

BRAZIL - TRENCHLESS MARKET PRESENTATION

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Fortezza da Basso – Firenze
October 2, 2019

Trenchless market situation

Situation of Trenchless Technology in Brazil

- States as Sao Paulo, Rio de Janeiro, Minas Gerais and Brasilia have been using more TT comparing to the others states. Those are matured industry in terms of TT.
- TT is commonly used in the great areas of Sao Paulo, Rio de Janeiro, Salvador and Belo Horizonte. The denser the area, the more TT is used.
- In the city of Sao Paulo due to the heavy traffic and environmental disturbance, 95% of the new projects authorizations are TT.
- Traditional open cut is allowed by Sao Paulo City Hall just in some specific cases.

Situation of Trenchless Technology in Brazil

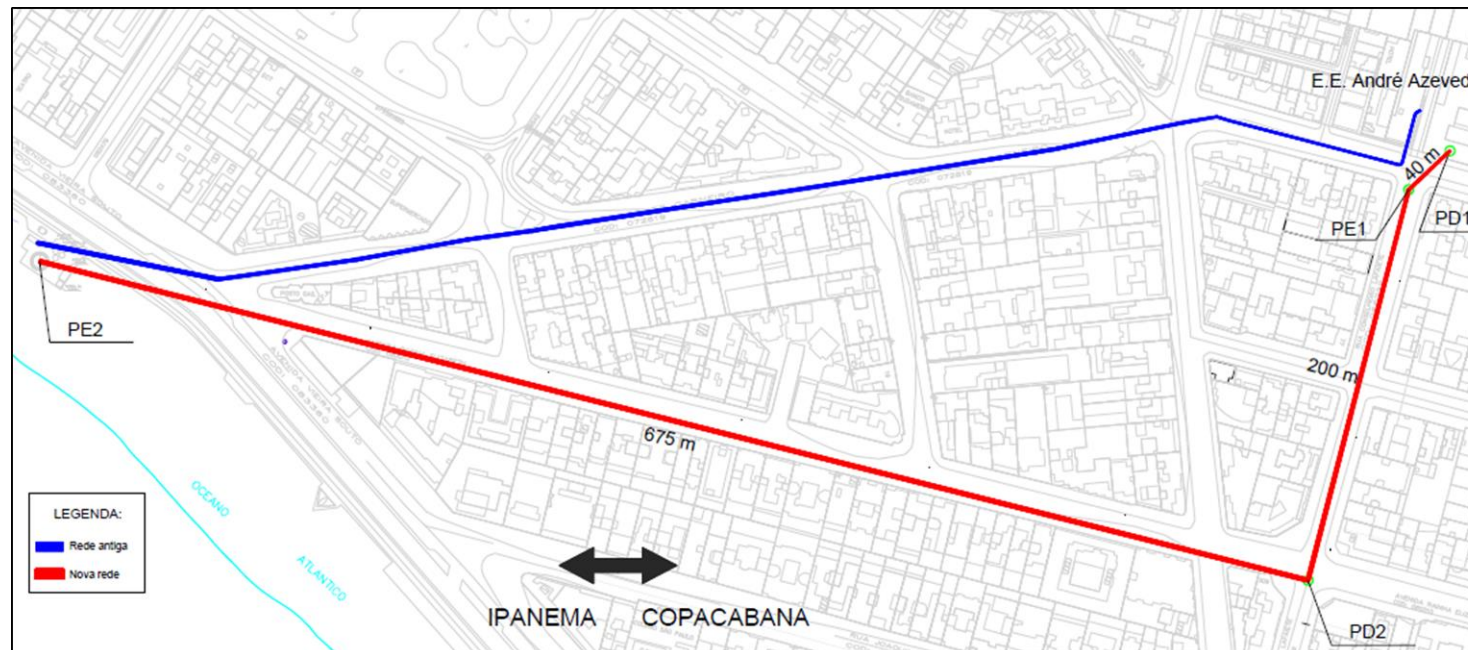
- The most common TT is HDD. There are about 800 units in the country. We have machines up to 500 tons of pull back force.
- HDD and Micro Tunneling are very advanced. The country has been doing huge and challenging projects.
- One of our affiliated won the ISTT Award in 2016 No Dig Show in Beijing.

