

BRAZILIAN INFRASTRUCTURE INVESTMENT OPPORTUNITIES: BEYOND THE ELECTIONS

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ANA CARLA ABRAO

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Contents

1. The infrastructure gap in Brazil	3
2. Investment opportunities	12
3. Challenges ahead	23

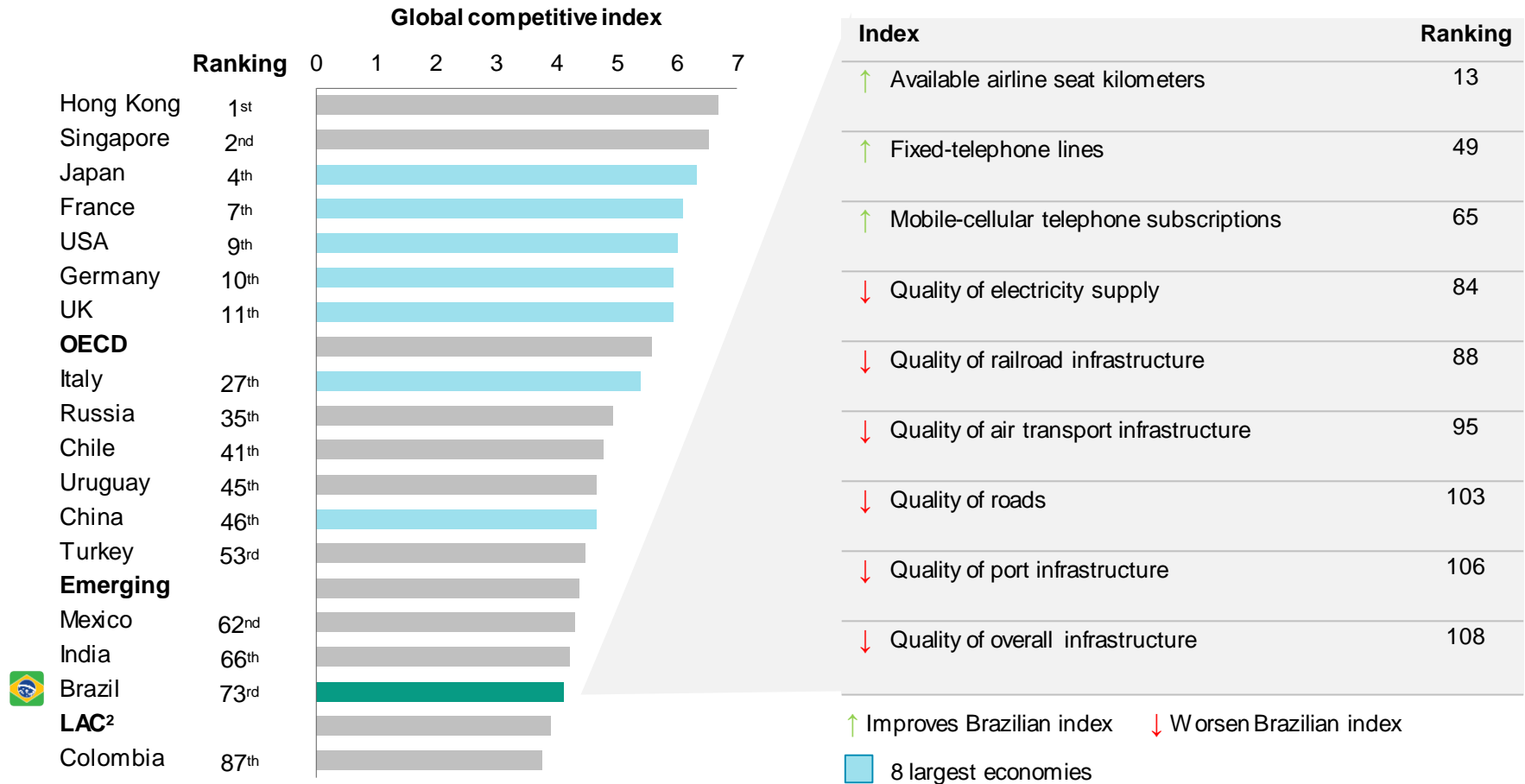
Section 1 | Infrastructure gap in Brazil

Infrastructure gap in Brazil

Despite being the 9th largest economy in the world, Brazil ranks 73rd in general infrastructure, close to LAC and below other emerging countries

General Infrastructure ranking ¹

Rank/137, 2017

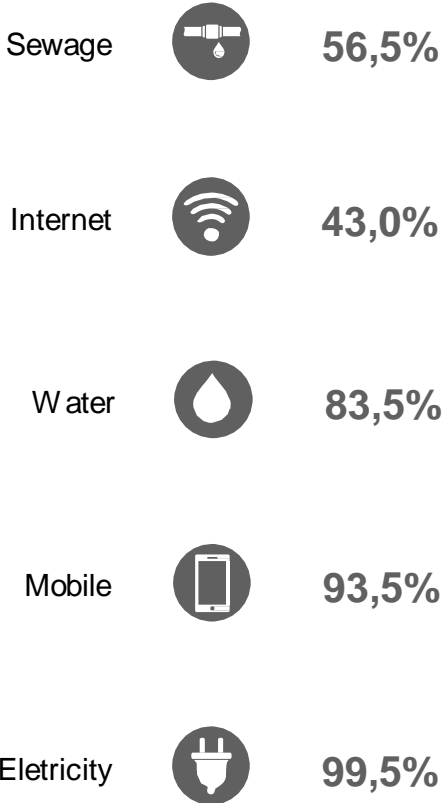


Source: (1) Global Competitiveness Index (GCI) 2017-18, World Economic Forum; (2) Latin America and the Caribbean countries; 2nd pillar: Infrastructure; Oliver Wyman Analysis;

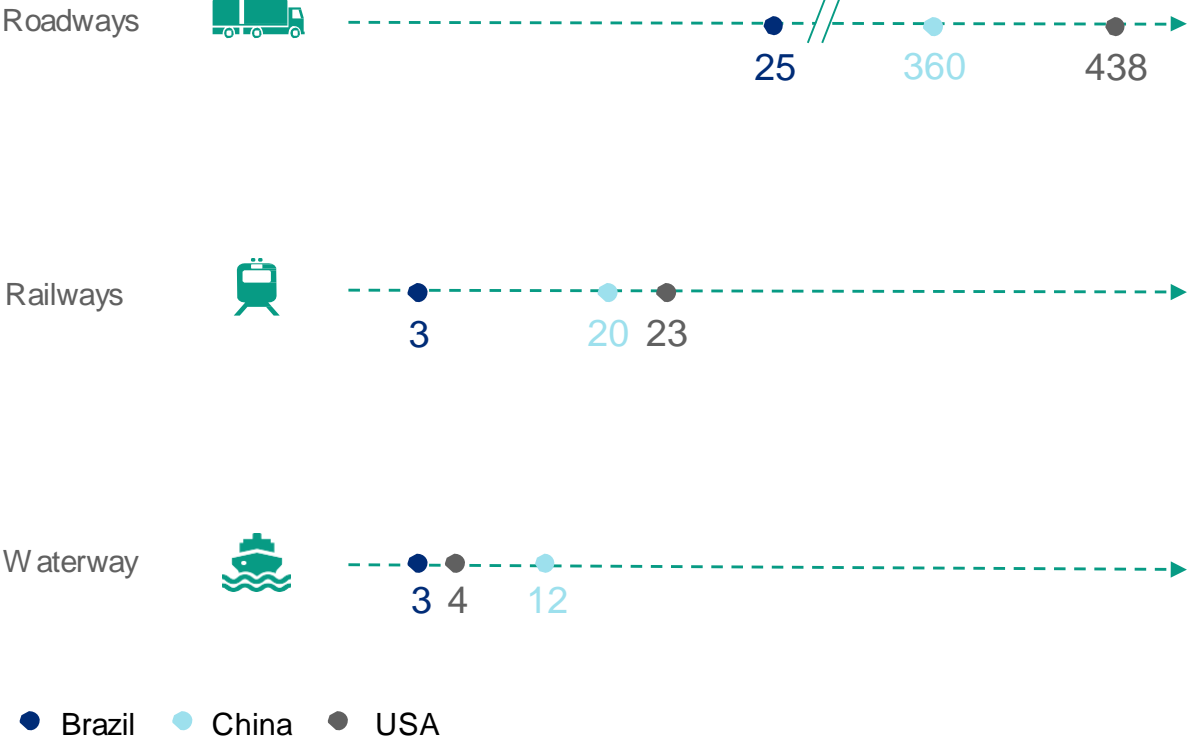
Infrastructure gap in Brazil

The inadequate infrastructure is reflected in poor indicators across key sectors, demonstrating that basic infrastructure is not yet universalized

