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USDA's 94th Annual Agricultural Outlook Forum



Brazil's Soy Infrastructure: Improvements and Perspectives

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Chief Economist

Arlington, VA

February 22, 2018

This is how soy started...



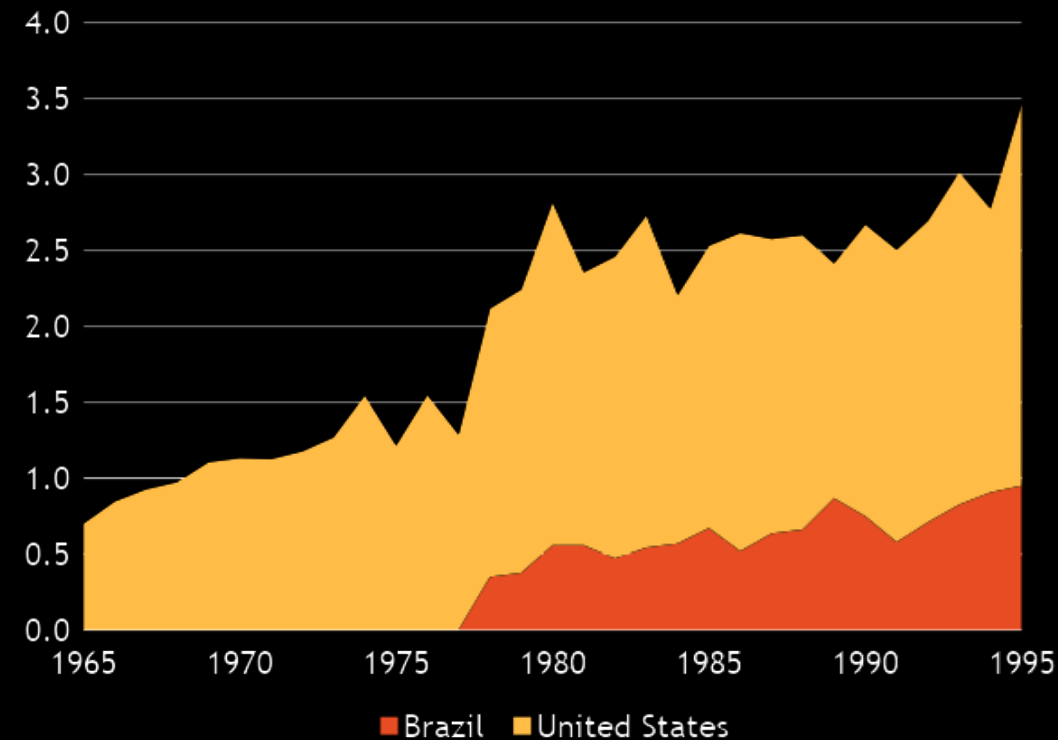
Credit image: Embrapa, Portifólio de Tecnologias Embrapa Soja 1975-2005, Documentos 262.



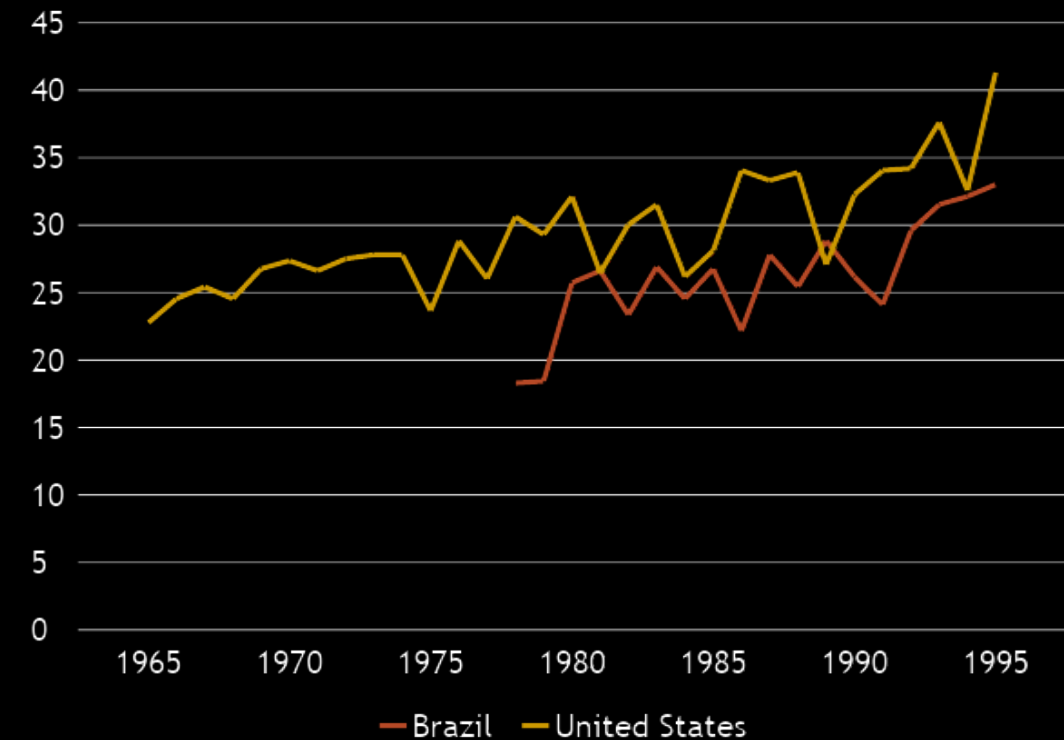
Credit image: Amaggi.

In the 1970's, soy began to grow, but its potential remained unexploited...

Production (billion bushels)

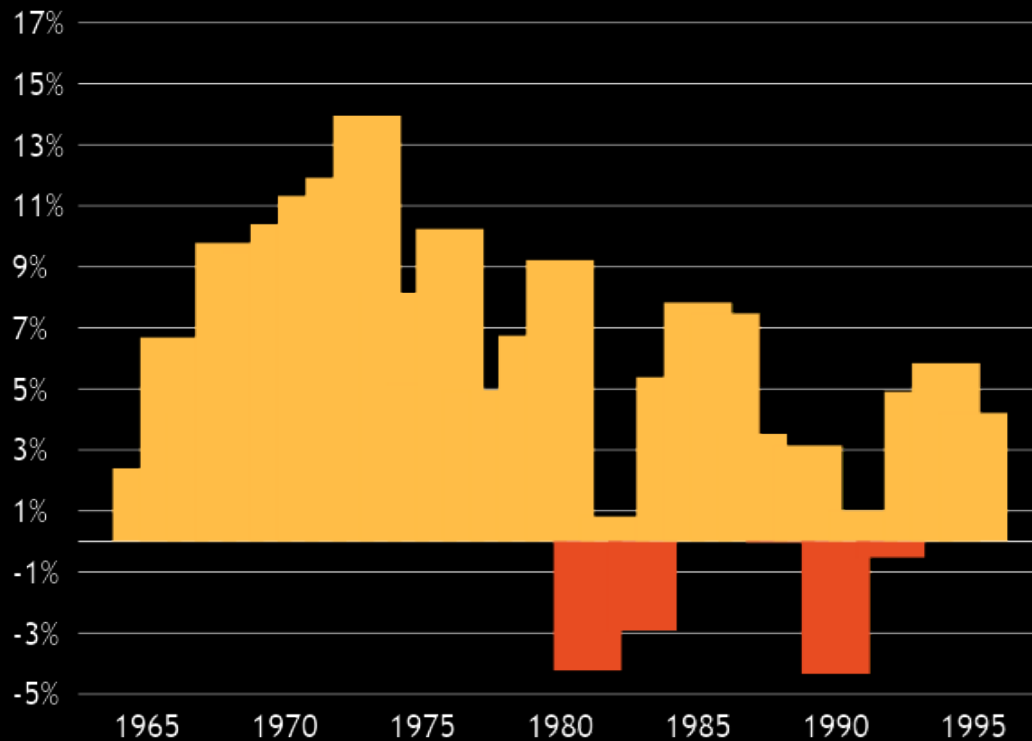


Yield (bushels/acre)

