



R Í O A R R O N T E
— F U N D A C I Ó N —

Conferencia

Envejecimiento de la Infraestructura Hidráulica: México y perspectivas internacionales

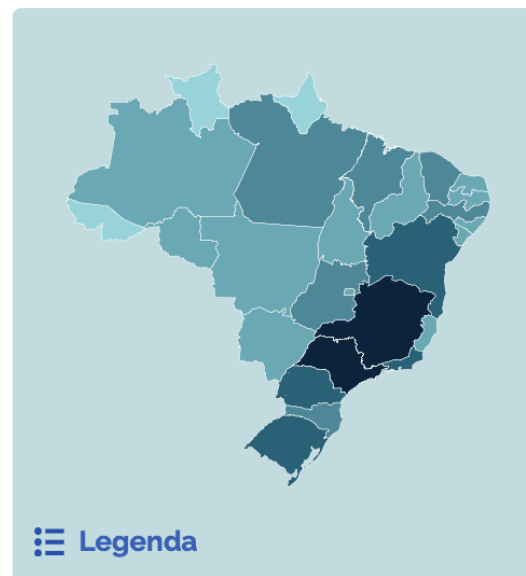
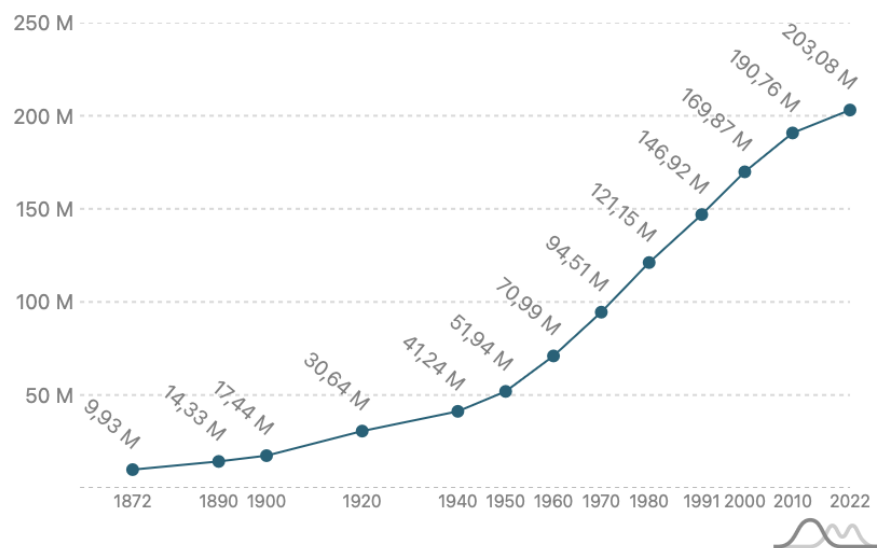
Tecnológico de Monterrey, Campus Monterrey.
20 de noviembre, 2025, Biblioteca, Sexto Piso (**Sala Novela**)

Envejecimiento de la infraestructura hidráulica en São Paulo

Dante Ragazzi Pauli (ex Super Intendente de Planeación Integrada
Compañía de Agua y Saneamiento del Estado de Sao Paulo (SABESP)
Actual director de Saneazzi Serviciosde Ingeniería BRASIL)
Professor at Mackenzie Presbyterian University
Ex Presidente of the Brazilian Association of Sanitary and Environmrntal Engineering - ABES

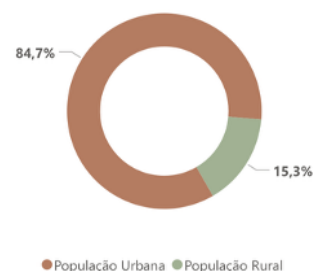
Brazil in Numbers

População residente



Ranking por UF

1	São Paulo	44.411.238 (pessoas)
2	Minas Gerais	20.539.989
3	Rio de Janeiro	16.055.174
4	Bahia	14.141.626
5	Paraná	11.444.380
6	Rio Grande do Sul	10.882.965
7	Pernambuco	9.058.931
8	Ceará	8.794.957
9	Pará	8.120.131
10	Santa Catarina	7.610.361



Brazil in Numbers - Water



SANEAMENTO BÁSICO NO BRASIL SINISA 2024 (ano base 2023)

SECRETARIA NACIONAL DE SANEAMENTO AMBIENTAL
MINISTÉRIO DAS CIDADES

Participantes SINISA 2024

Abastecimento de Água

Esgotamento Sanitário

Resíduos Sólidos

Águas Pluviais

Gestão Municipal

BRASIL

Atendimento com rede de abastecimento de água

Volume de água consumido
(l/hab.dia)
IAG2006
175,7



População Total
IAG0001
83,1%
167,6 Mi
(habitantes)

População Urbana
IAG0002
93,3%
160,4 Mi
(habitantes)

População Rural
IAG0003
24,2%
7,2 Mi
(habitantes)

Domicílio Total
IAG0004
80,6%
72,5 Mi
(domicílios)

Domicílio Urbano
IAG0005
92,1%
70,0 Mi
(domicílios)

Domicílio Rural
IAG0005
18,0%
2,5 Mi
(domicílios)

Micromedicação do volume consumido
IAG2002
87,4%

Macromedicação do volume consumido
IAG2003
90,7%

Alguns estados apresentaram valores superiores a 100% na Macromedicação do volume de água de entrada no sistema de distribuição (IAG2003). Essa variação pode ocorrer devido ao uso de estimativas por parte de alguns prestadores de serviço. Além disso, a metodologia de cálculo sofreu alterações em relação ao SNIS.

Perdas de água em sistemas de distribuição

Perdas de faturamento de água
IAG2012
32,2%

Perdas totais de água na distribuição
IAG2013
40,3%

Causas de perdas aparentes e reais



Receita e Despesa de Água

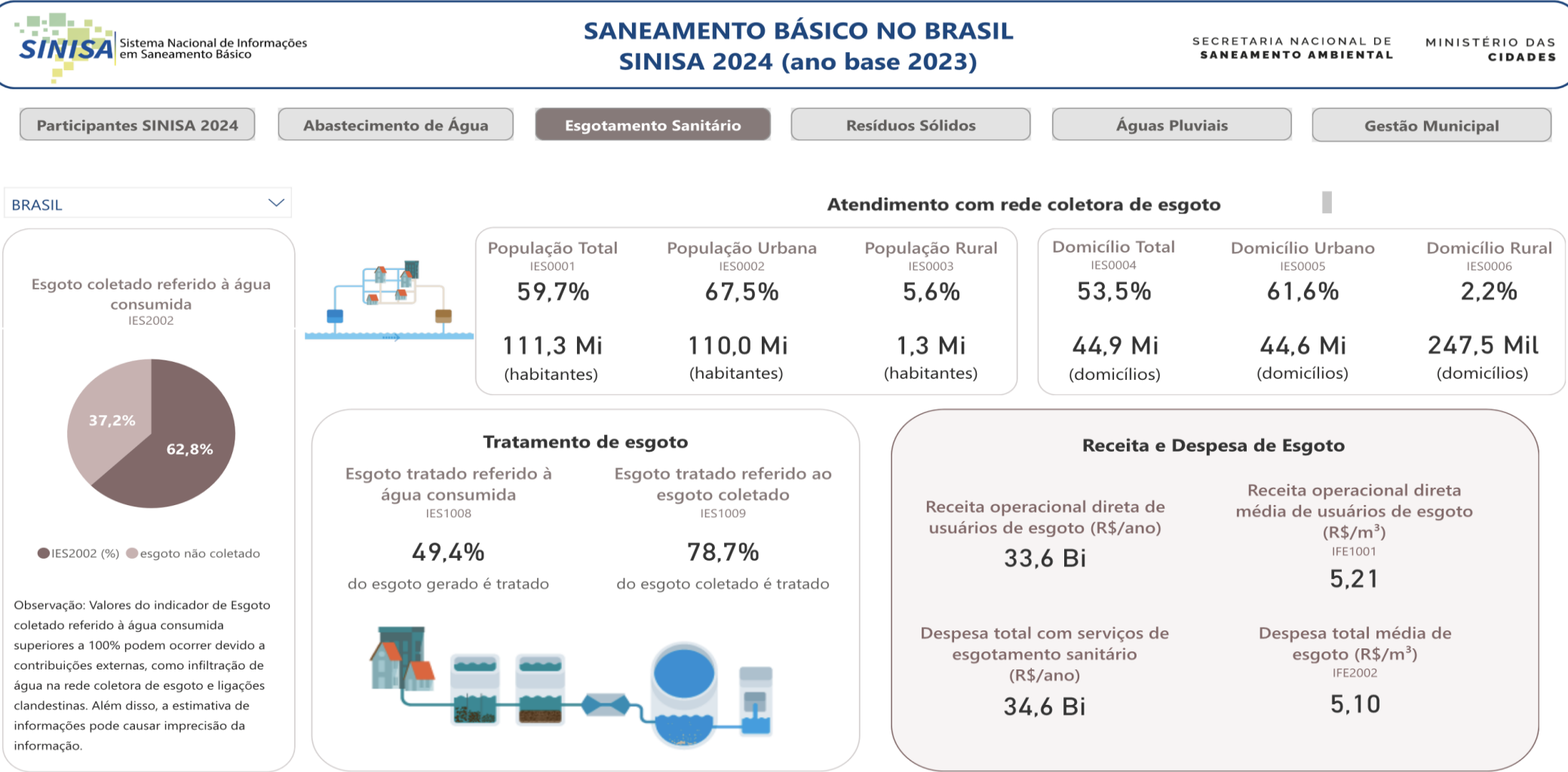
Receita operacional direta de usuários de água (R\$/ano)
63,2 Bi

Receita operacional direta média de usuários de água (R\$/m³)
IFA1001
4,99

Despesa total com serviços de abastecimento de água (R\$/ano)
67,1 Bi

Despesa total média de água (R\$/m³)
IFA2002
5,50

Brazil in Numbers - Sanitation



Asset Management

Ensures reliable and continuous water and sanitation services;

Reduces operational and maintenance costs

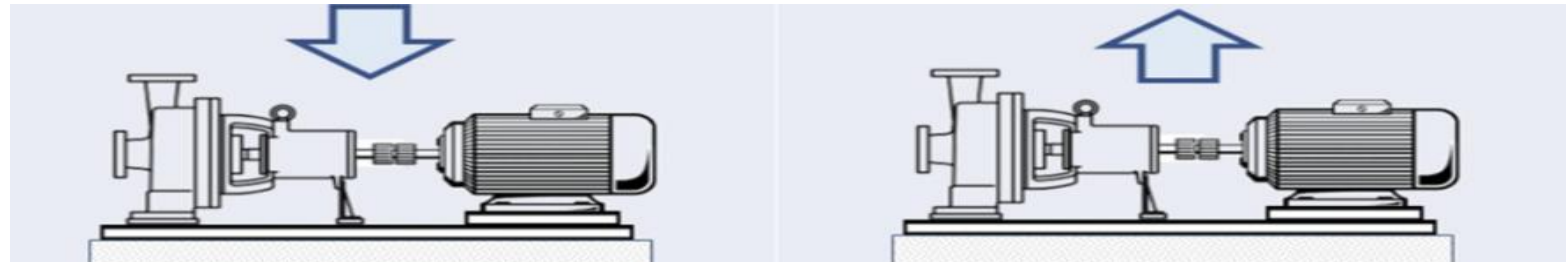
Extends the lifespan of infrastructure assets

Supports smarter long term investment planning

Minimizes operational and environmental risks

Improves resilience to climate impacts and growing demand

Asset Management



What can you do for assets

What assets can do for the company

<i>Item</i>	<i>Managing Assets</i>	<i>Asset Management</i>
<i>Level</i>	Operational / Tactical	Strategic
<i>Time horizon</i>	Short / medium term	Long term
<i>Focus</i>	Execution, maintenance, operation	Value, risk, life cycle
<i>Basis</i>	Procedures, workflows, tools	Policies, ISO 55000, long-term planning
<i>Outputs</i>	Work orders, inspections, repairs	Asset management policy and plans



