



ENERGY SECURITY

The Role of Brazil

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Content

- ❑ Security and reliability
 - ❑ Empire or institutions?
 - ❑ Integration: benefits and obstacles
 - ❑ Energy transition, security and competitiveness
 - ❑ Multilateral energy security
-
- reservoir



CONTEXT

- ❑ **Vast energy resources (renewable and fossil) but energy rationing is a frequent**
- ❑ **Integration offers opportunities for substantial economic and security benefits**
- ❑ **Barriers: infrastructure, regulation, pricing**



Security

- **Reliability**
 - **Avoid unexpected supply cuts**
 - **Domestic issue**
- **Supply security**
 - **Long time supply cuts**
 - **Opportunism**
 - **Adverse selection: higher supply costs**



INTEGRATION

- **Empire – Region**
 - **Political Block**
 - **Hegemonic country**

 - **Political agreement**
 - **SOE**

 - **Regional economic competitiveness**



INTEGRATION

- **Market- Institutions**
 - **Multilateral agreement**
 - **Regulation**
 - **Contracts**

 - **Energy charter treaty**
 - **Private investment**

 - **Regional economic competitiveness**



INTEGRATION

□ South America

- 1990: market-institutions
- 2000: empire-region?



INTEGRATION

- **Benefits**
 - **Hidrological diversity (power sector)**
 - Operation costs ((US\$ 529 million)
 - Investment costs
 - **Natural gas**
 - Low opportunity costs resources idle
 - Existing infrastructure idle
 - **Supply security**



INTEGRATION

- **Barriers**
 - **Conflicting views (Importers X Exporters)**
 - **Hidroreservoirs use**
 - **Dispute on rents**
 - **Environmental issue**
- **Fragility of bilateral agreements**
- **IIRSA: move on steps**



BRAZIL

- **Until the 1990's**
 - **Itaipu**
 - **Bolivia pipeline**
 - **Garabi converter + transmission line**
- **2000's**
 - **Crisis**



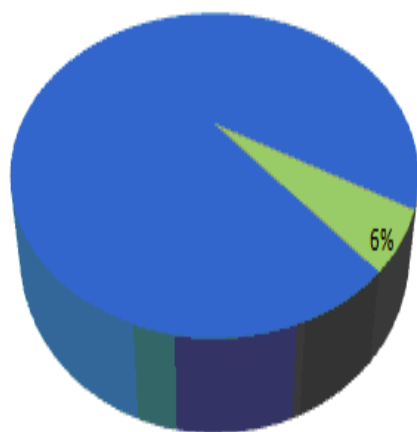
BRAZIL

- **Positioned for energy transition**
 - **Hydrocarbon resources**
 - **Renewable resources**
 - **Security and flexibility**



