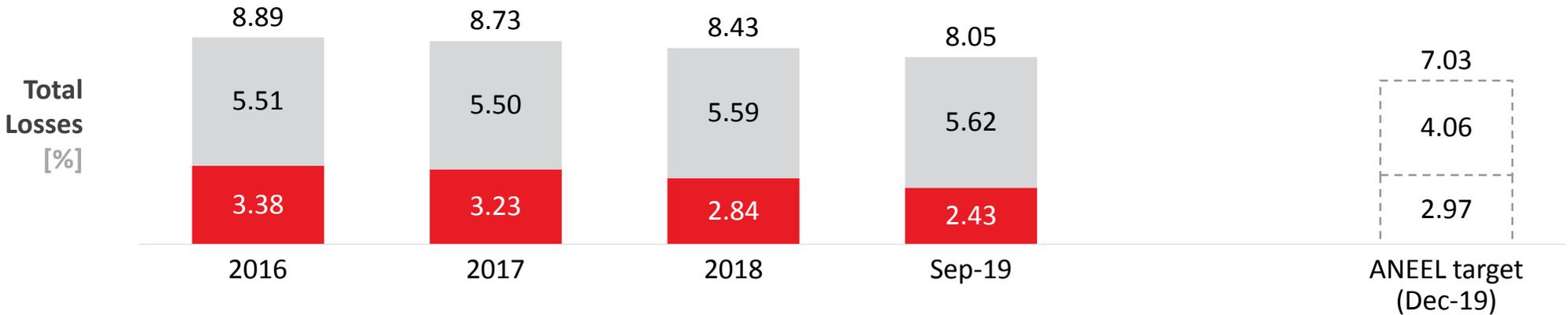
- ANEEL is currently revising the Regulatory WACC: the public hearing is still opened and companies can send contributions until December 2<sup>nd</sup>.
- The agency plans to update the WACC annually, and use this reloaded rate for all tariff reviews happening in a given year
- Tariff revisions in 2020: proposed WACC at **7.17% real post-tax**
- EDP tariff revisions: EDP ES in 2022 and EDP SP in 2023

# Steady decline of total losses

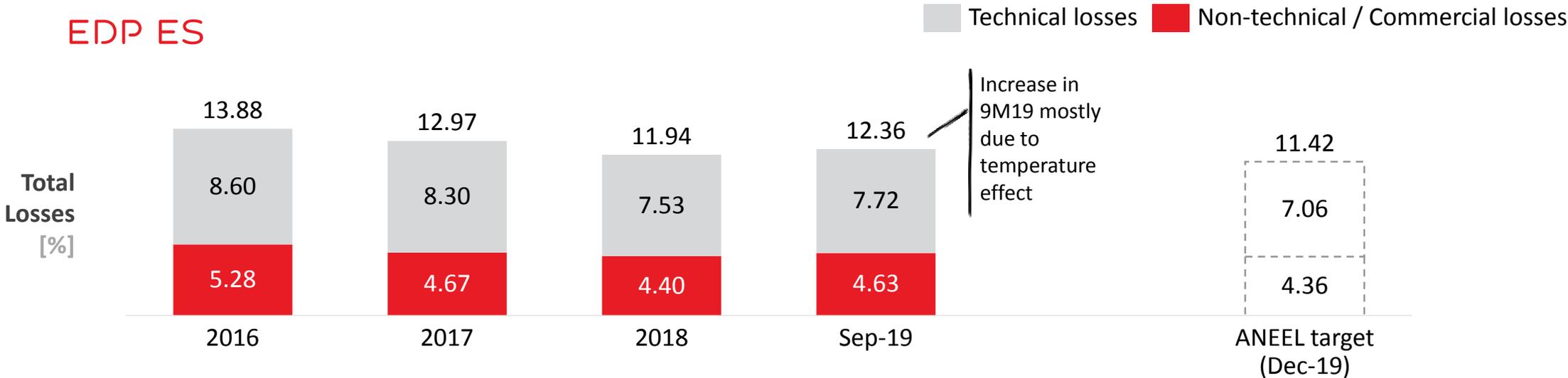


2

## EDP SP



## EDP ES

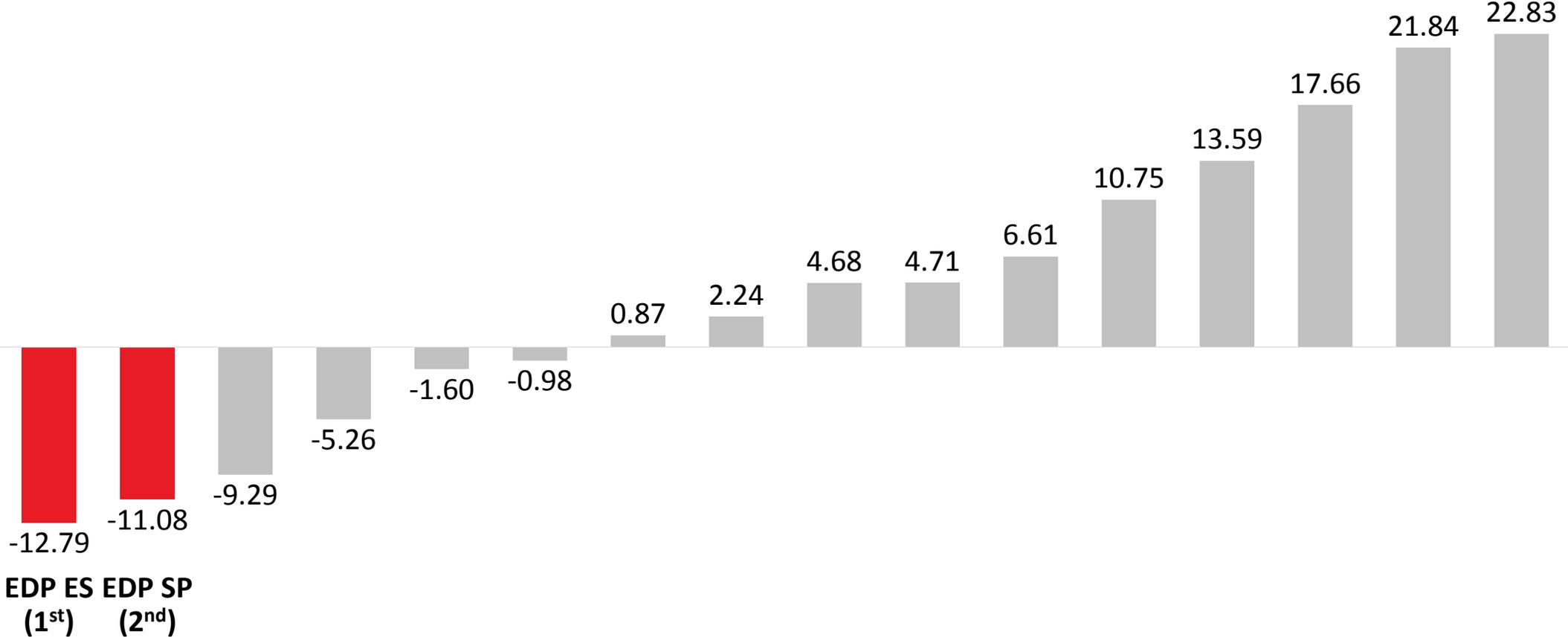


# Total losses evolution benchmark



2

2018 vs. 2014 change (%)



