ENERGY EFFICIENCY IN BRAZIL

Industry Sector

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Industries have significant participation in Brazil’s energy demand, GDP and GHG emissions. 48% of Brazil’s EE potential lies within industries.

- Industries are responsible for ~21% of Brazil’s GDP; ~33% of the country’s total energy consumption; and 8% of its GHG emissions. These shares are expected to remain relatively stable up until 2030.

- SMEs represent 99% of industrial companies and contribute to 47% of industrial GDP (~10% of national GDP). Industrial SMEs are responsible for 16% of total employment in Brazil.

- EPE estimates EE can save ~17 Mtoe by 2026, 48% of which within industrial sector, primarily fuel savings.
INDUSTRY REPRESENTS ~33% OF BRAZIL’S FINAL ENERGY CONSUMPTION
INDUSTRIAL ENERGY DEMAND UNTIL 2026 – STEADY GROWTH

- Increasing importance of primary export sub-sectors such as paper and pulp and other metallurgic thanks to a low exchange rates.
- Food and beverages pushed by internal demand growth following increasing GDP expectations.

SOURCE: PDE 2026
INDUSTRIAL ENERGY DEMAND UNTIL 2030 – STEADY GROWTH

Increasing importance of primary export sub-sectors such as paper and pulp and other metallurgical thanks to a low exchange rates.

Food and beverages pushed by internal demand growth following increasing GDP expectations

2026-2030 growth is based on an optimistic investment scenario once full capacity is reached.

SOURCE: PDE 2026 & PNE 2050
SMES REPRESENT 99% OF INDUSTRIAL COMPANIES IN 2011, CONTRIBUTING TO 47% OF INDUSTRIAL GDP (10% OF NATIONAL GDP)

Share of industrial companies per size (% 2009 - ´11)
- Micro: 79%
- Small: 17%
- Medium: 3%
- Large: 1%

Industrial GDP contribution per company size (% 2009 - ´11)
- Micro: 53%
- Small: 14%
- Medium: 9%
- Large: 24%

SOURCE: (SEBRAE, 2015)
THE INDUSTRIAL SECTOR ACCOUNTS FOR 25% OF THE COUNTRY’S EMPLOYMENT RATE, 68% OF WHICH IN SMES

SOURCE: (SEBRAE, 2015)
INDUSTRY ACCOUNTS FOR 8% OF BRAZILIAN EMISSIONS

Brazilian GHG emissions per economic activity in 2016.

- Transport: 9%
- Commercial, public, residential and sanitation: 3%
- Industry: 8%
- Agriculture: 3%
- Livestock direct emissions: 52%
- Fuel production and power generation: 5%
- Land Use Change: 9%

TOTAL: 2.28 GtCO2e

SOURCE: SEEG - GHG emission tracking system
EPE SEES POTENTIAL TO SAVE 5.6% OF ENERGY DEMAND IN 2026

- ~17 Mtoe
- can be saved by 2026

SOURCE: PDE 2026
## ENERGY EFFICIENCY FRAMEWORK IN BRAZIL

### Key Targets / Summary

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<tr>
<th>Category</th>
<th>Programme</th>
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<td><strong>FEDERAL PLANS</strong></td>
<td><strong>NDC</strong></td>
<td>• Mitigate 37% of GHG emissions in relation to 2005 levels by 2025. • Reduce electricity demand by 10% by 2030 against a baseline in line with National EE Plan</td>
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<td><strong>National Plan on Climate Change (PNMC)</strong></td>
<td>• Mitigate 36% - 39% GHG emissions by 2020 - against a baseline.</td>
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<td><strong>National Energy Efficiency Plan</strong></td>
<td>• Reduce electricity demand by 10% by 2030 against a baseline.</td>
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<td><strong>Plano Brasil Mais Produtivo (P+B Plan)</strong></td>
<td>• No targets - TA provided to 48 industrial SMEs to identify EE opportunities, aiming to scale up to 400 SMEs.</td>
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<td><strong>Inova Plan</strong></td>
<td>• No targets - seeks to accelerate innovation in specific sectors offering credit and grants through periodic public tenders.</td>
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<td><strong>CROSS-SECTOR FEDERAL PROGRAMMES</strong></td>
<td><strong>ANEEL’s EE Programme (PEE)</strong></td>
<td>• No targets - EE obligation scheme mandating electricity distribution utilities to invest 0.5% of their net revenues in end-user EE adding to ~R$630million/year.</td>
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<td><strong>Equipment Labelling Programme (PBE)</strong></td>
<td>• No targets - mandatory labels to communicate the relative efficiency of electric equipment to consumers</td>
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<td><strong>National Programme for Electricity Conservation (PROCEL)</strong></td>
<td>• No targets - awareness raising initiatives around EE in multiple sectors and a flagship labelling award for the most efficient equipment under each category of the PBE.</td>
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<td><strong>National Program for the Rational Use of Oil and Gas Products (CONPET)</strong></td>
<td>• No targets - mandatory labels to communicate the relative efficiency of fossil-fuel-powered equipment to consumers.</td>
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<td><strong>Govt. Sustainable Purchase Programme</strong></td>
<td>• No targets - non-compulsory sustainable procurement guidance to federal and state institutions.</td>
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<td><strong>CROSS-SECTOR FEDERAL REGULATION</strong></td>
<td><strong>Energy Efficiency Law</strong></td>
<td>• Determines minimum efficiency standards for a range of energy consuming product categories</td>
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<td><strong>INDUSTRIAL SECTOR PLANS AND REGULATIONS</strong></td>
<td><strong>Petrobras’ operational EE programme</strong></td>
<td>• No targets - in-house measures to enhance the efficiency of the company’s fossil extraction, refining, distribution, petrochemicals and biofuels - set as a regulation given the company’s public status.</td>
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THANK YOU