Net Exporter of Supply Security

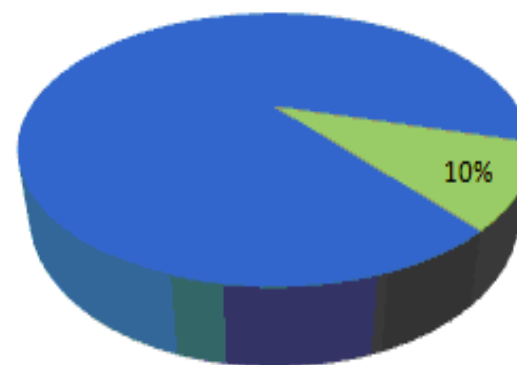
2010



South American Exports: 30.2m barrels/day

■ South American Exports

2030



South American Exports: 32.9m barrels/day

■ South American Exports



CAN

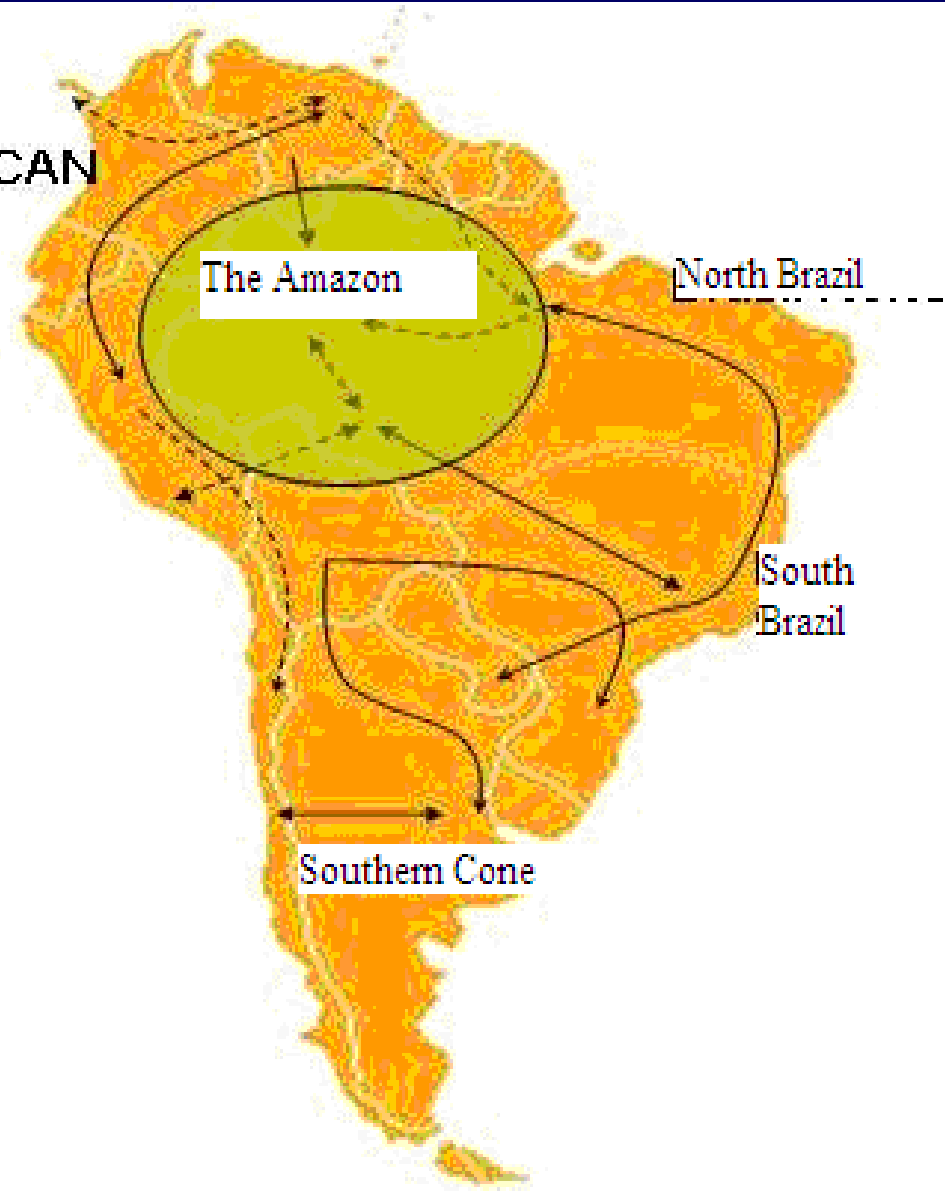
The Amazon

North Brazil

South
Brazil

Southern Cone

— Existing Axes
- - - Planned Axes





RMSE

□ CMSE

- Risk aversion curves
- Gas infrastructure idle
- Higher electricity prices
- Subsidies



RMSE

- **Multilateral agreement for the use of reservoirs in critical supply situations**
 - **Long term price**
 - **Access to transportation**



RMSE

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CHALLENGES

- Institution-market approach
- Access to the Brazilian reservoirs
- Treaty
 - Investment protection
 - Pricing mechanism
- Political convergence



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