Survey on Asset Management - 2022



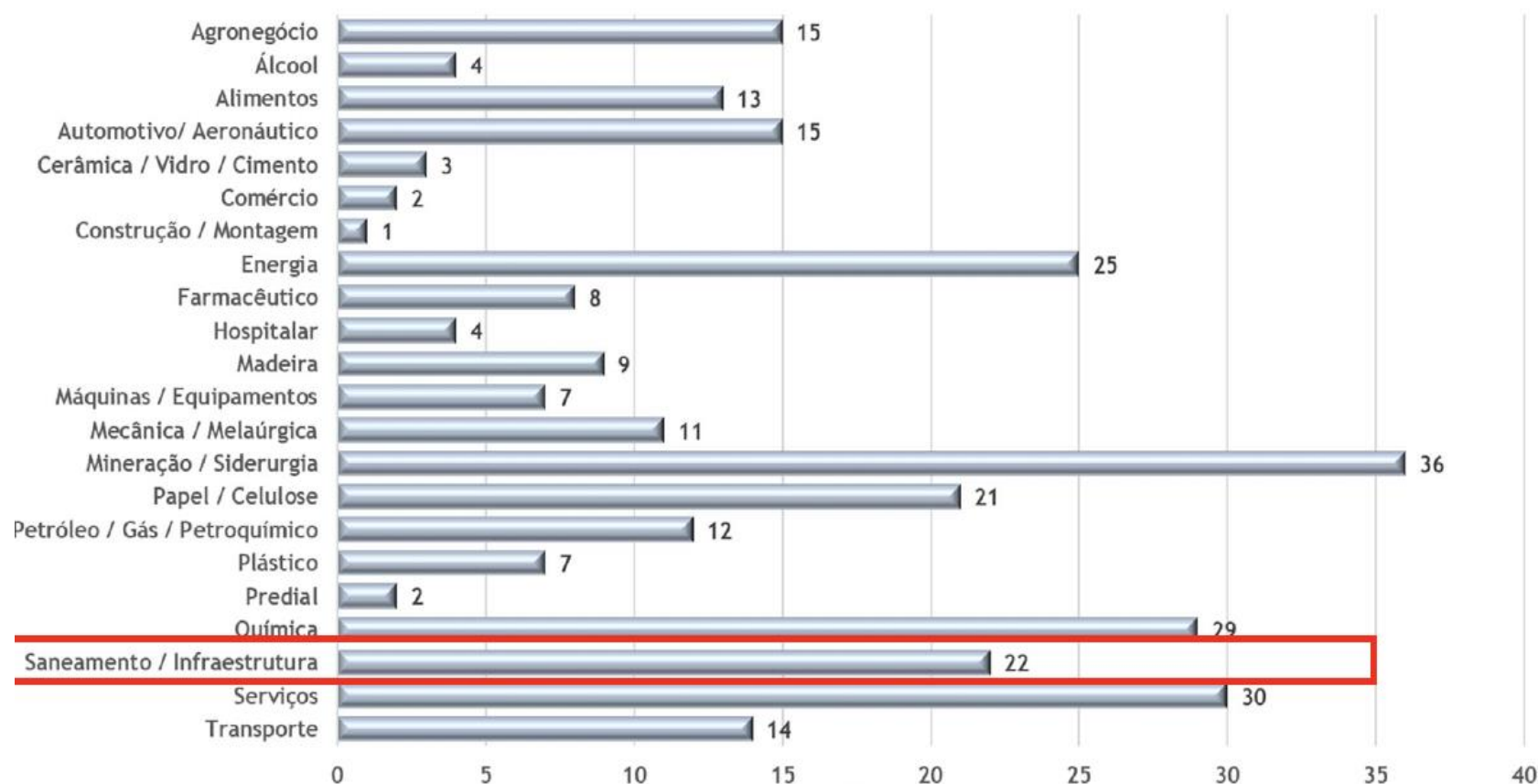
Pesquisa da situação da
Manutenção e da Gestão
de Ativos nas empresas do
Brasil

Documento Nacional 2022

 **abraman**
associação brasileira
de manutenção e gestão de ativos

Survey on Asset Management - 2022

Participants Profile



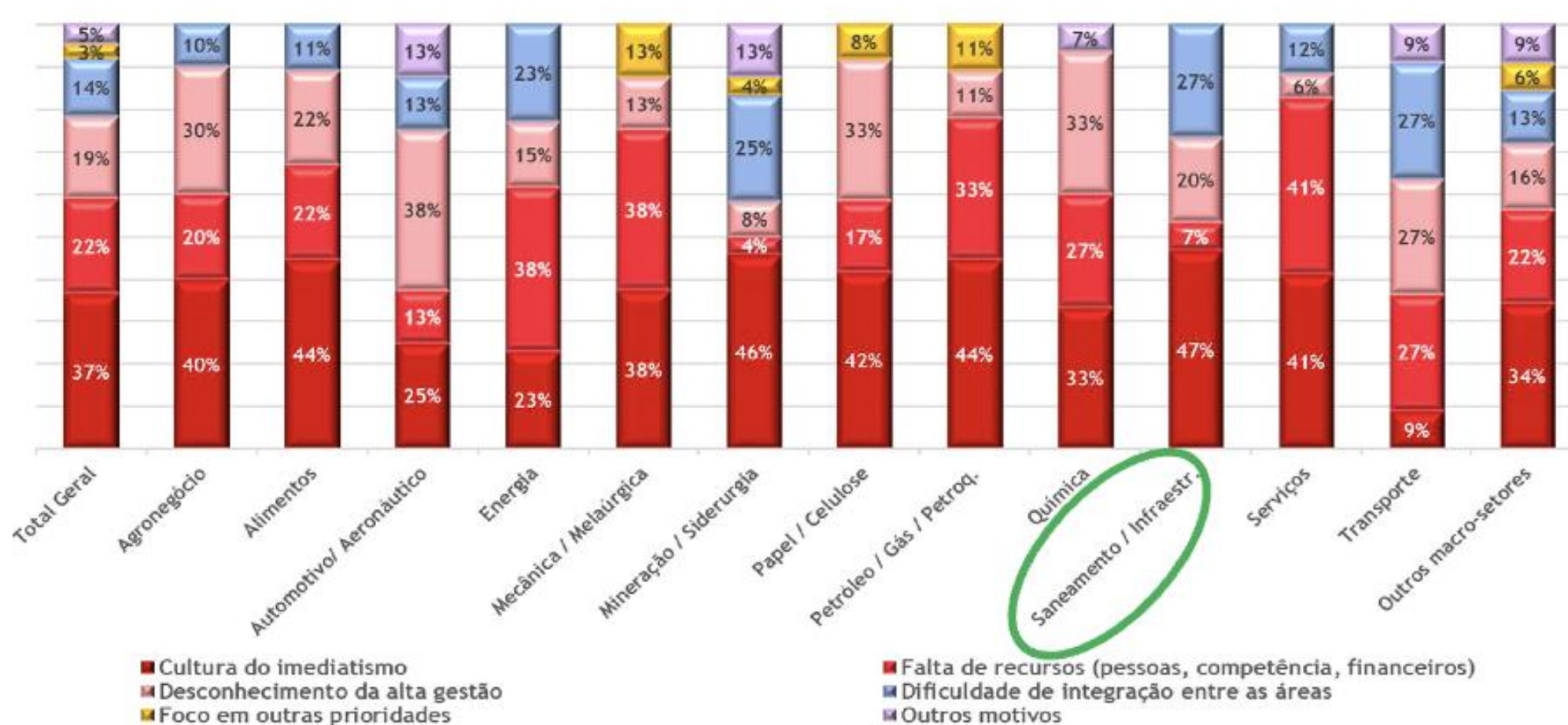
Water Sector

- Água e Esgoto de Ituiutaba MG
- Sanasa
- Sabesp
- Confab
- Sulzer
- Embasa



Survey on Asset Management – 2022

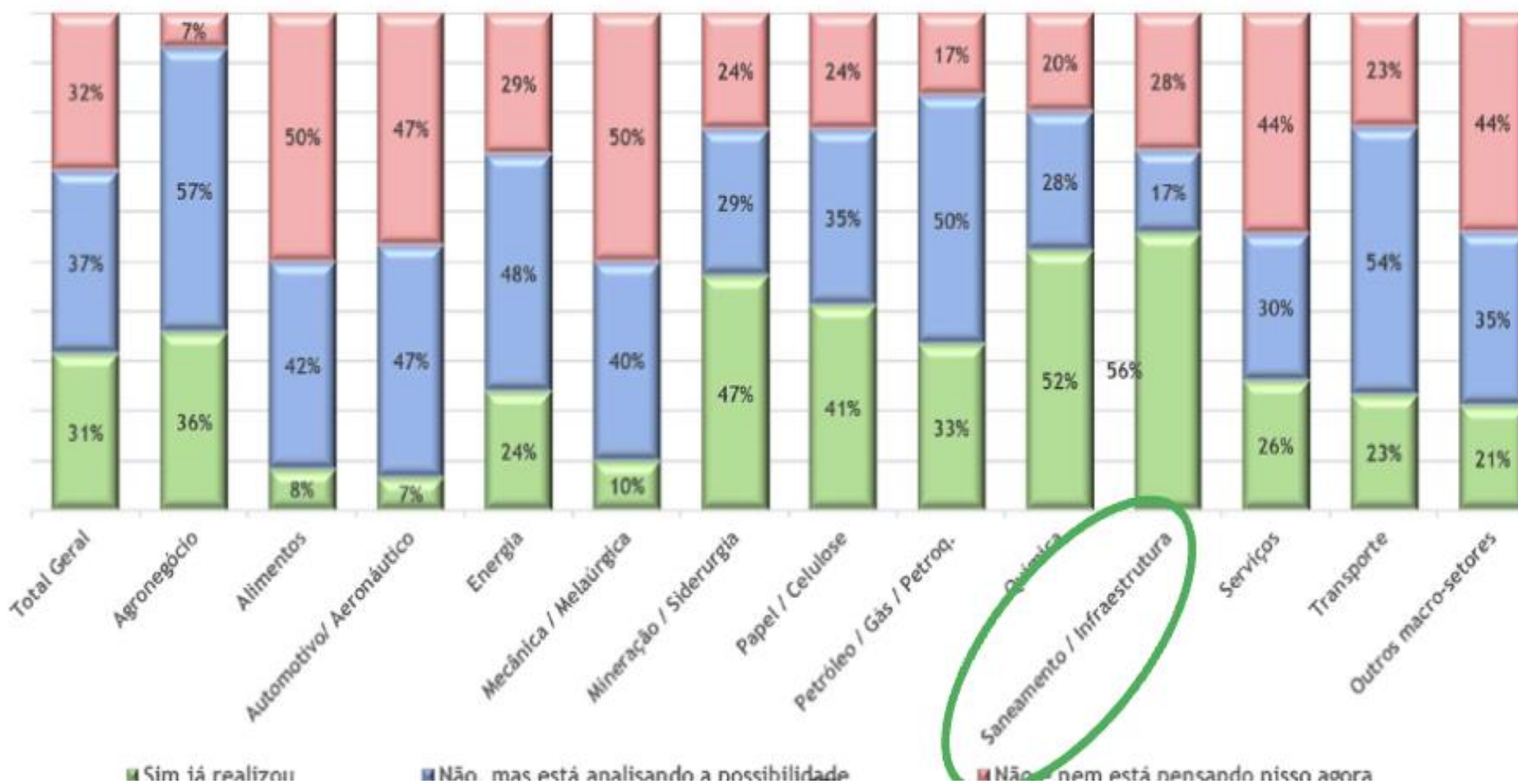
The Main Cultural Barrier in Implementing an Asset Management System





