



SUSTAINABLE
BUSINESS
COP30

Energy Transition Working Group

Booklet of Cases

OCTOBER 2025



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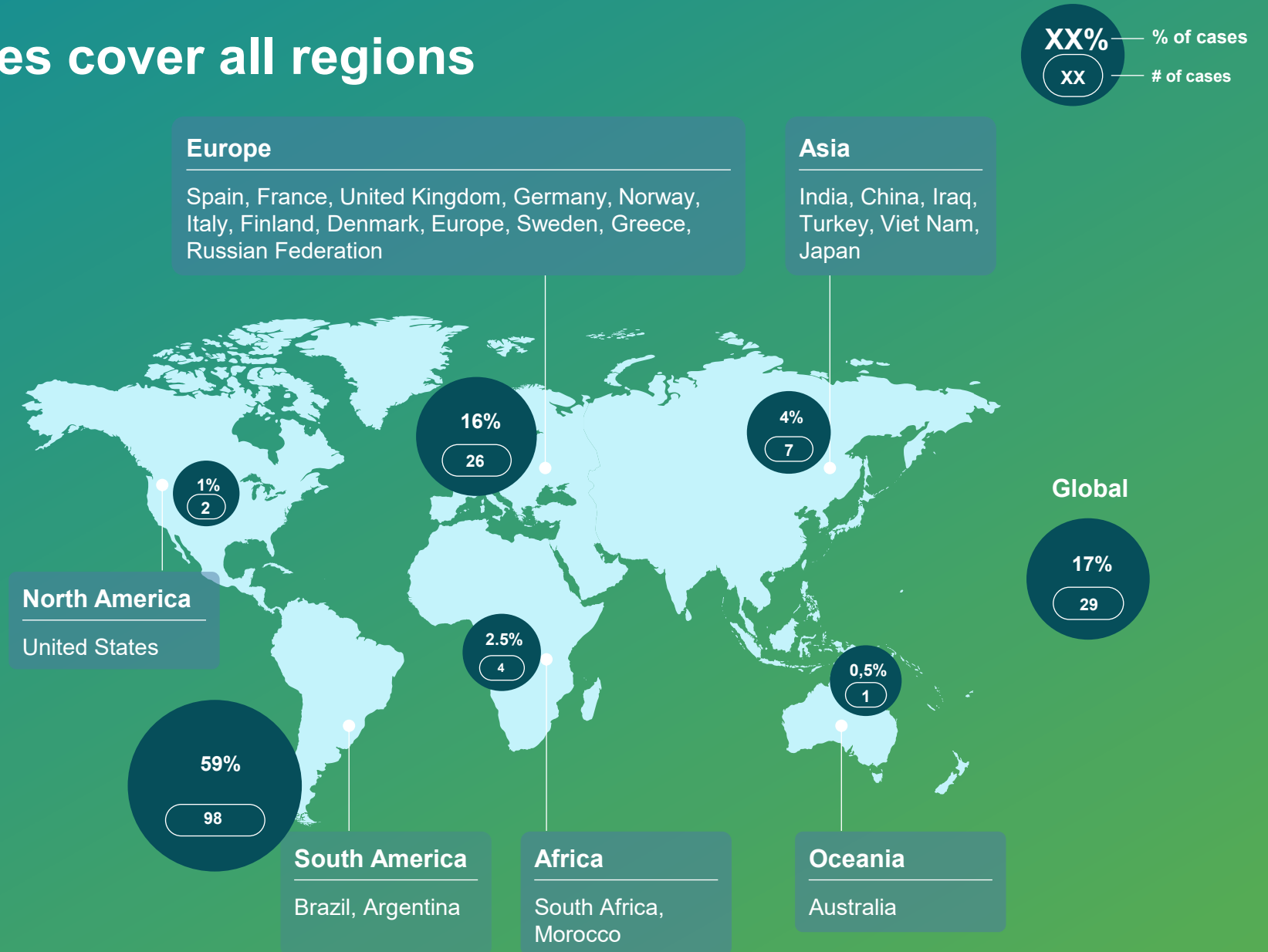
Introduction & Methodology

~170

cases

received from 23 countries to support the Working Group with tangible action examples

Cases cover all regions



A funnel methodology was adopted for the cases selection

167

Cases selected for the booklet

111

66

21

Cases selected for the Awards

6

Screening



Completion of information requested

Cases with all the main information requested in the form

Assessment



Classification based on 6 criteria

- Emissions impact
- Scalability
- Short-to-medium term implementation (maturity)
- Economic impact
- Innovation
- Alignment with SB COP positioning

Shortlist



Prioritization based on WG priorities

Degree of alignment with the Energy Transition Working Group priorities in Energy Efficiency, Renewables and Sustainable Fuels

Voting



Co-Chairs voting on best cases¹

- Geographical and sector balance
- Relevant economic and emissions impact already in place
- Scalable innovation

CRITERIA

1. 2 cases per priority topic

Top 6 cases selected for the SB COP Awards demonstrate high environmental and economic impact and scalability potential

Energy Efficiency

Biomass gasification at new facility



SUZANO

Gasification of black liquor and biomass residues to produce syngas for lime kilns

+20%
pulp capacity

~97%
GHG reduction

VESTA – Energy efficiency in a petrochemical complex



BRASKEM

Redesign of the thermoelectric system with high-efficiency motors and new cogeneration concept

-15M USD/yr
energy cost

-100 kt/year
CO₂e

Renewables

Gralha Azul power transmission line



ENGIE

Federal concession delivering ~1,000 km of transmission lines and 5 substations

27
municipalities

-1390 kt/year
CO₂e

Kenhardt hybrid (dispatchable renewable energy facility)



SCATEC

540 MW solar PV plant paired with 225 MW battery system

+100-120
permanent jobs

-900 kt/year
CO₂e

Sustainable fuels

De-risking & scaling waste-to-methanol plant (Ecoplanta)



REPSOL

Treatment of non-recyclable MSW (municipal solid waste) via molecular carbon recycling

+70%
carbon recovery

-340 kt/year
CO₂e*1

Hybrid flex-fuel vehicle technology



TOYOTA

First ever hybrid-flex technology merging electrification and biofuel (ethanol)

+100 k
units sold

-70% *2
CO₂ emissions

*1 Considering a straight-line of reduction throughout 10 years (-3,4 Mt CO₂ e over first 10 years of operations) ; *2 Compared to the same traditional combustion model using gasoline



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Overview of Cases

This booklet consolidates the information of all the selected cases

6

**Selected cases for
the SB COP Awards**



20

**Cases of energy
Efficiency**



46

**Cases of
Renewables**



39

**Cases of
Sustainable Fuels**



In the next pages, we bring more details about each case: overview, maturity and impact

1. Top 6

Case name	Company	Sector	Page
Biomass gasification plant at Suzano's new facility	Suzano S.A.	Energy Efficiency	19
Improving energy efficiency in a petrochemical complex through a pioneering approach	Braskem	Energy Efficiency	20
Gralha Azul Power Transmission Line	Engie Brazil	Renewables	21
Kenhardt Hybrid (Dispatchable Renewable Energy Facility)	Scatec; Partners: H1 Holdings; Lenders: Standard Bank (lead arranger); DFIs: Norfund, BII	Renewables	22
De-risking and scaling up of a first-of-a-kind (FOAK) waste to methanol project (Ecoplanta)	Repsol	Sustainable Fuels	23
Hybrid-Flex Fuel Vehicle Technology	Toyota Brazil and Toyota Motor Company	Sustainable Fuels	24

2. Energy efficiency cases (1/2)

Case name	Company	Sector	Page
Automa	Automa	Energy Efficiency	26
Commitment to the Logistics of the Future – Sustainable Transition at Serpa Transportation	Serpa Transportation; Grupo Serpa; CQ Circular Consulting; FETCEMG - Federation Of Freight Transport Companies Of Minas Gerais	Energy Efficiency	27
Decarbonization Pathway: From Extraction to Pellet Feed Production	Itaminas Mining Company S.A.	Energy Efficiency	28
Decarb Fast Track Programme	METRON (with support from Dalkia, BNP Paribas, and AWS)	Energy Efficiency	29
Decarbonization Pathways of the Aviation Sector	LATAM Airlines	Energy Efficiency	30
Driving decarbonization in automotive component production	Gestamp	Energy Efficiency	31
Energize: Accelerating Renewable Electricity Adoption in the Healthcare Supply Chain	PSCI, Schneider Electric, Amgen, AstraZeneca, Bayer, Bristol Myers Squibb, Chiesi Group, GSK, Johnson & Johnson, MSD; Novartis; Novo Nordisk; Pfizer; Sanofi; Takeda; Teva Pharmaceuticals; Sandoz; Schott; Almirall; Kenvue; United Health Group	Energy Efficiency	32
Energy Efficiency in Industry	Energy Efficiency Movement; 603 Movers	Energy Efficiency	33
Energy efficiency step-change for air conditioning with SKF magnetic bearings	SKF; HVAC Industry; Users Of Process Or Commercial Cooling	Energy Efficiency	34
Heat reuse in Data Centers - Sector coupling providing energy efficiency on a system level	Alfa Laval; Fernwärme Fyn; Data Center	Energy Efficiency	35

2. Energy efficiency cases (2/2)

Case name	Company	Sector	Page
A digital tool for Carbon Footprint Calculator (Houston)	Symrise; CO ₂ AI	Energy Efficiency	36
Internal investment frame driving mandatory decarbonization	SKF	Energy Efficiency	37
Investment in electrical mobility and operational fleet electrification	CPFL Energia	Energy Efficiency	38
ISA Energia Brazil's climate adaptation plan	ISA Energia Brazil	Energy Efficiency	39
Particolare Gelateria PotenzializEE	Particolare Gelateria	Energy Efficiency	40
Process Improvement Teams (PIT)	Solvay	Energy Efficiency	41
Safety and Sustainability: Innovation in leak detection guaranteeing leak-tightness in SF6 circuit breakers.	EHS Decarbonization Committee	Energy Efficiency	42
Silvertown, Newham	E.ON	Energy Efficiency	43
TripleE / Excellence in Energy Efficiency project in BASF Brazil and South America	BASF Brazil, BASF Argentina And BASF Chile; São Paulo State University (UNESP)	Energy Efficiency	44
Vale Mega Hubs	Vale; Steelmakers and local companies where projects are being developed; Local Governments; Banks	Energy Efficiency	45

