FAPESP BIOENERGY RESEARCH PROGRAM BIOEN

FAPESP

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ENERGY FOR THE FUTURE

The share of clean, renewable sources on Brazil's energy matrix corresponded to 39.4% in 2014, representing one of the highest percentages worldwide: the global average is 13.8%, and the percentage among Organization for Economic Cooperation and Development (OECD) countries is 9.8%. Indeed, bioenergy from sugarcane accounts for almost 15.7% of the Brazilian energy supply through the use of ethanol as fuel and sugarcane bagasse to generate electrical and thermal energy.

With 9.7 million hectares of sugarcane fields – the equivalent to 1% of the national territory and 14% of the planted agricultural and forest areas – Brazil is the world's top sugarcane producer. In the last few decades, the average ethanol productivity per hectare has been increasing annually due to the incorporation of new technologies. In the harvesting season 2014/2015, the country produced 705 million tons of sugarcane, 28.4 million cubic meters of ethanol and 33.2 million tons of oil equivalent (Mtoe) of biomass (bagasse).

Ethanol is an important component of the energy that powers Brazilian vehicles. In 2014, 54.5% of the light vehicle fleet and 88.2% of new vehicles sold in Brazil were equipped with flex fuel engines. In 2014, ethanol consumption corresponded to 13.6 Mtoe, whilst gasoline's was equivalent to 25.7 Mtoe. Furthermore, ethanol is blended to the regular gasoline sold in the country on a 27% ratio.

Brazil's technological leadership in sugarcane ethanol should be credited to the investments in research and development (R&D) undertaken by universities and research institutes, in addition to private companies that, over decades, have accumulated valuable knowledge on sugarcane production.

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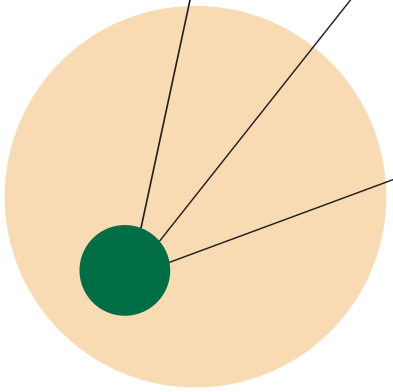
FAPESP BIOENERGY RESEARCH PROGRAM (BIOEN)

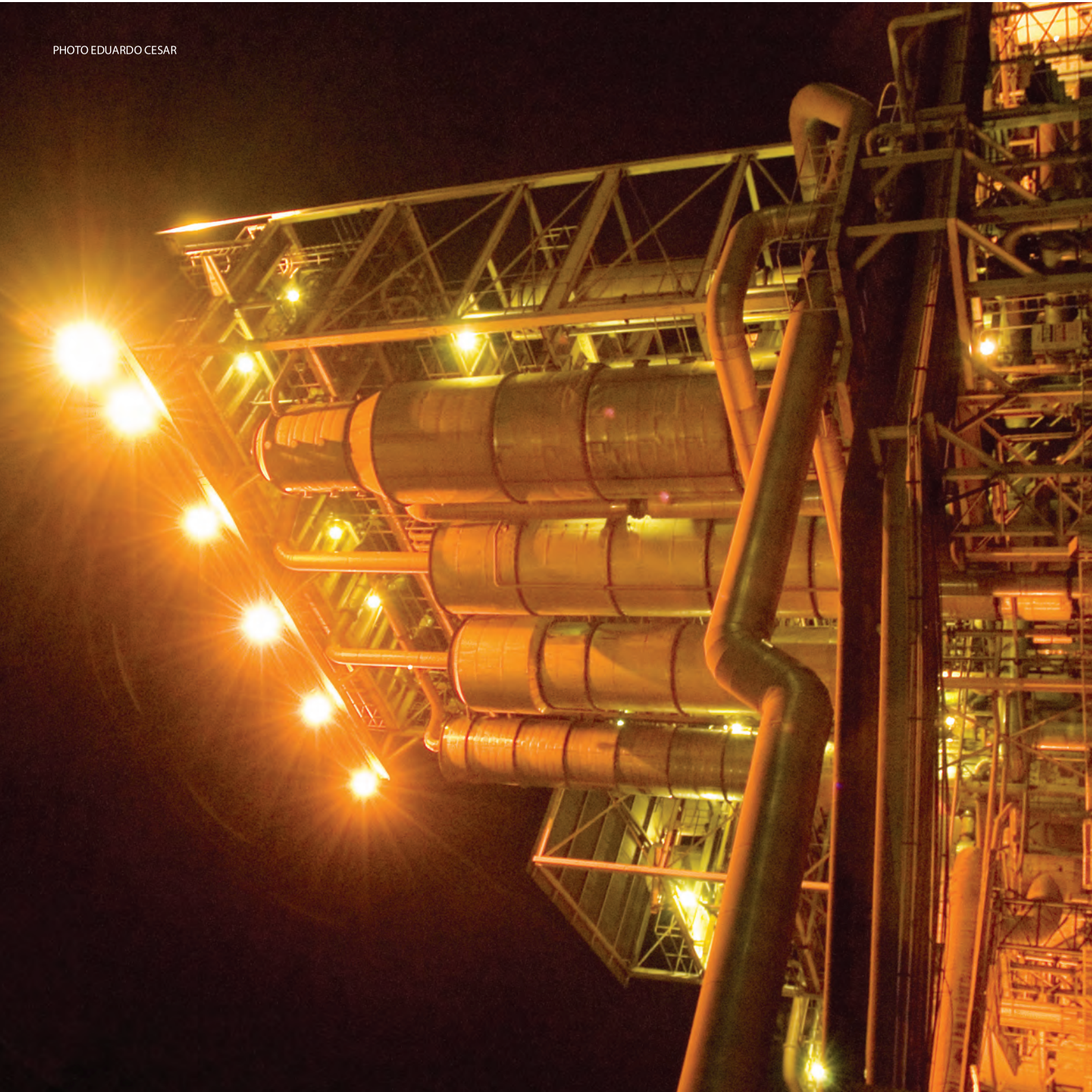
The BIOEN Program aims to expand R&D in bioenergy and to investigate new alternative technologies to consolidate Brazilian leadership in bioenergy research and production.