# Several initiatives in place to reduce grid losses

2



## Actions to reduce grid losses

- ✓ **Inspection**, with insourcing of inspection activities
- ✓ **Telemetry** for clients with high levels of demand
- ✓ **Meter Replacement** for more advanced ones
- ✓ **Project “Boa Energia”**, reinforcing engagement with communities
- ✓ **Centralized Metering system**
- ✓ **Public Lighting Recount** to prevent unbilled energy



# Efficient management of Clients' bad debt



2

R\$ Mn

	2018	9M19
(+) Revenue (fine/interest + fee to reconnect)	125	114
(+) Tariff recognition	62	51
(-) Opex collection	-28	-20
(-) PECLD <sup>1</sup>	-85	-91
<b>Result</b>	<b>+74</b>	<b>+54</b>

<sup>1</sup> Provision on estimated losses for doubtful accounts

# Sustained operating costs declining in real terms



3

## Example of initiatives

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### Field team management

- Centralized dispatch
- FSA project
- Productivity management
- Tree pruning truck



### Readings

- Optimization of readings' route
- New RFP



### Customer Care

- New RFP for Call Center
- New RFP for service agencies
- Video customer support

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OPEX growth below inflation, despite increase in activity level

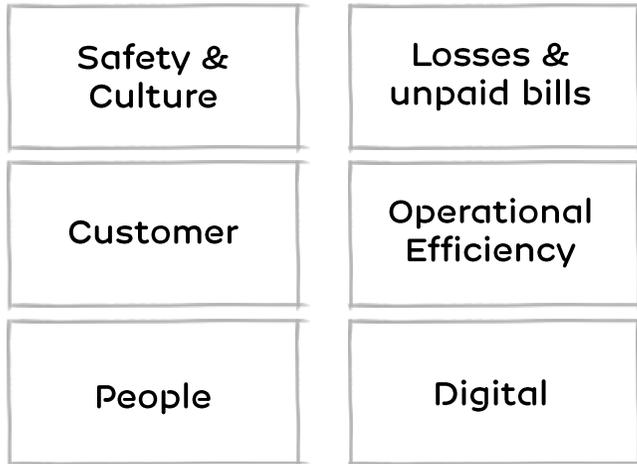
# Technological Development Plan: focus areas for Innovation



3

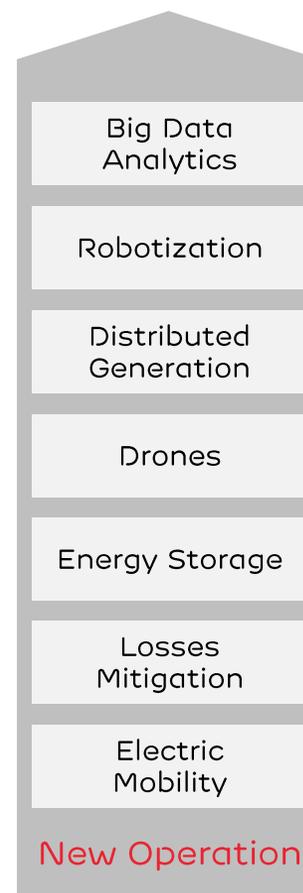
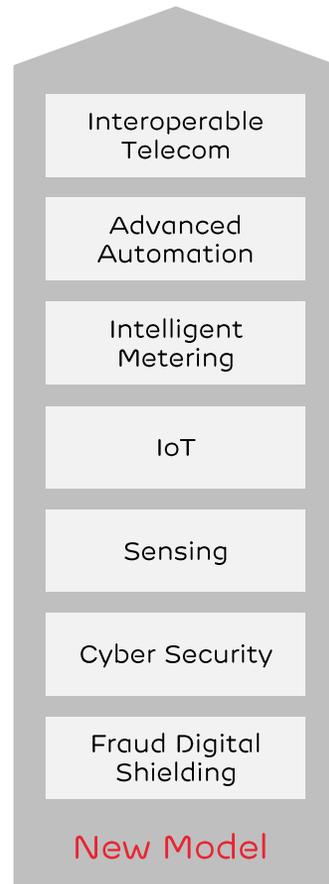
## Strategic Map of Distribution (EDP Brasil)

“Distribution must be prepared for the technological challenge and the need to increase both efficiency and quality of service that the market will require”