3. Renewables (1/3)

Case name	Company	Sector	Page
"Sol do Para" Hybridization for remote areas	Siemens Energy	Renewables	47
10 years of the BASF Camaçari Acrylic Complex on the path to decarbonization	BASF S.A.	Renewables	48
Biogas Enrichment via Advanced Separation Techniques	DG Impianti Industriali; University Of Chieti Pescara; University Of Messina	Renewables	49
Biocharger: Energy & Biochar	Green Farm CO ₂ FREE; AirBurners	Renewables	50
Biomass Steam in Alagoas -Large-scale renewable energy production	Braskem S.A.; Veolia Environmental Services Brazil Ltda.	Renewables	51
Caieiras Carbon Credits Project – Largest Waste Treatment Facility in Latin America	Solvi Essencis Ambiental S.A.	Renewables	52
Cipla's Renewable Energy Transition for Sustainable Manufacturing	AMP Solar Power Systems Pvt. Ltd.; AMP Energy Green Eleven Pvt. Ltd.; Clean Max Auriga Power LLP; Juniper Green Cosmic Pvt. Ltd.	Renewables	53
Claro's Energy Program	Claro S.A.; Engie; GDSUN; Solargrid; Green Yellow	Renewables	54
Clean Modes, iFood Pedal and Emissions	iFood	Renewables	55
Combating Energy Poverty through the Democratization of Solar Energy in Low Income Communities	Neoenergia Coelba; Municipal Government Of Salvador	Renewables	56
Contribution to the Renewable Energy Matrix	Grupo Iquine	Renewables	57
Coya BESS Project	Engie Energia Chile; CEN - Chilean National Energy Coordinator; City Of Maria Elena	Renewables	58
DAC.SI Project	Pontifical Catholic University Of Rio Grande Do Sul; Repsol Sinopec Brazil	Renewables	59
Decarbonization Due Diligence Assessment (DDA)	Siemens Energy	Renewables	60
Decarbonization of industrial manufacturing facility through waste heat recovery	SLB; Fuel Sustainability; ANP; MME	Renewables	61
Decarbonx	Angara Global Ltd.	Renewables	62
Defy Solar Off-Grid Refrigerator Project	Accredited Solar Installers; Defy Appliances (South Africa)	Renewables	63

3. Renewables (2/3)

Case name	Company	Overall objectives	Page
Driving the Energy Transition: Carbon Footprint and Decarbonization Pathways in the Brazilian Coatings Industry	ATA Environmental Consulting; Akatu Institute; ABRAFATI - Brazilian Coatings Manufacturers Association	Renewables	64
Drought Free World Crisis	Partimer Inc.; Global Economic Impact Forum; Lakshmi LLC	Renewables	65
Electrification of Boilers	Industrial Transition Accelerator (ITA) / Mission Possible Partnership (MPP)	Renewables	66
Electrolux Group Climate Leadership	Electrolux Group	Renewables	67
Energia do Amanhã Program	Grupo Boticário		68
Eoliennes Flottantes du Golfe du Lion (EFGL)	Ocean Winds; Engie; EDP Renewables; Banque Des Territoires; ECOCEAN; Gulf Of Lion Marine Natural Park; University Of Perpignan; Marine Ecosystem Research Center; Principle Power	Renewables	69
Fighting methane emissions: Italgas Strategy to contain GHG	Italgas; CIG - Italian Gas Committee; ARERA - Italian Energy Regulatory Authority; UNEP OGMP 2.0	Renewables	70
Full decarbonization in the manufacturing of the API for Aspiring	Bayer Hispania	Renewables	71
Golden Valley Wind Energy	Engie; Thebe	Renewables	72
Key for a Net-Zero Future - Unlocking Africa's potential in clean hydrogen and sustainable food systems	OCP Nutricrops; Hydrojeel	Renewables	73
Green Hydrogen Value Chain Development Program in Rio Grande do Sul (H2V-RS)	InvestRS; Department Of Environment And Infrastructure - State Government Of Rio Grande Do Sul; Governor's Office - State Government Of Rio Grande Do Sul; Civil House - State Government Of Rio Grande Do Sul	Renewables	74
Harnessing tidal power with robust drive train solutions	SKF; Local Government Organization; European Union Organization For Financial Support (Cf Green Deal)	Renewables	75
Hazelwood Rehabilitation Project	Engie; Mitsui & Co. Ltd.; Fluence; Eku Energy; Local Aboriginal Representation (GLAWAC); Community Groups; Local Council; Australian Minister For Environment; Victorian Minister For Environment, Minister For Resources, Minister For Water	Renewables	76
Huaneng "Yellow Sea No.1": China's First Wave-Resistant Floating Offshore Photovoltaic Platform	World Economic Forum, China Huaneng Group	Renewables	77
Industrial Heat Pumps with Ceramic and Magnetic Bearings - a way to decarbonize operations	SKF in collaboration with research institutes	Renewables	78
Innovation and sustainability for a Net Zero future: The role of new technologies and regulatory challenges	Siemens Energy (SE)	Renewables	79
Jirau Hydropower Plant.	Engie (40%); Eletrobras (40%); Mitsui (20%)	Renewables	80

3. Renewables (3/3)

Case name	Company	Sector	Page
New e.Solvay soda ash manufacturing process	Solvay	Renewables	81
Noronha Verde Project	Neoenergia	Renewables	82
Northern Lights	Equinor; Shell; TotalEnergies; Yara; Ørsted; Heidelberg Materials; Hafslund Celsio; Stockholm Exergi; Norwegian state (Gassnova); Norwegian Ministry of Petroleum and Energy; Research Institutions	Renewables	83
Rotor Sails	VALE	Renewables	84
Solar project in Turkey	UK Export Finance; KUKK; Kalyon Enerji; Standard Chartered Bank	Renewables	85
Sustainability is to innovate: eutectic plates	Mondelez Brazil; Tecpet	Renewables	86
Technology Reduces Emissions in the LNG Sector: Innovations for Sustainability	Petrobras; Excelerate Energy; Wärtsilä Gas Solutions (WGS)	Renewables	87
Ternium's first wind farm (Vientos Olavarria)	Ternium Argentina S.A.; Tecpetrol (Energy Transition Division); Vestas; Techint Engineering And Construction	Renewables	88
The world's first non-oil based jet fuel, compatible with existing aircraft	LanzaTech	Renewables	89
Transition from natural gas boiler to a biomass boiler, reducing by 40% the current CO ₂ emissions of Solvay Paulínia Site in Brazil.	Solvay; Combio	Renewables	90
Tractors 100% electric	YAK Electric Tractors	Renewables	91
Uberaba Green Fertilizer (UGF)	Industrial Transition Accelerator / Mission Possible Partnership; Brazilian Investment Platform (BIP); ABIHV - Brazilian Hydrogen Industry Association; SInprifert - Fertilizer Raw Material Producers Association; Macquarie Asset Management; National Council For Fertilizers And Plant Nutrition	Renewables	92

4. Sustainable fuels (1/3)

Case name	Company	Sector	Page
100% Sustainable Route	Binatural; Catto Transportes; DAF	Sustainable fuels	94
Andalusian Green Hydrogen Valley	Moeve	Sustainable fuels	95
Be8 BeVant®: Renewable Biofuel for a Low-Carbon COP30	Be8	Sustainable fuels	96
BECCS FS Project	Fueling Sustainability	Sustainable fuels	97
Biofuels in Alagoas: the potential of local energies in the decarbonization of industries	Veolia; Braskem; Grune Energies By Veolia	Sustainable fuels	98
Biogás RS Program: boosting biogas production and waste-to-energy solutions through biodigesters in Rio Grande do Sul	InvestRS; Department Of Economic Development - State Government Of Rio Grande Do Sul; Department Of Environment And Infrastructure - State Government Of Rio Grande Do Sul	Sustainable fuels	99
Biomethane for the Energy Transition: Zeg Biogás & Aroeira Case	Zeg Biogas e Energia S.A.; Zeg Biogás Aroeira SPE Ltda; Bioenergética Aroeira S.A.; BDMG	Sustainable fuels	100
Biomethane implementation in a stamping automotive plant	General Motors	Sustainable fuels	101
BP bioenergy Regenerative Agriculture Program	BP Bioenergy	Sustainable fuels	102
Building trust in the transition to clean transport to reduce CO ₂ emissions	Energy Distributors; Charging Point Manufacturers; Charging Point Operators	Sustainable fuels	103
Cemvita FermWorks : Turning Waste Into Low-Carbon Value	Cemvita Inc.; InvestRS	Sustainable fuels	104
CO ₂ CHEM – Development of Technological Alternatives for Production of Green Hydrocarbons from CO ₂	Repsol Sinopec Brazil; Senai Firjan; University Of São Paulo (USP); Hytron (Neuman & Esser Group)	Sustainable fuels	105
De-risking and scaling up of synthetic fuel production	Several Private Companies	Sustainable fuels	106

4. Sustainable fuels (2/3)

Case name	Company	Sector	Page
Decarbonization mining and railroad at Vale trough Biodiesel	Vale	Sustainable fuels	107
Decarbonizing Aviation with e-SAF	SAF+ INTERNATIONAL GROUP	Sustainable fuels	108
Decarbonizing Steel industry – Green HBI hub Brazil	BNDES - National Bank For Economic And Social Development; Vale; Green Energy Park	Sustainable fuels	109
Elephant grass as alternative to recover degraded lands and mitigate CO ₂ emissions through the substitution of fossil fuels in Cement Production	Ciplan; EMBRAPA - Brazilian Agricultural Research Corporation	Sustainable fuels	110
Energy Transition How the cement industry is transforming and becoming a solution for waste mng	All Cement Companies In The Sector; Brazilian Portland Cement Association	Sustainable fuels	111
Ethanol Reformer: Development and technological upscaling to produce 500 Nm ³ /h of Low Carbon Hydrogen	Hytron - Energy And Industrial Gases Ltda.; Shell Brazil Petroleum Ltda.; ANP - National Petroleum, Gas And Biofuels Agency; FIRJAN - Federation Of Industries Of The State Of Rio De Janeiro; Raízen Energia S.A.	Sustainable fuels	112
France KerEAUzen	Engie; Air France - KLM; Haropa Port; Normandy Region; Just Transition Fund	Sustainable fuels	113
From Pilot to Impact: Scaling HVO for a Low-Carbon Future	Repsol; Massachusetts Institute Of Technology (MIT)	Sustainable fuels	114
From Waste to Energy - Autonomous and Affordable Energy for our Communities	Engie Brazil; Brazilian Association Of Biogas And Biomethane; Engie Foundation; Biomovement; Energy Assistance France	Sustainable fuels	115
Fueling the Future: Biofuel Integration from the Ground Up	Volkswagen Truck & Bus; Vibra Energia	Sustainable fuels	116
Green Puffs: Green Inhalers with Near-Zero Climate Impact	Lupin Limited	Sustainable fuels	117
Greenbound - Decarbonizing our operations	L'Oréal	Sustainable fuels	118
Harvesting the Future: Ethanol-Powered Agricultural Machinery	CNH Latin America	Sustainable fuels	119