Infrastructure services access
% of households, 2015



Transportation network density
KM network/1,000 km² area, 2014

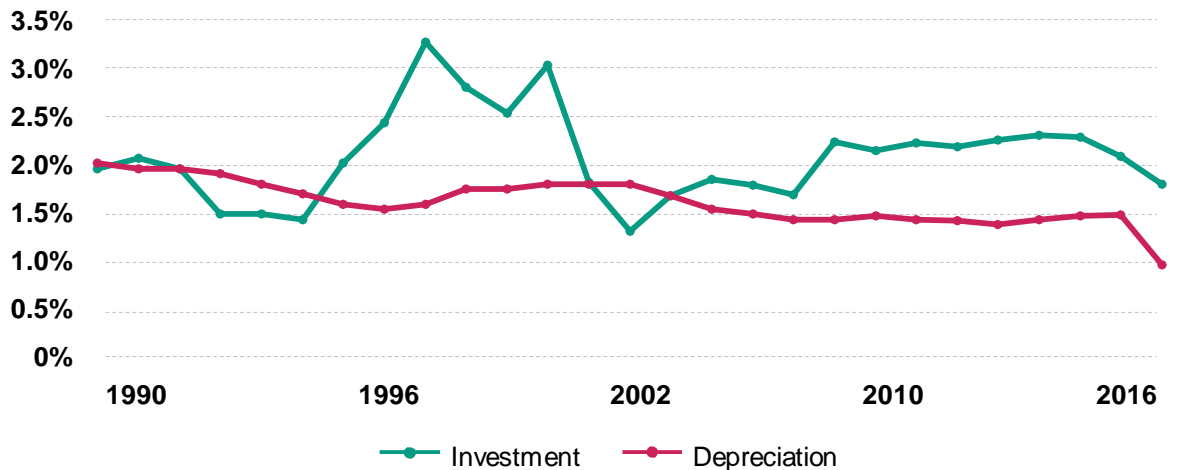


Source: PNAD – Pesquisa Nacional por Amostragem de Domicílios, IBGE; Confederação Nacional dos Transportes; World FactBook; Antaq; ANTF; Oliver Wyman Analysis

Infrastructure gap in Brazil

Brazil invests ~2% of GDP in infrastructure, which is not always enough to cover depreciation

Investment and depreciation of Brazilian infrastructure
% of GDP, 1990–2016



- While **Brazilian** infrastructure investments are ~2% of GDP, **China** invests ~7% and **India** ~5,5%

- In a few years, **investments were not sufficient** to cover depreciation

Understanding the investment volume

- Privatizations cycle (eg. Telecom) and creation of regulatory agencies
- Economic crisis across emerging markets (Mexico, Russia, Asia...)
- Public-private partnership law (2004)
- Efforts to resume growth path via multiple government infrastructure programs (e.g., PAC)
- New program (PPI) with focus on a new governance

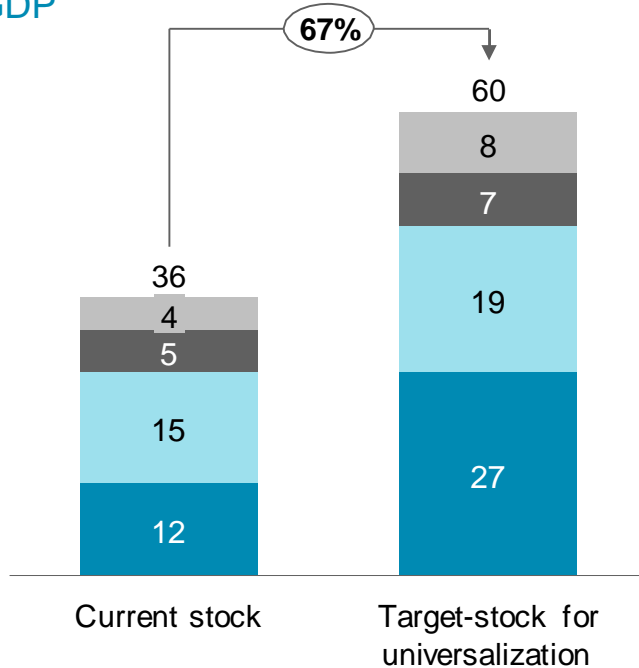
- **Singapore** invests around 2,5% of GDP, and **USA** investments **only** in **water** and **transportation** are more than that

Source: Frischtak e Mourão; Oliver Wyman Analysis.

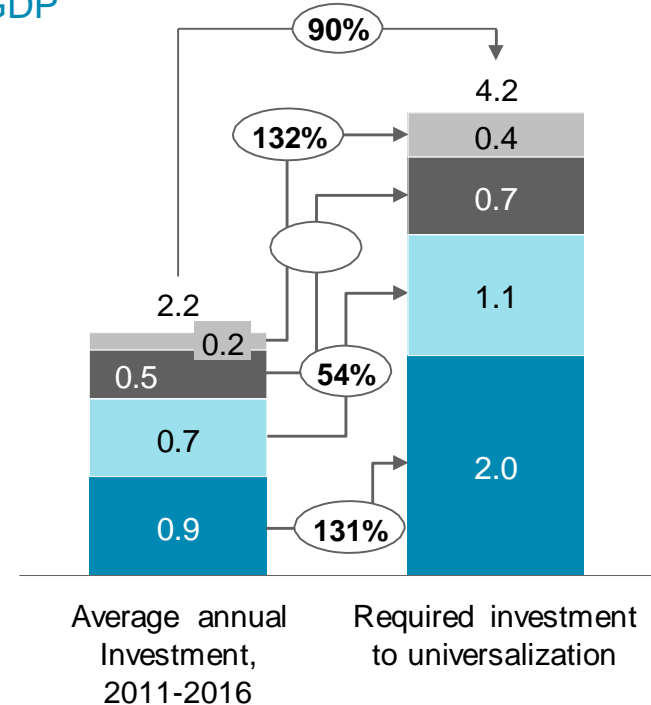
Infrastructure gap in Brazil

To achieve the universalization it is required a 67% increase in the infrastructure stock

Infrastructure stock by sector
% of GDP



Infrastructure investment by sector
% of GDP



Sanitation
 Telecommunication
 Energy
 Transportation



Drill-down on gaps by sector in the next pages

Infrastructure project overprice and poor investment allocation, as in the past, will result in longer time for universalization

Source: Frischtak e Mourão (2017)

Infrastructure gap in Brazil: Sanitation

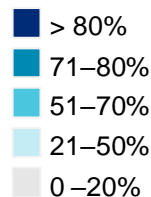
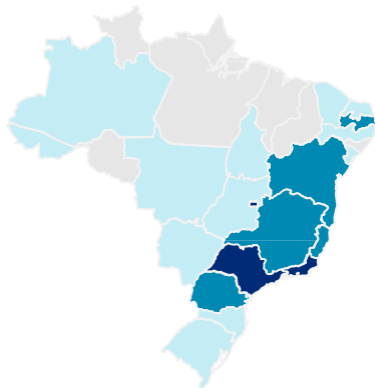
Basic sanitation shows the greatest gap with 56.5% of the population with access to the sewage network

Access to water and sewage network % population, 2014

Water network



Sewage network



Sources: (1) PNAD 2014

- In the modern world, **sanitation is perhaps the most basic service** to be provided by the government
- Unfortunately, **Brazil is lagged** in this fundamental area **mainly in North and Northeast regions**
- Brazilian **sewage treatment situation is even worse**
- Only the **South and Southeast have acceptable levels** of access to the sewage network
- Research shows complementary information on Brazilian lack of basic sanitation
 - World Bank indicates that **only 39% of households** in Brazil have access to **improved sanitation**
 - IBGE points that **almost 20% of households do not have** access to the **collection network or septic tank**

Infrastructure gap in Brazil: Telecommunication

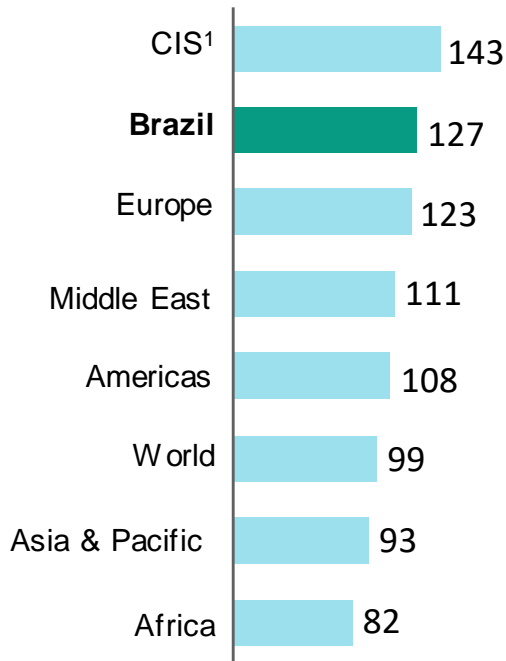
Brazil has one of the highest penetration rate of mobile phone in the world, but lags in broadband internet, fixed-voice and Pay-TV