2016 ISTT AWARD in BEIJING



Micro tunneling: 675 meters in one shot
DN: 1500mm

 **PASSARELLI**



Ipanema Beach



Job Site



2016 ISTT AWARD in BEIJING



Gas Pipe and Optic Fiber cable in the Amazon Rainforest



Extension: 661 km DN: 20" and 4"



250 tons Herrenknecht HDD machine



Challenging Crossings and Transportations



The largest crossing: 1826 meters and 100 meters deep under the Solimoes River

Trenchless market situation

Situation of Trenchless Technology in Brazil

- On the other hand, some rehabilitation techniques have been introduced recently in Brazil. That's our Achilles's heel!!!
- The most common techniques for rehabilitation are Pipe Bursting, CIPP, Slip Lining and Epoxy Coating.
- ABRATT (Brazilian society) has created a two days training course of TT

2 DAYS TRAINING COURSE PROGRAM

Day	Time	Topic	Instructor
1	8:00 – 10:00	ABRATT and TT	Helio Rosas
	10:30 – 12:00	Pipe Bursting	Helio Rosas
	14:00 – 15:30	CIPP	Rodrigo Tomazi
	16:00 – 17:00	Spot Repair	Ferdinando Manzolli
	17:00 – 17:30	Primus Liner	Felipe Montuori
2	8:00 – 8:30	Underground Utility Mapping	Jorge Dequech
	8:30 – 10:00	HDD	Liberal Ramos Jr.
	10:30 – 12:00	Welding of HDPE	José Luiz Delgado
	14:00 – 14:30	Drilling Fluid	Leonardo Silveira
	14:30 – 17:30	Micro Tunneling	Edson Peev