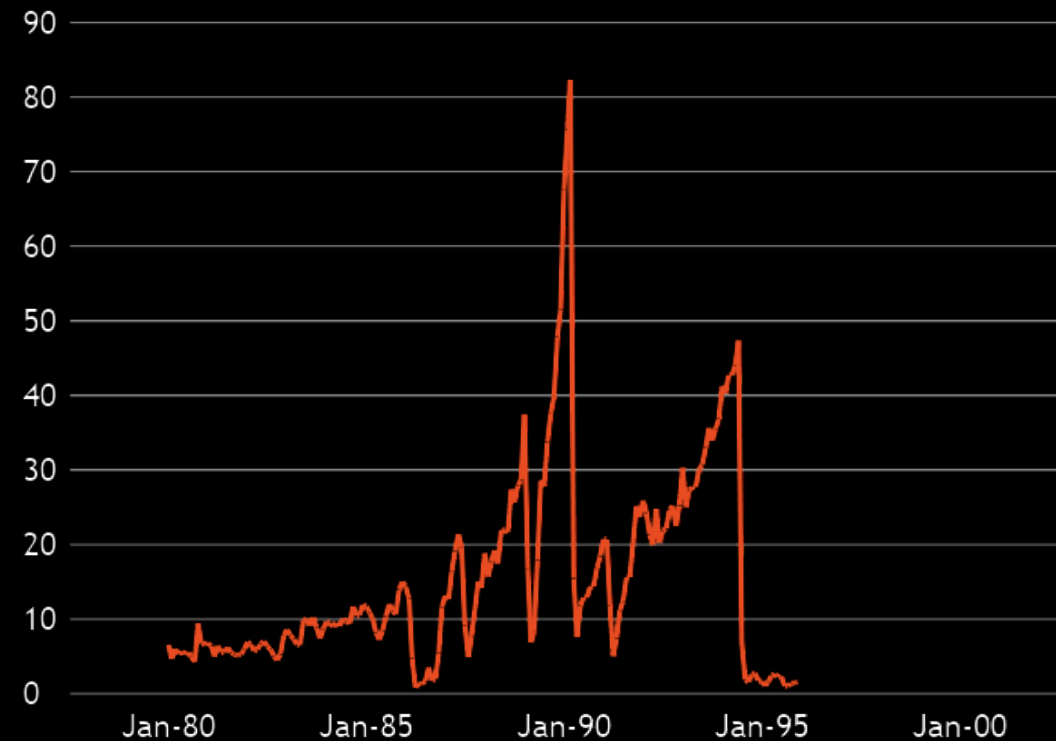


...the economy faced difficulties...

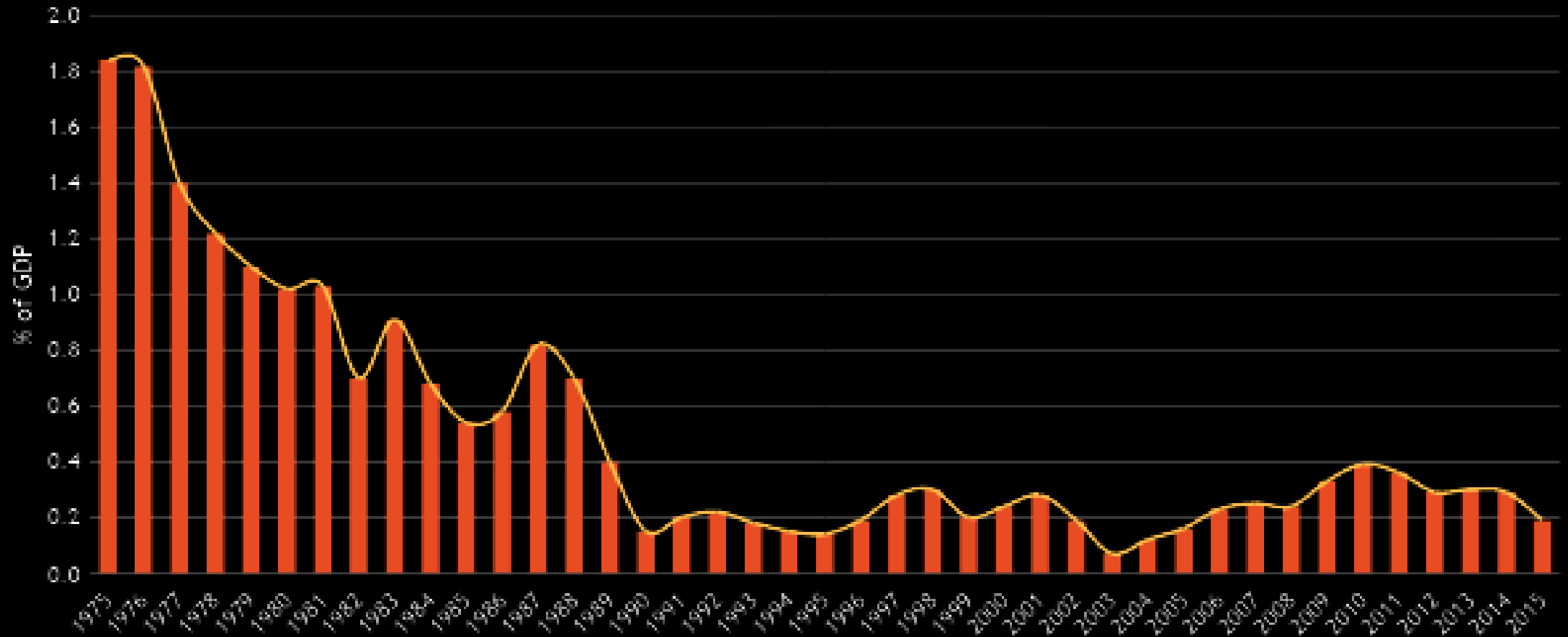
GDP growth (% y/y)



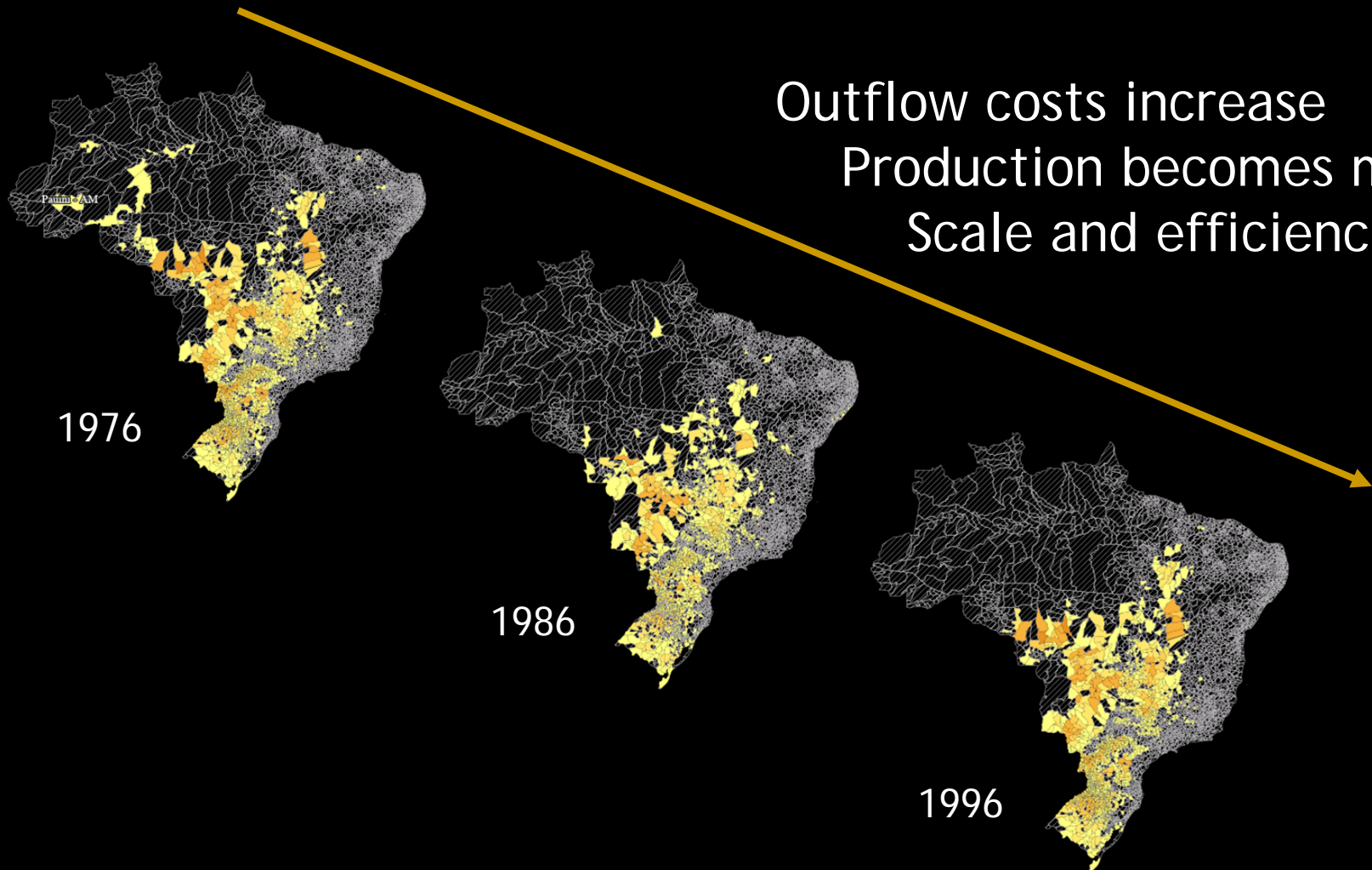
Inflation rate (%)