Penetration of telecom services by region/country
2015 figures

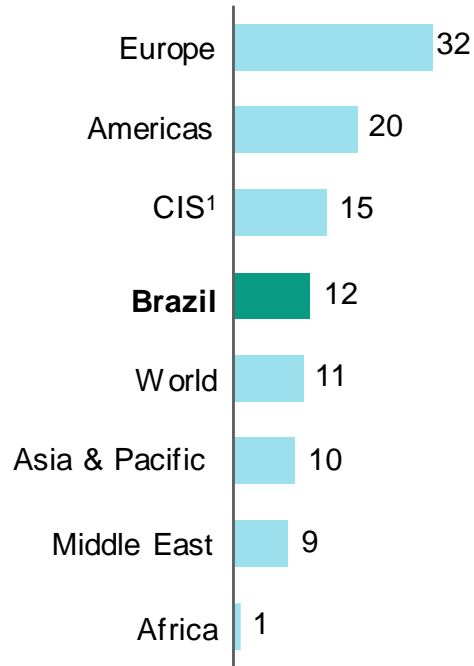
Main global direction



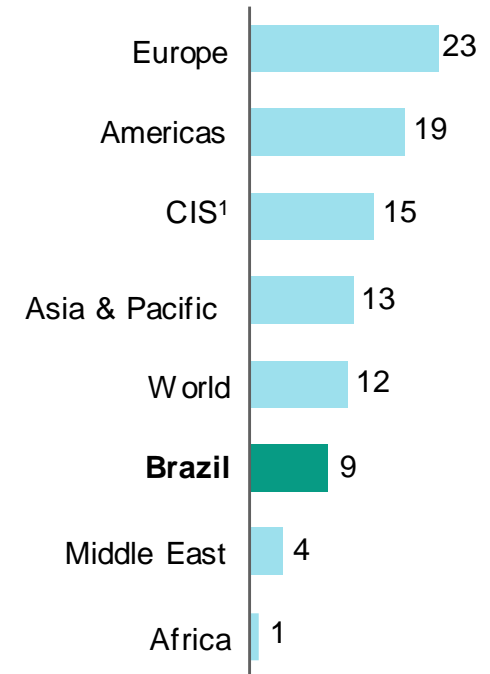
Mobile telephony
Subs/100 inhab.



Fixed broadband
Subs/100 inhab.



Pay-TV
Subs/100 inhab.



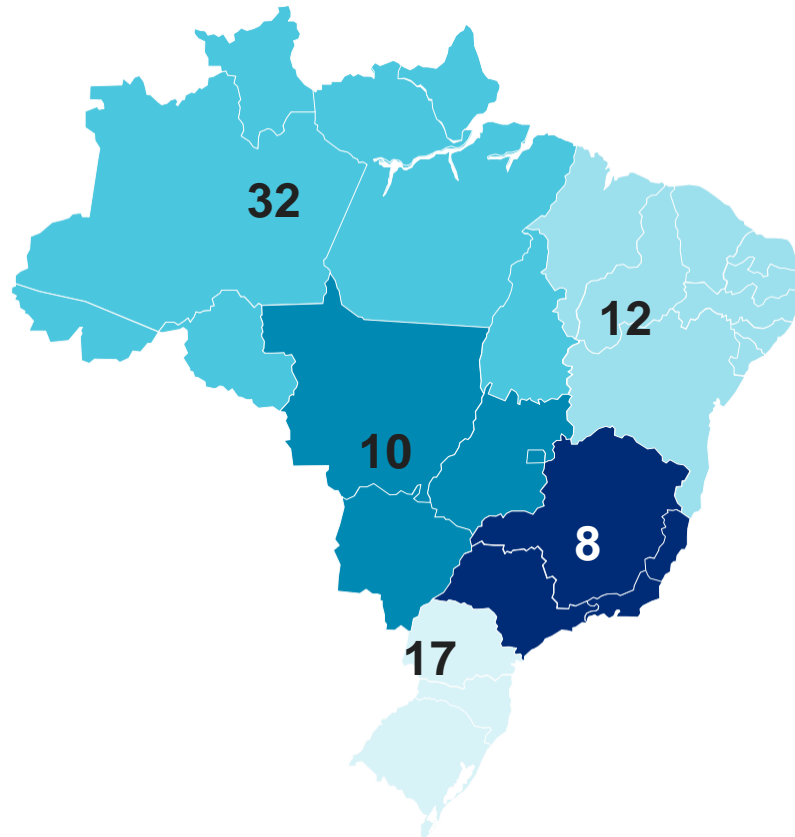
Notes: (1) CIS means Commonwealth of Independent States (Belarus, Russia, Kazakhstan, Moldova, Azerbaijan, Ukraine, Armenia, Georgia, Kurdistan, Uzbekistan, Turkmenistan)
Source: International Telecommunication Union; OVUM; Oliver Wyman analysis

Infrastructure gap in Brazil: Energy

One of the highest price worldwide, mainly due to inefficiency of the generation, distribution and to transmission costs

Blackouts frequency per region in 2015

EFC ANEEL



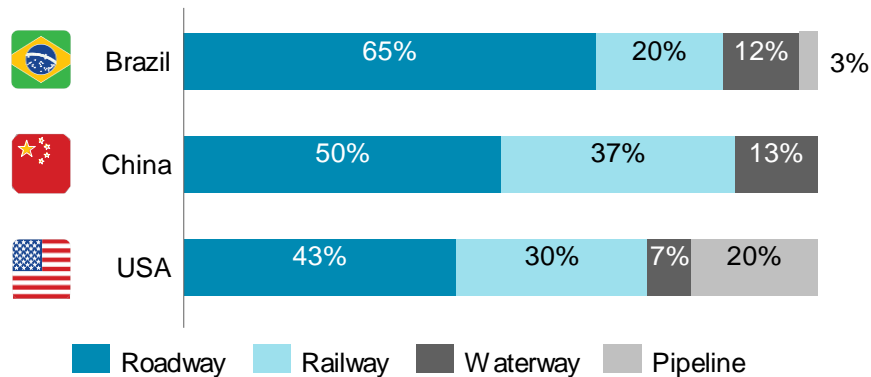
- Currently, **almost 70% of the country's energy is hydroelectric** - electricity reaches almost 100% of households in the country
- However, the system is still vulnerable to oscillations having **frequent blackouts**
- The system relies mainly on **expensive thermal energy** to compensate for the water deficit
- Adjustments are required to build a more **balanced matrix** that provides greater **safety** to the system at a **competitive cost** and maximizes the country's energy potential

Infrastructure gap in Brazil: Transportation

Transportation matrix relies mainly on roadways, despite the low density of the network, affecting the cost of freight and the logistics efficiency

Freight transportation matrix¹

% de TKU, 2015

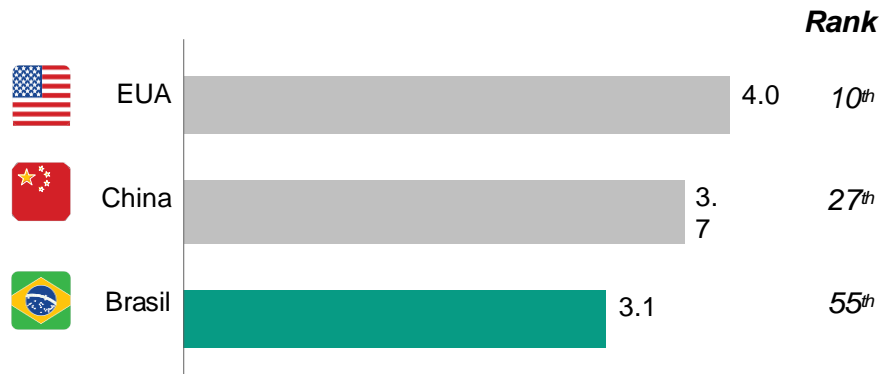


- Today, the **logistics network of Brazil is inefficient** compared to developed and even other developing countries such as China, Chile, India and South Africa

- **Logistics costs** in Brazil represented **12,3% of GDP** in 2015 vs **8% in the USA**

