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Group work exercise

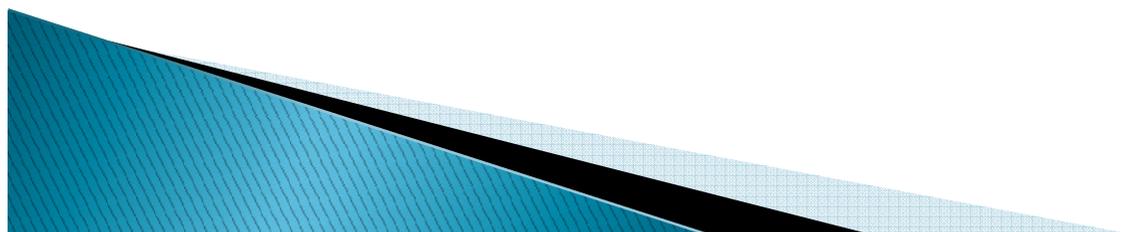
# Wastewater tariff in Southern Brazil: Case study of a typical town in the state of Rio Grande do Sul



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# Outline

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7. Tariff setting
8. Conclusions



# 1. Introduction

## Water and wastewater in Brazil:

- ▶ Water supply coverage: 82%
- ▶ Wastewater : 48% (18%)

Great interest of federal gov.  
to invest in wastewater

## Alba Maior (*pseudonym*):

- ▶ 61.000 urban inhabitants, rich and flat
- ▶ 100% of water coverage (State utility SANERGS – *pseudonym*)
- ▶ No sanitation system (septic tanks)
- ▶ State regulatory agency (AGERGS)



## 2. Regulatory framework

- ▶ Municipalities : specific issues; Regulator : tariffs + quality; Federal law (Act N 11.445 by 5/01/2007): general rules of services
- ▶ Cities can choose to have their own regulatory agency, share it with other cities (an inter-municipal agency) or make an agreement with a state or federal agency.
- ▶ No federal agency for water and sewerage services.
- ▶ Water tariffs are the same for all municipalities served by SANERGS and are fixed using cost-recovery method.
- ▶ Wastewater tariff: 70% of water tariff, without considering real costs.
- ▶ Wastewater = 90% of water consumption.

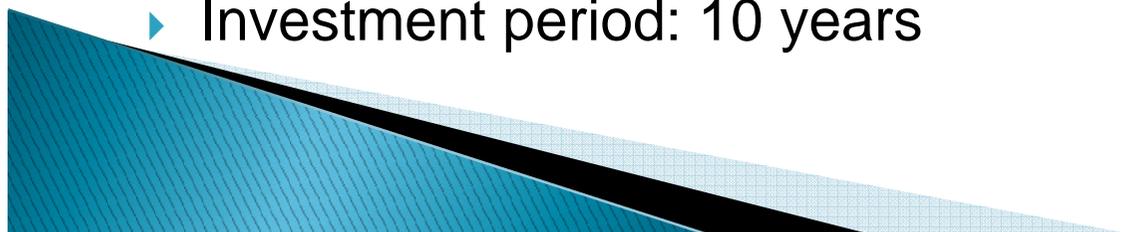


# 3. Stakeholders and incentives

Actor	Main incentives for the project	Main incentives against the project	Possible compromises and mitigation measures
<b>1) The Municipality of Alba Maior</b>	Electoral support for increased access to service and improved quality, creation of working places	No willingness to increase tariffs, no cash availability (dependency on external support)	Project needs to be heavily subsidized, tariffs need to increase very gradually
<b>2) The regulator AGERGS</b>	Improve quality of service, test a new formula for wastewater tariff to guarantee financial sustainability of the service	Risk of non-affordability of the new tariff; discourage other municipalities to sign regulatory agreements due to tariff increase under AGERGS's regulation, information asymmetry	Gradual increase of tariffs, improvements in quality of service which will encourage other Municipalities to follow the example
<b>3) State Utility SANERGS</b>	Implement better tariff for cost-recovery, increase scope of services, and contribute to achievement of yearly targets.	Regulatory risk, increase in general costs, rivalry with private company, risk of decreasing rate of bill collection due to higher tariff	Regulatory commitment (agreement/contract), clear mechanisms to pay for commercial services (in case of private intervention)
<b>4) The bank, Caixa Economica Federal</b>	Return on investment, corporate social responsibility	Regulatory risk (on tariff), connection risk, delays in construction and repayments	Agreements and contracts ready before the loan, regular monitoring of the implementation, proportionate release of loan together with equity and grant
<b>5) Consumers' protection association, FRACAB</b>	Improve service and environment, health benefits	Risk of tariff increase, rent-seeking by utilities, inconvenience during construction, information asymmetry	Good regulatory framework, Recycling water may reduce tariff
<b>6) Potential private company</b>	Profit, CSR, market expansion	Regulatory risk (on tariff), connection risk, delays in construction and repayments, popular protest, market risk of recycled water, information asymmetry (for private utility)	Agreements and contracts ready before the project, good regulatory framework, Recycling water may reduce tariff