...and State investments in transportation infrastructure plummeted



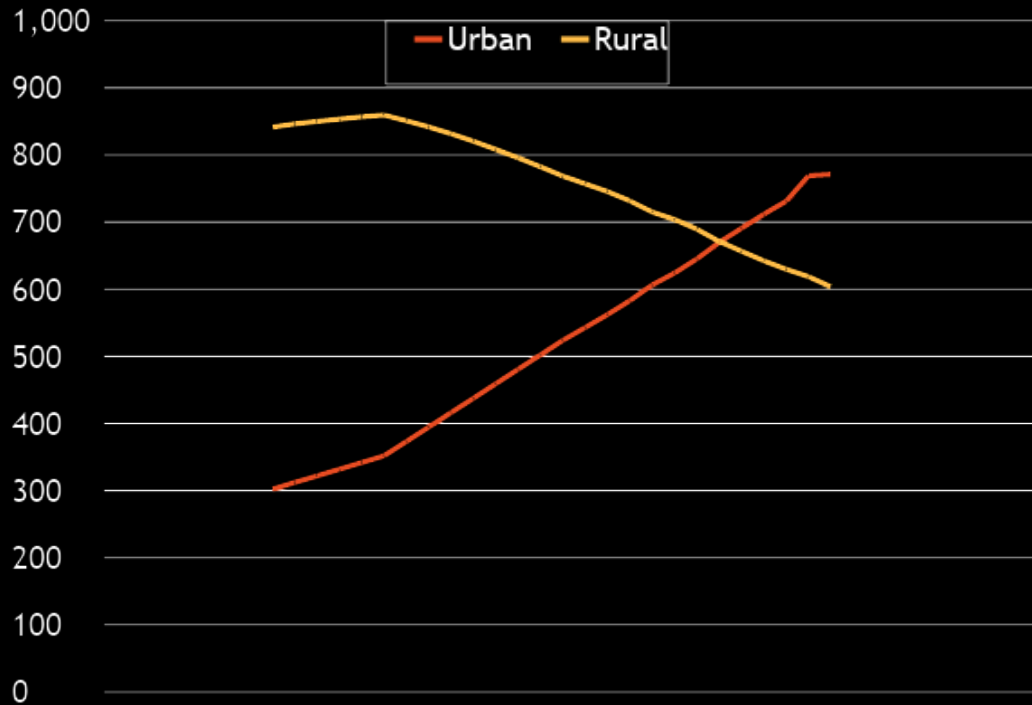
The crop increased, but the number of producer municipalities fell



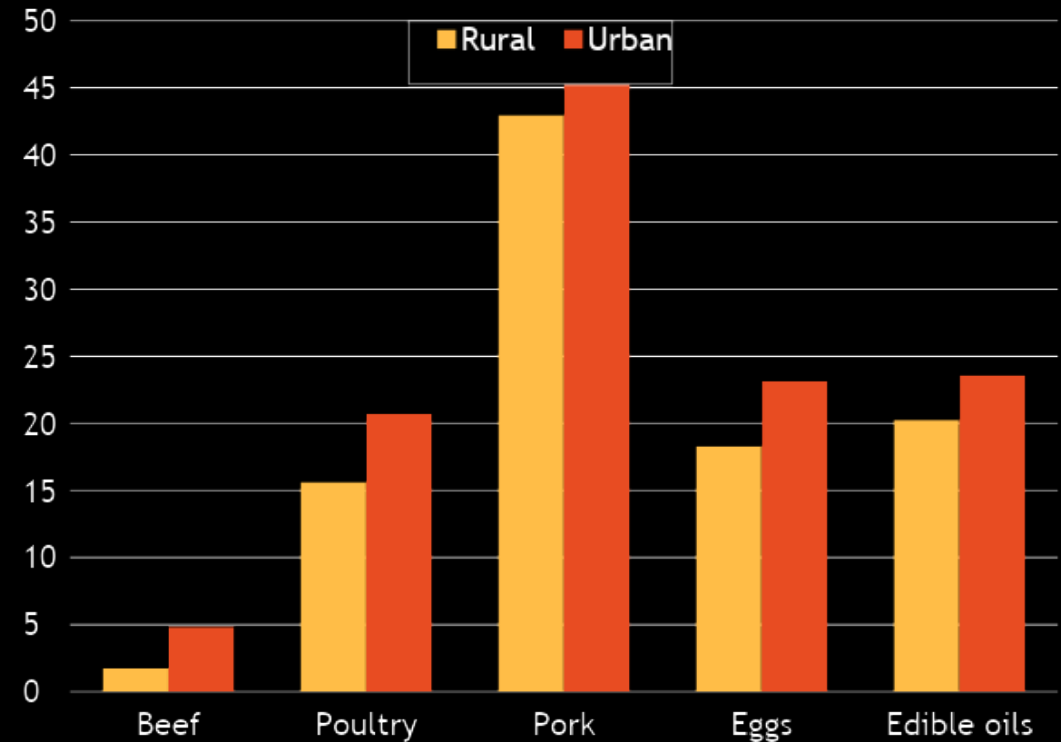
Outflow costs increase
Production becomes more concentrated
Scale and efficiencies are key

Then, a new soy consumer turns up

China: urban and rural population (in million)



China: consumption per capita (pounds/year)



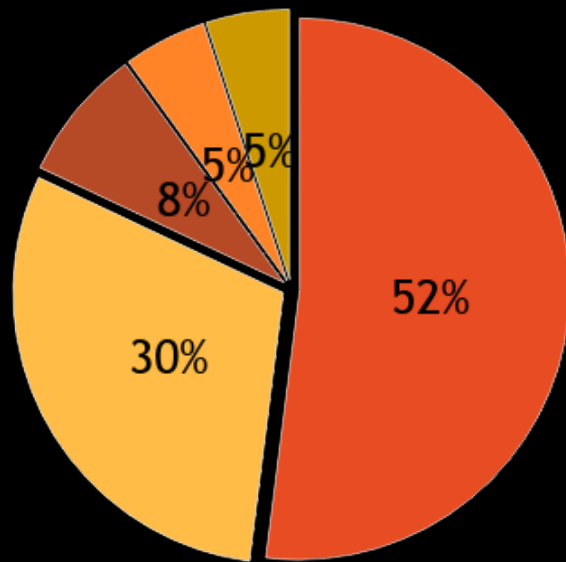
And Brazil becomes a big soy producer and exporter



Brazil Cargo Transportation Matrix

General transportation

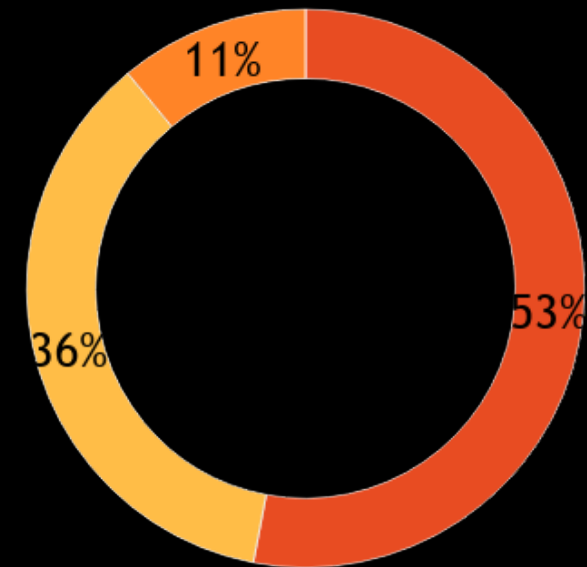
■ Roads
 ■ Rails
 ■ Cabotage
 ■ Barges
 ■ Pipelines



Source: Brazil, Ministry of Transportation - PNLT (2011).