**inovgrid**  
smart energy grid **Brasil**

**P&D edp**<sup>1</sup>  
Programa de Pesquisa e Desenvolvimento da Distribuição Brasil

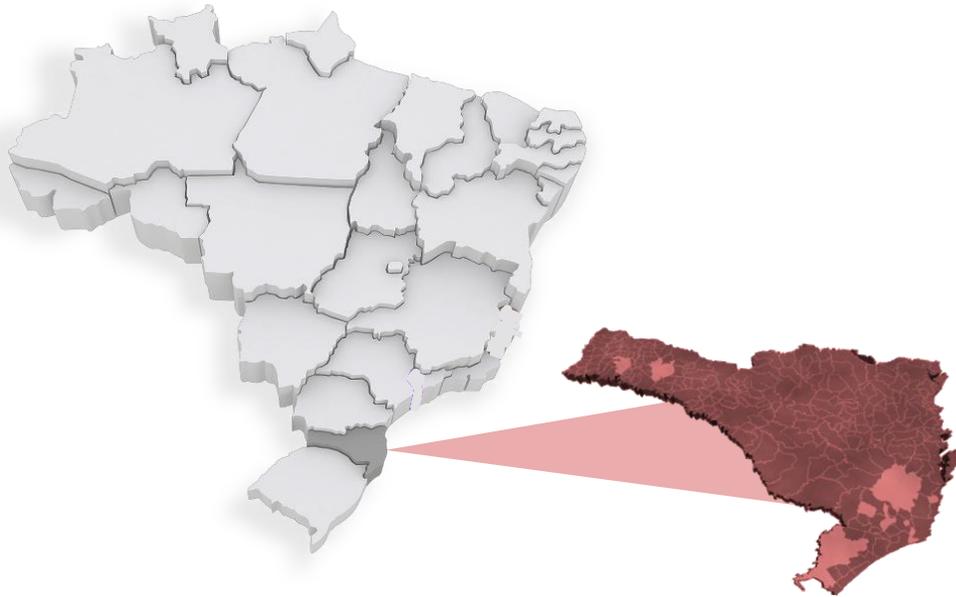


## EDP Innovation Focus Areas



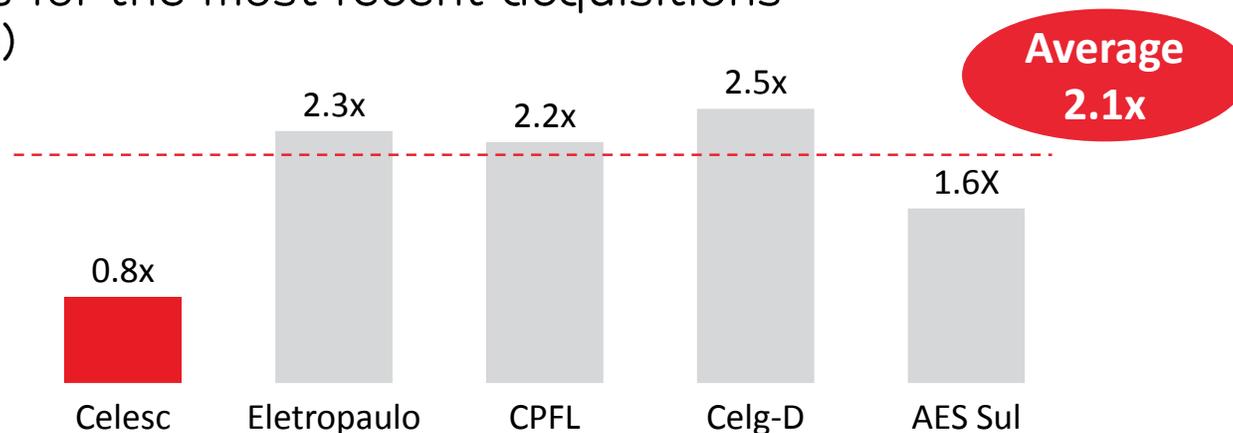
<sup>1</sup> R&D EDP - EDP Brasil Distribution Research and Development Program

# Growth option: 23.6% stake in Celesc



- Acquisition of a stake in Celesc in 2018
- Not only a financial position: 3 seats in the board (out of 11) and 1 seat in executive position
- Strategic partnerships in Santa Catarina

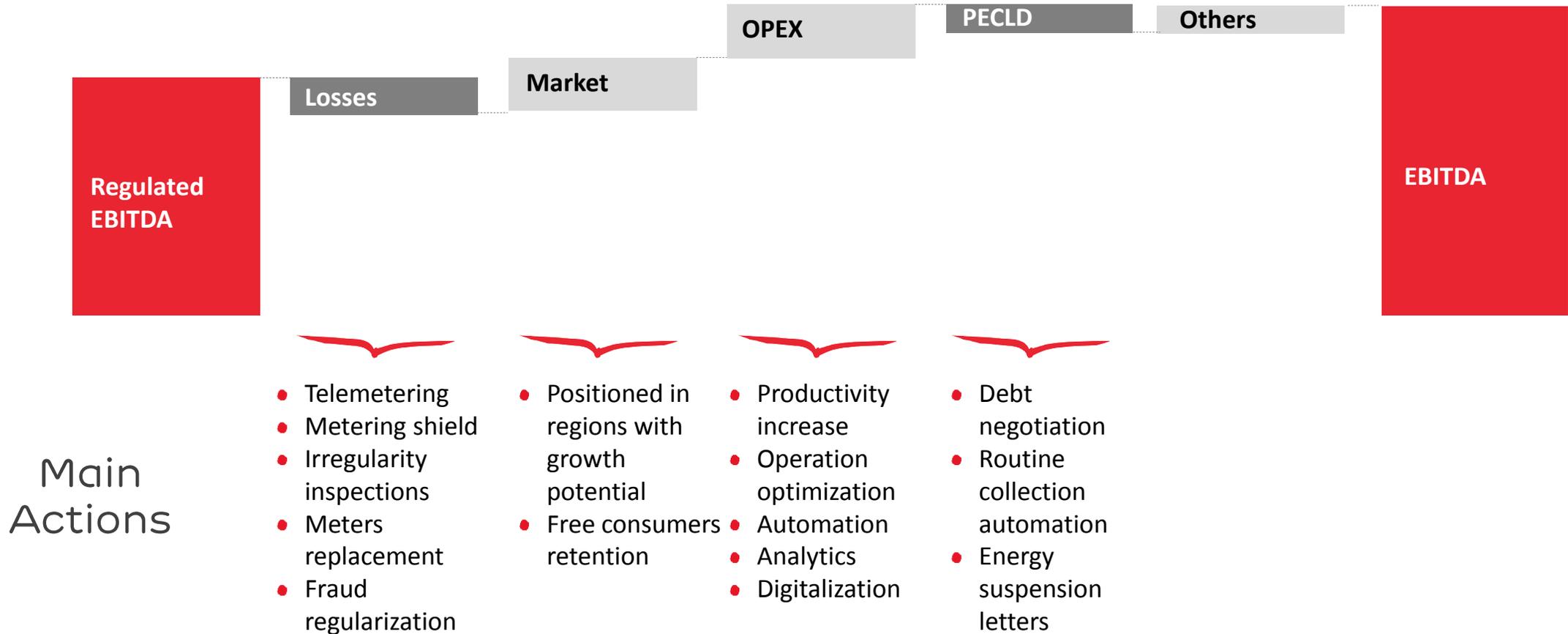
Multiples for the most recent acquisitions (EV/RAB)



Timing and the transaction structuring process allowed for relevant stake (largest shareholder) with below average multiples

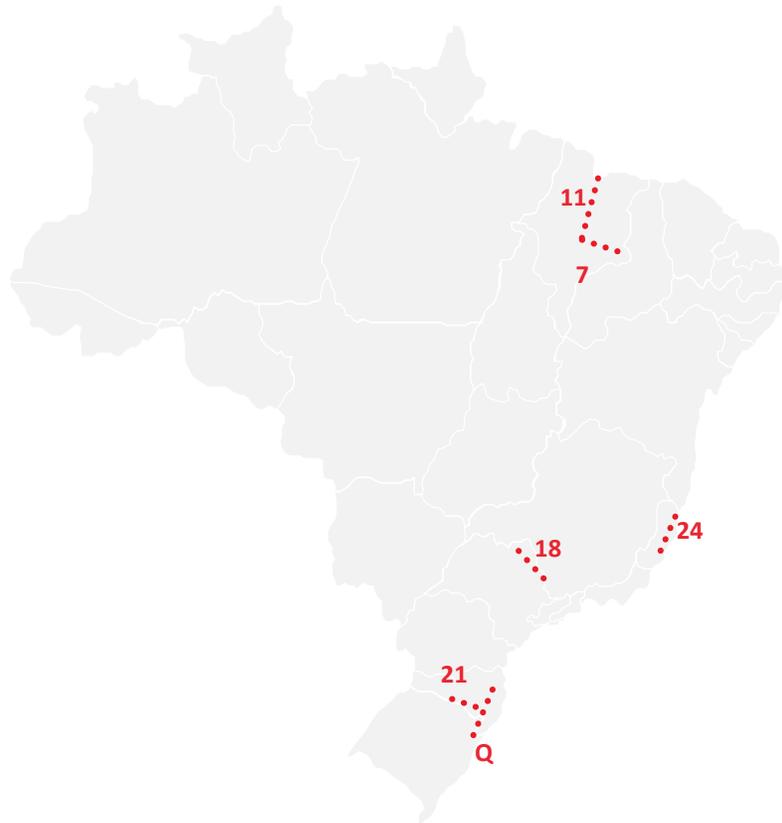
<sup>1</sup> Note: qualitative data extracted from the IBGE website