4. Sustainable fuels (3/3)

Case name	Company	Sector	Page
Intermediate Corn Crop Ethanol	Fueling Sustainability	Sustainable fuels	120
Macauba, from seed to fuel, an innovative and sustainable energy solution	Acelen Renewables	Sustainable fuels	121
Macrofuel - Energy use of pyrolytic bio-oil from aquatic macrophytes for biofuel production	Senai Institute Of Innovation In Biomass; CTG Brazil	Sustainable fuels	122
MDC Energia and its biomethane projects: transforming waste into sustainable fuel for the future	MDC Energia	Sustainable fuels	123
Natural gas replacement using biomethane from a landfill at stationary combustion sources at Ternium's integrated steel plant	Ternium Brazil; Gas Verde	Sustainable fuels	124
New Holland Biomethane Tractor and Ecosystem	CNH - New Holland; Sebigas Cotica; Air Liquide; Gas Futuro; Geoenergética; 3DI; Master Biogas; PlanET	Sustainable fuels	125
P2X Solutions Harjavalta	P2X Solutions Oy	Sustainable fuels	126
Pelletizing decarbonization at Vale through Biomethane	Vale	Sustainable fuels	127
Reduction in the Use of Fossil Fuels	Grupo Iquine	Sustainable fuels	128
Scaling up renewable fuels production to allow progressive substitution of conventional fuels for transport.	Repsol	Sustainable fuels	129
Technical-Scientific Studies for CO ₂ Geological Storage in Deep Saline Aquifers of the Paraná Basin	Geological Survey Of Brazil; Petrobras; Fundação De Apoio Ao Desenvolvimento Da Computação Científica (FACC)	Sustainable fuels	130
Volkswagen Meteor Hybrid Truck – Sustainable technology	Volkswagen Truck & Bus; Suspensys	Sustainable fuels	131
Volkswagen Truck Fuel Flex: moved by 100% Brazilian Biofuel	Volkswagen Truck & Bus; JBS; Be8; MWM; Vibra Energia	Sustainable fuels	132



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Portfolio of Cases

Awards



Overview

Case objectives

Suzano's new facility in Ribas do Rio Pardo was engineered to utilize syngas from biomass gasification, reducing GHG emissions by up to 97% and advancing SBTi, efficiency, and clean energy goals.

Institutions Involved

Suzano S.A.

WG Alignment

Energy Efficiency, Sustainable Fuels, Biogas

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Biomass supply and ROI uncertainty may impact performance and scalability

Scalability

The biomass gasification model is scalable to other industrial units, enabling significant GHG reductions, energy self-sufficiency, and circularity

Impact

Innovative Drive

The project leverages large-scale biomass gasification to replace fossil fuels with renewable syngas. It integrates GHG emissions reduction, reinforces the role of biomass as an important renewable fuel, and applies cutting-edge technology to drive sustainable industrial innovation

Economic Impact

Boosts Suzano's pulp capacity by 20%, strengthens local supply chains, and enhances logistics efficiency

CO₂ Impact

Reduced fossil emissions from lime kilns by ~97%



Improving energy efficiency in a petrochemical complex through a pioneering approach

Energy
Transition
case selection



Brazil
Energy Efficiency

TOP 6

Overview

Case objectives

Redesign of the thermoelectric system at the ABC Petrochemical Complex, replacing low-efficiency steam turbines with high speed and high-efficiency motors, supported by a new cogeneration concept

Institutions Involved

Braskem

WG Alignment

Energy Efficiency and Heat ,Renewables

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Techno risks due to burning high H2 content fuel (>60% vol.) in a cogeneration, and complexity of electrification projects

Scalability

project design can be applied in all replacements of low to high efficiency thermal systems

Impact

Innovative Drive

The cogeneration counts on a partnership between Siemens and Braskem resulting in an integrated plant design running on residue gas w/ high concentrations of H2. The motorizations implemented by GE use high speed motors to solve old assets challenges

Economic Impact

According to Braskem's financial metrics, the project has a low payback, positive NPV and ensures a reduction of more than 15 MMUS\$/year in the energy cost of the Complex

CO₂ Impact

The project aims to reduce 100kt/year of CO₂e in the site's GHG emissions by decreasing natural gas and grid electricity consumption, and replacing old generation technologies with more efficient ones

External Links

Link 01

Link 02

Engie

Gralha Azul Power Transmission Line

Energy
Transition
case selection



Brazil
Renewables

TOP 6

Overview

Case objectives

Federal BOOT concession with 1,000 Km and 5 new Substations. Part of the Brazil National Interconnected System – improving renewable energy supply in Paraná State (including from Itaipú)

Institutions Involved

Engie Brazil

WG Alignment

Renewables, Energy Efficiency, Transpass cost barrier and Public-private collaboration

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

Regulatory and financing assumptions mismatches; socio-environmental concerns. Comment: The concession scheme for transmission lines concessions in Brazil allows experienced investors-operators to prepare reliable business plans before concession auctions

Scalability

Federal Transmission Lines Concession Program, which grants investors 30-year BOOT contracts for greenfield projects through public auctions

Impact

Innovative Drive

The launching of cables through drones allowed the decrease of trees suppression in 50%, in comparison with the amount approved in the Environmental License

Economic Impact

The concession scheme is attractive for private investor-operators, as all lots in every auction are successfully granted. The scheme allows long term financing through BNDES and debentures. It promotes power security, tariffs moderateness and reduce the risk of curtailments in the System

CO₂ Impact

Estimated 1.39 MtCO₂eq/year avoided, through the connection of 27 municipalities to the National Interconnected System





Overview

Case objectives

Installed solar PV of 540 MW and BESS capacity of 225MW, this project delivers 150 MW of dispatchable power from 5 am to 9.30 pm, year-round, on 20-year PPA

Institutions Involved

Scatec; Partners: H1 Holdings; Lenders: Standard Bank (lead arranger); DFIs: Norfund, BII

WG Alignment

Renewables, PV, BESS

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

Operational Risk (e.g. battery dispatch and degradation challenges, weather variation, HSSE requirements, etc.)
Environmental Risk (e.g. soiling, dust, waste, weather events, HSSE requirements, etc.)
Social Risk (e.g. site disruptions, mismatch of project expectations, etc.)

Scalability

Impact grows with widespread adoption – first utility scale dispatchable (renewable) solar facility in Africa, LATAM and Europe

Impact

Innovative Drive

Kenhardt leads as Africa's first and largest utility scale solar-battery dispatchable hybrid facility, delivering baseload renewable capacity. Delivered in 18 months from financial close, this project was won in a technology agnostic tender

Economic Impact

Strong returns via 20-year PPA, with a healthy IRR and positive NPV. Job creation (3100 peak construction – 13% women; permanent 100 – 120, approx. 39% women), supply chain development, and skills development.

CO₂ Impact

Estimated 900 000 tons of CO₂ avoided annually

External Links

Link 01

Link 02

De-risking and scaling up of a first-of-a-kind (FOAK) waste to methanol project (Ecoplanta)



Overview

Case objectives

The ECOPLANTA project will manage non-recyclable municipal solid waste (and also forestry and agricultural waste) to produce circular chemicals and advanced biofuels, recovering over 70% of the carbon and reducing GHG emissions

Institutions Involved

Repsol

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under implementation

Risks Involved

Variability in feedstock supply and quality, technology immaturity, risks of not achieving yields and product quality, higher than expected CAPEX and market risk

Scalability

The ECOPLANTA project proposes a scalable and replicable methanol production plant from waste

Impact

Innovative Drive

Ecoplanta will recover large amounts of MSW rejects, reducing CO₂ emissions, and enabling low-carbon production of circular methanol and bio-methanol. It is the next step in demonstrating the waste-to-chemicals process at commercial scale as the first waste-to-fuel plant in Europe to implement molecular carbon recycling

Economic Impact

Ecoplanta aligns with private sector goals through solid returns and cost-effective implementation. Efficiency, market demand, scalability, financing options, government incentives, and turnkey solutions make it financially attractive and sustainable

CO₂ Impact

Based on the Innovation Fund methodology, the project will achieve 3.4 Mt CO₂,eq of GHG emissions reductions over the first ten years of operation

External Links

Link 01

Toyota Hybrid-Flex Fuel Vehicle Technology

Energy
Transition
case selection



Brazil
Sustainable Fuels

TOP 6

Overview

Case objectives



Creation of a scalable hybrid-flex technology for light vehicles that merge electrification and biofuel (ethanol), cutting transport CO₂ with a drop in solution while helping countries to achieve Paris Climate Agreement

Institutions Involved



Toyota Brasil and Toyota Motor Company

WG Alignment



Sustainable Fuels, Energy Efficiency

Case Maturity

Case Stage



Mature, generating stable results with more than 100k units sold

Risks Involved



Duty-free access for imported and subsidized electrified vehicles represent an unfair competition to local production and could slow local scale-up

Scalability



Other companies announced investments in the same technology in Brazil and other countries

Impact

Innovative Drive



World's first-ever hybrid-flex-fuel system combines BEV-like efficiency with no chargers, developed in Brazil and tested in countries like India, Indonesia, and Colombia, adapting to local infrastructure and income without altering customer habits

Economic Impact



For the customers themselves it's possible to save 20%-40% of fuel. Besides that, no public investment in automotive chargers, transmission lines, energy generation is necessary

CO₂ Impact



The hybrid-flex vehicle on ethanol reduces up to 70% CO₂ comparing to the same traditional combustion model using gasoline. Considering the whole vehicle cycle (cradle to grave), it brings a strong and real decarbonization impact

External Links



Link 01

Link 02



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Portfolio of Cases

Energy Efficiency



Overview

Case objectives



Deploy digital solutions that improve efficiency across renewable-energy generation, transmission, and distribution systems

Institutions Involved



Automa

WG Alignment



Energy Efficiency

Case Maturity

Case Stage



Mature, generating stable results

Scalability



Digital solutions reduce emissions and improve efficiency in grids, scalable across utilities and geographies

Impact

Innovative Drive



Developed for Brazil's clean matrix, Automa's tech is now exported to Europe, proving global relevance of Brazil as a climate tech leader.

Economic Impact



Automa tripled in size since investment, with strong margins and no debt, proving financial resilience.