Soybean transportation

■ Roads
 ■ Rails
 ■ Water

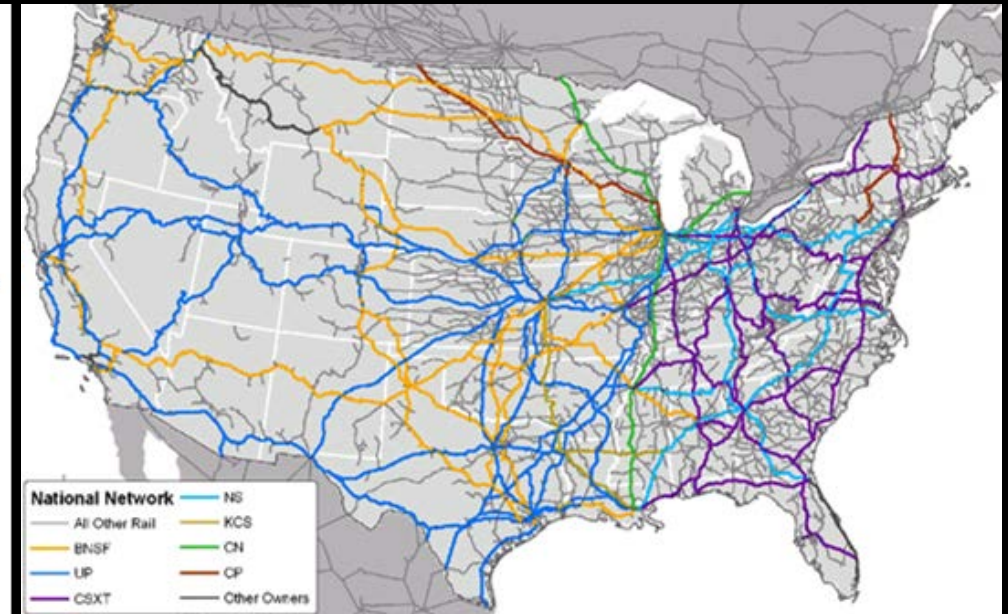
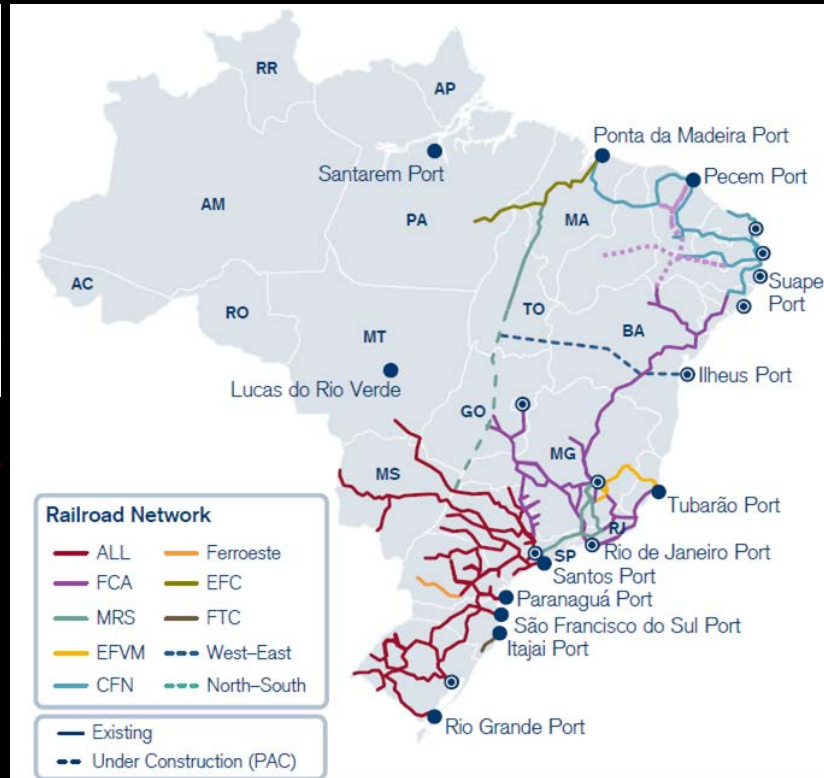
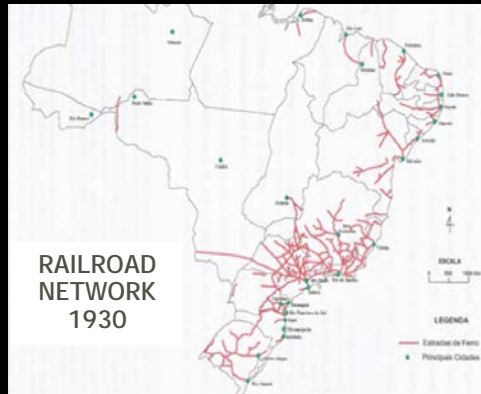


Source: Anec (2011).

Railroad Network - Brazil vs USA

Brazil  18,000 miles

USA  140,000 miles



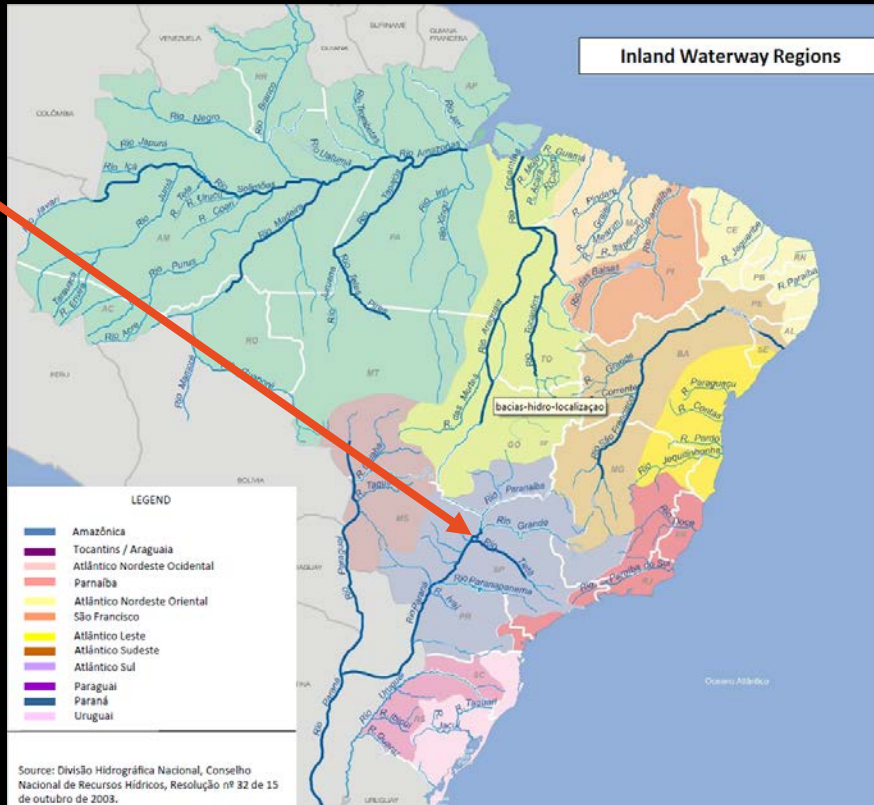
Railroad network has changed little since 1930