## 4. Description of the project

- ▶ Greenfield project: wastewater network and treatment plant
- ▶ Investment needs: 130 million R\$ (~55 million USD) / R\$ 5000 per family
- ▶ Two options analyzed:
  - Option 1 - state owned company SANERGS builds and operates (direct assignment) with a grant from a donor (state government)
    - 50% debt, 20% equity, 30% grant
  - Option 2 - tender for Build-operate-transfer (BOT) to a private utility by tendering
    - 50% debt, 50% equity
- ▶ In both cases: 25 years contract
- ▶ Investment period: 10 years



# 5. Financial model : assumptions

## ▶ Costs:

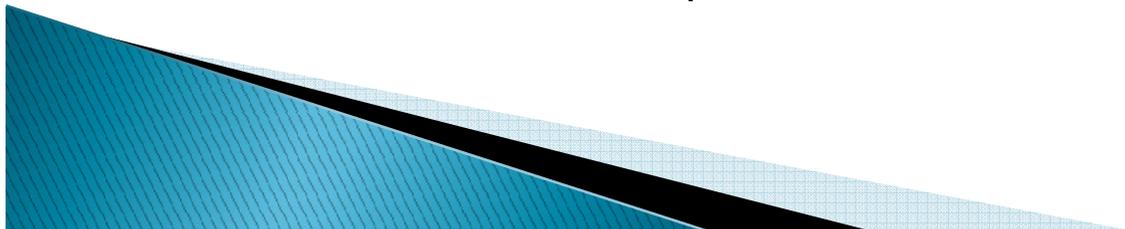
- Employees cost in option 1: lower N employees
- Employees cost in option 2: higher N employees
- Other operating cost: data from SANERGS of R\$ 0,62 per m<sup>3</sup> + inflation.

## ▶ Revenues:

- Tariff from waste water collection
- Sale a portion of treated water
- Fees for treatment of septic tank sludge

## ▶ Financial assumptions:

- Inflation: 6%
- Corporate tax: 15,8%
- Cost of debt:           Option 1 = 3%;                   Option 2 =9%
- Cost of equity:        Option 1 = 1%;                   Option 2 =11%
- WACC:                 Option 1 = 1,46%;               Option 2 =9,29%



# 6. Financial model: results

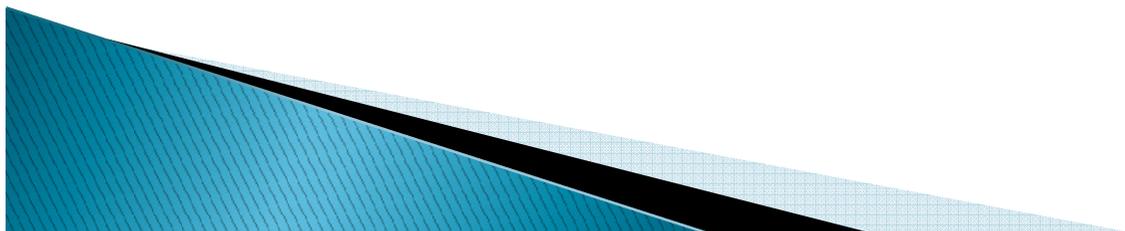
## Option 1 (direct assignment - public):

- If no recycling and tariff R\$2.7 => NPV = R\$ (-) 13.76 m => project not viable. (Need tariff increase to R\$3.00).
- If 30% recycling, NPV > 0 ; tariff = R\$2.73 (~current tariff).
- If 15% recycling (realistic) and NPV > 0 ; tariff = R\$2.87