Logistics efficiency of freight transportation²

Logistics Performance Index (0 –5), Rank/160, 2016



- This is mainly due to the **excessive use of roads** instead of other modes of transport that are cheaper and more efficient, such as railroads or waterways

- Despite of prioritizing roadways, when **compared with US and China** – countries of similar size – **Brazil has ~200x less roadways**

- Besides, Brazil's rail network is only 10% the US or China

Note: Air freight excluded from analysis as represents less than 1% of total transportation

Source: (1) Logistics Costs in Brazil, Ilos, 2017; (2) World Bank, Logistics Performance Index (LPI), 2016

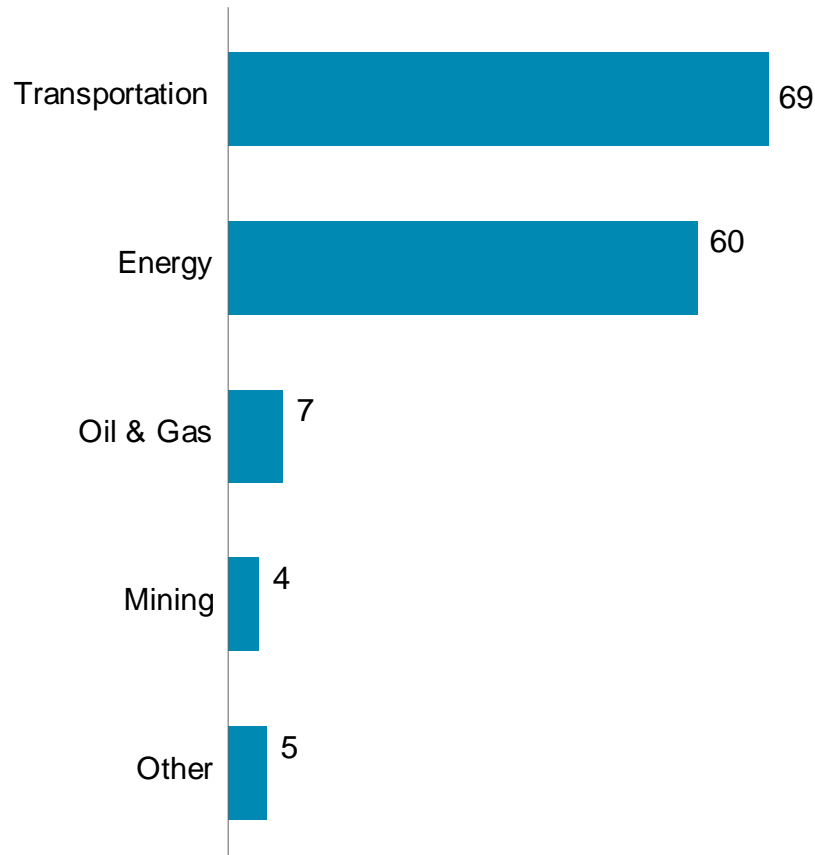
Section 2 | Investment opportunities

Investment opportunities

Currently, there are 145 projects on the pipeline under the Brazilian Investment Partnership Program (PPI)

Projects pipeline by sector

of projects, 145 projects of main sectors



Comments

- **34 projects** were qualified as **national priority** in September 2016
- In 2017, further **111 projects** were approved, mainly on the transportation and energy sectors, **totaling ~R\$ 275 billion** in investments
- It is estimated that 45% will be auctioned as concessions, 23% as PPP, and 8% will be privatization

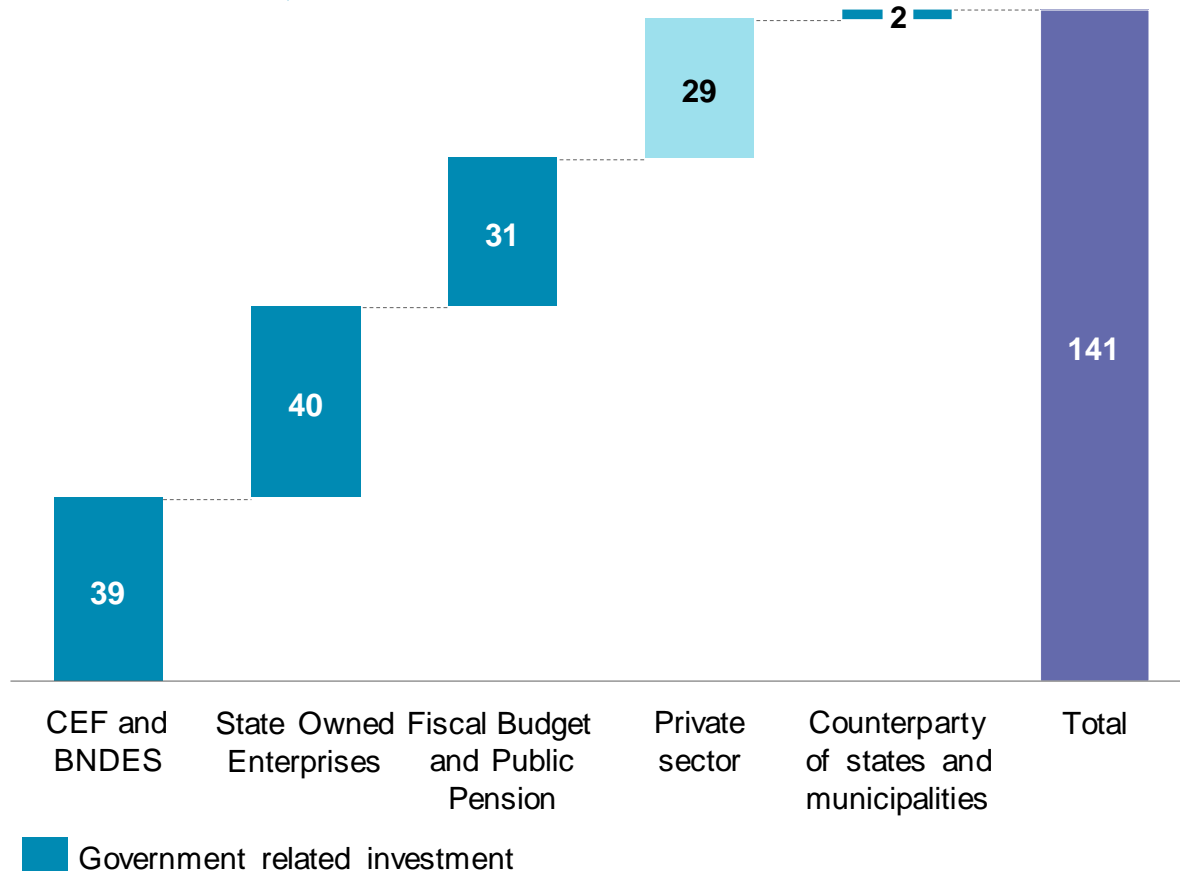
Source: Brazilian Investment Partnership Program (PPI); Selected media.

Investment opportunities

Traditionally, infrastructure projects have been mainly funded by the government through state banks and direct investments

Investment source split

2015 to 2017 H1, USD BN



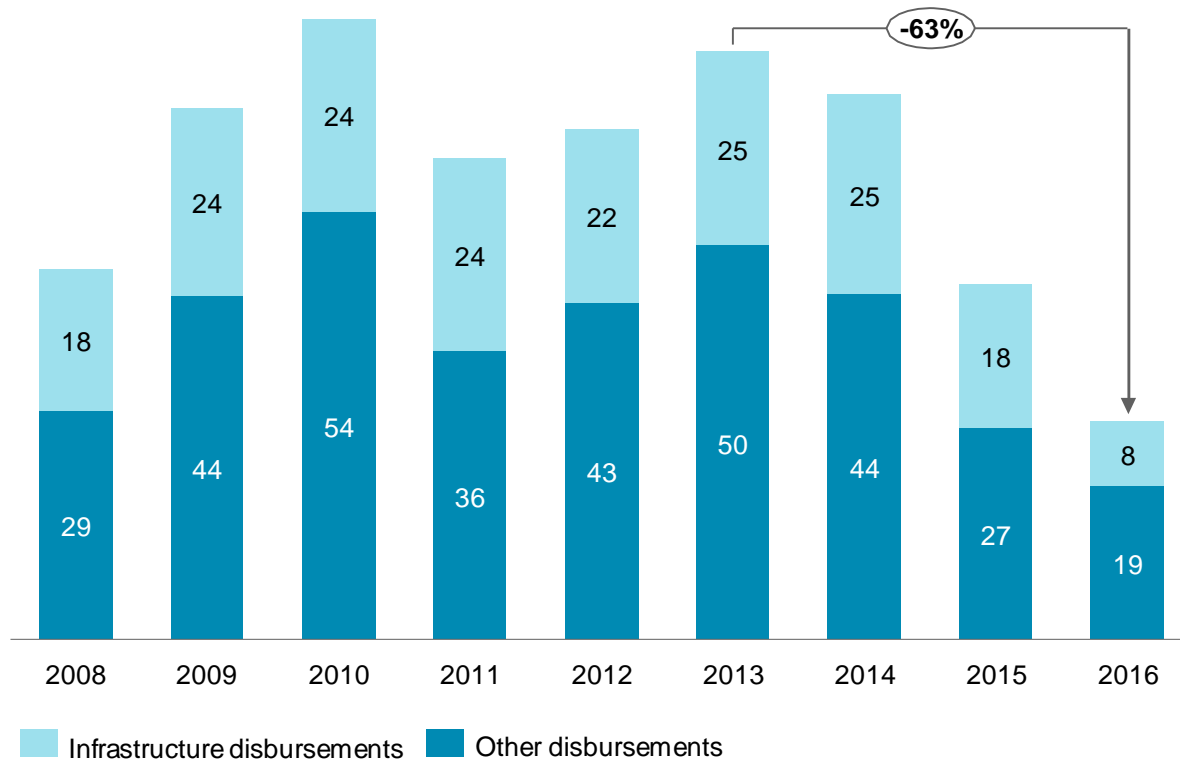
- The **government and its entities** (e.g. BNDES, Caixa Econômica Federal (CEF), Banco do Brasil) have provided **~80% of total funding** for infrastructure between 2015 and 2017 (H1)
- Public funding was provided via **subsidized loans, crowding-out other funding alternatives** – for example, infrastructure-focused (or other long-term) capital markets instruments