Waterway Network - Brazil vs USA

Brazil  8,700 miles

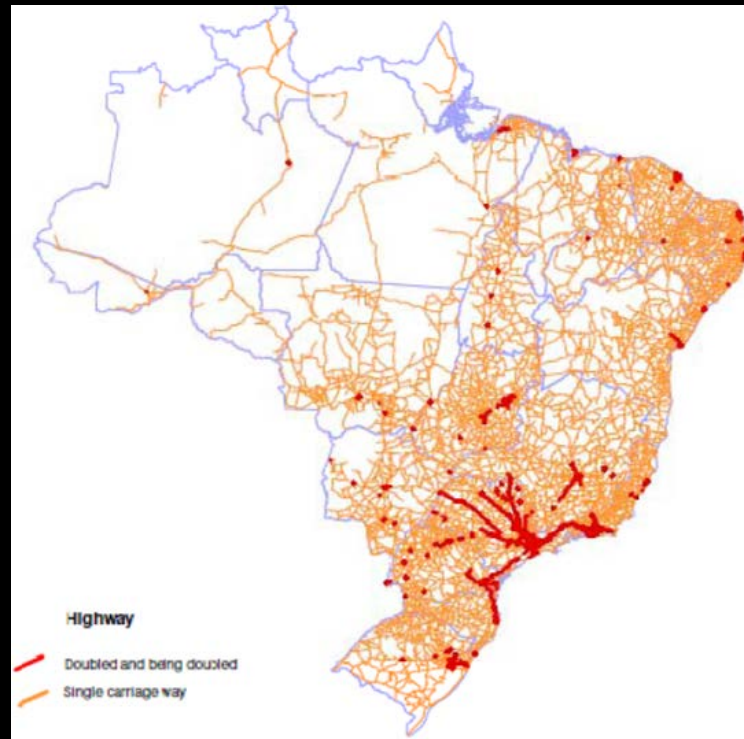
USA  25,500 miles



Only the Tietê-Paraná waterway is fully operational



Highway Network - Brazil vs USA

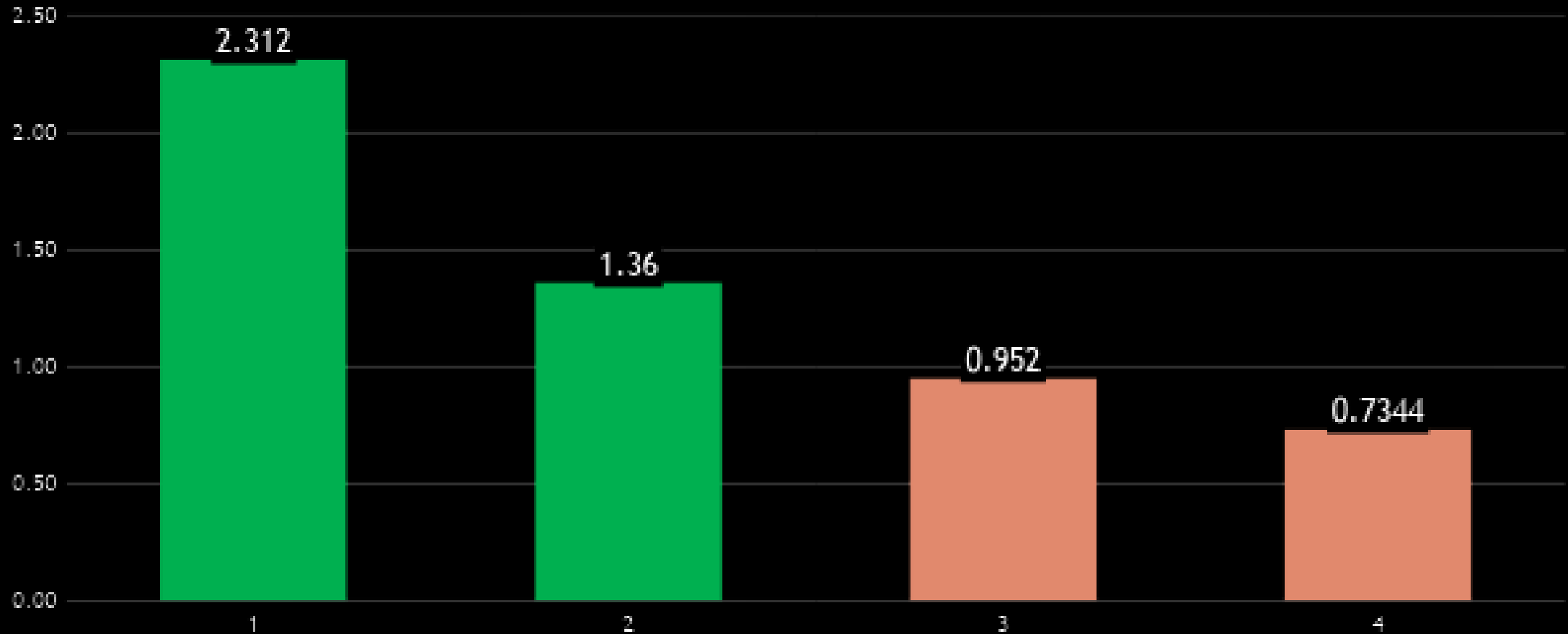
Brazil  132,000 miles (14% paved)
 980,000 miles



USA  2,720,000 miles (69% paved)
 3,935,000 miles



Soy Transportation Costs (US\$/bushel)



Queues on access routes to the ports of Santos and Paranaguá



Credit image: [Caminhões e Carretas](#) (accessed on Feb 3, 2018).

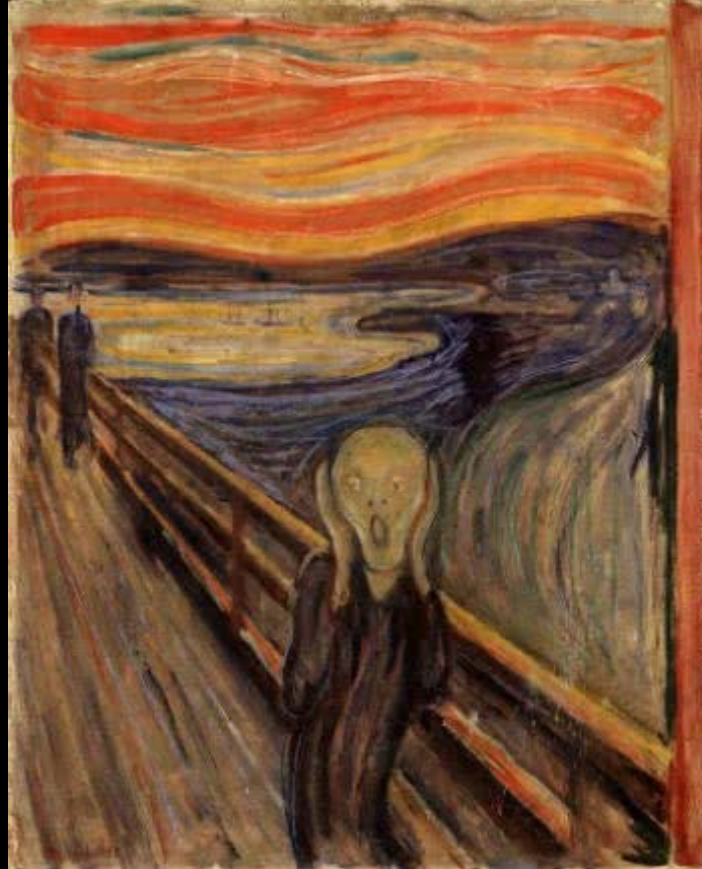


Credit image: [Gazeta do Povo](#) (accessed on Feb 3, 2018).

The BR-163 road (Pará State) interrupted due to excessive rain

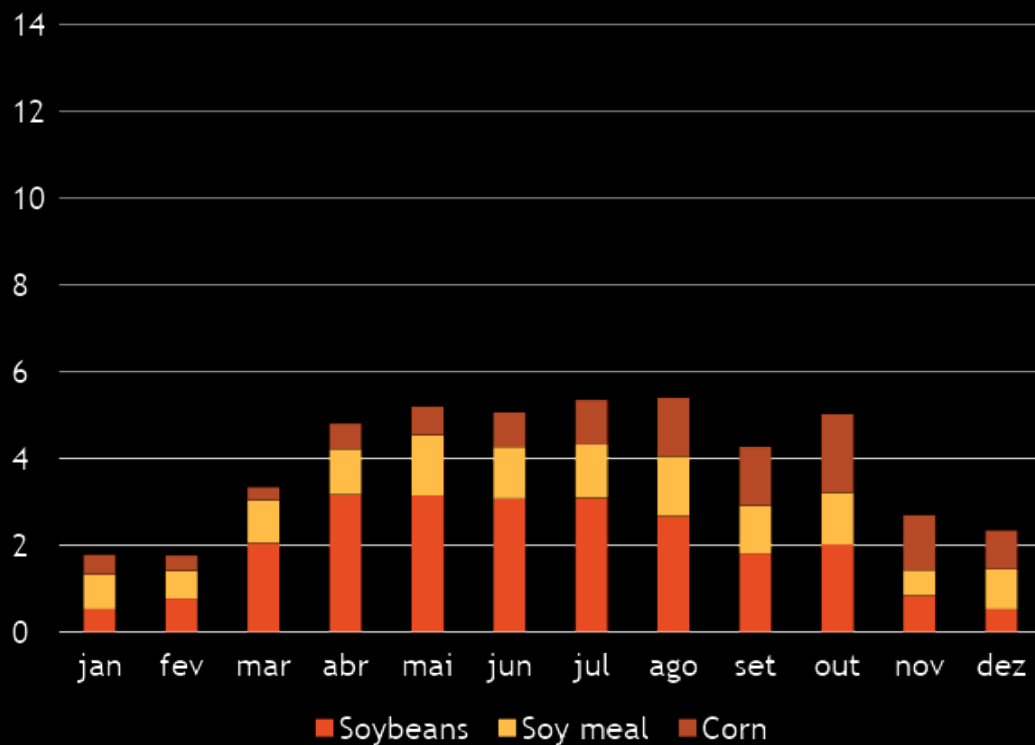


And now?