Survey on Asset Management - 2022

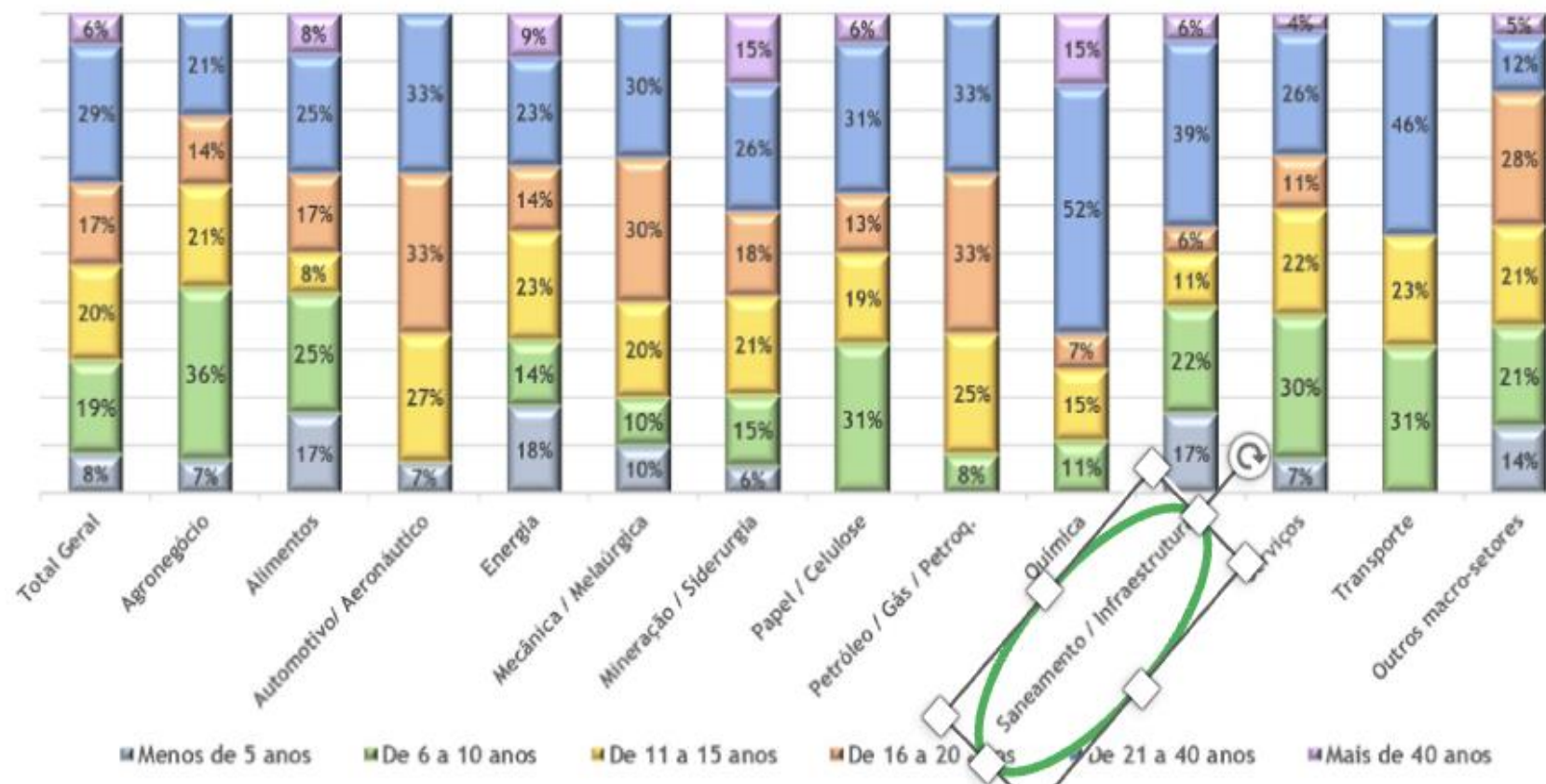
Have you conduct an Assesment Management Maturity Using a Recognized Methodology?





Survey on Asset Management - 2022

Average Age of Machines and Equipments in the Company/Unit



Survey on Asset Management - 2022

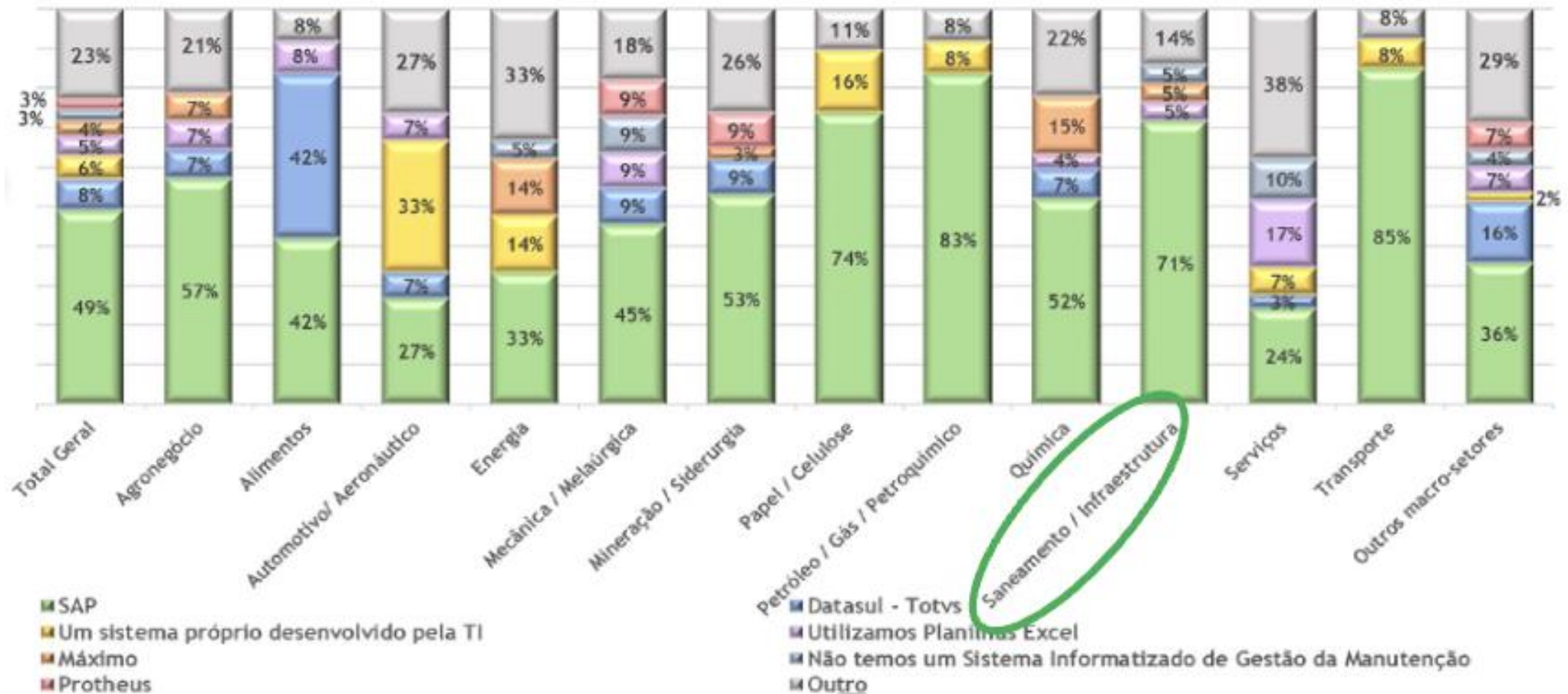


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Has a Computerized Maintenance Management System?



Survey on Asset Management - 2022

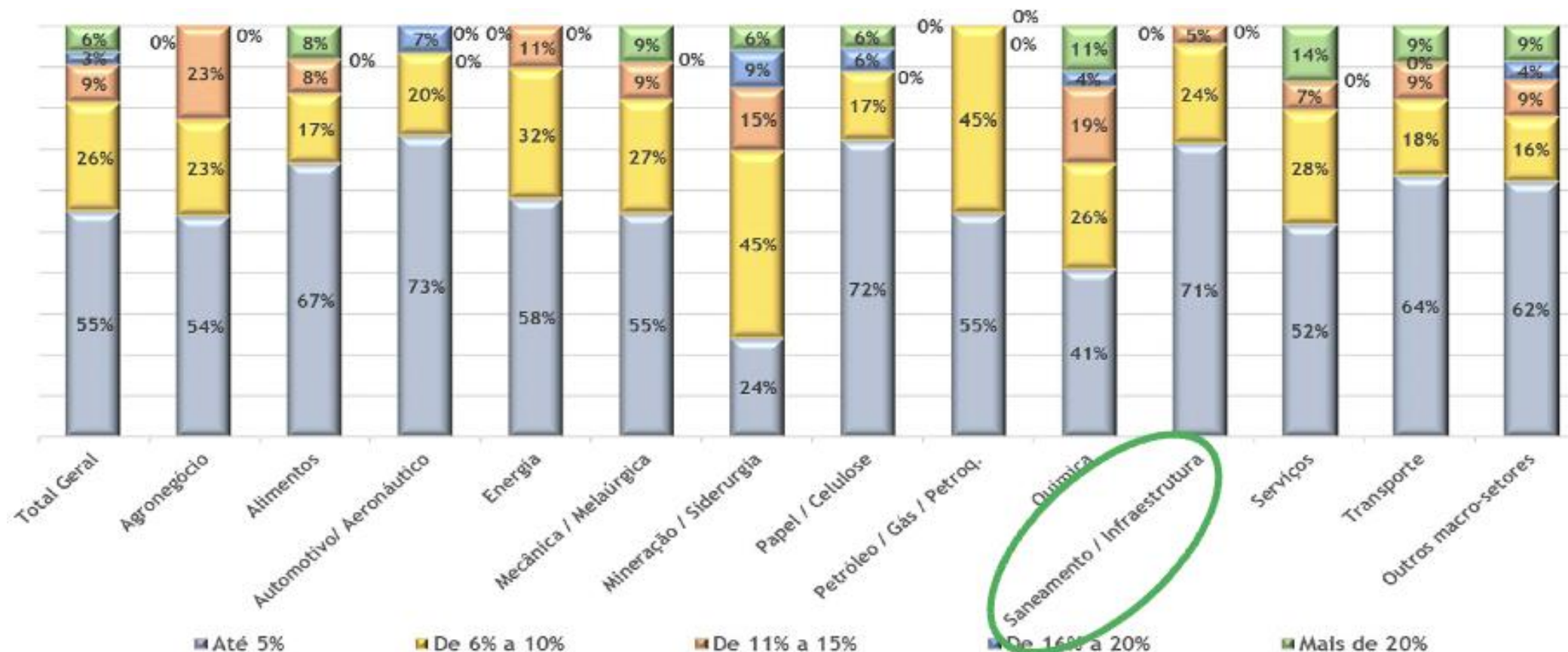


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Unavailability Due to Maintenance of Machines and Equipments



Survey on Asset Management - 2022

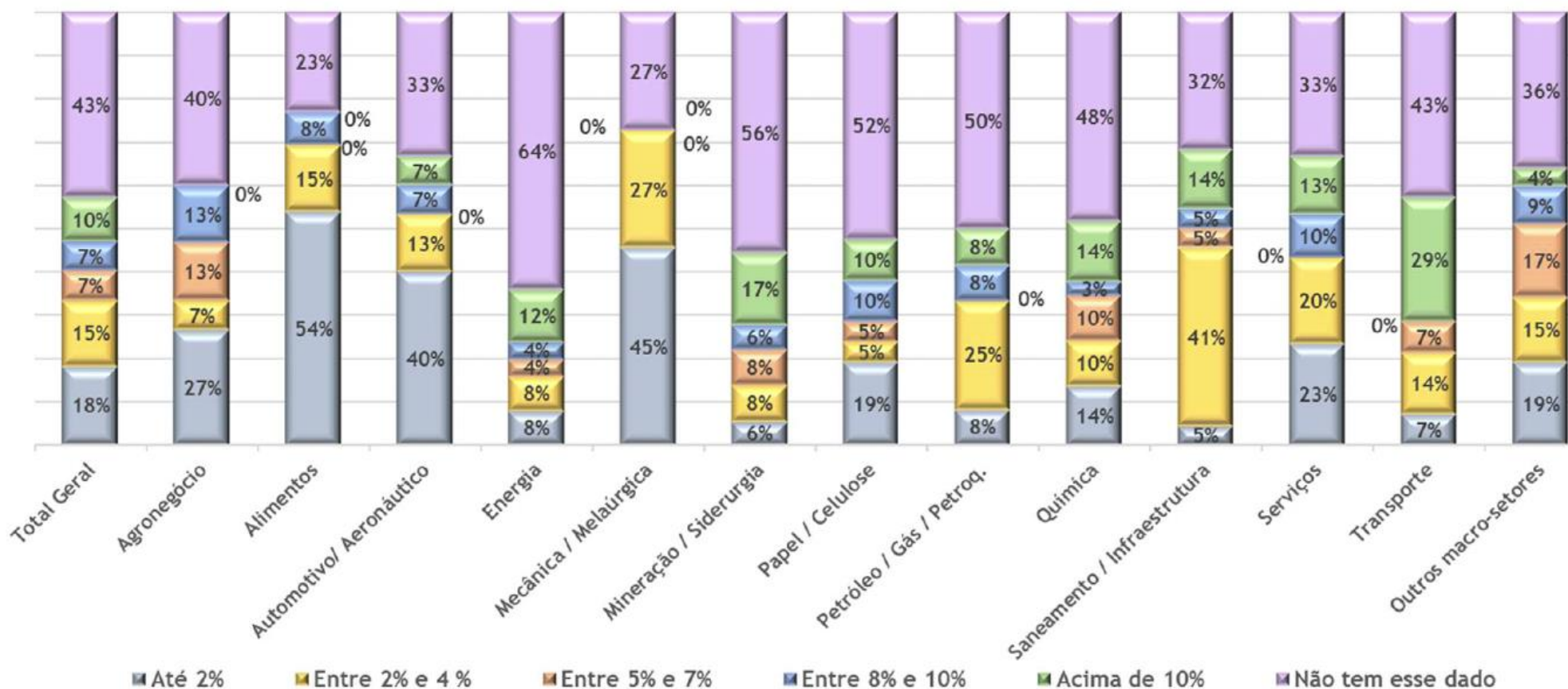


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Relationship Between the Total Annual Maintenance Cost and the Company/Unit's Gross Annual Revenue