Source: BNDES (Perspectivas de Investimento from February 2016), Programa de Aceleração do Crescimento (PAC), Oliver Wyman analysis

Investment opportunities

The usual infrastructure investments funding model has, however, become unfeasible due to the recent economic and fiscal crises

BNDES infrastructure disbursements
USD BN



- More recently, the government has been focusing on a fiscal consolidation agenda
- It is, hence, starting to decrease participation in infrastructure projects and incentivize further private investments
- As a consequence, BNDES disbursements already have decreased by 63% since 2013

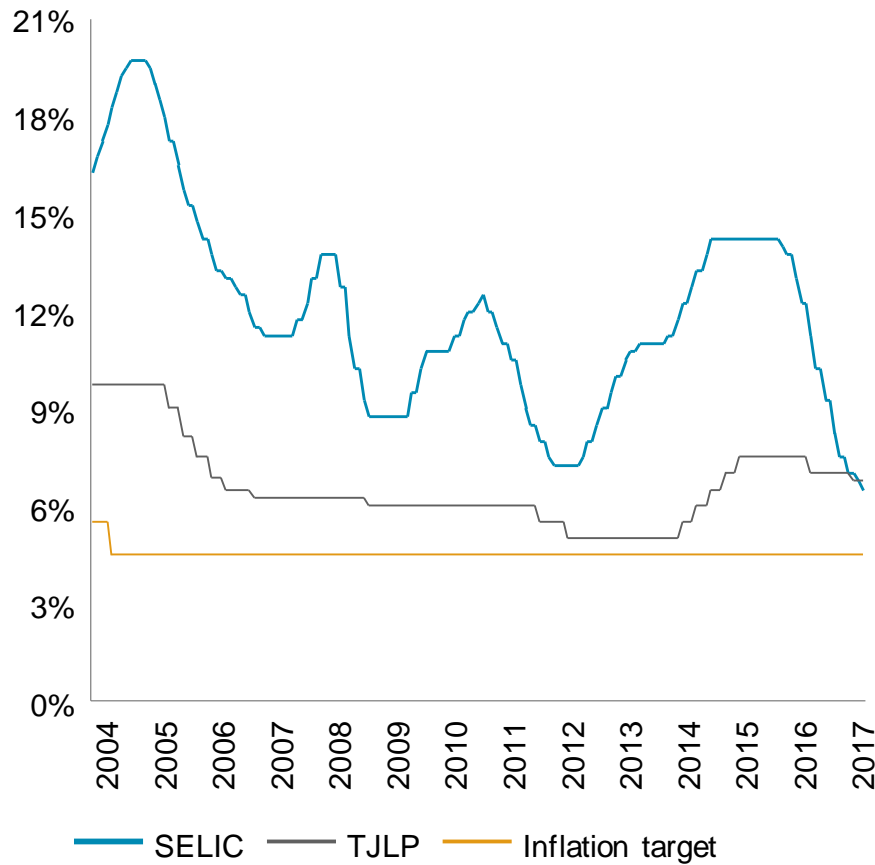
1. Exchange rate – as of each year end, from Ipea data (Institute of Applied Economic Research)
Source: BNDES (Perspectivas de Investimento from February 2016), Programa de Aceleração do Crescimento (PAC), Oliver Wyman analysis

Investment opportunities: Long-term interest rate

The Brazilian government introduced the a new long-term interest rate (TLP) in order to incentivize the private investment by reducing gap in interest rates

Basic interest rate (Selic), long-term interest rate (TJLP) and inflation target

% on year basis



- There was a considerable gap between previous long-term interest rate (TJLP), used by BNDES to finance infrastructure projects, and the basic interest rate (Selic)
- BNDES had a clear advantage over private sector to provide funding for infrastructure
- With the introduction of the new long-term interest rate (TLP), the difference between BNDES interest rates and the base rate will be gradually eliminated
- This decreases the advantage BNDES traditionally had of a much lower funding cost
- The measure should reduce the crowding-out effect and allow more private investment as a funding source for infrastructure
- The rates convergence also creates incentives for the development of other long-term financial instruments that channels resources to infrastructure

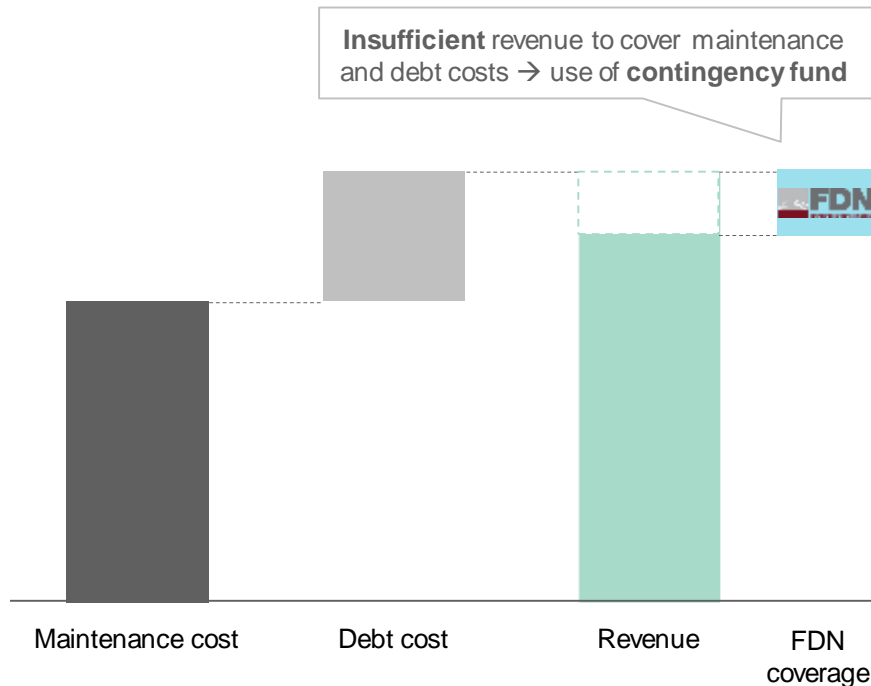
1. Includes Loans, Bonds, Investment Funds, Private Capital and others, 2. Includes: Federal Union, States, CEF, FI-FGTS.

Source: National Confederation of Industries (CNI), O Financiamento Do Investimento Em Infraestrutura No Brasil: Uma Agenda Para Sua Expansão Sustentada; Brazilian Central Bank.