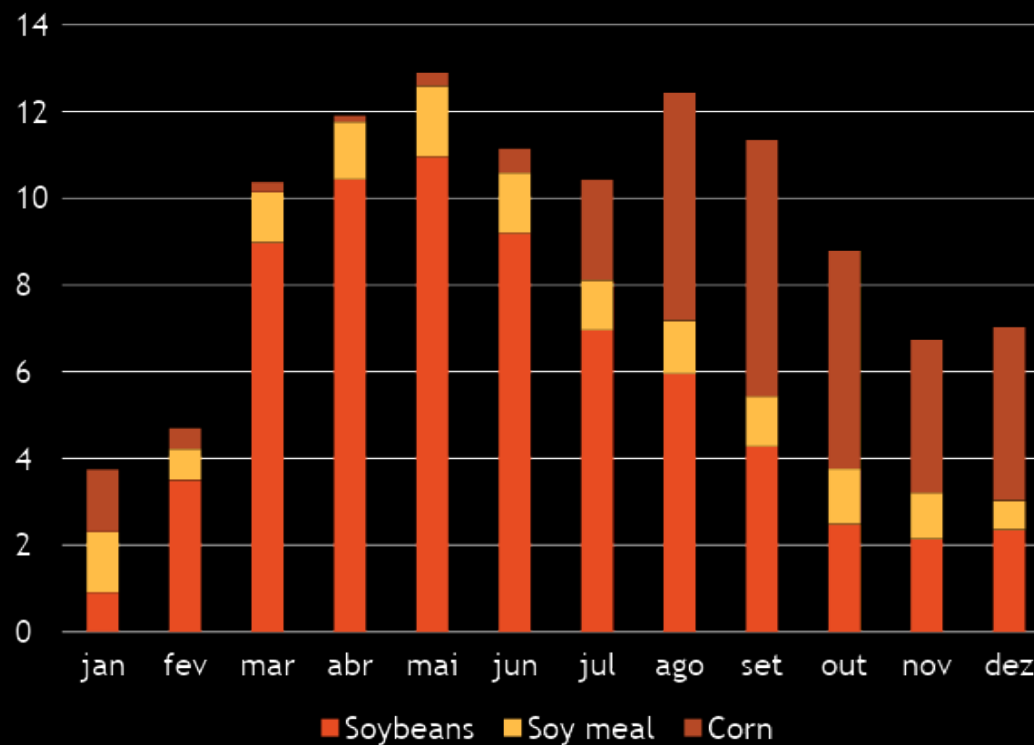


Higher productivity: total port exports (MMT)

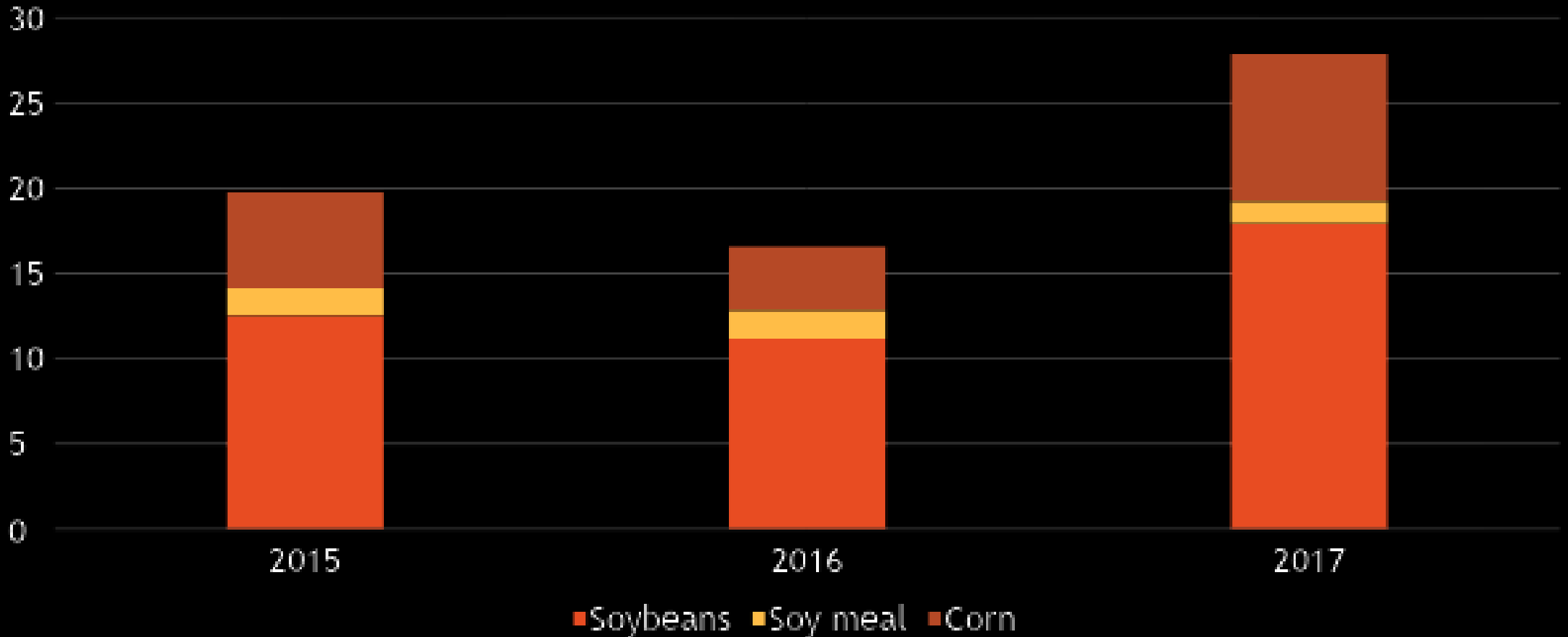
2007



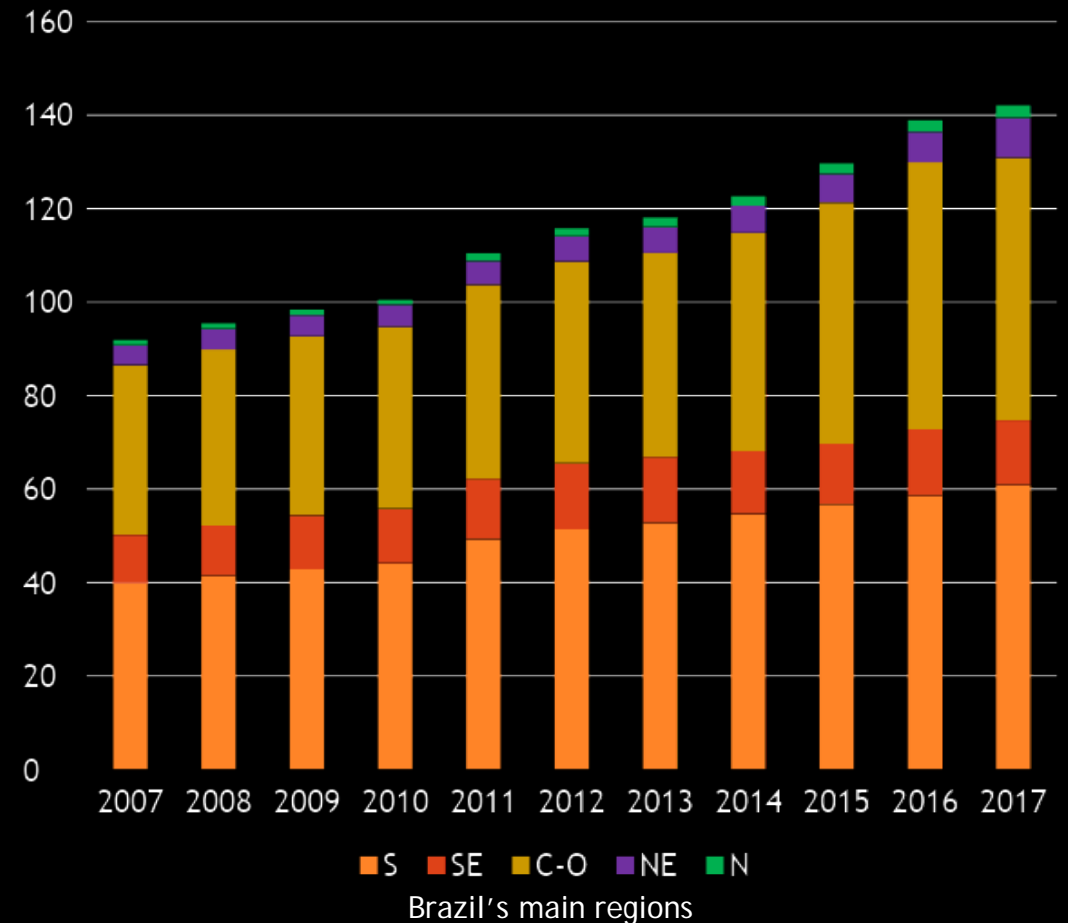
2017



Soybeans, soy meal and corn exports through the Northern Arc (MMT)



Warehousing capacity growth (MMT)



Mandatory truck scheduling at ports



Source: SEP, 2013.