CO₂ Impact



Automa helped avoid 31,696 tCO₂e in 2024 through grid optimization and efficiency improvements across 44.9?GW of monitored renewable energy capacity

External Links



Link 01

Link 02

Commitment to the Logistics of the Future – Sustainable Transition at Serpa Transportation



Overview

Case objectives



Reduce carbon emissions and advance sustainable logistics through energy transition, digitalization, and environmental certification by 2030

Institutions Involved



Serpa Transportation; Grupo Serpa; CQ Circular Consulting; FETCEMG - Federation Of Freight Transport Companies Of Minas Gerais

WG Alignment



Energy Efficiency

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



Regulatory fluctuations, high costs of new technologies, weak electrification infrastructure, resistance to change, and remote logistics challenges

Scalability



The methodology can be replicated by other carriers, reducing CO₂ emissions through fleet certification, renewable energy, and digitalization, aligned with the Paris Agreement

Impact

Innovative Drive



Pioneering integration of the Despoluir Seal in the fleet, large-scale use of solar energy, and operational digitalization, advancing sustainable practices in the logistics sector

Economic Impact



Positive returns through operational cost reductions and reputational gains; costs are controlled and aligned with the budget, with potential for expansion

CO₂ Impact



Certified fleet with the Despoluir Seal, with an estimated 30% emissions reduction in the diesel fleet, based on internal inventory methodology, renewable energy, and CNT protocols

External Links



Link 01

Link 02

Decarbonization Pathway: From Extraction to Pellet Feed Production



Overview

Case objectives



Expand Itaminas' plant to produce high-grade pellet feed, reducing consumption and CO₂ emissions per ton in the steel value chain

Institutions Involved



Itaminas Mining Company S.A.

WG Alignment



Energy Efficiency

Case Maturity

Case Stage



Under implementation

Risks Involved



Licensing delays, construction operational challenges, and market fluctuations

Scalability



The process route can be replicated by several mining companies with small adjustments, helping reduce CO₂ emissions and optimize natural-resource use at scale

Impact

Innovative Drive



Technology that combines high-pressure grinding rolls (HPGR) with two separation methods to better utilize low-grade ores, increasing recovery and reducing energy consumption

Economic Impact



Higher iron content and increased pellet-feed production add product value and reduce costs in the steel chain; NPV US\$3.334M, margin 55%, payback 5.0 years after the last investment phase

CO₂ Impact



CO₂ reduction in the steel value chain by increasing ore grade, which improves steel mill efficiency; measurement performed using a recognized emissions inventory



METRON

Decarb Fast Track Programme

Energy
Transition
case selection



France
Energy Efficiency

Overview

Case objectives



Accelerate industrial decarbonization: Save 100,000 tons of CO₂ by equipping industrial sites with energy management and optimization solutions, expert support, and a community to exchange best practices

Institutions Involved



METRON (with support from Dalkia, BNP Paribas, and AWS)

WG Alignment



Energy Efficiency

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



Low use of software, CAPEX investment funding, low digital maturity (difficult to reduce CO₂ emissions on site with low digital maturity), energy price volatility, change/culture management

Scalability



DFT Institute expands community, implements solutions on more sites, and replicates programs in different regions

Impact

Innovative Drive



First European community for industrial decarbonization through efficient energy management

Accessibility to advanced energy management and optimization tools and expert support thanks to subsidies

Economic Impact



Energy savings translated into financial savings. Saved time thanks to intelligent solution and improved efficiency can be invested into more ROI projects. More production with less energy consumption

CO₂ Impact



63,000 tCO₂ of 100,000 target saved so far through 100 projects, improved energy management and optimization in real-time, reduced energy consumption, faster reaction time: improved efficiency and reduced energy waste (e.g. alerts)

External Links



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Overview

Case objectives

Apply operational and fleet measures to reduce CO₂ and fuel intensity, in line with ICAO/CORSIA and national climate targets

Institutions Involved

LATAM Airlines

WG Alignment

Energy Efficiency, Sustainable Fuels, Aviation Sector

Case Maturity

Case Stage

Mature, delivering stable and progressive outcomes

Risks Involved

Over uncertain regulation limited local SAF supply, and lack of regulatory harmonization may restrict carbon credits, hinder the 5% SAF target by 2030, and increase costly aviation compliance burdens

Scalability

The case outlines a modular approach adaptable to different airline contexts through SAF adoption and operational levers

Impact

Innovative Drive

It integrates efficiency measures such as more efficient fleets and routes, the use of electric ground support equipment, and intelligent fuel management systems

Economic Impact

Aircraft fuel costs decreased by 10.6% compared to the same period in 2024, driven by a 16.1% reduction in the average price of jet fuel (including hedges) and a 6.5% increase in fuel consumption associated with the expansion of operations

CO₂ Impact

Since 2010, the Fuel Efficiency Program has helped LATAM avoid over 5.6 million tons of CO₂. In 2024, operational improvements reduced 98,000 tons of CO₂. LATAM enhanced the program by implementing fleet-wide performance monitoring software, targeting an additional annual reduction of 8,000 tons of CO₂

External Links

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Overview

Case objectives

Advancing the energy transition in component manufacturing by reducing emissions through efficiency, electrification, and renewable energy

Institutions Involved

Gestamp

WG Alignment

Energy Efficiency, Renewables, Renewable Heat and Public-Private Collaboration

Case Maturity

Case Stage

Under implementation

Risks Involved

Regulatory changes and energy price volatility

Scalability

The case can be replicated across the automotive sector, driving significant emissions reductions and resource efficiency

Impact

Innovative Drive

It integrates advanced technologies for furnace and boiler electrification, biofuel feasibility study, on-site renewables, and energy management systems.

Economic Impact

Investments show strong returns, boosted by government incentives and the CAEs program.

CO₂ Impact

41.8% CO₂ emissions reduction* *2024 vs. 2018 data for Scopes 1&2

External Links

Link 01

Energize: Accelerating Renewable Electricity Adoption in the Healthcare Supply Chain

Energy Transition
case selection



Brazil
Energy Efficiency

Overview

Case objectives

Accelerate renewable electricity adoption in the healthcare supply chain to reduce Scope 3 emissions and support the goals of the Paris Agreement through supplier education and collaboration.

Institutions Involved

PSCI, Schneider Electric, Amgen, AstraZeneca, Bayer, Bristol Myers Squibb, Chiesi Group, GSK, Johnson & Johnson, MSD; Novartis; Novo Nordisk; Pfizer; Sanofi; Takeda; Teva Pharmaceuticals; Sandoz; Schott; Almirall; Kenvue; United Health Group

WG Alignment

Energy Efficiency; Renewables

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

Market availability of renewable electricity, regulatory uncertainty in some regions, supplier creditworthiness, complexity of PPA contracts, voluntary participation limits uptake

Scalability

Designed for replication across industries/geographies. Education is on-demand via Zeigo Hub platform. Live webinars available in 60+ languages. Suppliers can purchase renewable energy as solo buyer or combine electricity demand to buy as group.

Impact

Innovative Drive

Pioneer a multi-buyer PPA model for supply chains, combining digital education, aggregated procurement, and expert support. It bridges access gaps for SMEs and accelerates Scope 3 decarbonization through scalable collaboration.

Economic Impact

Energize enables cost-effective renewable electricity procurement through aggregated buying power, reducing costs for suppliers. Group PPAs improve contract terms and mitigate credit risk, aligning with private sector ROI and decarbonization goals.

CO₂ Impact

435,543 tCO₂/year avoided over 10 years. Considering contracted energy volume + Spain's location-based emissions factor (170.4 g CO₂/kWh converted to metric tons CO₂/GWh; IEA, Emissions Factors 2024).

External Links

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Energy Efficiency Movement

Energy Efficiency in Industry

Energy
Transition
case selection

Energy Efficiency

Overview

Case objectives



Accelerate industrial energy efficiency to cut CO₂ by one-third, boost investments to \$1.8T by 2030, and drive innovation through global collaboration with 600+ movers in the Energy Efficiency Movement

Institutions Involved



Energy Efficiency Movement; 603 Movers

WG Alignment



Energy Efficiency

Case Maturity

Case Stage



Implemented, generating first results

Risks Involved



Very low risks involved

Scalability



The Energy Efficiency Movement is highly scalable and works hands-on with energy efficiency in industry

Impact

Innovative Drive



Systematic way to work with energy efficiency

Economic Impact



We must double the speed of energy-efficiency improvements to above 4% and triple efficiency-related investments to USD 1.8 trillion by 2030 by working across the value chain, fostering public-private collaboration, and raising awareness

CO₂ Impact



The industry accounts for about 40% of global energy use and one-third of global carbon dioxide (CO₂) emissions. 15% of industry costs can be decreased through energy efficiency within two years

External Links



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Energy efficiency step-change for air conditioning with SKF magnetic bearings

Energy
Transition
case selection

Energy Efficiency

Overview

Case objectives

More than 10% of global CO₂ emissions are from the use of HVAC systems; up to 30% energy savings can be made by shifting away from conventional compressor technology to high-speed magnetic bearings

Institutions Involved

SKF; HVAC Industry; Users Of Process Or Commercial Cooling

WG Alignment

Energy Efficiency



Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

No significant risks as this is now a mature technology

Scalability

Fully scalable and will lead to significant emission reductions



Impact

Innovative Drive

High-speed magnetic-bearing technology enables a shift away from conventional compressors to achieve much higher efficiency

Economic Impact

This case aligns well with private-sector ROI requirements

CO₂ Impact

Since 2015, magnetic chillers have avoided 2.9 MtCO₂e due to energy efficiency; projections show a further 12 MtCO₂e can be avoided by 2030 with wider adoption

External Links

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Overview

Case objectives

Reusing heat from data centers cuts CO₂ emissions, saves energy, and supports sustainable heating—turning waste into a valuable resource for greener cities and greater energy efficiency

Institutions Involved

Alfa Laval; Fernwärme Fyn; Data Center

WG Alignment

Energy Efficiency

Case Maturity

Case Stage

Mature, generating stable results

Scalability

The data center sector is growing rapidly due to AI and digitalization; according to the IEA, global electricity use by data centers is expected to more than double by 2026, rising from 460 TWh in 2022 to over 1,000 TWh in 2026

Impact

Innovative Drive

Proven solution to reuse heat; Kemira Kemi in Helsingborg has delivered heat to the city since 1974

Economic Impact

Reuse heat is a business case for the data center, energy company and the city

CO₂ Impact

2 million metric tons of CO₂ emissions avoided between 2011 and 2017

External Links

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Link 02

A digital tool for Carbon Footprint Calculator (Houston)

Energy Transition case selection

Energy Efficiency

Overview

Case objectives



Houston supports carbon-reduction decisions with data for efficiency across the value chain. Together toward net zero by 2045: source, design, produce, and transport better

Institutions Involved



Symrise; CO₂ AI

WG Alignment



Energy Efficiency

Case Maturity

Case Stage



Under implementation

Risks Involved



Data quality issues, organizational changes, and added feature requests may create extra work beyond scope

Scalability



As more companies use the tool, it boosts carbon transparency across supply chains, enabling better decisions, real data use, and progress tracking toward Paris-aligned net-zero goals