# Distribution: Strong focus on value creation drivers



- 1 Context
- 2 Distribution
- 3** Transmission

# Transmission Portfolio



-  **Construction ahead of schedule**
-  **Funding Optimization**

-  **Location**
-  **Extension**
-  **Start of Operation**

<b>Lot 24</b>	<ul style="list-style-type: none"> <li> <b>Espírito Santo</b></li> <li> 113 Km and 1 substation</li> <li> Operational start-up: Dec/18</li> </ul>	
<b>Lot 7</b>	<ul style="list-style-type: none"> <li> <b>Maranhão</b></li> <li> 123 Km and 1 substation</li> <li> Under construction</li> </ul>	
<b>Lot 11</b>	<ul style="list-style-type: none"> <li> <b>Maranhão</b></li> <li> 203 Km and 1 substation</li> <li> Under construction</li> </ul>	
<b>Lot 18</b>	<ul style="list-style-type: none"> <li> <b>São Paulo - Minas Gerais</b></li> <li> 375 Km</li> <li> Under construction</li> </ul>	
<b>Lot 21</b>	<ul style="list-style-type: none"> <li> <b>Santa Catarina*</b></li> <li> 484.5 Km and 1 substation</li> <li> Under construction</li> </ul>	
<b>Lot Q</b>	<ul style="list-style-type: none"> <li> <b>Santa Catarina/Rio Grande do Sul</b></li> <li> 142 Km and 2 substations</li> <li> Under licensing process</li> </ul>	

## Concession

- **Regulated by the Federal Government**, with stable track record
- Concession attributed through **auctions**

## Revenues

- **30-year contracts**, with Allowed Revenue (RAP) adjusted by inflation
- **Payment based on availability**, regardless of the transported energy volume

## Risks

- **Low counterparty risk**, as Allowed Revenue (RAP) is paid by generators, distributors and consumers in the free-market, with solid warranty mechanism
- **Low level of environmental and construction risks**

# Profitable contracted growth: Entrance timing ensuring superior returns



CAPEX ANEEL R\$ Mn



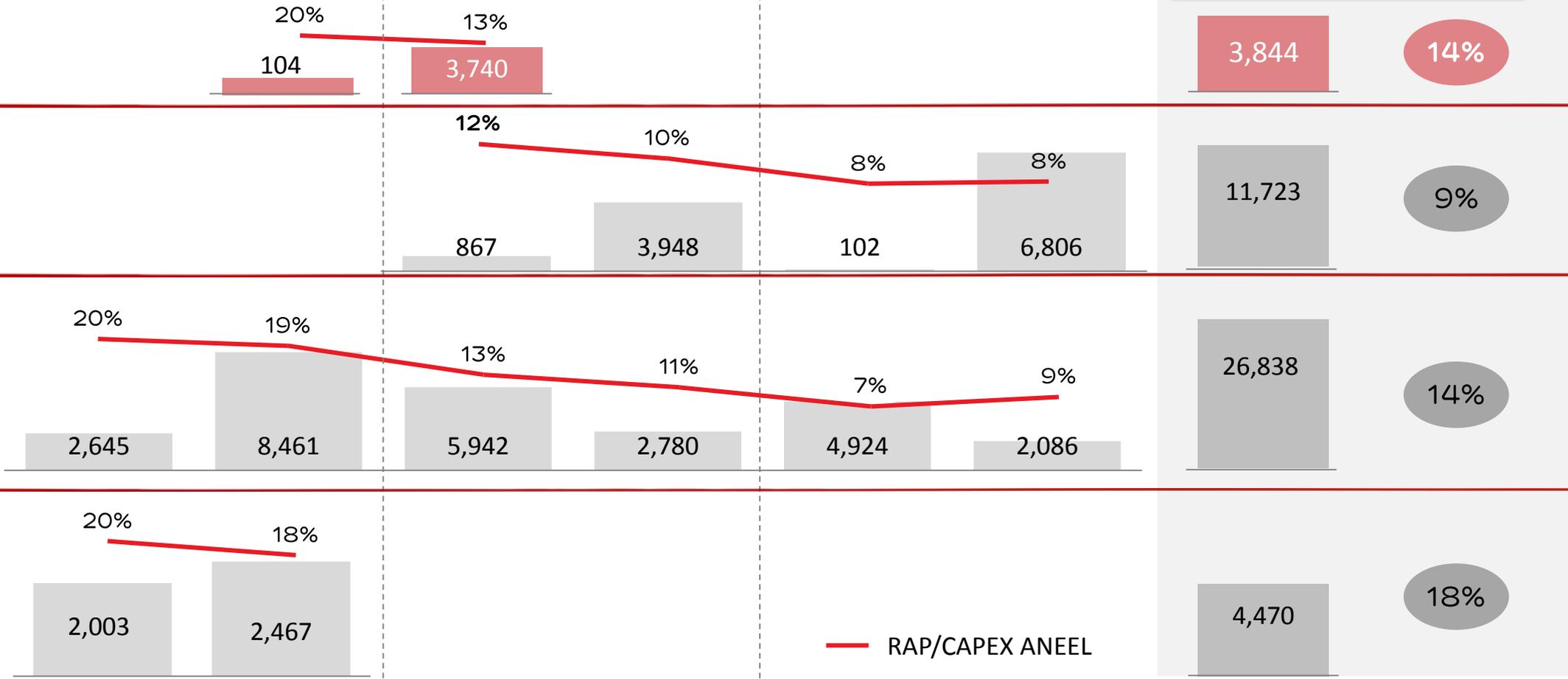
Integrated

Networks

Financial

Apr/16 (013/2015 I)    Oct/16 (013/2015 II)    Apr/17 (005/2016)    Dec/17 (002/2017)    Jun/18 (002/2018)    Dec/18 (004/2018)