Trenchless market situation



ENERGY

BURYING OF ENERGY CABLES AND MAINTENANCE

➤ *TECHNIQUE: HDD*

- **BUDGET:**

- US\$ 20 Million / Year

➤ **WHERE:** City of São Paulo

Trenchless market situation



OIL

PETROBRAS

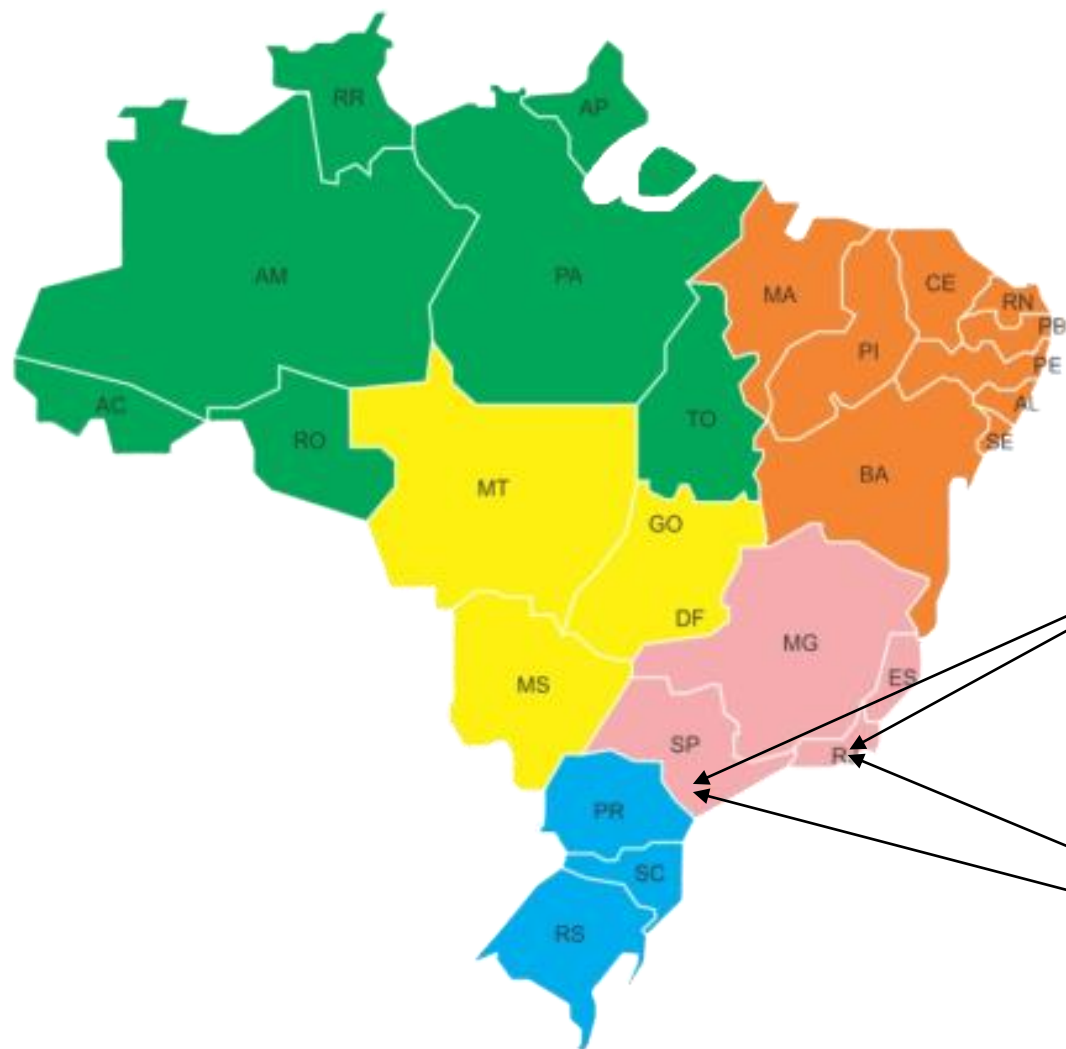
**OIL AND GAS PIPES VARY FROM 8 "(200 MM) TO 40" (1000 MM)
DIAMETER**

➤ *TECHNIQUES:*

- *BORING MACHINE (AUGER BORING MACHINE):* 62%
- *HDD:* 22%
- *PIPE RAMMING:* 16%

- **WHERE:** Oil pipeline is located everywhere, but most of the new projects are in São Paulo, Rio de Janeiro and Bahia. Specially in Sao Paulo and Rio because of the Pre-Salt Off Shore Projects.

Trenchless market situation



OPTIC FIBER - TLC

NEW INSTALATION OF OPTIC FIBER FOR TELECOMUNICATION – TLC

➤ **TECHNIQUE: MINITRENCH**

• **EXTENSION:**

- Period 2016 – 2019: 550 KM
- Period 2020 – 2022: Good perspective due to 5G network

➤ **WHERE:** States of São Paulo and Rio de Janeiro

➤ **TECHNIQUE: HDD**

• **EXTENSION :**

- Period 2016 – 2019: 150 KM
- Period 2020 – 2022: Good perspective due to 5G network