Impact

Innovative Drive



With CCF and PCF integration, the tool enables automated, traceable, auditable carbon data in a standard format; hosted in a secure, single-tenant cloud, it is operated by CO₂ AI; the software and supporting infrastructure serve only Symrise

Economic Impact



Ongoing quantitative evaluation includes time savings vs manual calculation, protecting share of business by reducing churn risk, boosting reputation and investor credibility, and avoiding fines through regulatory compliance

CO₂ Impact



Houston follows top global standards for emissions: GHG Protocol, ISO, PEF, TfS, and will align with PACT to harmonize data and ease sharing across stakeholders (e.g., via SiGreen)



Internal investment frame driving mandatory decarbonization

Energy
Transition
case selection

Energy Efficiency

Overview

Case objectives

Slow uptake of decarbonization investments puts objectives at risk. A pragmatic approach to estimating the cost of decarbonization sets the investment frame for which the organization is accountable to spend

Institutions Involved

SKF

WG Alignment

Energy Efficiency



Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Risk of overspending instead of cutting emissions that can be addressed with clear approval criteria; use of unproven tech requires strict technical review

Scalability

This is scalable and necessary for large industries to phase out fossil fuels at speeds aligned with the Paris Agreement



Impact

Innovative Drive

Delegated operating-unit responsibility combined with strong corporate commitment, with progress on spend tracked as a leading KPI

Economic Impact

We have shown that payback times align with IRR for decarbonization and energy measures; energy investments show better profitability, ensuring the investment frame's profitability

CO₂ Impact

The investment frame will take us to decarbonized operations; the part dedicated to decarbonization (phase-out of fossil fuels) will give annual emissions reductions close to 60,000 tonnes

External Links

Link 01



Overview

Case objectives

The main objective of the case is to gradually increase the proportion of electric vehicles within CPFL's fleet, especially heavy operational vehicles, known as "aerial lift trucks".

Institutions Involved

CPFL Energia

WG Alignment

Energy efficiency; Other

Case Maturity

Case Stage

Under implementation

Scalability

The case is scalable, and when adopted widely, can cut scope 1 CO₂ emissions, aligning with Paris Agreement goals. It also promotes efficient energy use and infrastructure for sustainable mobility, enhancing demand for heavy electric vehicles.

Impact

Innovative Drive

CPFL's case is unique for prioritizing heavy fleet electrification—unlike most companies that focus on light vehicles. It also pioneers a 675 km green corridor and an Electric Mobility Lab, combining innovation, infrastructure, and real-world testing

Economic Impact

The project aligns with profitability by reducing fuel costs (R\$1.3M saved in 2024), lowering maintenance expenses, and requiring affordable phased investments.

CO₂ Impact

1138 tons of CO₂eq from 2021 and 2025. The methodology considered GHG Protocol's emission factors for heavy and light vehicles, and the total distance (kilometers) traveled by the electric vehicles.

External Links

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Overview

Case objectives

Integrate climate-risk and opportunity analysis for extreme weather into company strategy, strengthening transmission-sector resilience against climate change

Institutions Involved

ISA Energia Brazil

WG Alignment

Energy Efficiency

Case Maturity

Case Stage

Under implementation

Risks Involved

Extreme weather could damage operations and raise rebuilding costs for assets in construction or operation

Scalability

Developing solutions to increase resilience and reduce the vulnerability of energy transmission to climate threats requires coordinated actions between government, the private sector, and academia for the resilience of electrical infrastructure

Impact

Innovative Drive

The combination of technology and climate modeling provides a pioneering contribution to the sector's adaptability, enabling it to anticipate more severe climate events, develop mitigation measures, and act more effectively.

Economic Impact

Economic impact comes from higher reliability and lower recurring costs, reduced exposure to extreme events and penalties, stronger grid resilience, regulatory modernization, and alignment with the energy transition by preparing assets for a cleaner, more reliable power system

CO₂ Impact

Not applicable for projects related to climate adaptation (physical risks)

External Links

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Particolare Gelateria

Particolare Gelateria | PotenzializEE

Energy
Transition
case selection



Brazil
Energy Efficiency

Overview

Case objectives

Particolare Gelateria joined PotenzializEE to boost energy efficiency. Actions may cut energy use by 47% and GHG emissions by 63%, while improving process performance and competitiveness

Institutions Involved

Particolare Gelateria

WG Alignment

Energy Efficiency

Case Maturity

Case Stage

Under implementation

Scalability

Energy-efficiency upgrades at Particolare—mainly equipment replacements and process improvements—will reduce GHG emissions by 1,350.87 tCO₂e over their lifetime

Impact

Innovative Drive

The proposed cooling system uses chillers with advanced control and monitoring technology and an electronic expansion valve, which reduces energy consumption and mitigates high annual maintenance costs

Economic Impact

With 6.6 million kWh saved and NPV of R\$3.3 million, the project proves that energy efficiency delivers high returns

CO₂ Impact

The project achieved a projected 63% reduction in greenhouse gas emissions, showcasing the power of energy efficiency to drive climate action in small industries

External Links

Link 01

Solvay

Process Improvement Teams (PIT)

Energy
Transition
case selection



Brazil
Energy Efficiency

Overview

Case objectives

Process Improvement Teams boosts short-to-medium term industrial performance by providing expertise and methods to drive cost reduction, capacity growth, quality gains, innovation and sustainability

Institutions Involved

Solvay

WG Alignment

Energy Efficiency, Cost reduction and Data

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

Performance risks, mainly for technological innovations
Economic risks related to engineering projects: investment higher than expected or lower return

Scalability

PIT aims to reduce resource use and emissions by managing raw materials, energy, water, and packaging efficiently across all industries and production scales

Impact

Innovative Drive

PIT drives technological innovation in production processes through incremental improvements that lead to effective gains in performance, productivity, quality, process safety and sustainability, resulting in greater competitiveness in the market

Economic Impact

High economic impact on the competitiveness of products, as it directly and continuously improves the variable cost of production

CO₂ Impact

Reduction of 1 - 5 kt CO₂e/year



Safety and Sustainability: Innovation in leak detection guaranteeing leak-tightness in SF6 circuit breakers

Energy
Transition
case selection



Brazil
Energy Efficiency

Overview

Case objectives

Detect SF6 gas leaks in circuit breakers to ensure system integrity, enhance efficiency, and reduce emissions for environmental protection and regulatory compliance

Institutions Involved

EHS Decarbonization Committee

WG Alignment

Energy Efficiency

Case Maturity

Case Stage

Implemented, generating first results

Scalability

Contribution to global climate targets: many countries and organizations have set targets for reducing greenhouse gases, including SF6; meeting these targets is essential to achieving Paris Agreement goals

Impact

Innovative Drive

High sensitivity: ultrasonic methods can detect leaks at very low concentrations, allowing early identification of problems before they become critical

Economic Impact

Cost reduction: early leak detection can prevent major damage and costs associated with operational failures, resulting in long-term savings

CO₂ Impact

Reduced SF6 emissions by 18.53 kg, equivalent to 435,455 kg CO₂, through ultrasonic technology and improved calculations (1 kg SF6 = 23,500 kg CO₂)





Overview

Case objectives



Silvertown is the UK's first large-scale 5th Generation District Heating network. This decentralized, bidirectional system enables energy sharing between buildings.

Institutions Involved



E.ON

WG Alignment



Energy Efficiency

Case Maturity

Case Stage



Under implementation

Risks Involved



Traditional systems couldn't meet the project's high sustainability ambitions, and the need to preserve the historic docks created restricted routes for utilities.

Scalability



Silvertown ectogrid™ isn't just an innovative technical solution it's a model for how cities can decarbonize at scale while delivering tangible benefits for society and the environment.

Impact

Innovative Drive



Digital, ectocloud, smart control, predictive algorithms, power market mechanisms

Heat recovery from industry via Data Centers

Hydraulics - A 2-pipe bidirectional ambient loop that provides both heating and cooling, saving crucial space

Economic Impact



By harvesting ambient and waste heat and balancing thermal loads across the network, ectogrid™ dramatically reduces primary energy consumption by 50%. Because heating and cooling are generated close to the point of use with minimal thermal losses <2%

CO₂ Impact



At full deployment, ectogrid™ will achieve up to 88% lower carbon emissions compared to traditional gas systems, saving approximately 4,000 tons of CO₂ per year.

External Links



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TripleE / Excellence in Energy Efficiency project in BASF Brazil and South America

Energy Transition
case selection



Brazil
Energy Efficiency

Overview

Case objectives



Launched by BASF in 2015, the Triple E program aimed to boost energy efficiency, reduce environmental impact, and cut operational costs through targeted sustainability initiatives developed by the team

Institutions Involved



BASF Brazil, BASF Argentina And BASF Chile; São Paulo State University (UNESP)

WG Alignment



Energy Efficiency

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



The project involved no relevant risks

Scalability



Replicated and implemented in seven BASF production sites across South America, TripleE has also been used as a benchmark by other companies and academic institutions in the region; the methodology is available to whoever is interested

Impact

Innovative Drive



As a sign of its innovative approach, with 400+ new opportunities identified and detailed by a multidisciplinary team of experts, BASF was the first ISO 50001-certified chemical industry in Brazil and Chile

Economic Impact



Overall results for BASF South American sites: US\$7.6 million/year cost savings; 133.9 GWh/year energy reduction; 33.2 kt/year CO₂ reduction

CO₂ Impact



Project enabled the elimination of 33.2K tons of CO₂/year across 7 South American sites since its launch in 2016

External Links



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Vale

Vale Mega Hubs

Energy
Transition
case selection



Brazil
Energy Efficiency

Overview

Case objectives

Enable the production of low-carbon HBI using renewable energy and low emission reductant (Hydrogen or Natural Gas), enabling steelmakers to reduce emissions at scale.

Institutions Involved

Vale; Steelmakers and local companies where projects are being developed; Local Governments; Banks;

WG Alignment

Renewables



Case Maturity

Case Stage

Under planning

Risks Involved

Permitting delays, fluctuations in green H2 availability and cost, uncertainties about CO₂ pricing, infrastructure bottlenecks (port, energy, natural gas, water)

Scalability

Mega Hubs enable up to 85% emission reductions on steel production by supplying low-carbon HBI to multiple global steelmakers. The model can be replicated across regions, aligned with the Paris Agreement.



Impact

Innovative Drive

Integrate low carbon metallics (reduced by hydrogen or natural gas) and Vale's new briquette tech for decarbonized steelmaking.

Economic Impact

Each hub targets multi-billion USD investment with positive NPV and competitive IRR, supported by CBAM, HBI Premiums and potential off-take contracts.