CAPEX ANEEL TOTAL R\$ Mn    RAP/CAPEX ANEEL



CPFL  
Neoenergia  
Engie

Equatorial  
Energisa  
CTEEP  
Alupar  
Sterlite  
State grid

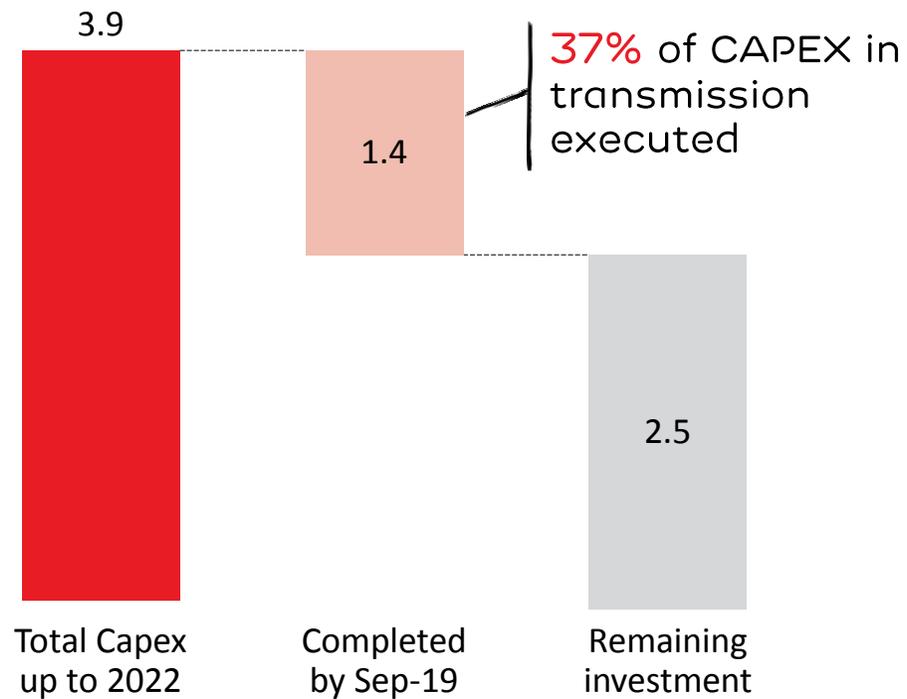
Brookfield  
Pátria

# CAPEX execution on transmission, while anticipating COD

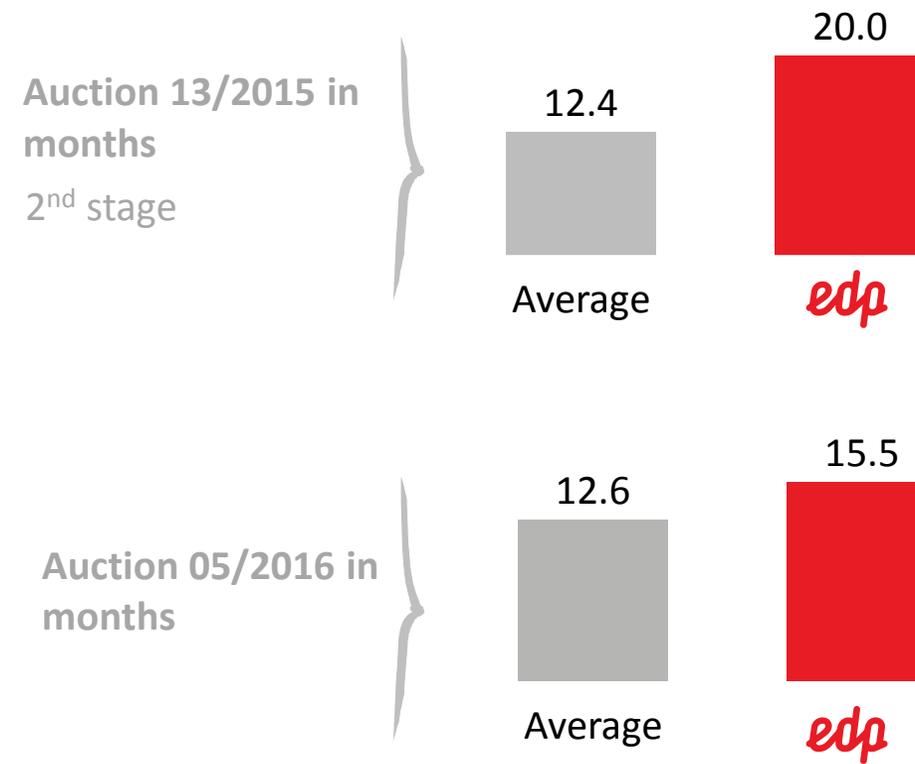


## CAPEX in Transmission

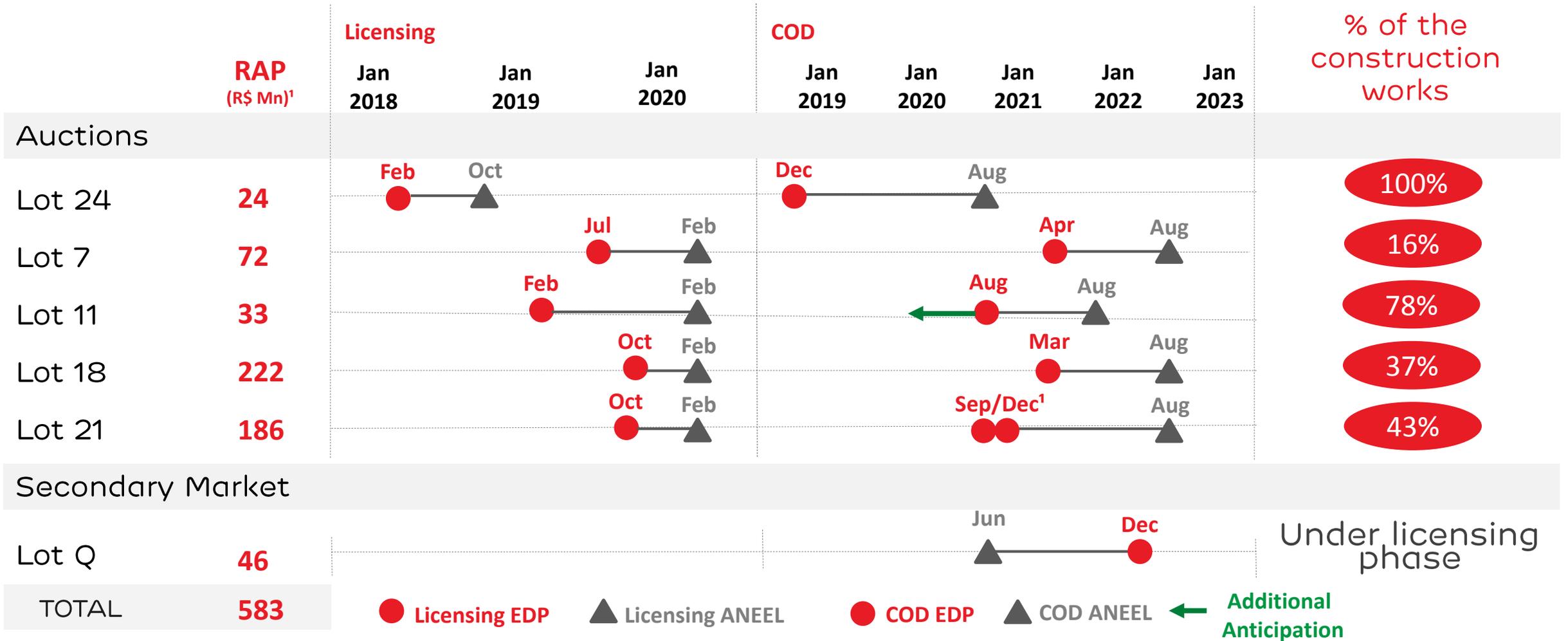
R\$ Bn in nominal terms



## Anticipation of expected CODs<sup>1</sup>



# Execution benchmark: construction work anticipation

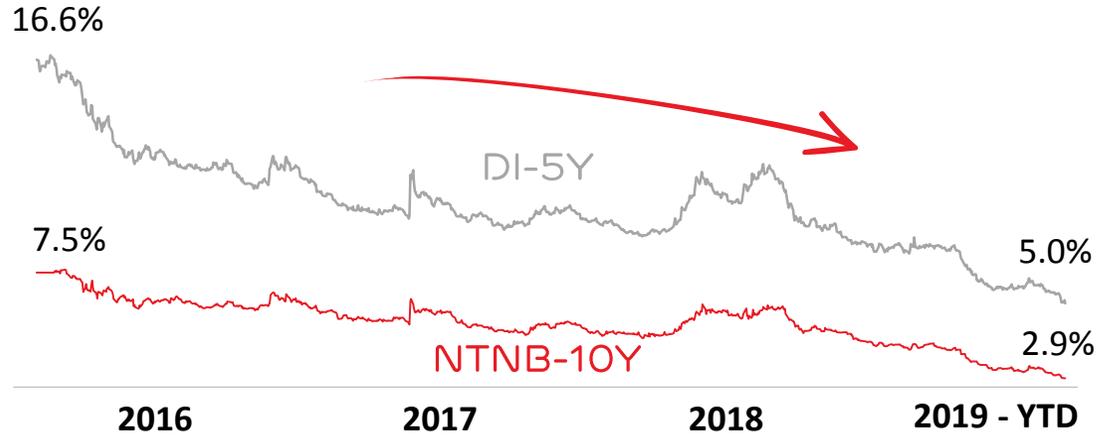


Note: RAP restated at the IPCA with a baseline date of 09/30/2019 / <sup>1</sup> Partial start-up in September and total start-up in December 2020