Sabesp at-a-Glance

Sabesp is one of the world's largest water and sewage companies and the main provider of sanitation services in Brazil

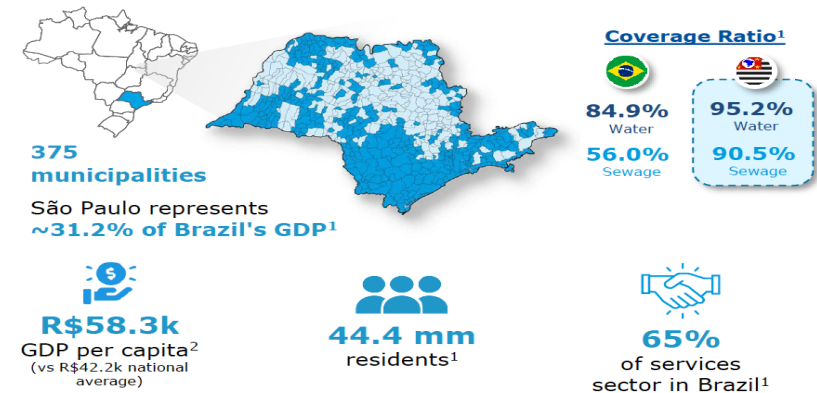
Company Overview

- ✓ Sabesp supplies **water and manages sewage collection and treatment in approximately 375 municipalities in São Paulo State, Brazil's leading state by GDP, under long-term concessions**
- ✓ The company's **privatization was held in July 2024 (new management took over in October 2024)**, significantly **raising Sabesp's governance standards** and establishing **the new contractual model**, driving top-line growth while sustaining performance optimization initiatives
- ✓ Brazil has one of the largest sanitation gaps globally and **Sabesp plays a central role in the sanitation universalization goals** in the country

Operating and Financial Highlights

3.2 bn of m ³ Total Volume Produced (Water)	1.3 bn of m ³ Total Volume Treated (Sewage)	24.8 mm Active and Registered Units ¹ (Water and Sewage)
R\$21.9bn Net Revenue ³ (US\$ 3.9bn) ⁴	R\$11.8bn Adj. EBITDA ⁵ (US\$ 2.1bn) ⁴	1.7x Net Debt / Adj. EBITDA

State of São Paulo



Sabesp Footprint and Operating Highlights



Source: Company filings, Exame, IBGE, Painel do Saneamento 2022, Ranking de Competitividade dos Estados 2022
Notes: Unless otherwise stated, figures as of 1Q25 LTM. ¹ As of 2022. ² According to Exame, with data from IBGE as of 2021. ³ Does not consider construction revenues and asset bifurcation. ⁴ Considers average USD/BRL FX rate of 5.6111 from 31-Mar-2024 to 31-Mar-2025. ⁵ Does not consider construction revenues, costs and AAPS effects; Defined as net income before net financial expenses, income tax and social contribution tax, depreciation and amortization, non-operating income or expenses, and extraordinary items net of income tax and social contribution, as set forth in Sabesp's consolidated Financial Statements.

Sabesp at-a-Glance (Cont'd)

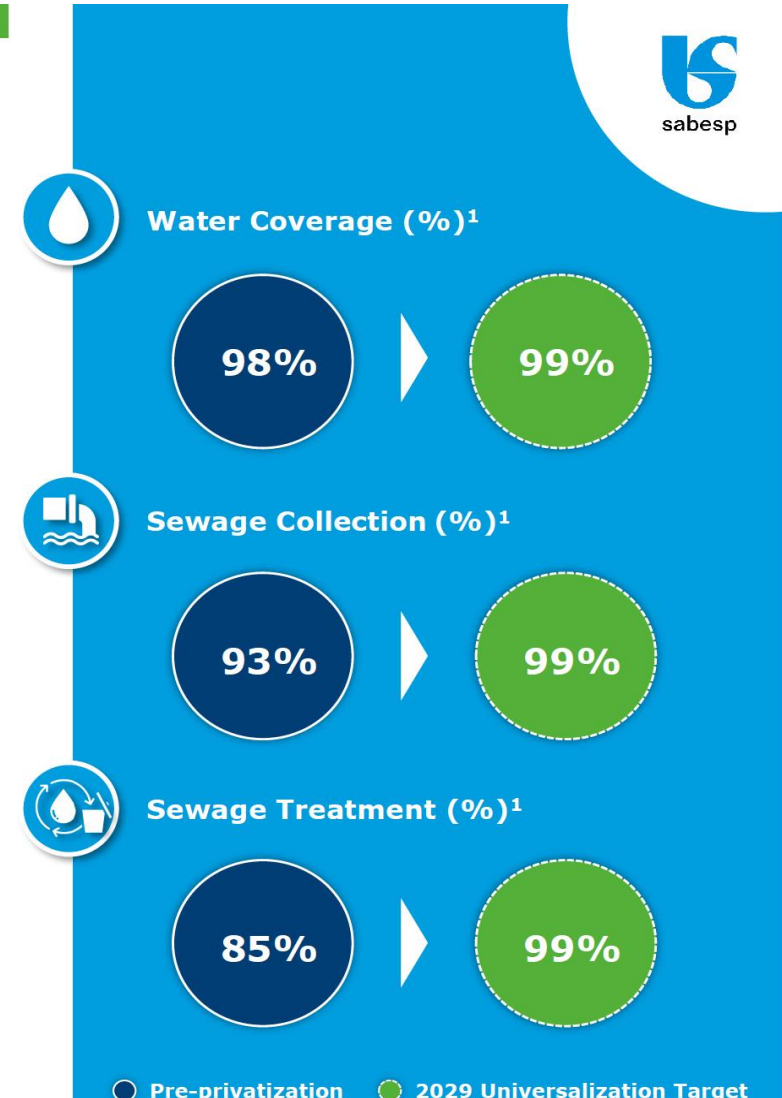
Leading water and sewage operations, based on long-term concessions with predictable revenue streams

- ✓ Long-term concession contracts with municipalities in the state of São Paulo
- ✓ Revenues from tariffs are charged directly to residential, commercial, and industrial consumers - **ensuring stable cash flows with low demand elasticity**
 - **Water Supply:** Sabesp sources, treats, and distributes water to **28.1 million people**, counting with **93.5 thousands of km of pipelines**
 - **Sewage Collection:** Sabesp collects sewage from **24.9 million people**, covering 93.5% of its operational area with a **pipeline network of 63.9 thousands of km**
 - **Sewage Treatment:** The company **operates several treatment plants, processing ~85% of collected sewage with a goal of full treatment coverage**
- ✓ Sabesp continuously invests in **expanding its water and sewage network, reducing losses, and improving operational efficiency**

Source: Company filings

Notes: Data reflects pre-privatization figures. ¹ Considers a standard deviation of ± 2 p.p.

Source: www.ri.sabesp.com.br



Sabesp's Privatization Overview

Sabesp has evolved into a true corporation, significantly advancing its corporate governance to align with best market practices



8-month privatization process, including a new concession model to which 371 municipalities adhered



Equatorial, a leading utility company, became a reference shareholder through the acquisition of 15% of stake in a secondary offering



An additional **17% of shares** were sold to the general market during the offering, which reduced the State of São Paulo's ownership stake from 50% to 18%, generating R\$14.7 bn (US\$2.6 bn¹) in proceeds



Reference shareholder cannot sell Sabesp shares acquired in the public offering until 2029

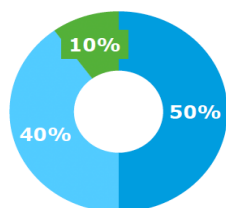


After privatization, Sabesp became the **first Brazilian private listed pure-sanitation utility company**

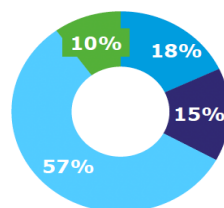


Focus on **bringing the sanitation universalization forward** (from 2033 to 2029)

Before Privatization



After Privatization



■ São Paulo State Government ■ Equatorial
■ Others (Brazilian Investors - B3) ■ Others (US Investors - NYSE)

Privatization



First B3-listed Green Equity Company



NYSE Level-III ADR



Highest Corporate Governance Level in B3

Sabesp evolved from a state-controlled utility into a professionally managed, transparent, and investor-friendly organization

With a new **regulatory model** established by the privatization, Sabesp is now an efficiency-focused company with a clear path for additional performance optimization

Sabesp to invest more than R\$60 bn until 2029

Expansion	~61% of total	✓ Necessary CapEx to comply with concession contract universalization targets ✓ Investment prioritization following annual targets, initially focusing in main urban areas, followed by rural areas starting in 2027
Efficiency	~27% of total	✓ Investments on productivity and cost reduction, including equipment upgrades, losses reduction and automation ✓ Financial return analysis (NPV, IRR and payback) to drive decisions
Renovation	~11% of total	✓ Maintenance CapEx on current asset base ✓ Prioritization considers risk matrix including service quality, legal, environmental and other risks
Indirect	~1% of total	✓ Investments on support infrastructure such as IT systems ✓ Defined by company's corporate strategy

Sabesp - Strategical Maintenance Department

Technical Registers



Water Tanks
2.823



Equipments
292.454



Water
Treatment
Plants
321



Wells
1.650



Waste Water
Treatment
Plants
529



Booster
2.356



Installatios
32.931



Main Pipes Water
7.700 km



Main Pipes Sewage
7.700 km

São Paulo Metropolitan Region - SPMR

- 💧 19% of Brazilian GDP
- 💧 7.946 km²
- 💧 21,2 million inhab - 30% in vulnerable areas