CO₂ Impact

Each Mega Hub enables up to 85% CO₂ reduction per ton of steel compared to traditional blast furnace routes.





SUSTAINABLE
BUSINESS
COP30

Portfolio of Cases

Renewables

Siemens Energy

"Sol do Pará" Hybridization for remote areas

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives



Hybridization of the current generation in the isolated system, including solar and battery, in four cities until interconnection with the SIN—date still uncertain—without deforestation

Institutions Involved



Siemens Energy

WG Alignment



Renewables

Case Maturity

Case Stage



Under planning

Risks Involved



Government disapproval, licensing delays, loss of solar components in transport, and battery malfunction

Scalability



The model can be adopted in any isolated power-generation system or integrated into the SIN and applied by any power company; a 30% Renewable Factor corresponds to eight hours of light per day, reducing CO₂ emissions from fossil fuels

Impact

Innovative Drive



Hybridizing an existing system without deforestation, using natural or recovered areas, bringing greater security of energy supply to the community, usable in an isolated system or in the SIN as ancillary functions

Economic Impact



Hybridization will reduce diesel purchase costs, bringing returns that offset the investment, enabling a 5% reduction in community energy bills, and placing a clean-energy seal on operations

CO₂ Impact



32,000 tons per year of CO₂ avoided directly through reduced diesel consumption via solar energy; other CO₂e avoided could reach 70,000 tons per year



BASF S.A.

10 years of the BASF Camaçari Acrylic Complex on the path to decarbonization

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives

BASF's production site in Camaçari achieved in 2024 a 61% reduction of its CO₂ emissions, overcoming and anticipating BASF's global goal of 25% reduction by 2030, with a 29% production increase

Institutions Involved

BASF S.A.

WG Alignment

Renewables

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

No relevant risks involved in this project

Scalability

BASF's ISO 50001 expertise enabled a replicable benchmark already adopted by other companies; BASF also certified its South American sites, adapting the model to each operation, so it can be scaled globally across similar industries

Impact

Innovative Drive

Since 2015, BASF's Acrylic Complex has focused on sustainability; it developed a decarbonization strategy that achieved savings and earned important certifications, becoming a pioneering chemical plant in Bahia

Economic Impact

With payback under four years, the 16 projects reduced 18 GWh/year and 11 kt CO₂e, bringing strong economic and environmental gains; emissions dropped while production rose 29% in the same period

CO₂ Impact

In 2024 the BASF Camaçari industrial complex surpassed BASF's global target to reduce CO₂ emissions by 25% by 2030, cutting emissions by 61%, ahead of schedule and 144% above the goal

External Links

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Biogas Enrichment via Advanced Separation Techniques

Energy Transition
case selection



Italy
Renewables

Overview

Case objectives



Develop an innovative and scalable biogas-upgrading technology to selectively capture CO₂ under mild conditions, enabling the production of low-cost, high-purity biomethane

Institutions Involved



DG Impianti Industriali; University Of Chieti-Pescara; University Of Messina

WG Alignment



Renewables

Case Maturity

Case Stage



Implemented, generating first results

Scalability



The process is easily scalable as it only requires increasing the gas feed and vessel volume

Impact

Innovative Drive



The use of innovative organic solvents, which are safer and operate at lower temperatures, opens a new frontier in terms of CCUS capability

Economic Impact



Biomethane can be sold on the free market or used on site for heat generation; saved emissions allow savings on carbon-emission tokens

CO₂ Impact



The system allows cutting emissions caused by biogas, making it both ecologically and economically viable | Carbon impact — captures more than 95% of CO₂ from biogas at 30 °C while consuming 264 kJ less than conventional solvents for every kilogram of CO₂ captured, saving 13% of total energy



Green Farm CO₂FREE Biocharger: Energy & Biochar

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives



Biomass removals and carbon storage toward improved forest management, harvesting lesser-known species, and collecting wood residues to produce energy and biochar using Biocharger technology

Institutions Involved



Green Farm CO₂FREE; AirBurners

WG Alignment



Renewables

Case Maturity

Case Stage



Under planning

Risks Involved



Lack of investment to purchase biocharger plant, lack of carbon credits buyers for expensive BiRCS/CDR credits

Scalability



All biomass can be used to produce energy and biochar by Biocharger, one of PACM's priority areas with CDR solutions

Impact

Innovative Drive



Use of biomass to produce electricity to feed machinery in off-grid situations or supply energy to the grid when available; produces energy, reduces biomass residues, and produces biochar for soil amendment

Economic Impact



The estimated ROI is around 4 to 7 years with the Biocharger, and the system's lifespan is projected to reach 25 years

CO₂ Impact



Each Biocharger unit reduces up to 1,000 tCO₂e in biochar credits, plus another 100 tCO₂e from energy production and 2,500 tCO₂e from AR or IFM

External Links



Link 01



Overview

Case objectives

Decarbonize Alagoas's Vinyl Complex by replacing the natural-gas steam generation process with a biomass-based one, supported by electrification of equipment

Institutions Involved

Braskem S.A.; Veolia Environmental Services Brazil Ltda.

WG Alignment

Renewables

Case Maturity

Case Stage

Under implementation

Risks Involved

Electrification project complexity and delays due to unpredictable impacts on structural changes in old existing assets

Scalability

Such project design can be applied in ventures that aim to competitively decarbonize assets from higher-carbon fuels to lower-carbon ones

Impact

Innovative Drive

The project integrates electrification with the use of biomass in a partnership between Braskem and Veolia; it uses renewable sources and technology, promoting a circular economy and decarbonization

Economic Impact

The investment presents a short payback and positive NPV, ensuring an energy cost reduction of 4.3 MM USD per year

CO₂ Impact

Reduction in emissions of 115 kt CO₂e/y at the Alagoas plant in 2024, reaching 150 kt CO₂e/y annually from 2025 onward according to GHG Protocol standards

External Links

Link 01

Caieiras Carbon Credits Project – Largest Waste Treatment Facility in Latin America

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives



Capture landfill biogas from organic-waste decomposition to generate renewable electricity and high-integrity carbon credits

Institutions Involved



Solvi Essencis Ambiental S.A.

WG Alignment



Renewables

Case Maturity

Case Stage



Mature, generating stable results

Scalability



The technology for biogas capture and utilization has been replicated in 11 other landfills within the group, helping companies reduce emissions, generate renewable energy, and contribute to reducing global GHGs

Impact

Innovative Drive



We were the first company in the world to issue landfill biogas carbon credits with the UN, combining methane capture, renewable energy generation, and continuous tracking with international certification

Economic Impact



Biogas capture generates continuous revenue through certified credits and energy sales, guaranteeing solid returns; the model has viable costs and economic results aligned with sector profitability

CO₂ Impact



Estimated reduction of 13.9 million tCO₂e (Mar/06–Feb/25)

External Links



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Cipla's Renewable Energy Transition for Sustainable Manufacturing

Energy
Transition
case selection



India
Renewables

Overview

Case objectives



Achieve 50% of total power consumption from renewable sources and reduce absolute Scope 1 (energy-related) and Scope 2 emissions by 80% from the FY20 baseline by December 2025 for India operations

Institutions Involved



AMP Solar Power Systems Pvt. Ltd.; AMP Energy Green Eleven Pvt. Ltd.; Clean Max Auriga Power LLP; Juniper Green Cosmic Pvt. Ltd.

WG Alignment



Renewables

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



Changes or uncertainties in electricity regulations, Delays or complexities in obtaining necessary permits & approvals, Potential revisions in incentives such as electricity banking

Scalability



Our renewable-energy initiative is inherently scalable, demonstrating a replicable model for reducing GHG emissions through a diversified portfolio of captive solar projects, rooftop solar, and virtual PPAs/IRECs

Impact

Innovative Drive



The hybrid approach combining captive solar and wind, rooftop solar across multiple sites, and virtual PPAs represents a pioneering and integrated model within the Indian pharmaceutical sector

Economic Impact



We ensure cost-effective, stable energy through captive models and virtual PPAs, backed by state and central incentives that lower implementation costs and enhance investment appeal

CO₂ Impact



Through these efforts, we secured a total of 189,797 MWh of renewable electricity during FY 2024–25, which helped avoid/reduce 137,982 tCO₂e Scope 2 emissions

External Links



Link 01

Claro

Claro's Energy Program

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives

It focuses on the self-production of renewable energy through partnerships via distributed generation and PPA contracts, aiming to supply 80% of the company's energy and reduce carbon emissions

Institutions Involved

Claro S.A.; Engie; GDSUN; Solargrid; Green Yellow

WG Alignment

Renewables



Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

Connection problems with local providers, lack of specialists, unstable weather, political shifts, and policy uncertainty

Scalability

Energy use represents more than half of our carbon footprint; we created PMBoK-based guidelines and shared knowledge with other companies and countries where Claro operates, including competitors



Impact

Innovative Drive

Two of the largest distributed-generation power plants in Brazil operate for Claro using biogas; this technology serves regions near large cities and provides a better destination for organic waste in landfills

Economic Impact

Before adopting carbon credits, there is ample room for energy-efficiency projects to meet the 2030 Agenda; this became our policy, leading to more than 30% energy-cost reduction

CO₂ Impact

Claro's energy program has avoided more than 450,000 tons of CO₂e since its inception through direct initiatives without the use of carbon credits

External Links

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Link 03



Overview

Case objectives



Decarbonize urban delivery operations through fleet electrification, reducing GHG emissions and generating positive impact through the expansion of deliveries and couriers using clean modes

Institutions Involved



iFood

WG Alignment



Renewables



Case Maturity

Case Stage



Implemented, generating first results

Risks Involved



Limited charging infrastructure, high EV costs, weather conditions, and restrictive urban regulations for micromobility

Scalability



With a US\$7.5 million contribution to the YvY Fund, established partnerships (Tembici), and proprietary investment, the model is easily replicated in new cities; our base of 380,000 couriers enables rapid expansion throughout the ecosystem



Impact

Innovative Drive



Ecosystem with Pedal and YvY creates smart cities; the system is pioneering and pays couriers per km pedaled, combining sustainability and inclusion

Economic Impact



Sector transformation: fuel savings and creation of a market for 600,000 electric motorcycles per year; the model generates sustainable revenue and reduces operational costs

CO₂ Impact



Methodology used: GHG Protocol; estimated reduction of emission intensity by 63.8% by 2035



Combating Energy Poverty through the Democratization of Solar Energy in Low-Income Communities



Overview

Case objectives

Promote sustainability and democratize access to clean energy by installing 13 solar power plants in a low-income housing complex, aiming to reduce electricity bills for low-income families

Institutions Involved

Neoenergia Coelba; Municipal Government Of Salvador

WG Alignment

Renewables

Case Maturity

Case Stage

Mature, generating stable results

Scalability

With a photovoltaic solar power plant, the project contributes to Paris Agreement goals by increasing the share of renewables in the energy mix and, consequently, reducing greenhouse gas emissions