# Low interest rate environment as a positive driver of investments in transmission...

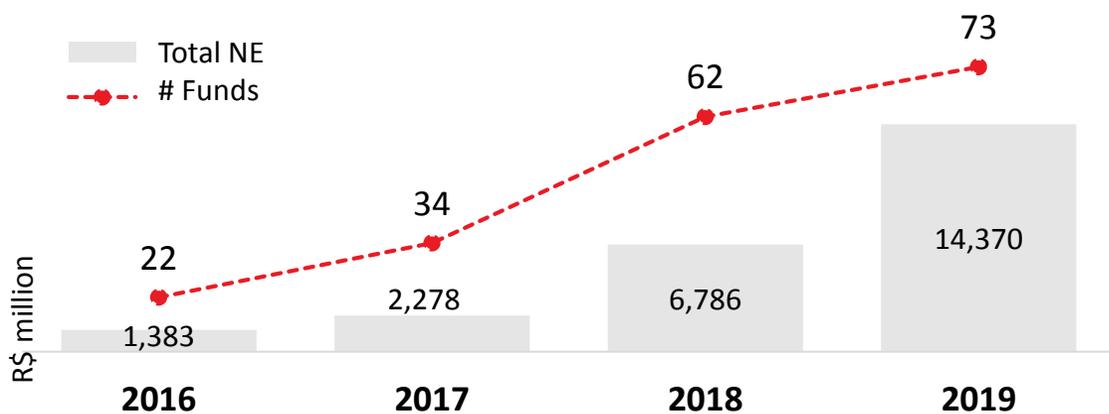


Decline of 10 p.p. in interest rates

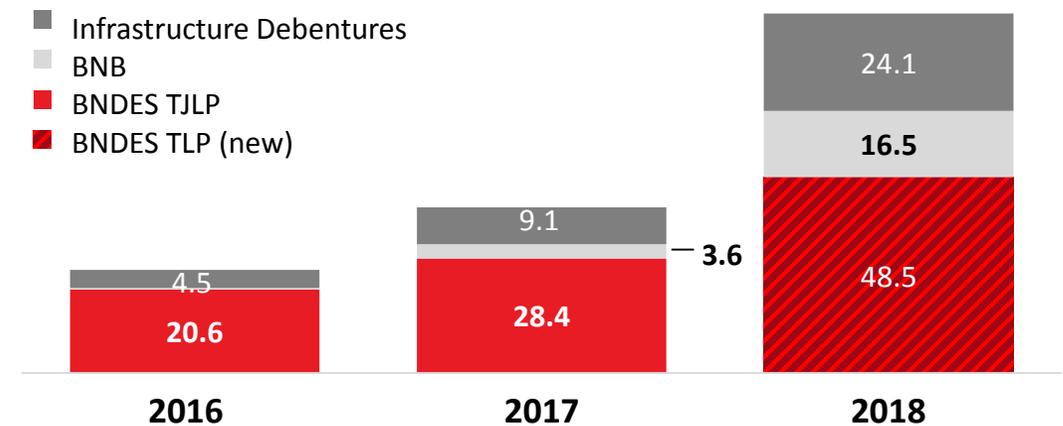


- In 2017, BNB and the capital markets became attractive sources for infrastructure funding
- Post-2017, there was major growth in the infra debentures market (+ 6x Net Equity of the Funds)

+ 6x Net Equity for the Infra Funds



+ 6x of Infrastructure Debentures Volume



... While maximizing value through diversification of financing sources



## Performed operations

<b>Lot 11</b> 005/2016	<b>Lot 24</b> 013/2015	<b>Lot 18</b> 005/2016	<b>+ R\$ 525 Mn</b> Long term Additional Lot 18
<b>BNB</b> <b>R\$ 124.5 Mn</b> IPCA + 2.18% <sup>1</sup> 20 years	<b>Infra Deb.</b> <b>R\$ 115 Mn</b> NTNB + 1.70% 15 years	<b>Infra Deb.</b> <b>R\$ 800 Mn</b> NTNB + 0.85% 20 years	
<b>Lot 07</b> 005/2016	<b>Lot 21</b> 005/2016 	<b>Lot Q</b> 013/2015	<b>R\$ 405 Mn</b> CAPEX in Lot Q  Structure Long Term Debt
<b>BNB</b> <b>R\$ 252 Mn</b> IPCA + 2.16% <sup>1</sup> 24 years	<b>Infra Deb.</b> <b>R\$ 1.2 Bn</b> NTNB + 0.85% 15 years	<b>Bridge</b> <b>R\$ 250 Mn</b> CDI + 0.44% 12 months	

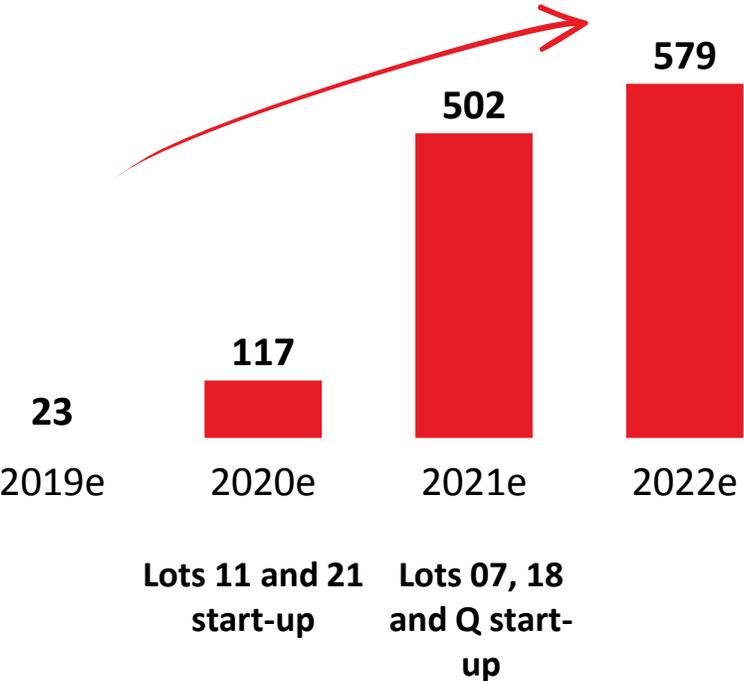
**Additional R\$ 500 million in NPV**

<sup>1</sup> Considering default bônus.