## Option 2 (BOT - private):

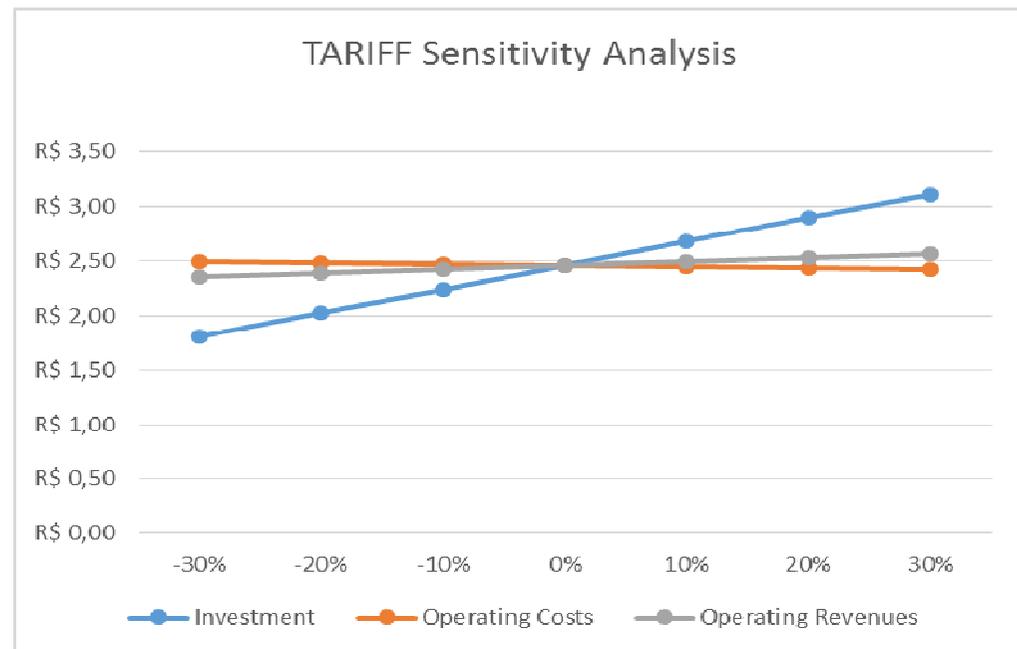
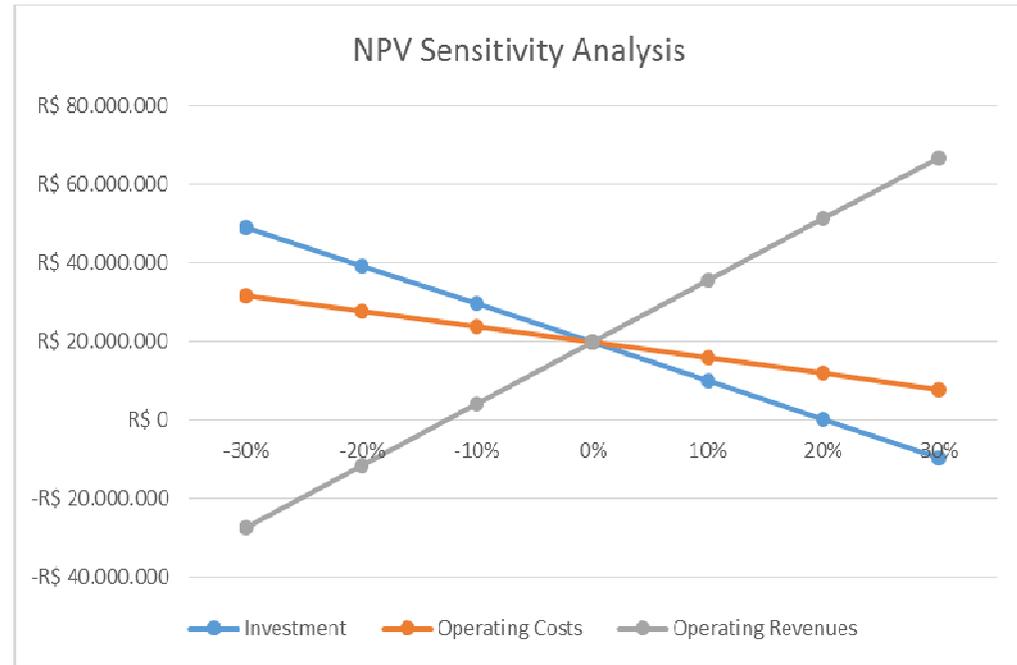
- If no recycling and tariff R\$2.7 => NPV = R\$ (-) 50.27 m => project not viable. (Need tariff increase to R\$3.77) (=+40%).
- If 50% recycling and tariff R\$2.7 =>, NPV = R\$(-) 40.27 m ; need to increase tariff to R\$ 3.58 (=+33%)
- This option is excluded because in order to make NPV > 0, tariff would need to be dramatically increased which is not politically and socially acceptable.