Investment opportunities: government role

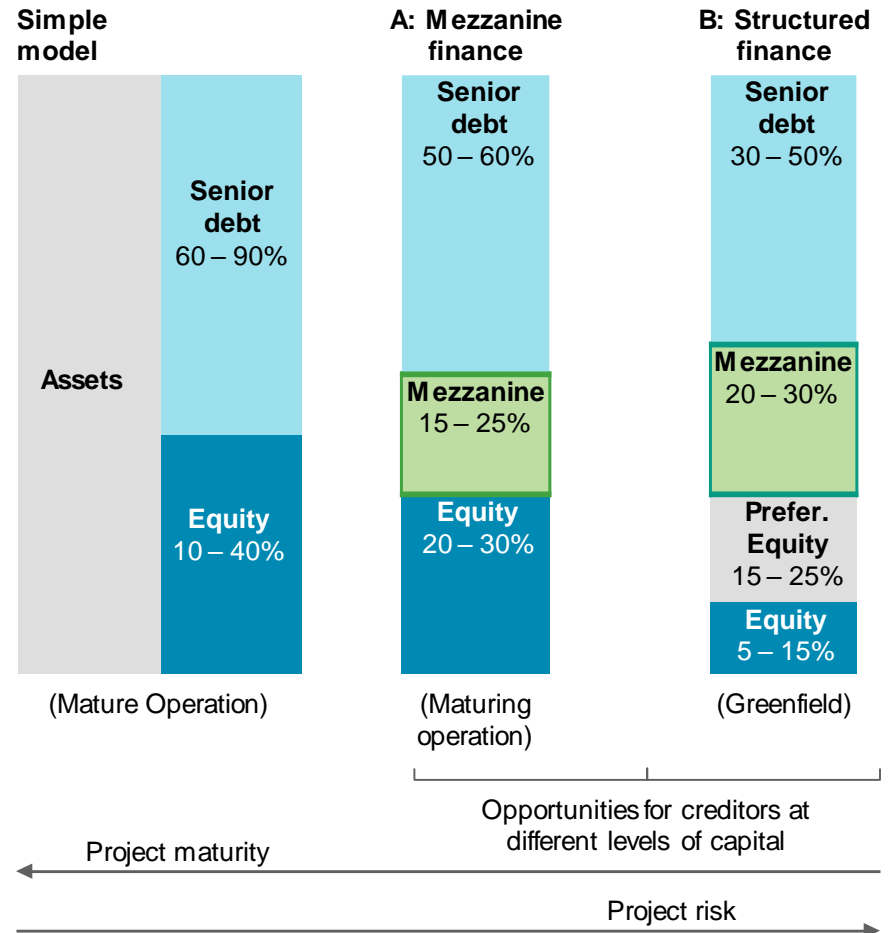
The government and, particularly, the BNDES have enough expertise to have a role that is value-adding and not distortive

Example: The FDN in Colombia



- The FDN has a **contingency fund** for problems that arise during the construction or operation of projects
- If also supports the formation of the infrastructure funds via **securitization** and initial capital injections, attracting additional investors

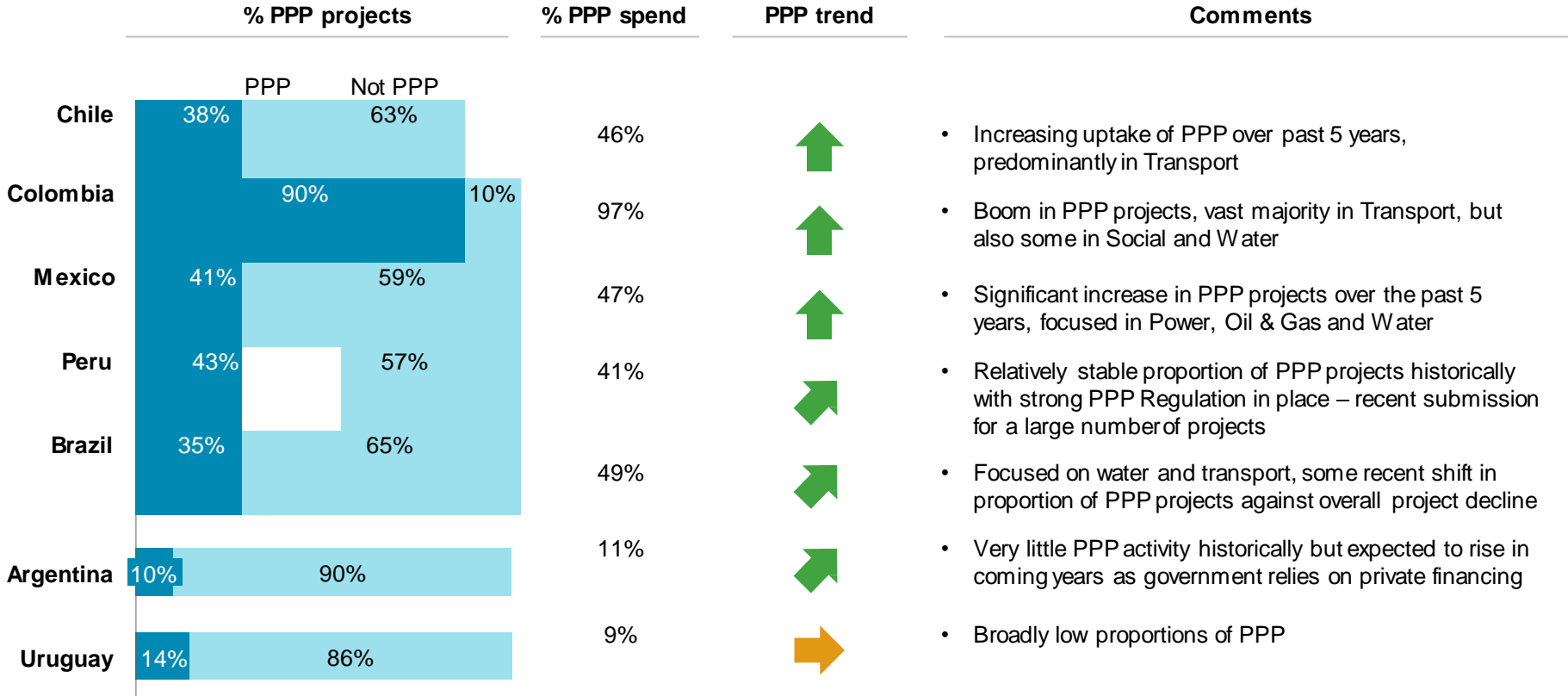
Example: BNDES as investor in mezzanine debt



Investment opportunities

Brazil is following the movement across Latin America, where a strong PPP activity is on the rise as an alternative to government funding

























Privately financed projects – PPP activity¹



1. % of all privately financed projects that are PPP, 2015-16, for Renewables, Transport, Social, Power, Oil and Gas, Water, Telecomms for projects costing \$50 MM to \$1.5 BN
 Source: IJ Global, InfraPPP, Public reports, Oliver Wyman analysis

Investment opportunities

Considering the balance between the risk-return profile vs the pipeline size, Brazil is still the most attractive option in Latin America

Opportunity	Pipeline	Returns	Risk profile
1  Brazil Projects	 Large pipeline of opportunities in social and urban, energy and logistics	 10–15% (premium for construction risk)	 Complexity on construction No/limited merchant risk with government revenue mechanisms. Still an element of political risk
2  Argentina Projects	 Sizeable pipeline for tram extensions and considerable rolling-stock demand	 8–12% (could be 13–15% for unsolicited proposals)	 No merchant risk. May be some residual risk on rolling stock partnerships
3  Chile Projects	 Pipeline currently limited, particularly for 12–18month time frame; more projects to enter pipeline to meet government offshore targets	 9–15% (potentially lower because market is more mature)	 Complex construction , limited expertise in new markets. Merchant risk limited by revenue mechanisms. Risk of minority equity stakes
4  Colombia Projects	 Large pipeline, primarily in Colombia but also adjacent countries	 11–14% (large merchant element)	 Necessity to take on merchant risk , with large exposure to wholesale market prices, but favourable fundamentals should make this relatively predictable
5  Mexico Projects	 Strong pipeline for PV solar and wind – expected to be largest renewables market in LatAm in next 5 years	 6–9% (very competitive projects being bid at US returns)	 Auction contracts offer long-term returns (15–20 years), limited merchant risk Some country risk
6  Peru Projects	 Lots of activity in a fast moving market; various initiatives and models to play in	 12–17% (large degree of merchant/regulatory uncertainty)	 Necessity to take on merchant/operation risk Fast moving market, difficult to judge competitiveness