Impact

Innovative Drive

The initiative not only promotes energy efficiency but also fosters social inclusion and sustainable development by democratizing access to clean and renewable energy sources through a public-private partnership

Economic Impact

The project delivered tangible benefits for the energy distributor by reducing commercial losses, evidenced by a significant drop in overdue bills; the cumulative collection index increased from 82% (Feb 2024) to 94% (Mar 2025)

CO₂ Impact

Estimated reduction of 28.36 tons of CO₂ based on the generation of 278 MWh and a carbon intensity of 102.03 grams of CO₂e/kWh (source: Our World in Data)

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Grupo Iquine

Contribution to the Renewable Energy Matrix

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives



From 2025, have I-REC in place—a tracking system that certifies the consumption of energy from renewable sources—at all manufacturing plants

Institutions Involved



Grupo Iquine

WG Alignment



Renewables

Case Maturity

Case Stage



Implemented, generating first results

Risks Involved



Increase in I-REC certification costs

Scalability



Scope 2 CO₂ emissions neutralized with I-REC certification; commitment to SDG 7; commitment to ABRAFATI sector targets; compliance with best practices for the Sectoral Sustainability Program (PSS) indicator

Impact

Innovative Drive



With the abundance of Brazil's renewable energy matrix, the use of exclusively renewable sources is a differentiator that drives best practices, and the most innovative aspect is tracking the sources with certified verification

Economic Impact



Affordable cost set for 2025; kWh cost: R\$1.50 (with certificate)

CO₂ Impact



In the last year we avoided about 838 tons of CO₂ by purchasing electricity on the free market from renewable sources without source traceability; methodology: government CO₂ emission factors

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Engie Coya BESS Project

Energy
Transition
case selection



Chile
Renewables

Overview

Case objectives

The Coya Project is the largest BESS project in Latin America. It consists of implementing a 139 MW/638 MWh battery-storage capacity at the Coya PV park. This lithium battery facil

Institutions Involved

Engie Energia Chile; CEN - Chilean National Energy Coordinator; City Of Maria Elena

WG Alignment

Renewables

Case Maturity

Case Stage

Implemented, generating first results

Scalability

The project contributed to the economic dynamics of the Antofagasta Region

Impact

Innovative Drive

The BESS Coya can store about 5 hours of electricity and inject it into the grid, which represents 200 GWh of clean electricity for local households every year (about 100,000 households)

Economic Impact

Total implementation fits an 18-month schedule (announced December 2022, commercial operation March 2024)

CO₂ Impact

Project expected to save 65,000 tCO₂ annually, equal to removing 22,000 combustion vehicles from circulation





Overview

Case objectives

Establish a national DAC(Direct Air CO₂ capture) infrastructure and Center of Excellence in R&D for testing and validating CO₂ removal technologies and support Brazil's energy transition and climate leadership through global decarbonization efforts

Institutions Involved

Pontifical Catholic University Of Rio Grande Do Sul; Repsol Sinopec Brazil

WG Alignment

Renewables

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Technical scalability, climate variability, high energy use, regulatory uncertainty, and market acceptance may affect DAC deployment

Scalability

The DAC.SI project demonstrates a modular experimental DAC system tested under Brazilian conditions, with potential to scale from 300 tons/year to megaton levels, contributing to climate goals, the energy transition, and net-zero targets

Impact

Innovative Drive

DAC.SI is the first Brazilian and largest Latin American initiative to validate DAC under local conditions; it integrates modeling, renewables, and sorbent testing in an open-innovation DAC platform that supports the future energy transition

Economic Impact

The initiative uses ANP-regulated RD&I funding, lowering investment risk; its modular design enables gradual cost optimization, supporting future commercial viability and private-sector interest through reasonable capture costs and carbon credit

CO₂ Impact

The DAC.SI project can remove up to 300 tons of CO₂ per year via modular direct air capture, is under validation for Brazil's climate, and has the potential to scale to megatons annually

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Overview

Case objectives

Decarbonization of the Supply Chain by at least 30% by 2030 based on the annual calculation of supplier emissions. It reduces CO₂ (environmental), strengthens suppliers with data and support (social) and improves efficiency and productivity in the supply chain (economic).

Institutions Involved

Siemens Energy

WG Alignment

Energy Efficiency

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

A change in the mindset and culture of companies can lead to lower-than-expected supplier engagement and a potential need for investment, cost increases and process improvements on their part.

Scalability

The project works directly with decarbonization, reducing the CO₂ footprint in scope 3, also encouraging efficient resource management and other sustainable actions for suppliers.

Impact

Innovative Drive

By using digital platforms such as “supplier+s” for personalized CO₂ mgmt., encouraging and giving transparency to all projects that involve reducing emissions in the Supply Chain, which turn environmental goals into practical, replicable and scalable.

Economic Impact

The project supports profitability by reducing waste, increasing efficiency and preparing for global requirements. With digital tools and the use of existing systems, it is low cost and improves the company's image in the ESG market.

CO₂ Impact

From FY18 to FY24, Siemens Energy's Brazilian suppliers cut 117.5 thousand tons of Scope 3 CO₂e, with emissions intensity down 41%. Globally, carbon intensity fell from 0.508 to 0.408 kg CO₂e/EUR—over 19% lower.



Private Company

Decarbonization of industrial manufacturing facility through waste heat recovery

Energy
Transition
case selection



United States
Renewables

Overview

Case objectives



Project's objective is to capture and permanently store CO₂ from ethanol production, advancing carbon removal and supporting sustainable energy solutions in Brazil creating carbon negative ethanol.

Institutions Involved



SLB; Fuel Sustainability; ANP; MME

WG Alignment



Renewables

Case Maturity

Case Stage



Under implementation. Injection well being drilled as per Sep 2025

Risks Involved



Infra legal regulations, but already under experimental regulations by ANP (pilot). Challenges on MMV as a new usage of technology. Market adoption of carbon credits

Scalability



This project model can be replicated by companies or industries belonging to the free energy market. We are even moving forward with implementing this concept in our operations in the United States.

Impact

Innovative Drive



This case pioneers CO₂ for capture from bioenergy in LATAM. Most technologies are mature enough, but business model and the perspective are different. More innovation comes on the MMV plan after injection. This would be the first CO₂ injection for permanent storage in Brazil.

Economic Impact



This case proves decarbonization drives profitability. The project delivered \$55K in energy savings in one season. Our "efficiency first" approach reduced capital costs for Phase 2, proving sustainability is good for business.

CO₂ Impact



With a 60% boost in heating efficiency, Scope 1 emissions were cut by 364 tons in the first year of operation. Phase 2 will eliminate gas-fired steam boilers, reducing Scope 1 emissions by another 270 tons annually.

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Overview

Case objectives



DecarbonX has developed an innovative approach to managing fouling-degradation risks in heat exchanger equipment—Decarbonization-Centered Maintenance (DCM)

Institutions Involved



Angara Global Ltd.

WG Alignment



Renewables

Case Maturity

Case Stage



Implemented, generating first results

Risks Involved



The Decarbonization-Centered Maintenance approach and risk orchestration platform helps transition to proactive fouling management, prioritizing efficiency and CO₂ abatement

Scalability



400,000,000 tons per year—emission-reduction potential confirmed by DNV, an independent provider of quality assurance and risk management services operating in more than 100 countries; DNV also confirmed technology readiness level 8–9

Impact

Innovative Drive



The technology uses an AI-powered solution to integrate decarbonization into maintenance practices, emphasizing sustainability and environmental efficiency; it won first prize at the Asian Downstream Summit in 2024

Economic Impact



The technology addresses energy-efficiency issues, so CO₂ abatement comes “for free” with fuel savings; additionally, we improve reliability and product yields; typical IRR is 70%+

CO₂ Impact



400,000,000 tons per annum — DNV has confirmed the total abatement potential of this technology; DNV also rated the technology at TRL level 8–9

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Accredited Solar Installers

Defy Solar Off-Grid Refrigerator Project

Energy
Transition
case selection



South Africa
Renewables

Overview

Case objectives

The Defy Solar Off-Grid Refrigerator Project provides reliable, affordable cooling in South Africa with solar, battery, and smart energy to cut spoilage, improve food security, and reduce grid reliance

Institutions Involved

Accredited Solar Installers; Defy Appliances (South Africa)

WG Alignment

Renewables

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Panel theft or damage, battery degradation, affordability and adoption barriers, weather dependence, and installation certification needed for warranty

Scalability

Scalable solar-powered refrigeration addresses unreliable grids for 600M+ people, reduces spoilage, supports clinics and agri-chains, empowers rural enterprises, and enables cost-efficient, low-carbon adoption

Impact

Innovative Drive

The Defy Solar Off-Grid Fridge pioneers appliance-centered energy autonomy with Smart Control Box, Endura Chill insulation, hybrid operation, and a lithium battery, enabling reliable, efficient off-grid refrigeration for underserved communities

Economic Impact

The fridge cuts energy costs up to 44%, needs minimal solar setup, avoids costly inverters, boosts food security, reduces spoilage, and supports small businesses through donations, offering affordable, profitable off-grid refrigeration

CO₂ Impact

60cm saving: 285 kWh/yr; CF300 saving: 310 kWh/yr; grid factor 1.013 kgCO₂/kWh; at 1,000 units: 289k + 323k tCO₂e avoided; total annual avoidance = 612k tCO₂e

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Driving the Energy Transition: Carbon Footprint and Decarbonization Pathways in the Brazilian Coatings Industry

Energy
Transition
case selection



Brazil
Renewables, Energy efficiency

Overview

Case objectives

The main objective is to present the carbon footprint of the coatings industry in Brazil and the sectoral strategies, including energy transition, to achieve decarbonization by 2030, based on a GHG inventory

Institutions Involved

ATA Environmental Consulting; Akatu Institute; ABRAFATI - Brazilian Coatings Manufacturers Association

WG Alignment

Renewables, Energy efficiency

Case Maturity

Case Stage

Under implementation

Risks Involved

Low company adherence, limited investment capacity, data gaps, technological barriers, and regulatory or market changes

Scalability

The strategy engages 26 companies and targets 25% GHG cuts by 2030; it's scalable across the sector as more members join, supporting Paris goals via the energy transition and efficient resource use

Impact

Innovative Drive

The innovation lies in a sector-specific approach, integrating GHG reduction with energy transition, fuel switching, and advanced cooling systems; this scalable model addresses industry gaps and pioneers sustainability in the coatings sector

Economic Impact

The strategy includes cost-effective actions like energy efficiency and cleaner fuels, lowering operational costs; early pilots show positive NPV and IRR, proving financial viability and alignment with private-sector profitability goals

