

List of Abbreviations

2DS – two-degree scenario

ABIOVE – Brazilian Association of Vegetable Oil Industries/ Associação Brasileira das Indústrias de Óleos Vegetais (ABIOVE)

ABVE – Brazilian Association of Electric Cars/ Associação Brasileira do Veículo Elétrico (ABVE)

AGROPALMA – Brazilian palm enterprise

AMYRIS – G2 biofuels enterprise

ANFAVEA – National Association of Automotive Vehicle Manufacturers/ Associação Nacional dos Fabricantes de Veículos Automotores (ANFAVEA)

ANP – Brazilian National Oil Agency/ Agência Nacional de Petróleo, Gás Natural e Biocombustíveis (ANP)

APAMO – Mozambique Sugar Producers Association

ASTM – American Society of Testing of Materials

AZUL – Brazilian Airline company

B5 – 5% biodiesel in the diesel

B/l – billion litres

B/gal – billion gallons

BEN – Brazilian National Energy Balance/ Balanço Energético Nacional (BEN)

BEV – battery electric vehicles

BIOEN/FAPESP – FAPESP Bioenergy Research Program/ Programa de Bioenergia da FAPESP (BIOEN/FAPESP)

BIOPALMA – AGROPALMA – Brazilian palm enterprise

BNDES – The Brazilian Development Bank/ Banco Nacional de Desenvolvimento Econômico e Social (BNDES)

CENBIO – National Reference Center on Biomass/ Centro Nacional de Referência de Biomassa (CENBIO)

CEPEA/USP – the economic research center at Esalq/USP/ Instituto de Pesquisa Científica (CEPEA/USP)

CGEE – Brazilian National Center of Management and Strategic Studies/ Centro de Gestão de Estudos Estratégicos (CGEE)

CIDE – Brazilian Federal tax on fuels, including ethanol

CIT – Norwegian Environmental Agency

CCUS – carbon capture, utilization, and storage

COALBRA – coke and wood ethanol enterprise

CODETEC/UNICAMP – Company of Technology Development/Companhia de Desenvolvimento Tecnológico (CODETEC/UNICAMP)

COFINS – Brazilian Federal security tax on fuels, including ethanol

COGEN – energy cogeneration industry association/ Associação da Indústria de Cogeração de Energia (COGEN)

CONAB – Brazilian national agriculture supply company/ Companhia Nacional de Abastecimento (CONAB)

COPERSUCAR – Brazilian sugar & ethanol trading company

COSAN – Brazilian sugar & ethanol enterprise associated with SHELL

CPFL – Brazilian utility company/ Companhia Paulista de Força e Luz (CPFL)

CTA – Aeronautic Technology Center/ Centro Tecnológico da Aeronáutica (CTA)

CTBE – *Bioethanol* Science and Technology Laboratory/ Laboratório Nacional de Ciência e Tecnologia do Bioetanol (CTBE)

CTC – COPERSUCAR Technology Center/ Centro de Tecnologia Canavieira (CTC)

DATAGRO – strategic consulting

DDG – Dry Distiller's Grain

DEDINI – Brazilian sugar & ethanol equipment manufacturer/ DEDINI Indústrias de Base (DEDINI)

WDG – Wet Distiller's Grain

E100 – 100% ethanol vehicles

EACEA – Brazilian horticulture enterprise

EMBRAER – Brazilian aeronautic company

EMBRAPA – Brazilian Agricultural Research Corporation/ Empresa Brasileira Agropecuária (EMBRAPA)

- ENSYN – a Canadian renewable fuels and chemical enterprise
- EPA – Environment Protection Agency
- EPE – Brazilian Energy Planning Agency/ Empresa Brasileira de Planejamento Energético (EPE)
- EQUIPAV – Brazilian infra-structure investment group
- ESALQ/USP – “Luiz de Queiroz” College of Agriculture from USP (University of São Paulo)/ Escola Superior de Agricultura Luiz de Queiroz (ESALQ/USP)
- FAO – Food and Agriculture Organization
- FAPESP – São Paulo State Research Funding Agency/ Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP)
- FENABRAVE – Brazilian National Federation of Vehicles/ Federação Nacional da Distribuição de Veículos Automotores (FENABRAVE)
- FPBO – fast pyrolysis bio-oil
- FT – Fischer-Tropsch
- FvF – food versus fuel
- G1, G2, G3 – first, second, and third generation biofuels
- GHG – greenhouse gases
- GOL – Brazilian Airline company
- GranBio – Brazilian G2 ethanol producer
- HDR – DEDINI Rapid Hydrolysis Process
- HFO – heavy fuel oil
- HEV – hybrid electric vehicles
- HVO – hydrotreated vegetable oil
- IAA – Brazilian Sugar and Alcohol Institute/ Instituto do Açúcar e do Alcool (IAA)
- IAC – Agronomic Institute of Campinas/ Instituto Agrônomico de Campinas (IAC)
- IATA – International Air Transport Association
- IBAMA – Brazilian Institute for Environment and Renewable Natural Resources/ Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais (IBAMA)
- IBGE – Brazilian statistics enterprise/ Instituto Brasileiro de Geografia e Estatística (IBGE)
- ICAO – UN International Civil Aviation Organization
- ICMS – Brazilian state tax on merchandises and services/ Imposto sobre Circulação de Mercadorias e Serviços (ICMS)
- IEA – International Energy Agency
- iLUC – indirect land use change
- IMO – International Maritime Organization