Scenarios and Challenges

Water Availability



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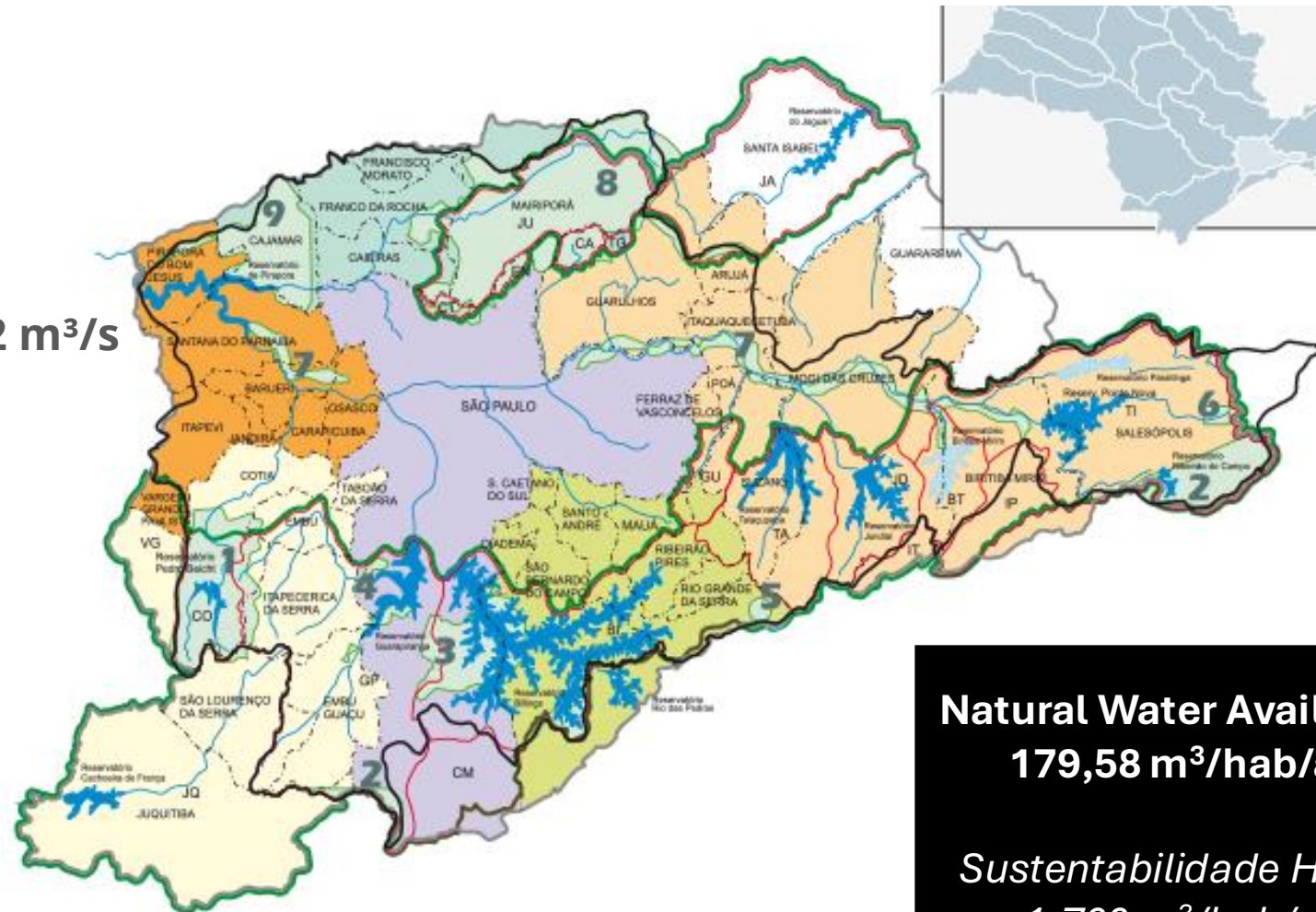
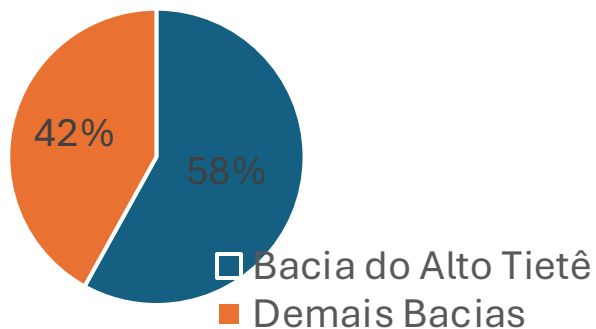


RÍO ARRONTE
FUNDAÇÃO

- Area: 5,7 mil km²
- Rio Tietê
- Q média: 115 m³/s / Q 95%: 37,2 m³/s
- 700 m do Nível do Mar

(fonte Plano Bacia AT)

Abastecimento RMSP -
2020



Limite da Região Metropolitana de São Paulo

Limites da Bacia do Alto
Tietê

Natural Water Availability

179,58 m³/hab/ano



Sustentabilidade Hídrica

1.700 m³/hab/ano

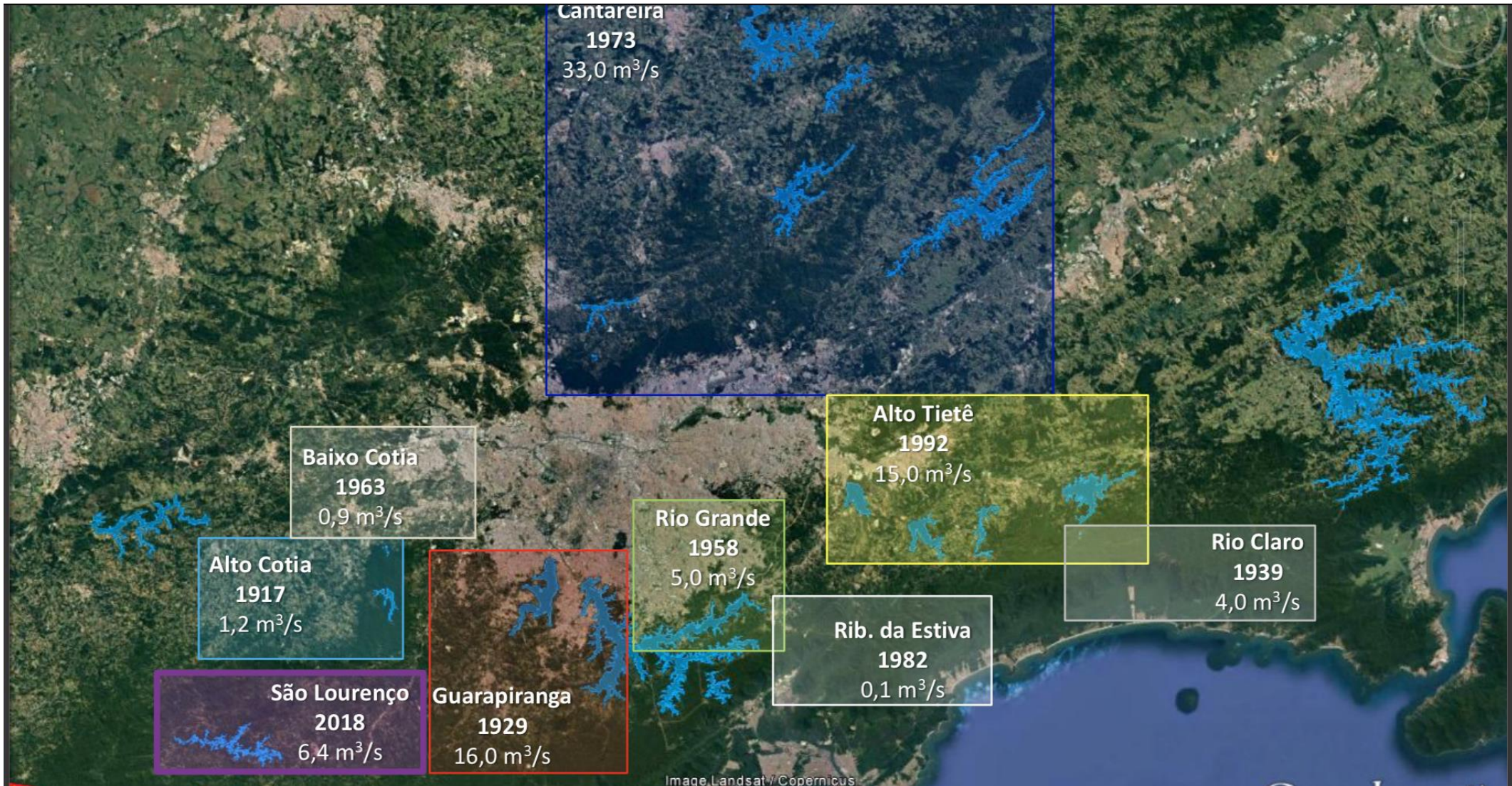
(Falkenmark)

SPMR – Data from Technical and Commercial Records



- ***Water Connections: 5,3 millions***
- ***Water Pipes Length – 44.500 km***
- ***Sewage Pipes Length – 31.000 km***
- ***Water Connections Length – 27.000 km***
- ***Sewage Connections Length – 19.500 km***
- ***Main Pipes Water Length – 1.600 km***
- ***Valves – 198.000 un***

SPMR – Water Supply Sources and Year of Implementation



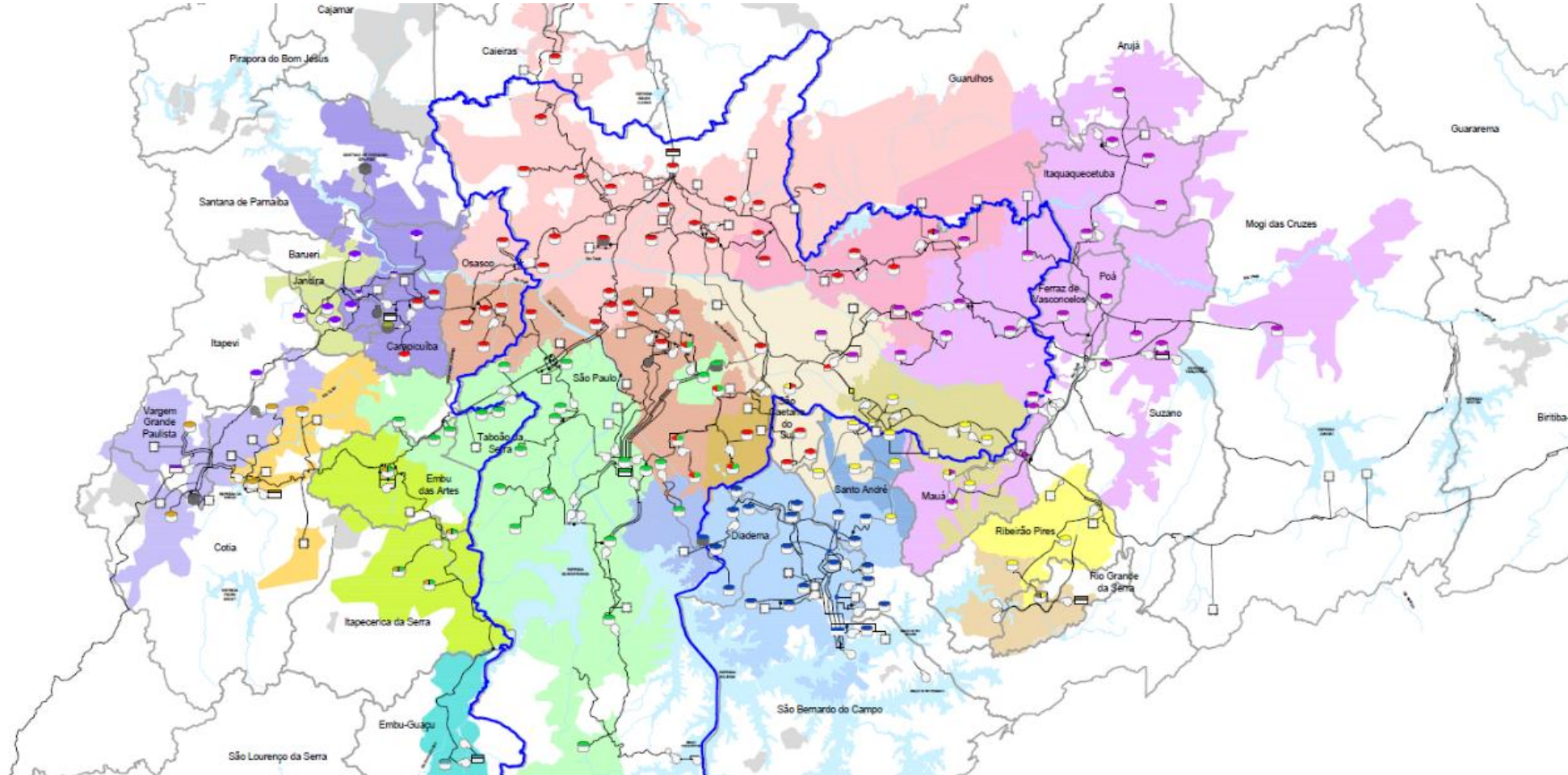
Metropolitan Integrated Water System



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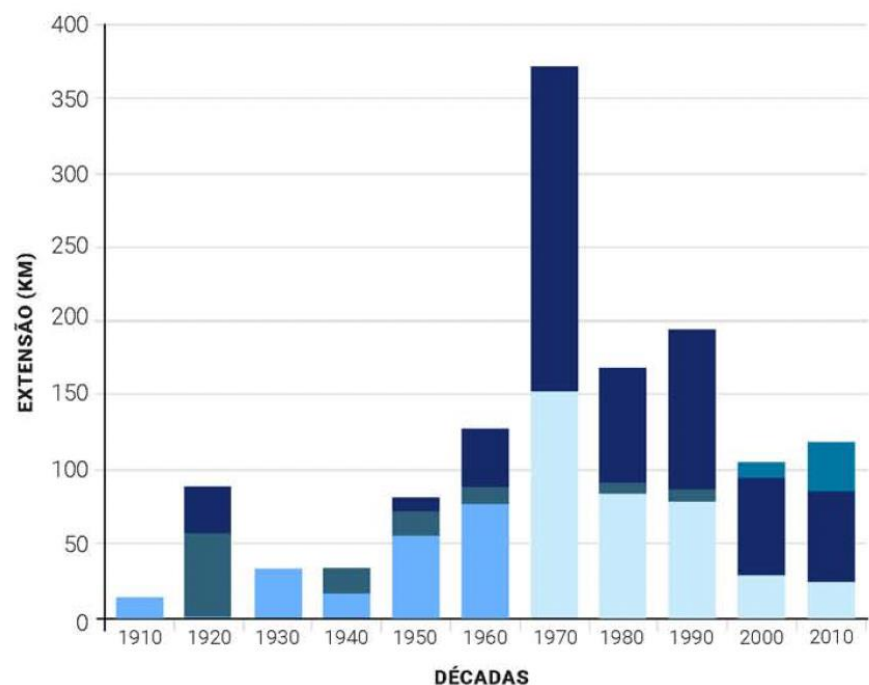