Therefore, it is recommended that the tariff is kept at R\$ 2,87 per m<sup>3</sup> for the entire period (adjusted to inflation)!



# Sensitivity analysis

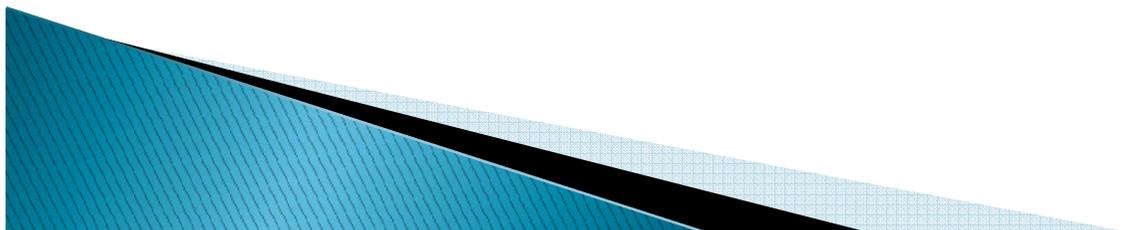
- If revenues < 12%, NPV < 0;
- If investment > 20%, NPV < 0;
- Tariffs are most sensitive to the investment, and very low sensitive on the revenues



# 7. Tarif setting

- ▶ Low sewage connection (18%) => IRR or cost recovery method.
- ▶ Volumetric tariffs: R\$ 2,87 per m<sup>3</sup>.
- ▶ Affordability analysis:

Income per households / month (for 2012)	R\$ 3390,89
Monthly fee for WS (m <sup>3</sup> ) - 10m <sup>3</sup>	R\$ 56,85
Monthly fee for WW (m <sup>3</sup> ) - 9m <sup>3</sup>	R\$ 25,82
Total fee / month	R\$ 82,67
Affordability (<4%)	2,44%



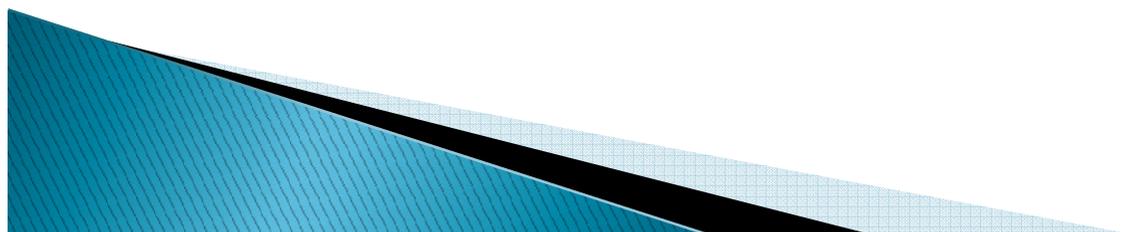
# 8. Conclusions and limitations

## Conclusions:

1. Market failure (Lack of conditions for equal competition between private and public)
2. New approach for tariff setting in Rio Grande do Sul based on cost-recovery and potential for tariff increase
3. Potential of service diversification to improve viability

## Limitations:

- Due to time constraints, the case study includes basic assumptions;
- Financial model
  - only takes into account domestic consumption;
  - takes operational costs as given;
  - does not include revenues from connection fees;
- The tariff was not detailed by category of users
- It was not possible to assess the market potential for recycled water.





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Ви благодариме

Grazie!

Obrigada!