➤ **WHERE:** Mainly in the states of São Paulo and Rio de Janeiro

Trenchless market situation



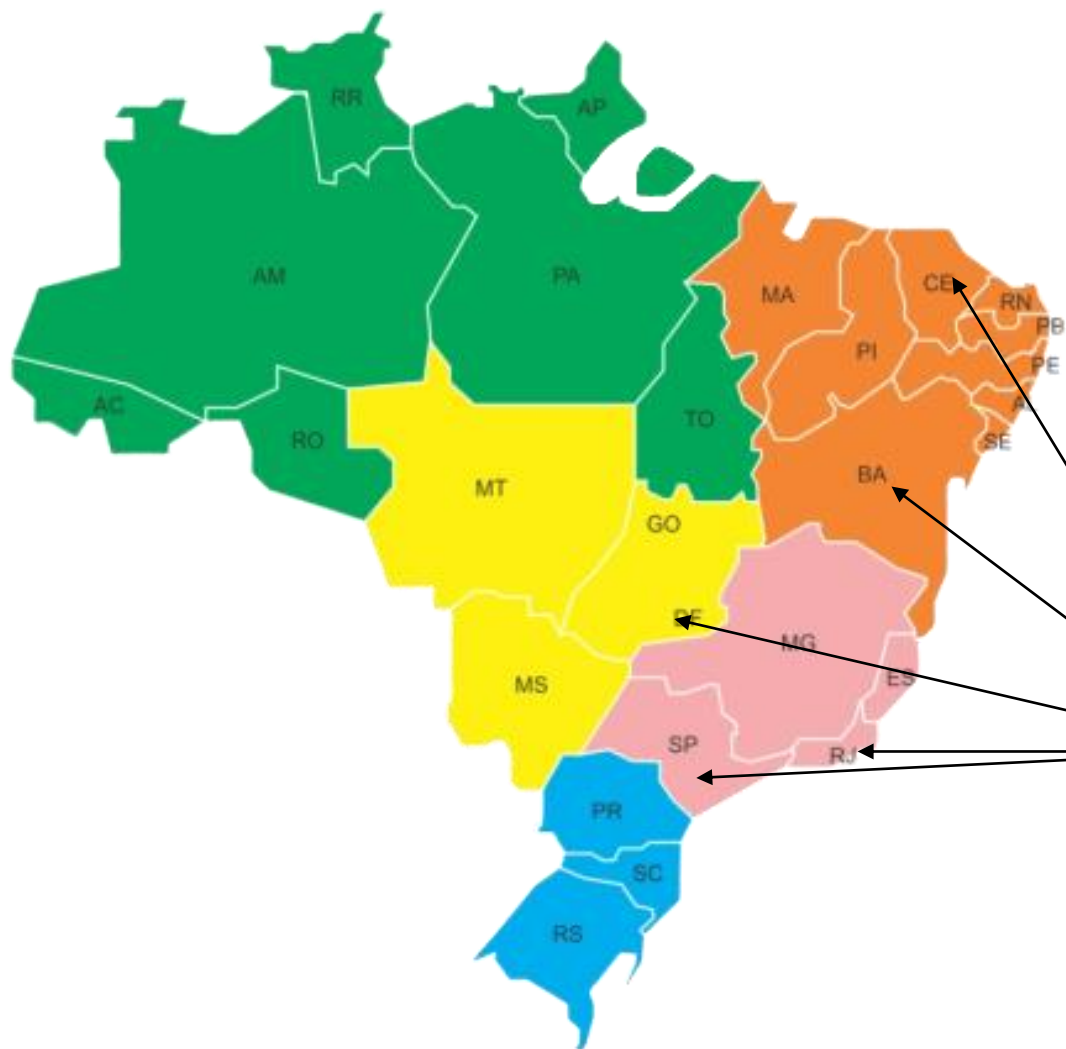
SEWERS NEW INSTALLATION

➤ *TECHNIQUE: MICRO TUNNELLING*

• BUDGET:

- Period 2016 – 2019: US\$ 50 Million / Year
- Period 2020 – 2022: US\$ 100 Million / Year

➤ **WHERE:** City of São Paulo and Rio de Janeiro



SEWERS REHABILITATION

➤ *TECHNIQUE: UV CURING CIPP*

• **BUDGET:**

- Period 2016 – 2019: US\$ 15 Million / Year
- Period 2020 – 2022: US\$ 20 Million / Year

- #### ➤ **WHERE:** City of Salvador, Rio de Janeiro, Fortaleza, Brasilia and State of São Paulo.

Trenchless market situation



WATER PIPE REPLACEMENT

➤ **TECHNIQUE: HDD AND PIPE BURSTING**

• **BUDGET:**

- Period 2016 – 2019: US\$ 250 Million / Year
- Period 2020 – 2022: US\$ 400 Million / Year

➤ **TECHNIQUE: SLIPLINING**

• **BUDGET:**

- Period 2016 – 2019: US\$ 15 Million / Year
- Period 2020 – 2022: US\$ 20 Million / Year

➤ **WHERE:** State of São Paulo

Trenchless market situation

GAS

DISTRIBUTORS:

- ALGÁS - ALAGOAS
- BAHIA GÁS - BAHIA
- NATURGY
- CEGÁS - CEARÁ
- CIGÁS - AMAZONAS
- COMGÁS - SÃO PAULO
- COMPAGAS - PARANÁ
- BR PETROBRAS DISTRIBUIDORA S/A
- COPERGÁS - PERNAMBUCO
- CEBGÁS - BRASILIA
- GASBRASILIANO DISTRIBUIDORA S/A
- GASAP - AMAPÁ
- GÁS DO PARÁ - PARÁ
- GOIASGÁS - GOIÁS
- GASMIG - MINAS GERAIS
- GASPISA - PIAUÍ
- GASMAR - MARANHÃO
- MTGÁS - MATO GROSSO
- MSGÁS - MATO GROSSO DO SUL
- RONGÁS - RONDONIA
- PBGÁS - PARAÍBA
- POTIGÁS - MARANHÃO
- SERGÁS - SERGIPE
- SCGÁS - SANTA CATARINA
- SULGÁS - RIO GRANDE DO SUL



Trenchless market situation



GAS

➤ *TECHNIQUE / METHOD: HDD*

• *DISTRIBUTOR: COMGÁS*

- **PROJECTION: 900 to 1.100 KM / Year**

➤ **WHERE:** State of São Paulo

• *DISTRIBUTORS: ALGÁS, BAHIA GÁS, NATURGY, CEGÁS, CIGÁS, COMPAGAS, BR PETROBRAS DISTRIBUIDORA S/A, COPERGÁS, CEBGAS, GASBRASILIANO DISTRIBUIDORA S/A, GASAP, GÁS DO PARÁ, GOIASGÁS, GASMIG, GASPISA, GASMAR, MTGÁS, MSGÁS, RONGÁS, PBGÁS, POTIGÁS, SERGÁS, SCGÁS AND SULGÁS*

- **PROJECTION: 400 to 550 KM / Year**

➤ **WHERE:** Alagoas, Bahia, Ceará, Amazonas, Paraná, Pernambuco, Brasília, Amapá, Pará, Goiás, Minas Gerais, Piauí, Maranhão, Mato Grosso, Mato Grosso do Sul, Rondonia, Paraíba, Maranhão, Sergipe, Santa Catarina and Rio Grande do Sul.

Grazie Mille



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