Lifespan of Water Assets

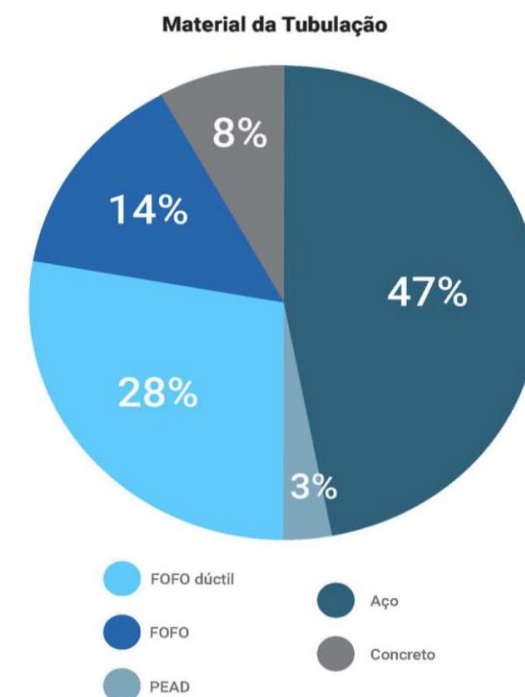
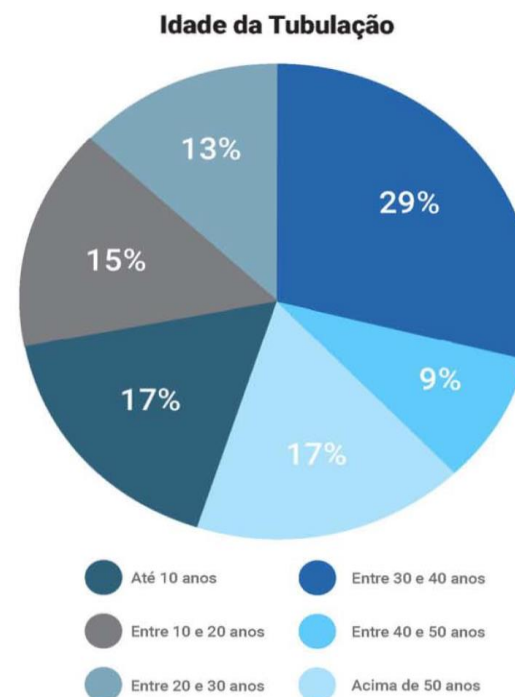
Asset Description	Life Span
Buildings – concrete	80
Buildings - timber	50
Dams	100
Storage lakes	150
Pumping and treatment equipment	25
Pipelines - steel, concrete lined	90
Pipelines - bitumen lined	150
Pipelines - unlined cast iron	100
Pipelines - cast iron, concrete lined	130
Pipelines - asbestos cement	50
Pipelines - ductile iron, concrete lined	130
Pipelines - concrete	60
Tunnels	150
Structures - reinforced concrete	100
Reservoirs- concrete	80
Bridges - timber	50
Bridges - steel	80
Bridges - concrete	100
Roads - seal	10-15
Electrical control equipment, computers	5-10
Valves (sluice)	50
Valves (other)	30
Flow meters, transmitters	20
Monitoring instruments	10

Water Supply – Main Pipes – Age and Materials

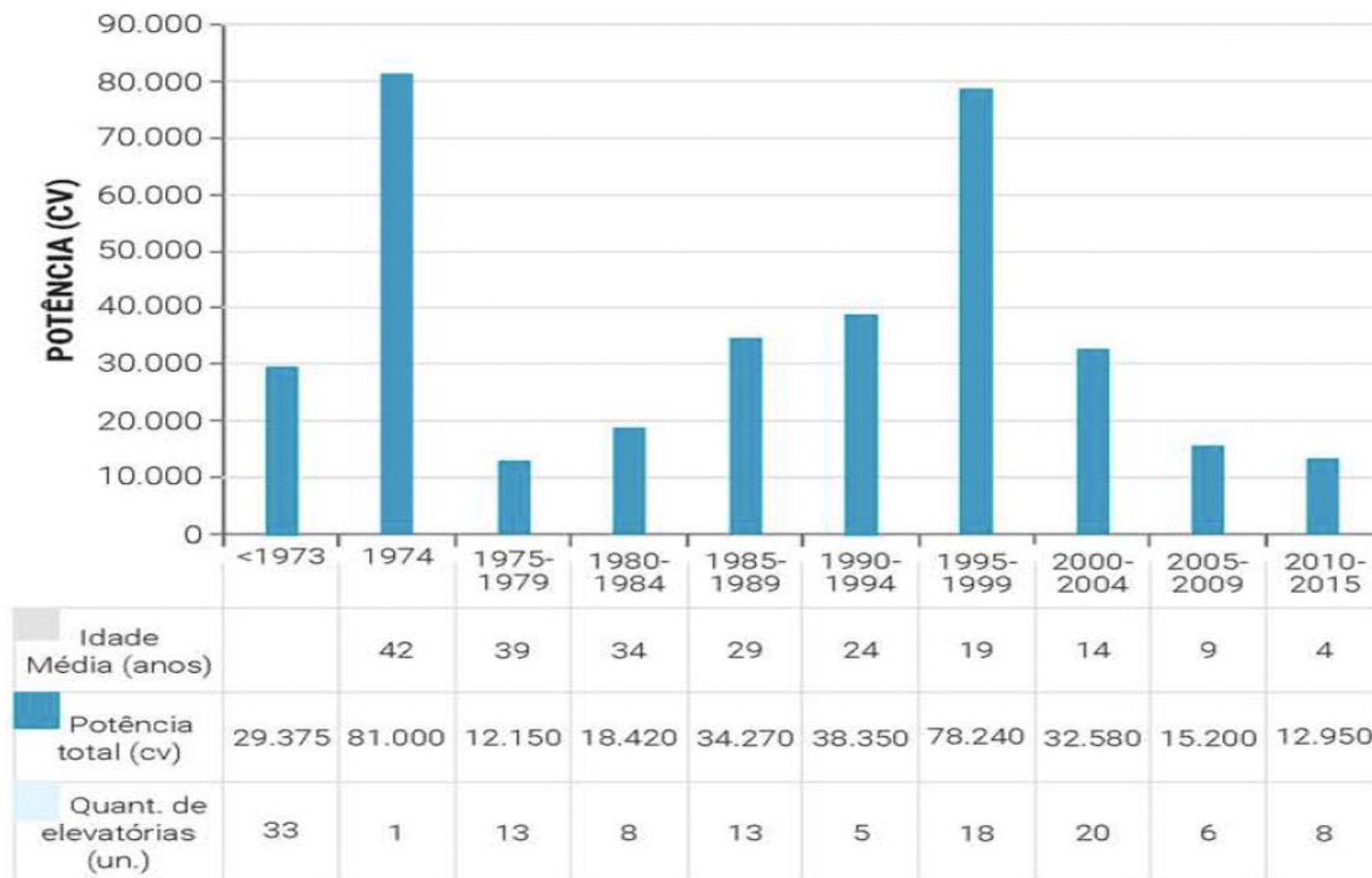
Length – 1.600 km



Fonte: Sabesp/Signos

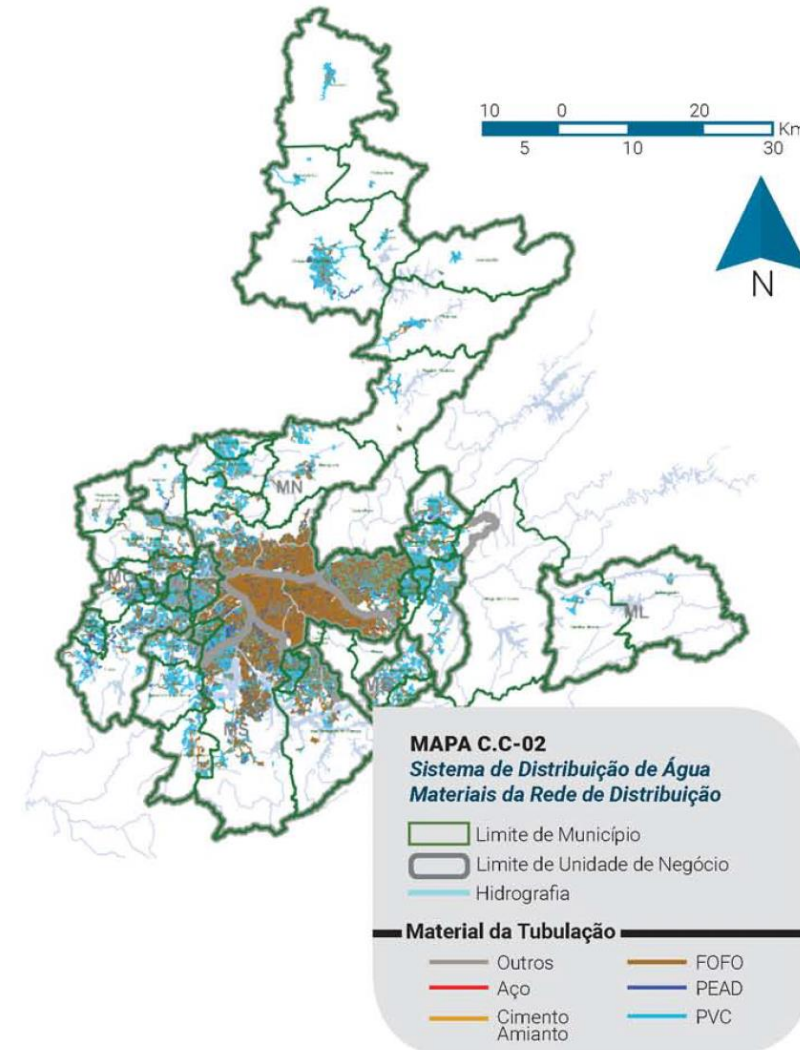
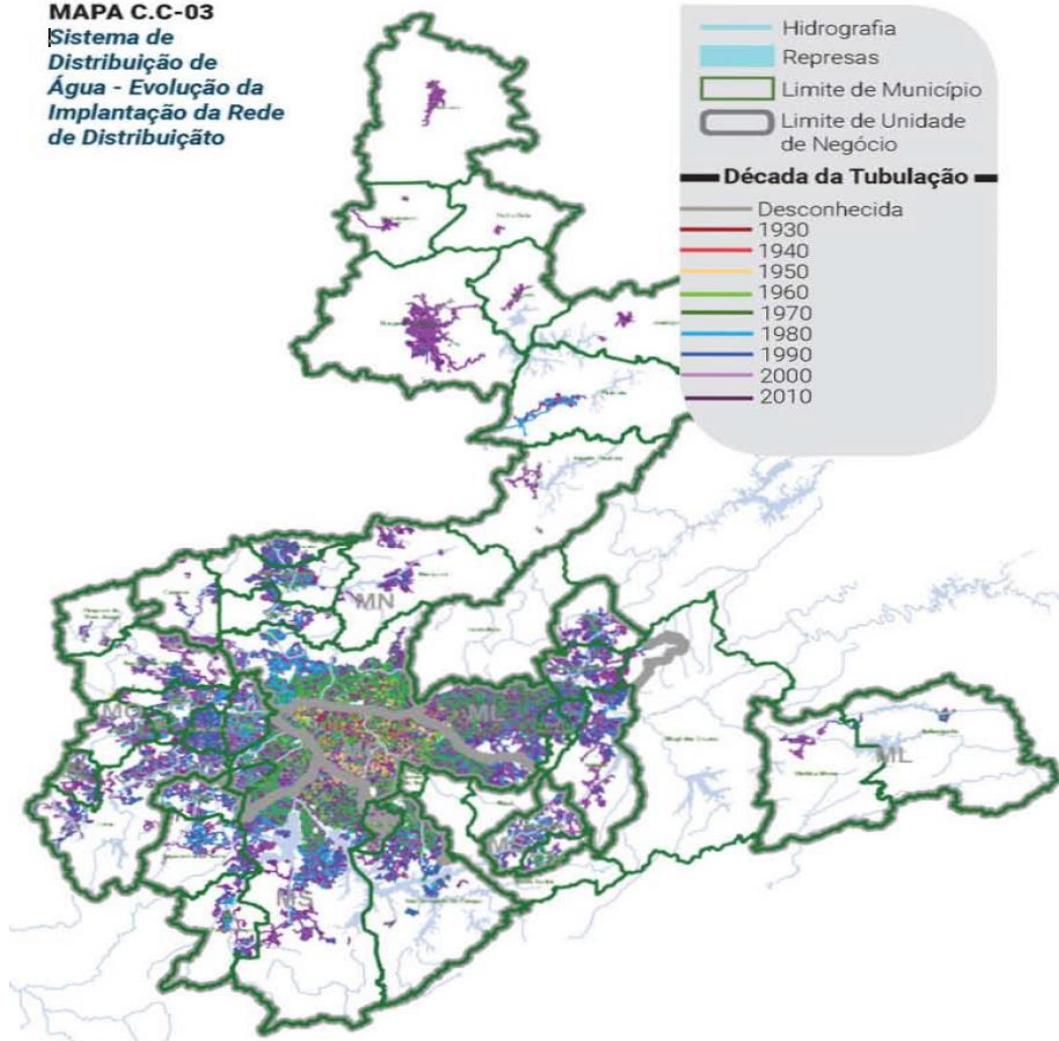