- INT – Brazilian National Institute of Technology/ Instituto Nacional de Tecnologia (INT)
- IPAM – Amazon environment research institute/ Instituto de Pesquisa Ambiental da Amazônia (IPAM)
- IPT – Institute of Technological Research/ Instituto de Pesquisas Tecnológicas (IPT)
- IRENA – International Renewable Energy Agency
- ITA – Institute of Aeronautic Technology/ Instituto Tecnológico da Aeronáutica (ITA)
- KAV – aviation kerosene
- LATAM – Brazilian airline company
- LCA – life cycle analysis
- LFO – light fuel oil
- LNBR – Brazilian Biorenewables National Laboratory/ Laboratório Nacional de Biorrenováveis (LNBR)
- LOGUM – logistics system for ethanol transportation
- LUC – land use change
- MAPA – Brazilian Ministry of Agriculture/ Ministério da Agricultura, Pecuária e Abastecimento (MAPA)
- MGO – marine gasoil
- Mha – million hectares
- MME – Brazilian Ministry of Mines and Energy/ Ministério de Minas e Energia (MME)
- Mt – million tons
- NOVACANA – sugar & ethanol magazine
- NREL – National Research Energy Laboratory
- PETROBRAS – Brazilian Oil Company
- PHEV – plug-in hybrid electric vehicles
- PIS/PASEP – Brazilian Federal social tax on fuels, including ethanol
- PLANALSUCAR – National Program for Sugarcane Genetic Improvement/Plano Nacional de Melhoramento da Cana-de-Açúcar (PLANALSUCAR)
- POLI – São Paulo University Polytechnique School/ Escola Politécnica da Universidade de São Paulo (POLI/USP)
- PROALCOOL – Brazilian National Alcohol Program/ Programa Nacional do Alcool (PROALCOOL)
- PROBIODIESEL – Brazilian National Biodiesel Program/ Programa Nacional do Biodiesel (PROBIODIESEL)
- PROCONVE – Program for Vehicle Emission Control/ Programa de Controle da Poluição do Ar por Veículos Automotores (PROCONVE)

PV – photovoltaics

RAÍZEN – Brazilian G2 ethanol produce

R&DD- Research, development, and demonstration

RE – renewable energy

RENOVABIO – an initiative from MME to promote the production of sustainable biofuels in Brazil/

REPAR – President Getúlio Vargas Refinery/ Refinaria Presidente Getúlio Vargas (REPAR)

RFA – Renewable Fuel Association

RIDESA – interuniversity network for the development of sugarðanol sector/ Rede Interuniversitária para o Desenvolvimento do Setor Sucroalcooleiro (RIDESA)

ROTA2030 – Brazilian Federal program to promote automotive engine efficiency

SAF – sustainable aviation fuels

SEEG – Brazilian GHG emissions estimative system/ Sistema de Estimativa de Emissão de Gases (SEEG)

SOFC – Solid Oxide Fuel Cell

SOLAZYME – G2 biofuels enterprise

SOV – Straight Vegetal Oil

SUZANO – a Brazilian pulp and paper enterprise

SUW – Solid Urban Wastes

tc – tons of cane

TAG – Long-Term Aspirational Goal

TERMOQUIP – a Brazilian biomass thermal conversion enterprise

TFC – total final consumption

TRS – total recoverable sugars

UFOP

UFRJ – Federal University of Rio de Janeiro/ Universidade Federal do Rio de Janeiro (UFRJ)

UNCTAD – United Nations Conference on Trade and Development

UNEM – Brazilian national corn ethanol union/ União Nacional do etanol de Milho (UNEM)

UNESP – São Paulo State University/ Universidade Estadual Paulista (UNESP)

UNICA – Brazilian Sugarcane Producers Association/ União da Indústria da Cana-de-Açúcar (UNICA)

UNICAMP – State University of Campinas/ Universidade Estadual de Campinas (UNICAMP)

USDA – United States Department of Agriculture

USP – University of São Paulo/ Universidade de São Paulo (USP)

VALE – Brazilian multinational operating in the mining sector