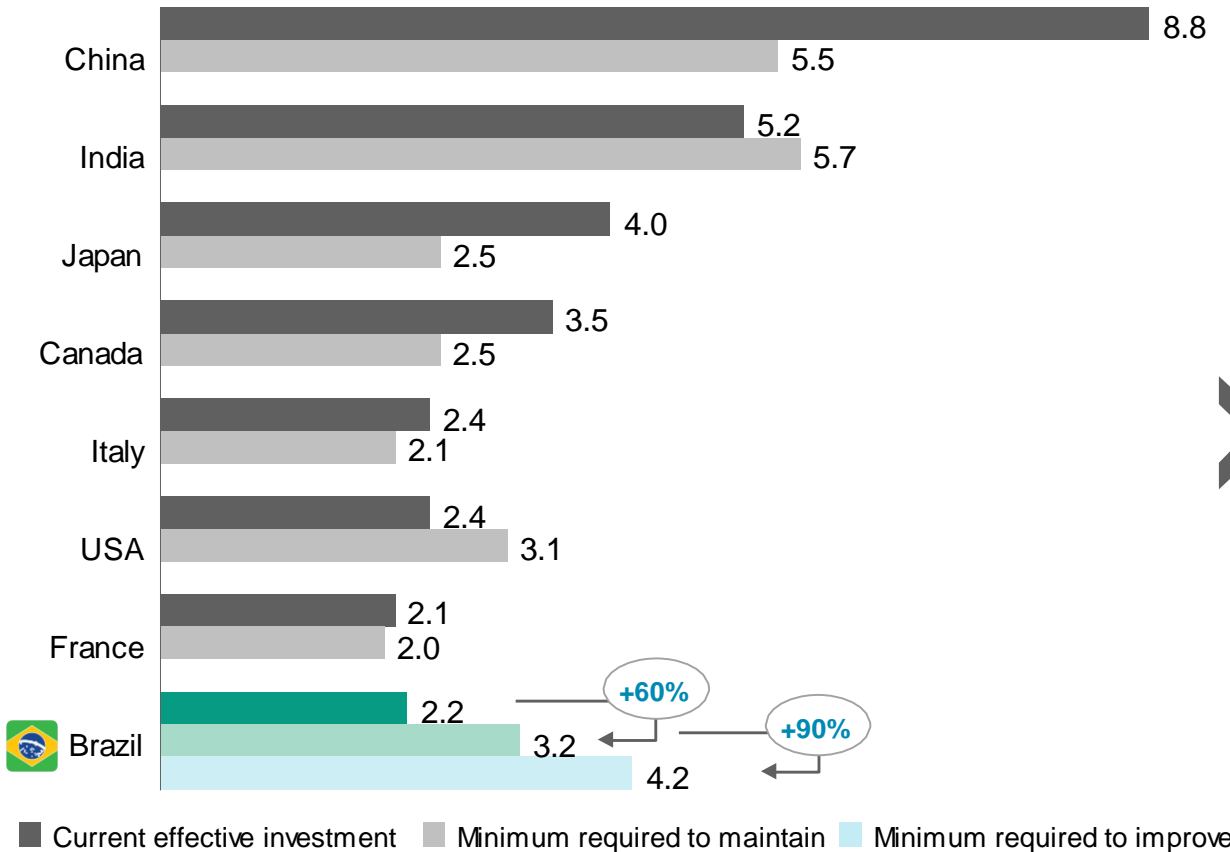
Key:  Favourable conditions  Neutral conditions  Headwinds

Source: Oliver Wyman analysis

Investment opportunities

Brazil has the largest investment gap compared to other countries and hence the greater upside for investors

Average annual investment in infrastructure¹² % GDP



- Brazil's has the largest gap of required investment to current investment
- As a consequence there is a high demand for infrastructure across sectors and across the country
- The large expected pipeline as well as the high demand for infrastructure presents a significant opportunity for investors

Note: Values to 2016 level

Source: (1) Infrastructure Yearbook Exame 2016-2017; Oliver Wyman; (2) Average 2008-13 to other countries and 2011-16 to Brazil, to be aligned with previous pages

Section 3 | Challenges ahead

Challenges ahead

There are four main risk areas to be managed to increase efficiency in the sector and attractiveness to investors



Procurement model unable to ensure legal stability



Environmental licensing excessively bureaucratic



Regulatory agencies with no autonomy to act

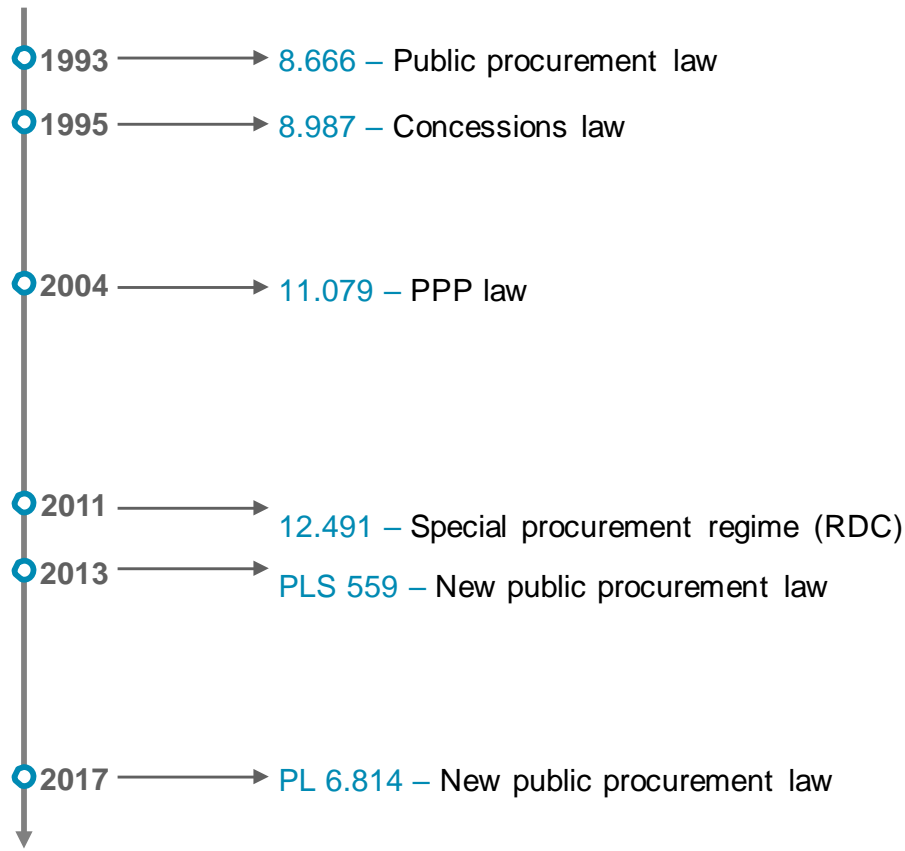


Delays on processes and decision making

Challenges ahead

Procurement model is unable to ensure legal stability and, despite having been amended several times still carries inefficiencies

Evolution of the legal framework of the procurement model



Source: ANEEL – National Agency of Electrical Energy

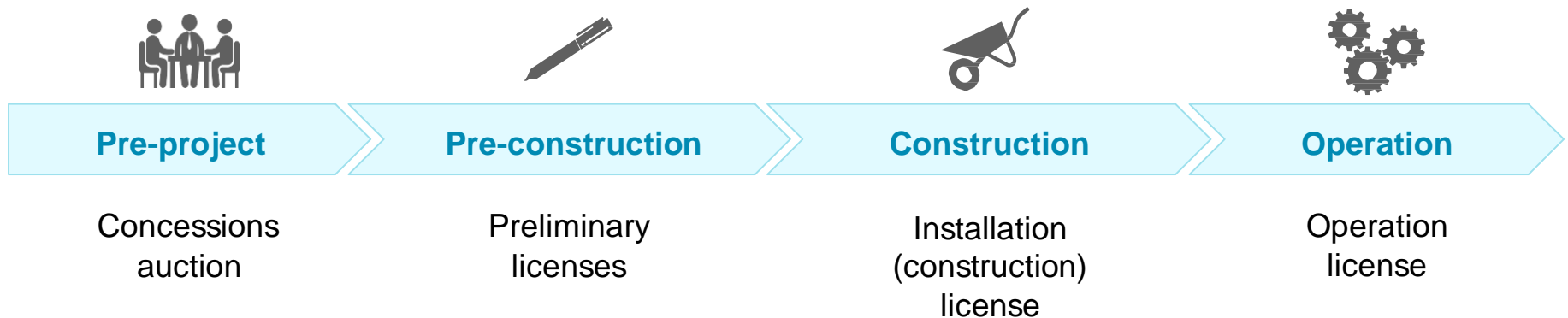
Proposed initiatives to improve the contractual relationship between public and private sectors

- Improve the **design of bidding auctions** to ensure appropriate risk and revenue sharing and to curb opportunistic renegotiation
- Create **companies** classification entries with **quality assessments** of their services
- Elaborate contractual provisions to **reduce requests for rebalancing**
- Include in the contracts **clear rules on compensation** over the life of the project
- Stimulate the contracting of **performance bonds** and **other alternative instruments** for all infrastructure projects

Challenges ahead

Environmental licensing is extremely bureaucratic and is a source of risk for investors and fund providers