Water Supply – Main Pump Stations – Age and Power

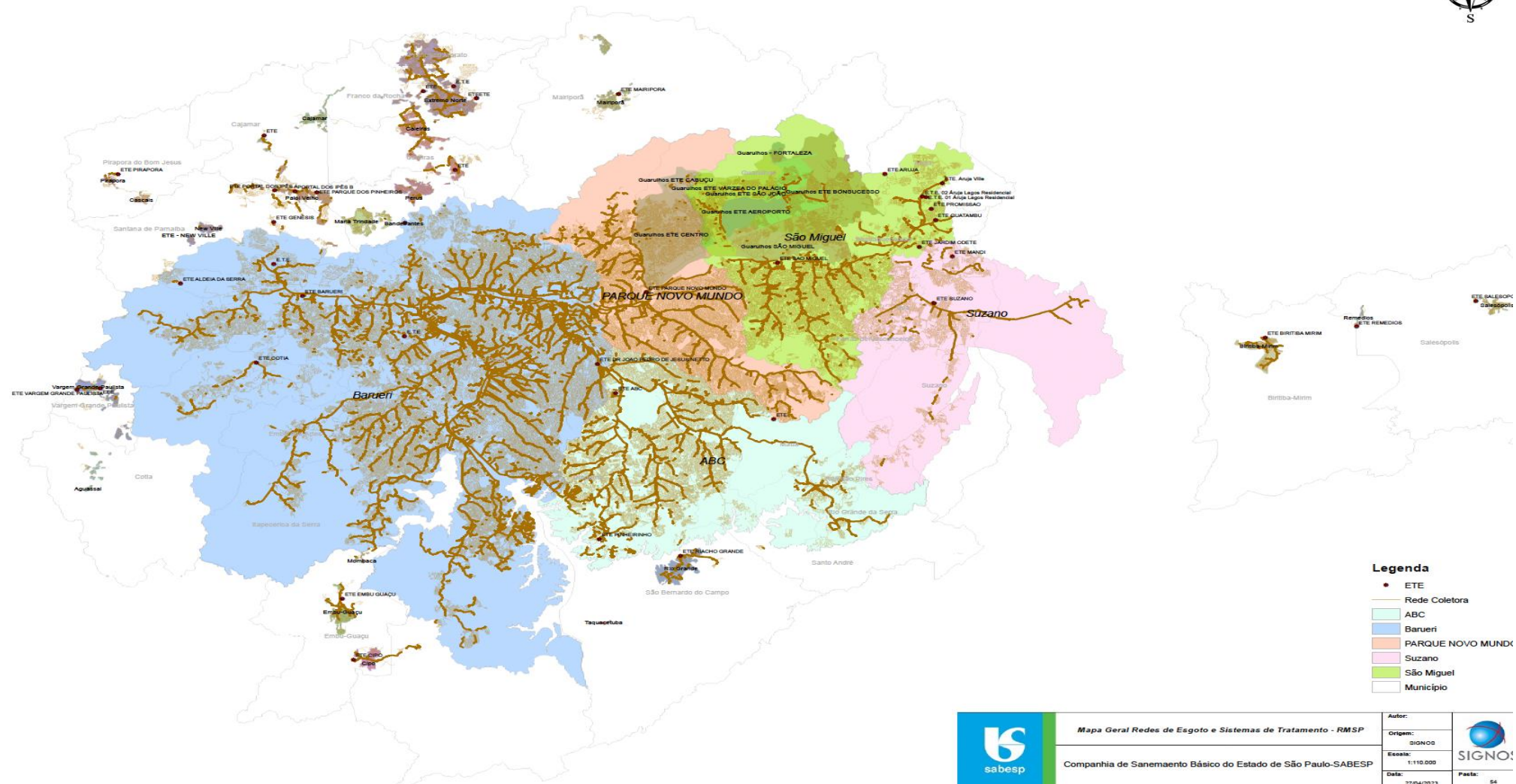


Water Distribution – Age and Materials

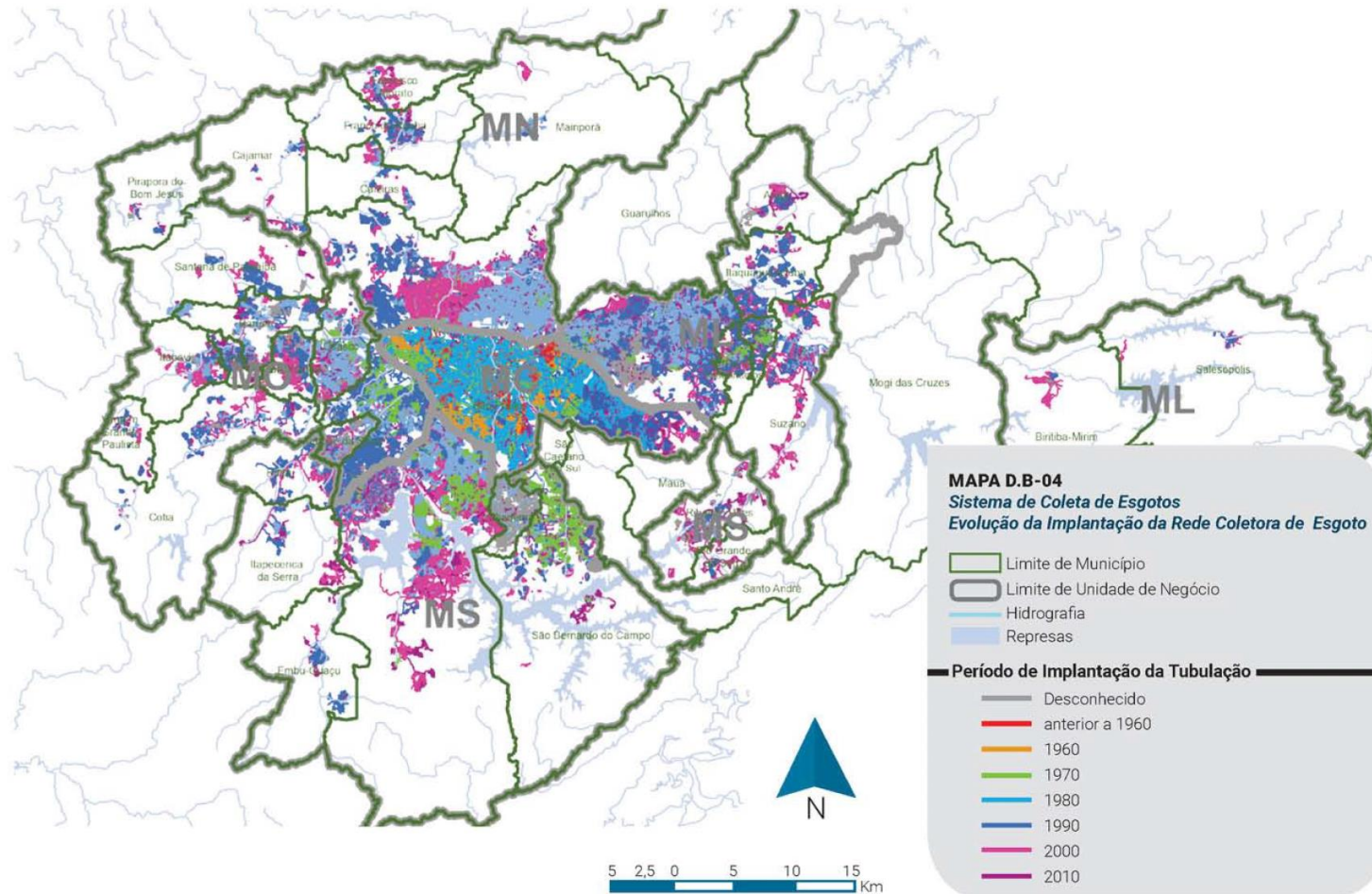
MAPA C.C-03
Sistema de
Distribuição de
Água - Evolução da
Implantação da Rede
de Distribuição



RMSP - Metropolitan Sewer System



Sewage Collection – Age/Year of Implementation

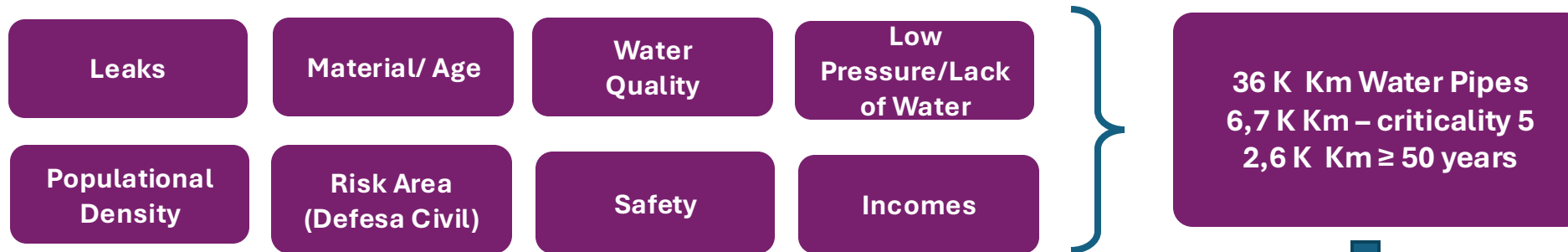


Renewing Water Pipes – Selection of Districts –

Kernel Maps/AHP-Analytic Hierarchy Process

METODOLOGY - Short description of steps

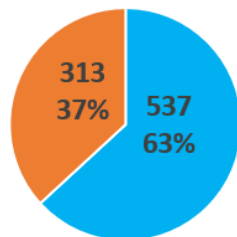
8 Criteria defined for AHP:



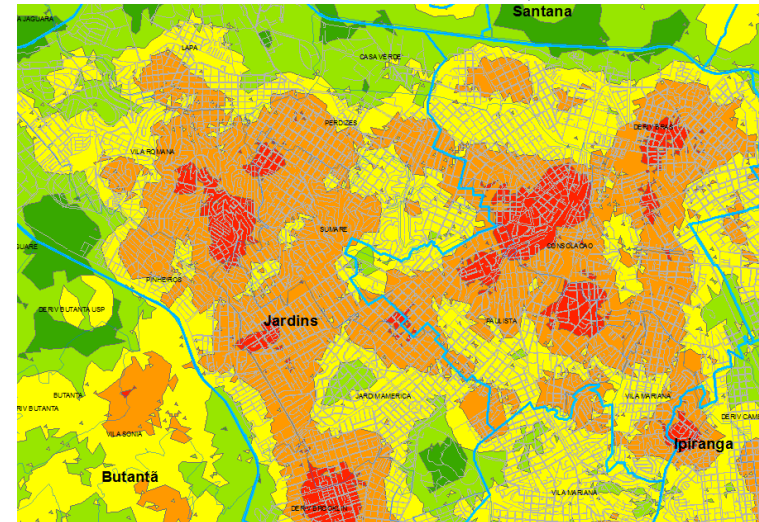
Criteria – KERNEL MAP:

Régua probabilidade PK	Grupo	Significado	Valor para Campo Nota do Critério Kernel
Improvável	Criticidade 1	não critico	1
Baixo	Criticidade 2	pouco critico	2
Possível	Criticidade 3	crítico	3
Provável	Criticidade 4	muito critico	4
Quase certo	Criticidade 5	extremamente critico	5

Troca de Redes (extensão em KM)

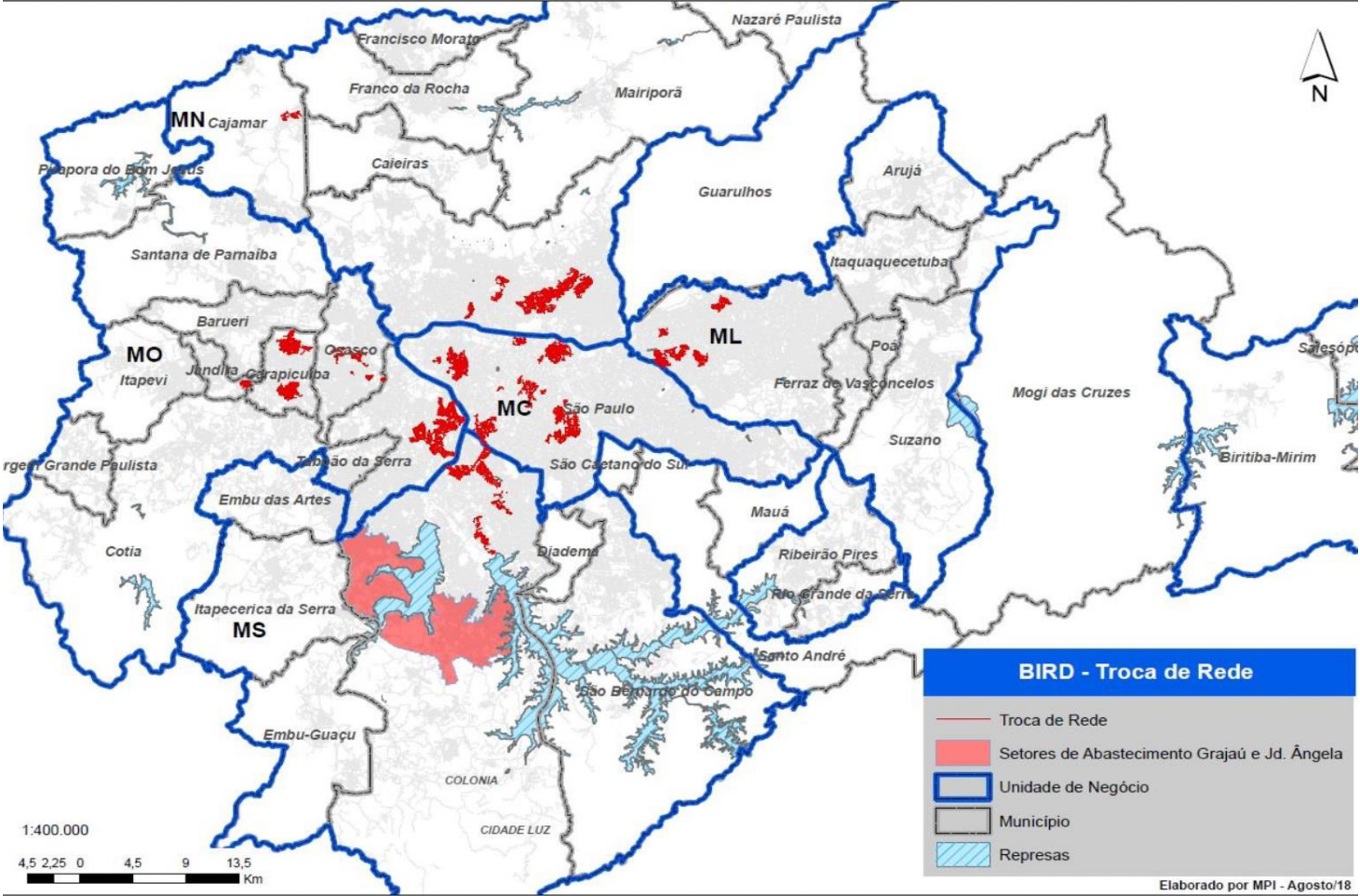


■ São Paulo ■ Outros municípios



Renewing Water Pipes – Selection of Districts – 803 km

Áreas Identificadas para Obras de Substituição de Redes de Água
(com as Áreas de Intervenção nos Setores de Abastecimento Grajaú e Jardim Ângela)



Sabesp Capex Plan Amount Budget up to 2060

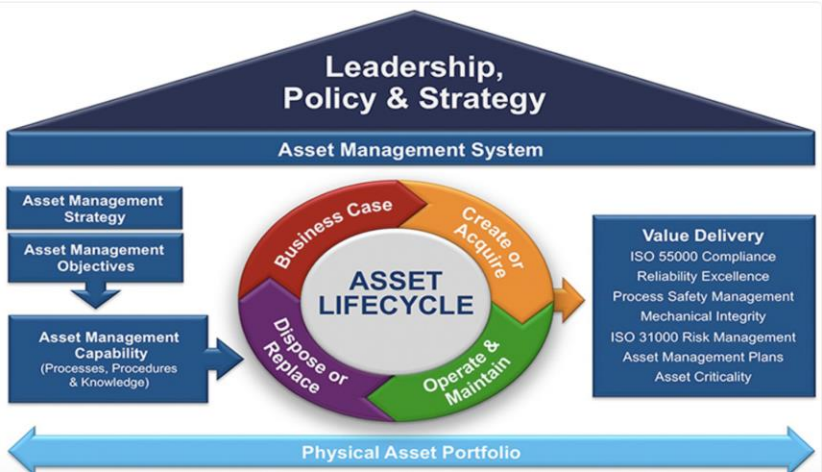
(R\$ billion)

Asset Renewal, Operational and Commercial Improvements and Modernization	161
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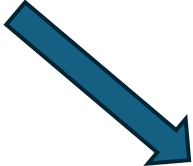
Expansion	58
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Others	38
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Critical Success Factors



Value Add



		PROBABILIDADE				
		1 Muito Baixa	2 Baixa	3 Média	4 Alta	5 Muito Alta
IMPACTO	5 Muito Alto	5	10	15	20	25
	4 Alto	4	8	12	16	20
	3 Médio	3	6	9	12	15
	2 Baixo	2	4	6	8	10
	1 Muito Baixo	1	2	3	4	5

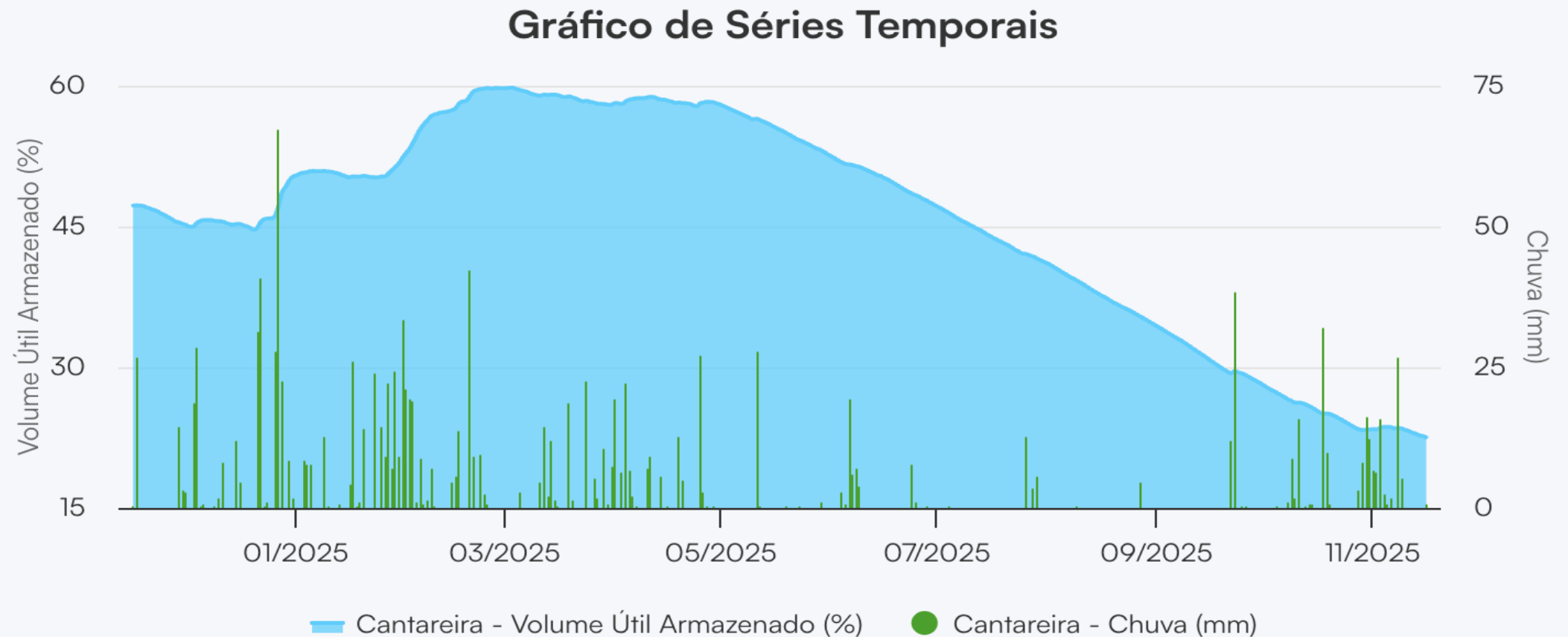


Long Term Vision





SPMR – Current Drought



Government and Regulatory Agency Measures

Measure	Description	Objective / Impact
Reservoir prevention/contingency regime	ARSESP establishes a control regime for water withdrawals; monitored by SEMIL and Civil Defense.	Preserve reservoir levels during scarcity.
Nighttime Demand Management (GDN)	Extended pressure reduction in RMSP networks from 8 to 10 hours (19h–5h).	Reduce nighttime consumption and save reservoir volume.
Suspension of new water grants	SP Águas suspends issuance of new water-use permits.	Prevent new demands that could hinder reservoir recovery.
Monitoring & enforcement package	R\$11.6M for enforcement technology + R\$6.2M for modernizing the Water Situation Room.	Increase oversight, prevent irregular use, improve decision-making.
River dredging	R\$50M for sediment removal and river rehabilitation.	Increase hydraulic capacity and water availability.
Advanced water management model	New methodology with 7 action levels and 12-month forecasting.	Enable early and scalable responses to scarcity.
Resilience infrastructure incentives	Credit lines for municipalities (UniversalizaSP) to reduce losses, drill wells, and improve drainage.	Strengthen local resilience and reduce vulnerability.
IntegraTietê program	More than R\$22B for pollution reduction, sewer connections, and automatic monitoring stations.	Improve water quality and bolster long-term water security.



What are the consequences for old water assets?



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Thank you...

Dante Ragazzi Pauli
Saneazzi Serviços de Engenharia Ltda.
dante.ragazzi@terra.com.br
+55 11 98685-2571