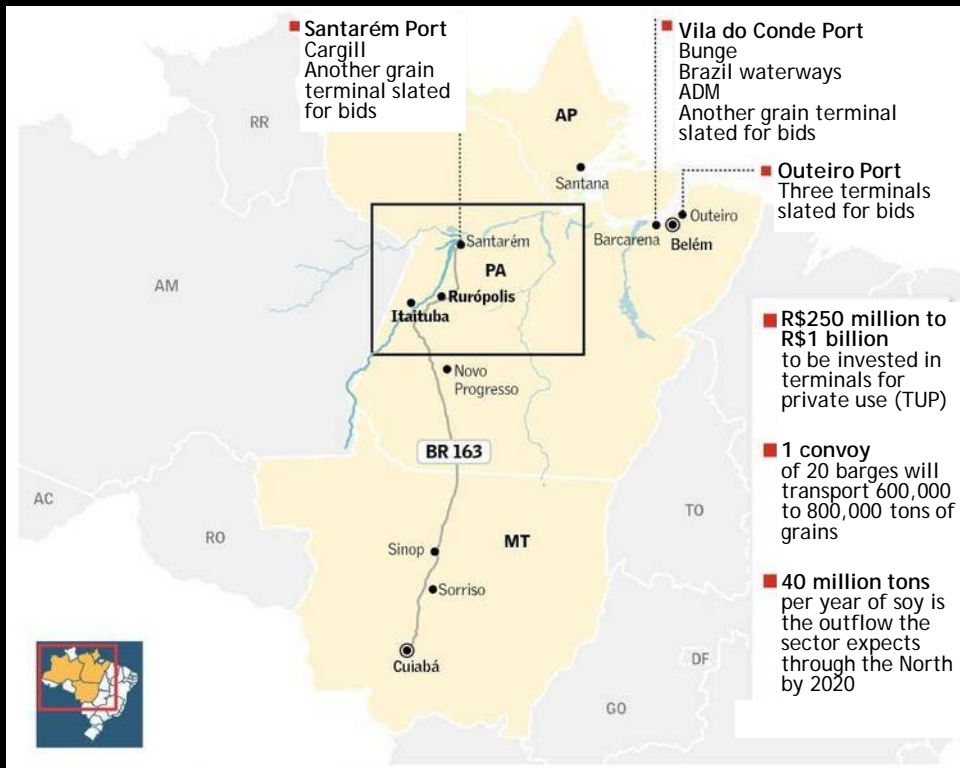


Credit image: [Caminhões e Carretas](#) (accessed on Feb 3, 2018).

BR-163 Highway: roadworks and traffic



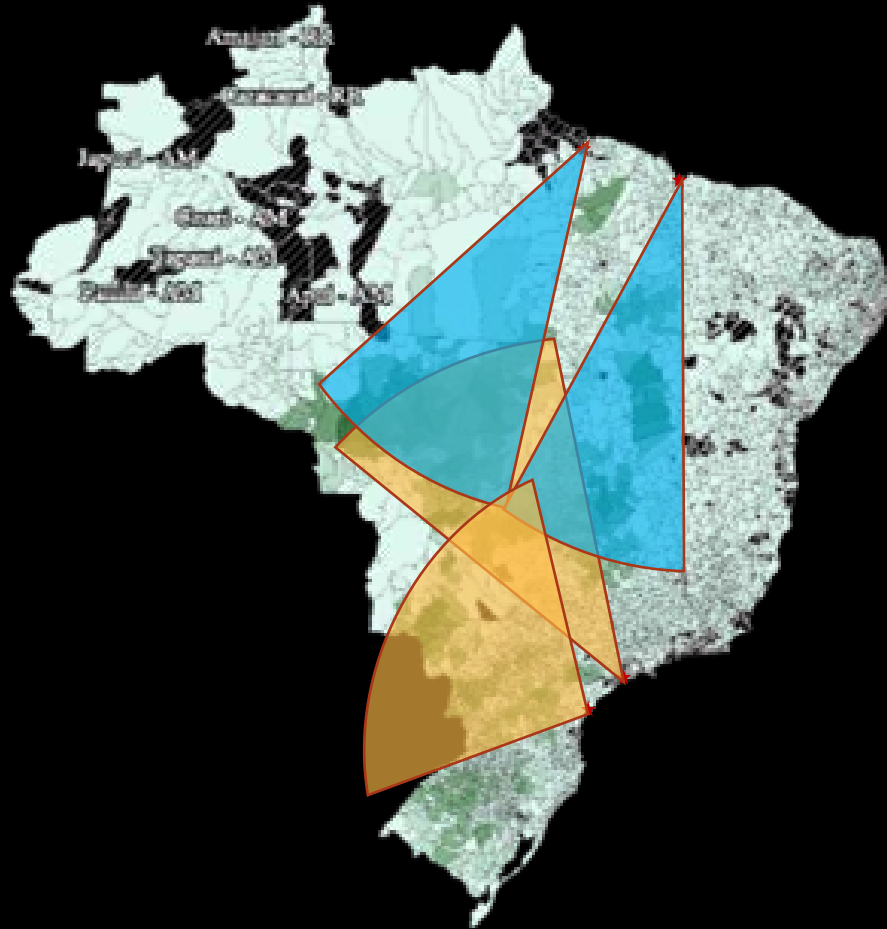
Grain terminals in the Tapajós River corridor



Source: Valor Econômico newspaper on Feb 25, 2014.

Credit image: ABIOVE.

Greater competitiveness for cargo between outflow modals and routes



- Ports in the South and Southeast will continue to be important: soy, corn and other products will continue to be influenced
- Ports in the Northern Arc:
 - Will increase competition
 - Will create new opportunities
 - Will benefit the Center-West and Northeast regions

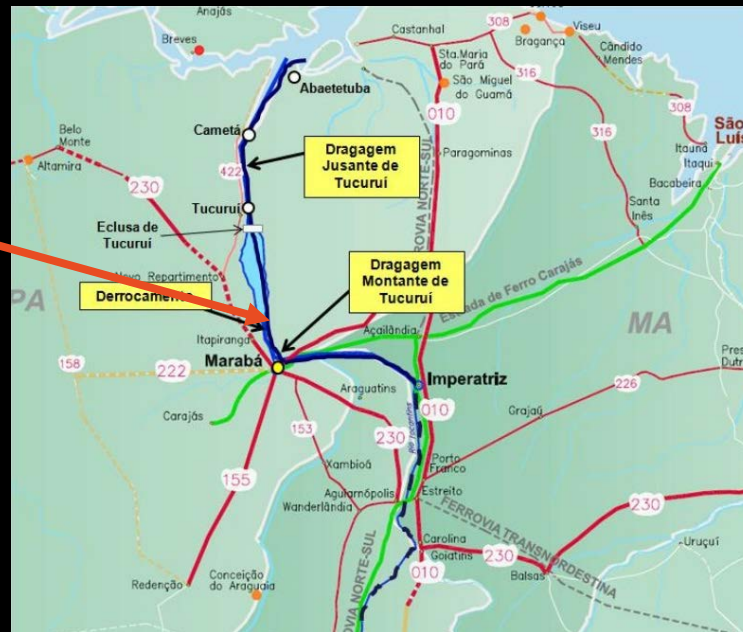
Tocantins River waterway: demolition of Pedral will allow unrestricted navigation

Tocantins river - removal of Lourenço rocks



Credit image: [DNIT](#).

Waterway must be efficient: only 500 km by truck



Credit image: [DNIT](#).