Environmental licensing



Government, agencies and concessionaires plays a role in the reduction of these risks

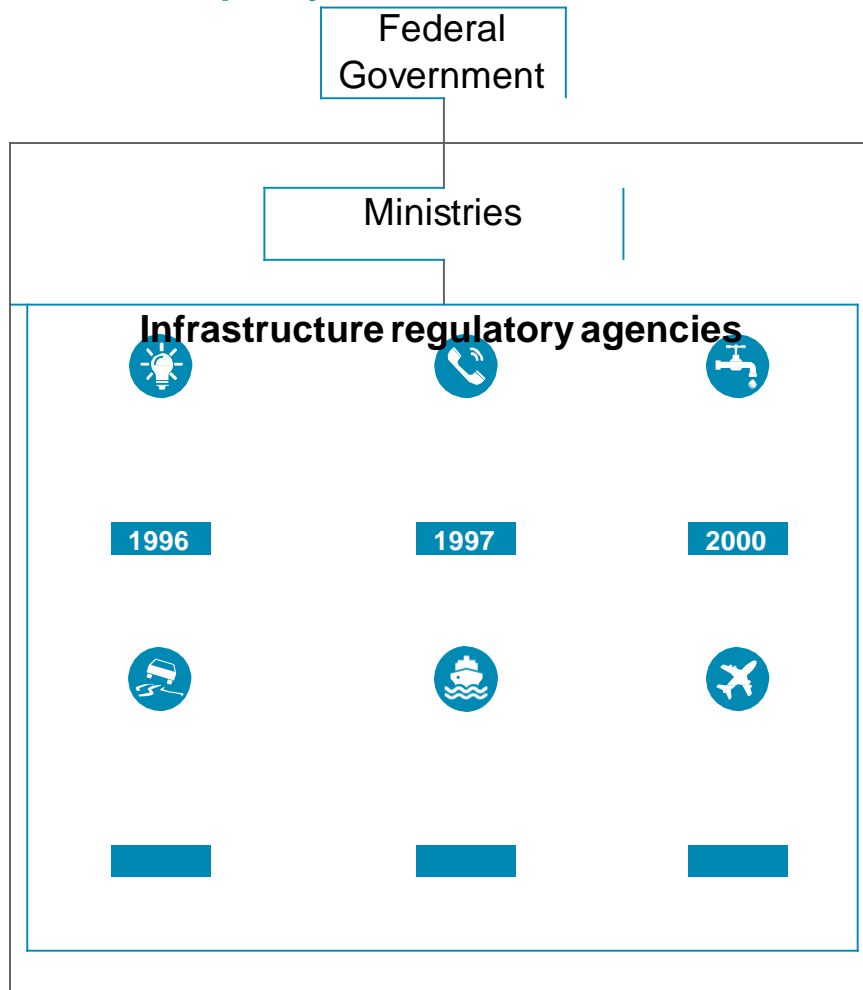
Government	Regulatory agencies	Concessionaires
<ul style="list-style-type: none">• Define rules and competencies of each body involved• Review joint liability for environmental damage	<ul style="list-style-type: none">• Increase transparency in processes• Simplify and streamline processes	<ul style="list-style-type: none">• Improve the structuring of projects

- Changes to licensing rules have been discussed in Congress, but suggestions were deemed too polemic
- Some projects are being auctioned with preliminary/ construction licences to cut red-tape

Challenges ahead

Regulatory agencies have inefficiencies and are unable to ensure a stable legal environment

Regulatory agencies were set up in 1990 to ensure the quality of services



To improve legal environment, it is necessary to

- Provide budgetary **autonomy** to regulatory agencies to ensure independent decision-making
- Review the **eligibility criteria** of board members
- Fix the problem of executive **high vacancy** level
- Some proposals are already being discussed in the Congress and they aim at providing
 - **More objective rules** for the appointment of key decision-makers of regulatory agencies – example: ten years experience in the field of activity of the regulatory agency or related area
 - **More autonomy** for agencies, improving decision-making capacity and technical robustness of choices
 - **More transparency**

Challenges ahead

Excessive liability of civil servers delays decision processes. New law enacted last April aims at minimizing this problem

What issues civil servers face regarding excessive liability?



- Public officials are **personally responsible** for any decision taken and, if this is considered undue, **may face administrative/legal action**
- The risk makes them **excessively cautious**, and the situation is exacerbated by increased **scrutiny of oversight bodies**
- This results in **delays in processes** and **insecurity** for investors

What is expected with the new law?



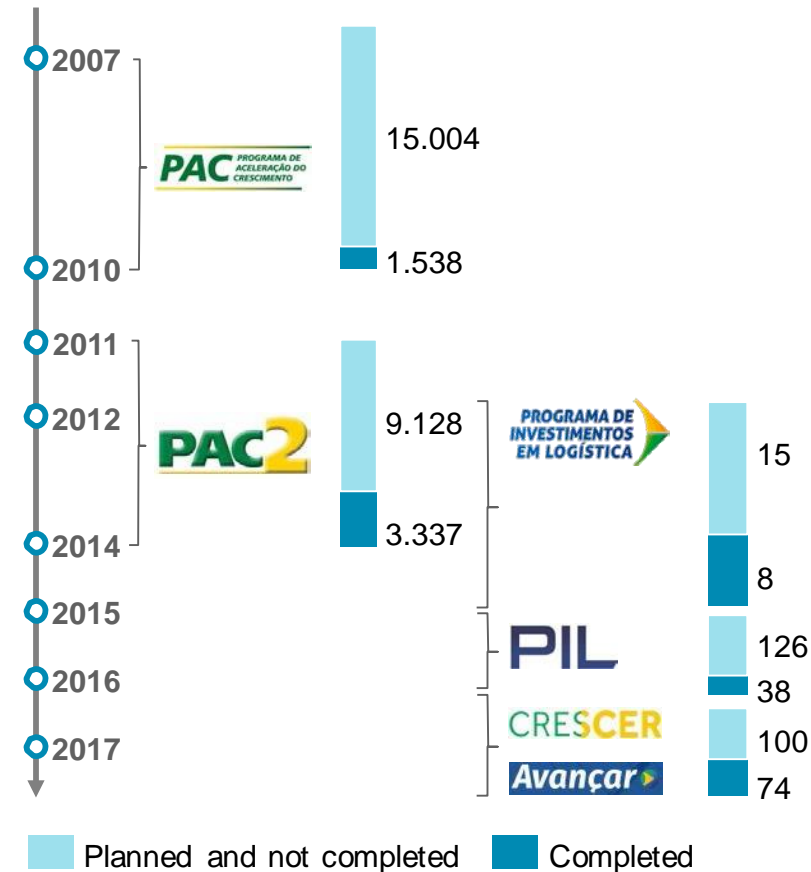
- Greater **clarity in public decisions** as it requires clarification on the motivations behind decision
- Transparency **and evaluation of the impacts** of decisions taken by public agents
- **Sharing of responsibility** and defense of the public interest among administrators, judges and controllers
- **Punishment** of public officials who commit **intentional illegality, negligence, malpractice, recklessness or gross errors**

This will impact problems mentioned previously as civil servers try to always “check the box”, in a confuse regulatory environment, instead of providing the best solution

Challenges ahead

Lack of structured prioritization process makes it difficult for infrastructure projects to be carried out

Evolution of government infrastructure programs in Brazil



To ensure continuity and proper prioritization, it is necessary to

- **Improve coordination among** multiple ministries, agencies and government bodies
 - Have effective **sector planning** with long horizons, but periodically revised
 - Improve the **prioritization** of investments
 - Enhance **technical capability** of the public sector
 - Provide further flexibility for **hiring specialized consultants**
 - **Collect data** concerning construction and bidding companies
- The PPI (Brazilian Investment Partnership Program) has been created in 2016 to fulfill some of these roles. It, however, has not been able yet to fully fulfill it

Source: Infrastructure Yearbook 2016–2017 Exame. Avançar Parcerias.

Brazil is paving the way to attract further private investment for infrastructure

- Brazil will have to double investment in infrastructure for the next 25 years to reach universalization of basic services and transportation and there is a large appetite for private investment in the sector
- We expect a regular pipeline of projects to close the gap
- The distortive subsidy policy with crowding-out effect on capital markets was the main barrier to private investment has currently been lifted
- Discussions are ongoing on how the development bank (BNDES) can best support infrastructure investment
- Some bottlenecks for infrastructure investment are being lifted:
 - Distorting subsidy system
 - Lack of internal coordination and prioritization
 - Excessive accountability of civil servants
- Other bottlenecks are under discussion:
 - Insufficient autonomy of regulatory agencies
 - Environmental licensing