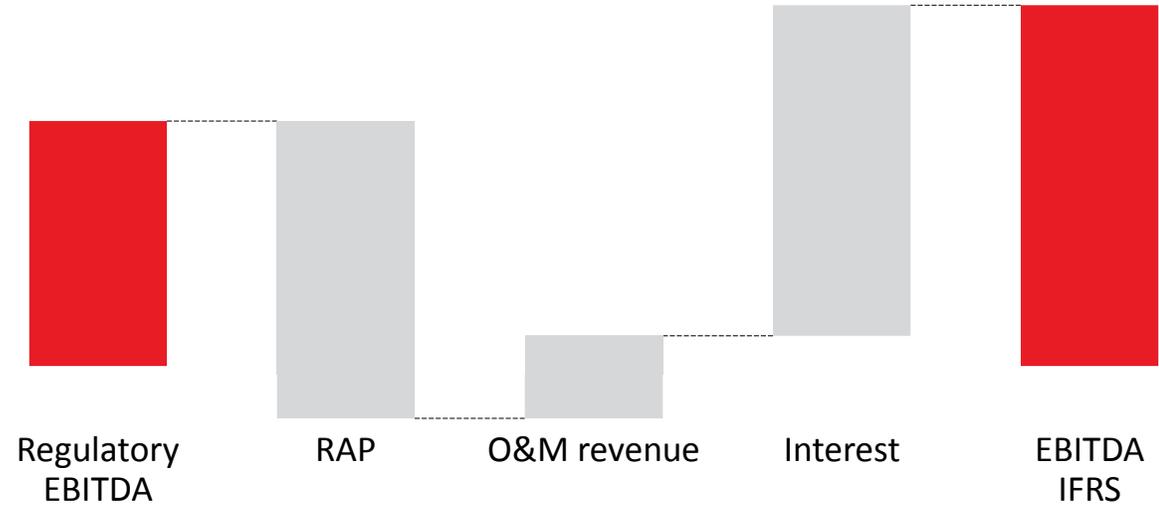
# Transmission EBITDA accounting methodology



Annual Allowed Revenues (RAP)<sup>1</sup>  
R\$ M



Transmission EBITDA  
Conceptual – Operational lots<sup>2</sup>



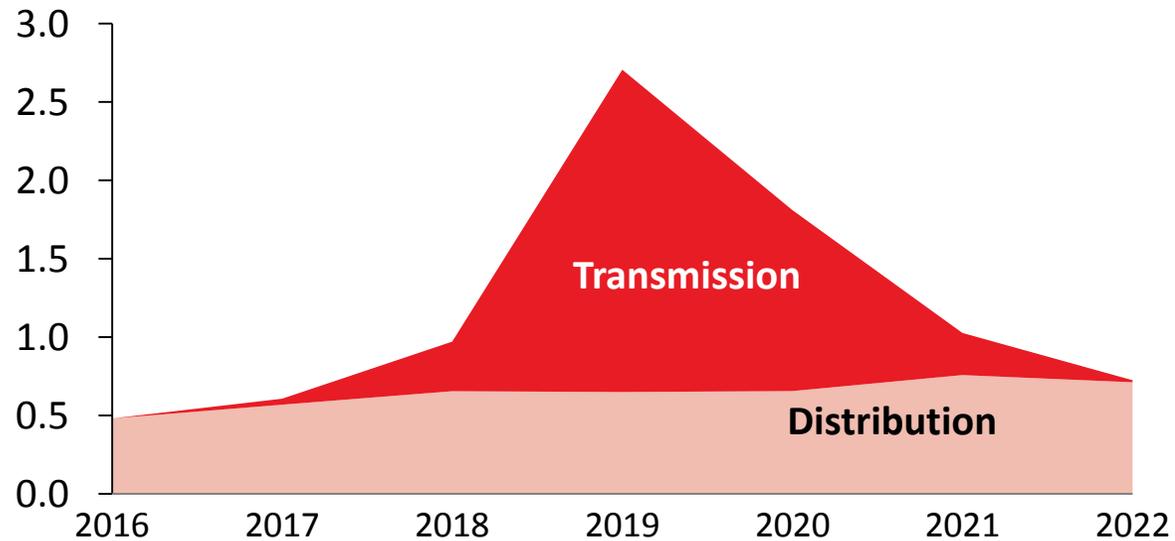
<sup>1</sup> Real RAP | <sup>2</sup> Example using lot 24 (Espírito Santo) as reference

# Capital allocation in Networks with distinctive returns



## CapEx Evolution

(R\$ Mn)



### Transmission:

NPV > R\$ 1 billion

- ✓ Construction ahead of schedule
- ✓ Funding optimization



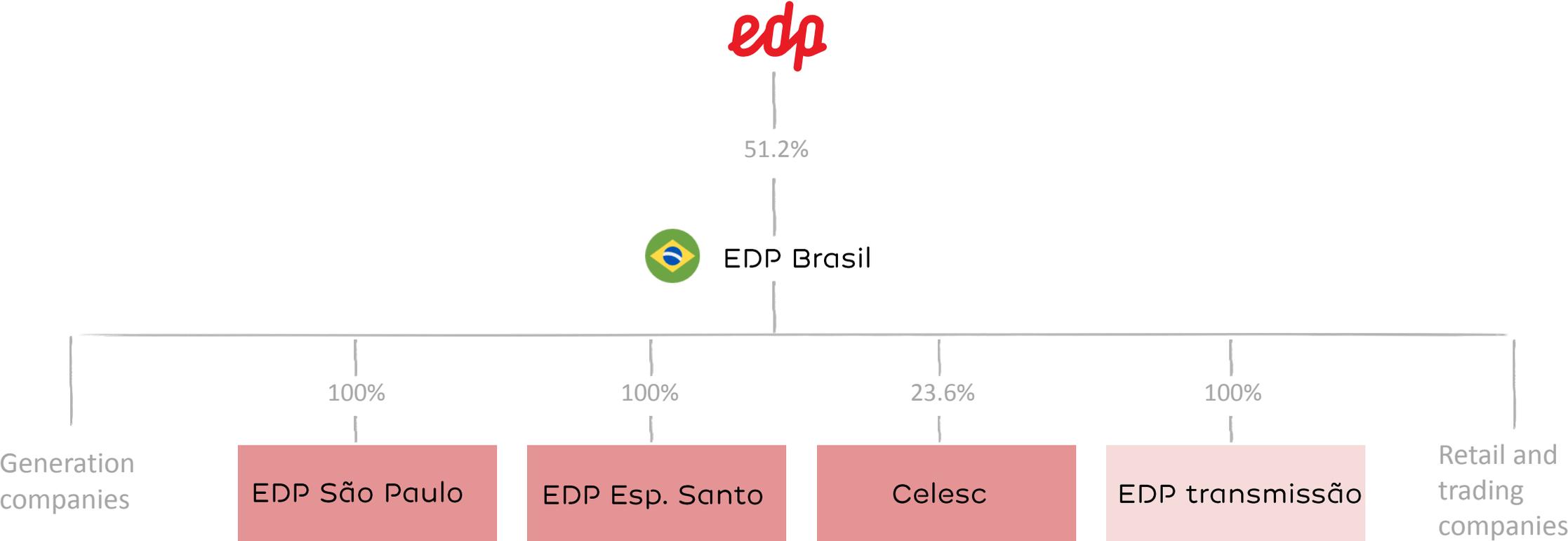
### Distribution:

Investment ~2x  
Regulatory depreciation

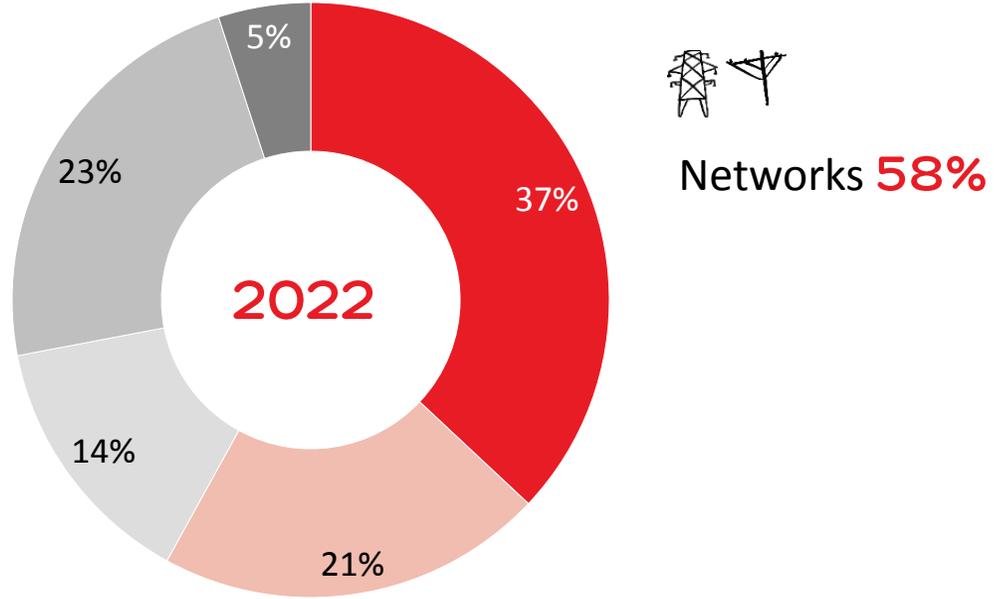
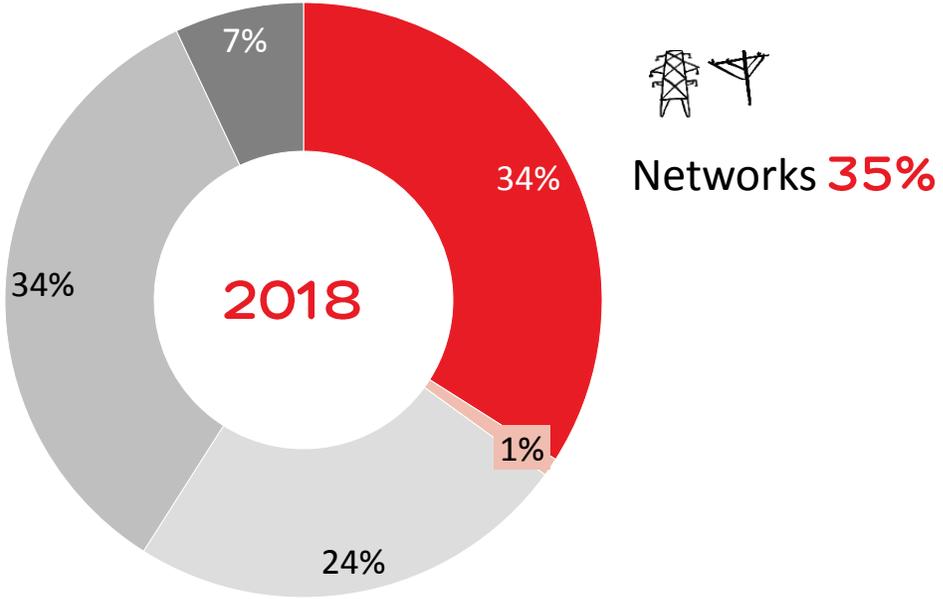
Growth strategy with value creation

*edp*

# Structure of networks activities in EDP Brazil



# EDP Brasil EBITDA breakdown



■ Distribution ■ Transmission ■ Thermal ■ Hydro ■ Retail

# There are several possibilities of a revision in the distribution WACC based on the methodology used by ANEEL

WACC

$$k_e = r_f + \beta(r_m - r_f) + r_D$$

$$k_d = d_{BR} + ce_{BR}$$

## EQUITY

$\beta$  Daily rather than weekly data

$r_i - \Delta r_f$ ; Fix errors in risk beta formula  
 $r_m - \Delta r_f$

$CPI$  Evaluate inflation to be used (CPI, projection, etc)

$r_f$  Delete NTN-Bs past due

$r_D$   $\beta$  Improve segment differentiation (either by beta by adding premium)

7.52%

7.30%

7.78%

## THIRD-PARTY CAPITAL

$d_{BR}$  Evaluate best rate to reference debentures

- actual rate for past-due debentures
- B3 rate for others

$d_{BR}$  Evaluate better clustering of debentures (frequency can contaminate the final average)

- Average for annual averages per company

7.27%

7.35%

**Tariff reset:** For the tariff reset we have 2 components: **Component A and Component B.**

$$RR = VPA + VPB$$

RR = Requested Revenue

VPA = total amount of the component A

VPB = total amount of the component B

**Component A:** The component A is a “pass through”. It includes the expenses with energy purchase (energy supply), transportation and charges.

**Component B:** The Component B is readjusted based on the inflation variation in the period (IGP-M index) deducted from the X factor.

In the calculation of the X factor, three components are considered: productivity (Pd), trajectory (T) and quality (Q). The Pd and T components are defined in the tariff revision process and remain the same until the next revision cycle. The Q component is updated in every tariff adjustment process.

$$\mathbf{X \text{ Factor} = Pd + Q + T}$$

where:

*Pd* : productivity gain;

*Q*: technical and commercial quality of the services provided; and

*T*: operational costs trajectory

## Regulatory model of distribution (II/II)



The market usually does not model the Component A, as it should be net = zero. It commonly models the component B considering:

### **CAOM: Administration, Operation and Maintenance Costs**

= Operational costs adjusted by inflation+

Non-recoverable expenses: historical % for projected losses x Estimated revenue

+

### **CAA: Annual cost of Assets**

Capital remuneration: Regulatory WACC x RAB (Regulatory asset base - which can be taken from Sparta file from last revision cycle)

+

### **CAIMI: Annual Cost of the Real Estate Facilities**

= Annual depreciation rate x RAB (each distribution company has to invest at least 1x regulatory depreciation – QRR - but some companies invest more than that. EDP for instance, has invested around 1.9 x QRR).

# Change in accounting measurement IFRS 15 – IFRS9



## Revenue

	Model until 2017	Actual Model – IFRS 15	
(+) Financial	IRR <sup>(1)</sup>	WACC*	<b>Note:</b> (1) Return Rate – “Goal Seek” (2) Without margin appropriate in the construction (all returns allocated as funding).
(+) O&M Regulatory	Regulatory: without margin	Regulatory with Margin	
(+) Construction	CapEx without Margin <sup>(2)</sup>	CapEx with Margin (Difference)	

Total Revenue = Financial + O&M + Construction

### Until 2017 Calculation

(+) Financial Returns - Project IRR

*(Construction and O&M with zero margin)*

### IFRS 15 Calculation

(+) **Financial Returns - WACC post construction**

(+) Construction + O&M with margin

Contractual Asset: The financing rate occurs in the beginning of the contract, with no update afterwards