Tucuruí hydroelectric power plant

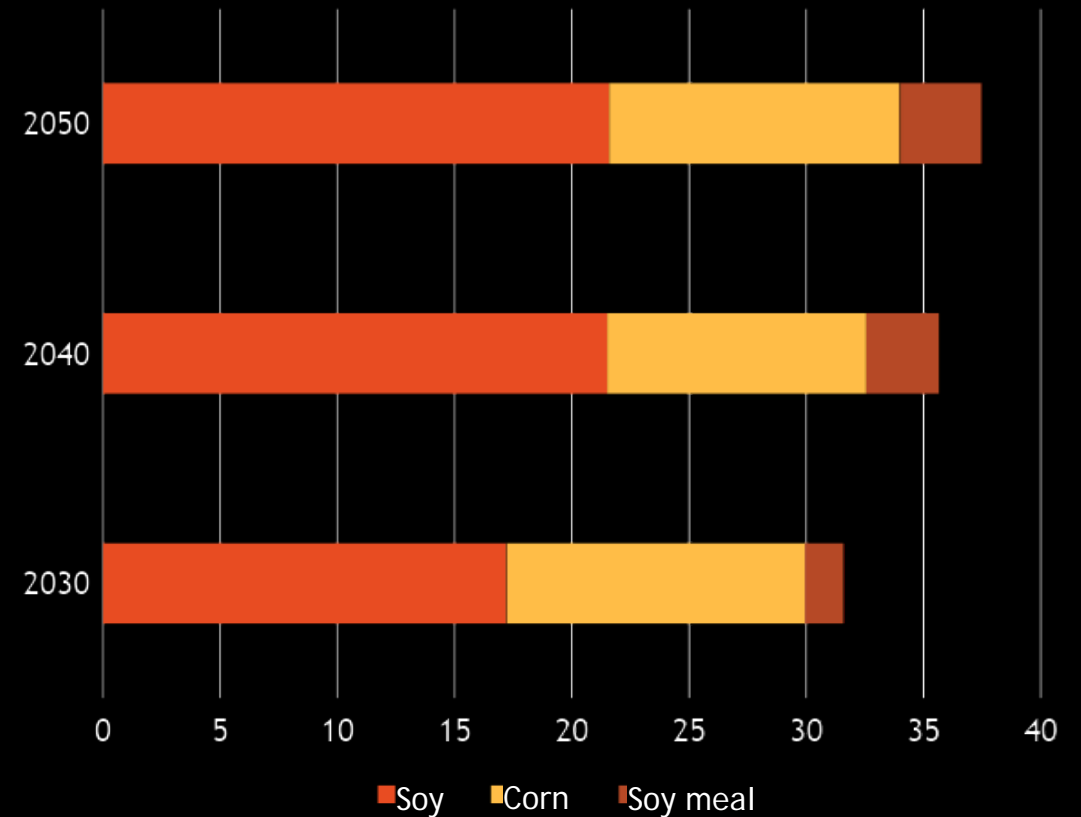


Credit image: [DNIT](#).

EF-170: MT-PA railroad ("Ferrogrão")



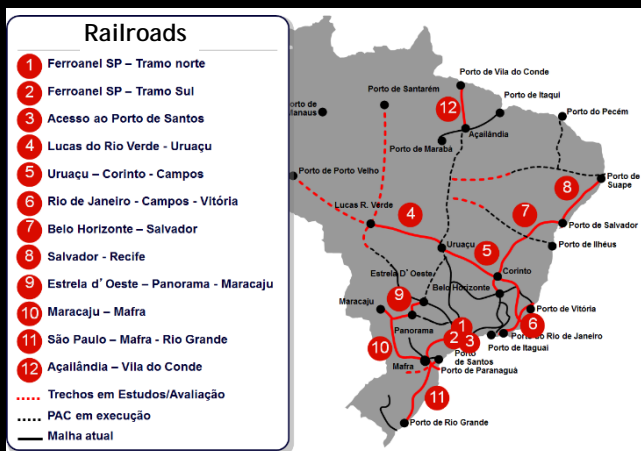
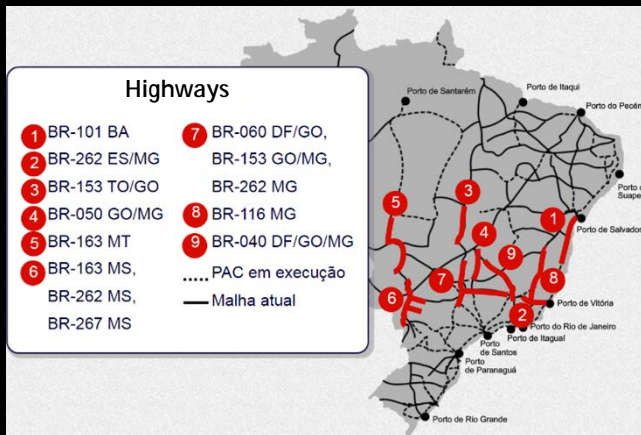
Cargo via Ferrogrão (MMT)



Consensus on the new infrastructure that is needed...

2014

2018

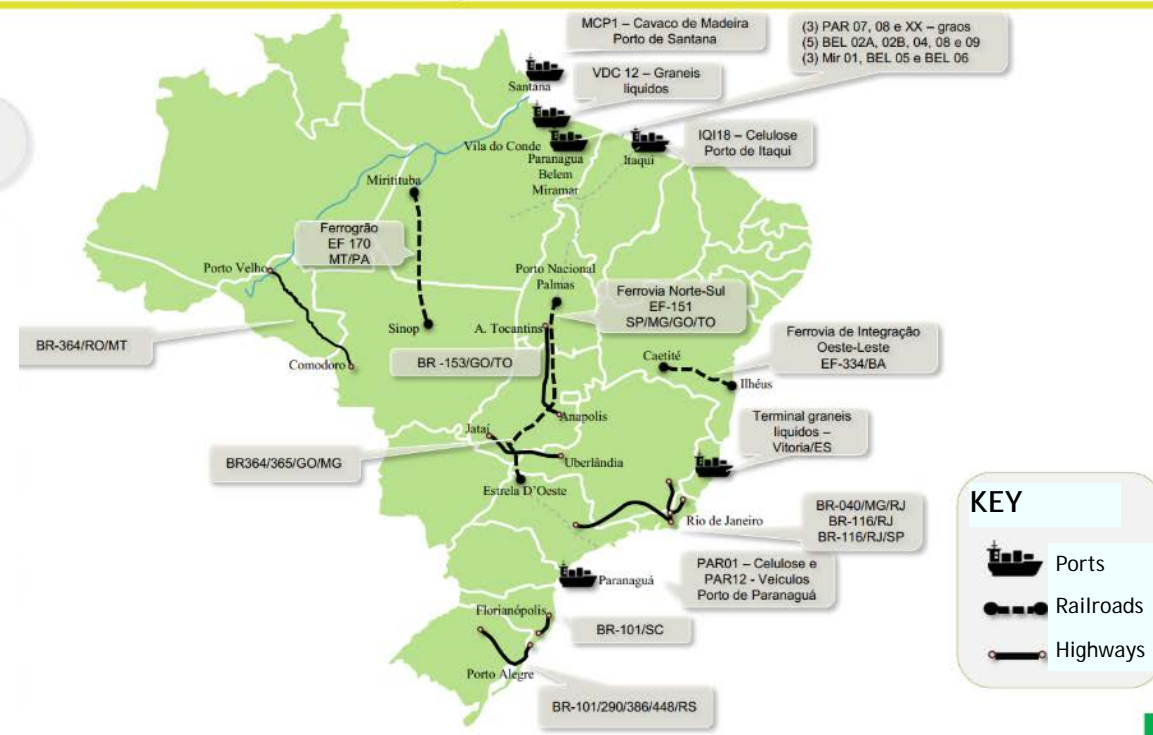


PPI Programa de Parcerias de Investimentos

Logistics projects promoting interconnections between important hubs and cargo outflow

Logistics

ENERGY
MINING
PETROLEUM & GAS
DEFENSE
SUPPLY & FINANCING



Source: PPI Secretariat

...and advanced discussions on investments in current concessions



- **5 railroads:** moving 457 MMT/year
- **30-year extension conditional on investments** estimated at US\$ 8 billion to expand capacity
- Access to Brazil's **main ports**

Final Comments

- Brazil has become a **big soy producer** after mastering technology and expanding the consumer market
- The last two decades have revealed the **shortfall in infrastructure**
- **New projects are ongoing**, and the deficit should be fully resolved in 10 to 20 years
- **Full services** rendered at competitive prices will increase Brazil's productive capacity
- **Long-term offer** of products from the soy and corn complexes should increase especially in underutilized pastures

Associated Companies