BIOEN HAS THREE MAIN OBJECTIVES



- Increase sugarcane productivity through innovative research;
- Evaluate and search for ways of reducing the socioeconomic and environmental impacts that may result from bioenergy production;
- Generate knowledge to guarantee Brazil's leadership in bioenergy research and production.

In that sense, BIOEN articulates public and private R&D on academic and corporate laboratories to generate and apply knowledge related to ethanol production in Brazil.



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BIOEN: RESEARCH AREAS

- Biomass for bioenergy production;

- Biofuel technologies;

- Biorefineries and alcohol-chemistry;

- Ethanol-run automotive engines, i.e., combustion engines and fuel cells;

- Environmental and socioeconomic impacts, land use, sustainability and intellectual property.

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HOW TO JOIN

The BIOEN Program supports 574 projects through Research Grants and Fellowships in Brazil and abroad – 457 already finalized. Among those, 33 are Thematic Projects, involving groups of researchers from several institutions engaged in bold projects. This intense research activity aims to promote biofuel production, mainly sugarcane ethanol, as well as to investigate new production technologies.

Under the Research Grant rubric, projects should be submitted to FAPESP as Thematic Projects, Regular Research Grants, or under the Young Investigators in Emerging Center modality. Under the Fellowships and Research Internships Abroad rubric, proposals should be associated with one of those three types of Grants, according to the Foundation's rules.

Thematic Projects are granted to a team of researchers led by a principal investigator (PI) or, in some cases, co-PIs (www.bv.fapesp.br/en/1/thematic-grants). Regular Research Grants are generally granted to an individual researcher (www.bv.fapesp.br/en/6/regular-line-of-funding). The Young Investigators in Emerging Centers award aims to create or establish a new research group led by a promising scientist early in his or her career (www.fapesp.br/en/yia). The application rules for Fellowships are available at www.fapesp.br/en/fellowships. For post-doctoral fellowship opportunities, see www.fapesp.br/oportunidades. Collaboration with research groups from other states and abroad are encouraged, especially for Thematic Projects.

The proposals are evaluated through FAPESP's procedure for the analysis of research proposals; all proposals are peer reviewed. The Program's steering committee then recommends whether they should be included in the BIOEN Program, taking into consideration their compliance with BIOEN's objectives.

www.fapesp.br/en/ bioen

www.bioenfapesp.org

SÍRIO CANÇADO

ABOUT FAPESP

The São Paulo Research Foundation, FAPESP, is one of Brazil's leading research funding agencies. FAPESP was created in 1962 with the mission of supporting scientific and technological research projects in all fields of knowledge. FAPESP's research funding has three main strands: advancement of knowledge, application-driven research and support for research infrastructure.

FAPESP also funds research in areas that are considered strategic for Brazil and crucial to advancing science worldwide, through programs related to major themes such as global climate change (RPGCC – www.fapesp.br/en/rpgcc), bioenergy (BIOEN – www.fapesp.br/en/bioen) and biodiversity (BIOTA-FAPESP – www.fapesp.br/en/biota).

All project proposals are evaluated on the basis of a peer review model (using ad hoc specialists) and scientific merit.

In the bioenergy area, FAPESP has made significant contributions since the late 1990s. It sponsored the sequencing and analysis of sugarcane genes and their relation with productivity, resistance to plague, diseases and climate variations, under the scope of the Sugarcane Genome Project, and the research focused on technological development of ethanol production through acid and enzymatic hydrolysis on industrial scale.

It also provides funds for application-driven research through innovation programs, in collaboration with private companies and research programs in public policies, in partnership with public and third-sector organizations.

The Foundation keeps cooperation agreements with national and international sponsoring entities, foreign higher education or research institutions and private companies.

FAPESP also has the administrative and financial autonomy to manage its budget, which is equal to 1% of the tax income of São Paulo State, as guaranteed by the São Paulo State Constitution.

Research supported by FAPESP can be consulted
at FAPESP Grant Database
available at **www.bv.fapesp.br/en**

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