CO₂ Impact

The sector's baseline GHG emissions were calculated for 2023 using the GHG Protocol; reduction impacts will be measured in 2027 through a midpoint inventory and in 2030 based on the same method | Target to reduce carbon footprint by 25% by 2030, equivalent to an average reduction of 0.007 kg CO₂e per kg of product

Partimer Drought Free World Crisis

Energy
Transition
case selection

Renewables

Overview

Case objectives



Provide clean water through renewable-powered desalination and produce green hydrogen to combat drought, support clean energy, and promote sustainable development in water-scarce regions

Institutions Involved



Partimer Inc.; Global Economic Impact Forum; Lakshmi LLC

WG Alignment



Renewables

Case Maturity

Case Stage



Under planning

Risks Involved



Customers may resist paying 15% more than fossil diesel, showing low awareness of transition urgency

Scalability



Adoption by multiple companies can cut emissions by replacing fossil-fuel water and hydrogen systems, support Paris goals through green hydrogen, and ensure efficient water use with renewable-powered desalination across sectors

Impact

Innovative Drive



This project uniquely combines renewable-powered desalination with green hydrogen production, using smart energy systems and brine recovery; it pioneers a dual-use, zero-emission model tackling both water scarcity and climate change

Economic Impact



The project offers dual revenue from water and hydrogen sales, with IRR of 12%–16% and NPV of \$35–50M over 20 years; modular design and falling tech costs ensure affordability, aligning with private-sector profit and sustainability goals

CO₂ Impact



Renewable-powered desalination and green hydrogen cut ~210,000 tCO₂/yr, with ~280 GWh/yr of clean electricity replacing fossil desalination and grey H₂—about 45,000 cars off the road or CO₂ absorbed by 3.5M trees. Brine-disposal efficiency protects marine ecosystems. Scalable impact: 1 plant 210k tCO₂/yr; 10 plants 2.1 Mt; 100 plants 21 Mt



Industrial Transition Accelerator

Electrification of Boilers

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives



Decarbonize the Alumar refinery by replacing oil- and coal-fired boilers with electric boilers

Institutions Involved



Industrial Transition Accelerator (ITA) /
Mission Possible Partnership (MPP)

WG Alignment



Renewables

Case Maturity

Case Stage



Under planning

Risks Involved



High CAPEX, need for new electrical infrastructure, and current grid stability problems

Scalability



Project will have a significant impact on the refinery's decarbonization, reducing current emissions by 50%

Impact

Innovative Drive



The project will replace the current oil and coal boilers with new electric boiler technology. As part of the path forward, we are introducing a new business model possibility, where investment will be made by a third party and project profits will be shared

Economic Impact



The FEL 2 project is still under development, with completion expected by the end of the year. For FEL 1, we've already defined the technological path and are now conducting pre-engineering to perform the feasibility analysis. The project aims to decarbonize Alumar's steam generation by eliminating the use of coal and fuel oil. This will reduce emissions by over 1 million tCO₂e

CO₂ Impact



The project aims to reduce emissions from the refinery by 50% (from 0.6 tCO₂e/talumina to 0.3 tCO₂e/talumina), reducing more than 1 million tCO₂e/year



Electrolux Group

Electrolux Group Climate Leadership

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives



Electrolux Group met its first SBTi-approved climate target in 2022, three years early. Now pursuing net-zero by 2050 under a second SBTi target, aligned with the UN net-zero pledge signed in 2018

Institutions Involved



Electrolux Group

WG Alignment



Renewables

Case Maturity

Case Stage



Under implementation

Scalability



The strategy—based on identifying key impacts and improving processes—has proven to reduce emissions and is scalable to companies aiming to meet Paris Agreement goals

Impact

Innovative Drive



By embedding science-based goals, sustainable materials, and digital innovation, Electrolux sets a new standard in climate leadership with a consumer-focused, scalable decarbonization strategy

Economic Impact



Electrolux's Net Zero strategy lowers operational costs, attracts green financing, and boosts brand value—enhancing NPV and IRR through efficient resource use, risk mitigation, and long-term financial resilience

CO₂ Impact



From 2021–2024, the Electrolux Group cut scopes 1 and 2 emissions by 36% and scope 3 by 31%, using clean energy, recycled materials, efficient products, and CO₂-reduction strategies company-wide

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Overview

Case objectives



Focused on reducing GHG emissions from electricity consumption in retail, the program accelerates the transition to renewable energy sources in Grupo Boticário's beauty ecosystem

Institutions Involved



Grupo Boticário

WG Alignment



Renewables

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



No operational risks

Scalability



Grupo Boticário's Energia do Amanhã Program contributes directly to Paris Agreement goals, especially regarding greenhouse gas reduction and the energy transition for the retail ecosystem

Impact

Innovative Drive



As an innovative differential, the program allocates a percentage of each invoice paid by franchisees to the Movimento Viva Água, which develops water security and climate adaptation projects, creating a virtuous cycle of value generation

Economic Impact



Stores that join the program can reduce electricity costs by up to 20% without investing in infrastructure; cheaper, more stable energy improves participating stores' profit margins

CO₂ Impact



The Energia do Amanhã Program can reduce an average of 30 tCO₂e per year for each point of sale, indicating an additional 70,000 tCO₂e avoided by 2030

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Ocean Winds

Eoliennes Flottantes du Golfe du Lion (EFGL)

Energy
Transition
case selection



Overview

Case objectives

The objective of the EFGL project is to demonstrate the technical and environmental feasibility of floating offshore wind in the French Mediterranean through a 30 MW pilot farm with innovative, biodiversity-friendly solutions.

Institutions Involved

Ocean Winds; Engie; EDP Renewables; Banque Des Territoires; ECOCEAN; Gulf Of Lion Marine Natural Park; University Of Perpignan; Marine Ecosystem Research Center; Principle Power

WG Alignment

Renewables

Case Maturity

Case Stage

Under implementation

Risks Involved

Sensitive marine environment needs biodiversity safeguards, offshore ops depend on stable wind/waves; turbulence is high but not harsh, new infrastructure in the region requires strong coordination

Scalability

EFGL is a 30 MW pilot, and its success paves the way for larger floating farms —such as our EFLO project (250 MW). Floating wind unlocks clean energy in deep waters and supports climate goals

Impact

Innovative Drive

EFGL combines advanced floaters, eco-design, and regional teamwork—setting a global model for sustainable marine energy. EFGL proves WindFloat® works in deep waters, expanding offshore wind to new zones

Economic Impact

EFGL shows floating wind is scalable and bankable. Backed by Ocean Winds, Banque des Territoires, ADEME, and global banks, it proves financial viability through public-private partnership

CO₂ Impact

Avoided CO₂ emissions – 50 000 tons annually

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Overview

Case objectives

Since 2020, Italgas has developed an advanced model to cut CH₄ emissions, optimize network maintenance, and improve its ESG rating

Institutions Involved

Italgas; CIG - Italian Gas Committee; ARERA - Italian Energy Regulatory Authority; UNEP OGMP 2.0

WG Alignment

Renewables

Case Maturity

Case Stage

Mature, generating stable results

Scalability

Italgas cut methane emissions by 43%, supporting the 1.5°C target, optimizing costs, improving safety (-60% odor calls since 2017), and extending its model to Greece; easily replicable in other urban gas networks if resources are available

Impact

Innovative Drive

The Italgas model leverages advanced CRDS technology, 1000× more sensitive than traditional methods, enabling direct quantification and prioritization of major leaks; the company is continuing scouting activities—satellites, drones, OGI cameras

Economic Impact

Since 2020, the reduction in the social cost of CO₂ has been estimated at €6.6 million, and community savings from raw material not emitted at ~€2.6 million

CO₂ Impact

Italgas Group achieved a -43% reduction that corresponds to 66.8 kton of CO₂e avoided; Italgas has adopted a transition plan aligned with the Paris Agreement and validated by Carbonsink

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Full decarbonization in the manufacturing of the API for Aspiring



Overview

Case objectives

In the production of acetylsalicylic acid (API for aspirin), a lot of energy in the form of electricity and heat is used. In 2026 the goal is to have both types of energy coming from renewable sources

Institutions Involved

Bayer Hispania

WG Alignment

Renewables

Case Maturity

Case Stage

Under implementation

Risks Involved

Innovative technology for accumulation of heat is a challenge

Scalability

Use of green electricity to provide green heat is a challenge in industry; this would serve as an example for other industries to follow

Impact

Innovative Drive

Use of heat storage in a molten-salt tank with electrical resistances that put in heat during hours of excess renewable electricity production (solar, wind, hydro)

Economic Impact

Implementation costs are currently higher than fossil fuels (gas); however, via a long-term HPA (Heat Purchase Agreement) with the steam provider, we guarantee price stability and obtain the "Aspirin green label"

CO₂ Impact

Goal is to achieve zero CO₂ Scope 1 emissions | goal of "full decarbonization," with CO₂ figures in Bayer reports (30% reduction by 2030 globally, applicable to the site)



Overview

Case objectives



Golden Valley Wind Energy facility is a 120 MW onshore wind project which consists of 48 2.5 MW Goldwind permanent-magnet direct-drive turbines

Institutions Involved



Engie; Thebe

WG Alignment



Renewables

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



Grid access limitations, wind availability, bird collisions, and turbine supply chain delays (turbine spares and repairs)

Scalability



By displacing fossil-fuel electricity with renewable wind power, the project directly reduces greenhouse gas emissions and supports South Africa's Nationally Determined Contributions (NDCs)

Impact

Innovative Drive



The Observer-Led Shut Down on Demand (SDOD) Programme is a groundbreaking programme implemented at Golden Valley Wind Energy as part of the project's commitment to no net loss of priority bird species

Economic Impact



The total project cost of ~ZAR 3.2 billion for 120 MW of installed capacity reflects competitive implementation costs; electricity is sold under a 20-year PPA, ensuring predictable long-term revenue

CO₂ Impact



Golden Valley generates about 477.6 GWh per annum, supplying an estimated 163,995 households with clean, sustainable energy; in 2024 the avoided CO₂ emissions were approximately 421,583 tonnes

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Overview

Case objectives

Accelerate green-ammonia deployment, leveraging Africa's renewable-energy potential and OCP Nutricrops' leadership to scale green hydrogen, green ammonia, and derivatives for a sustainable transition

Institutions Involved

OCP Nutricrops; Hydrojeel

WG Alignment

Renewables



Case Maturity

Case Stage

Under implementation

Risks Involved

Carbon credit price fluctuations and environmental law changes may impact certification, revenue, and viability

Scalability

More than 95% of ammonia is made using fossil fuels, primarily through natural gas or coal; conventional ammonia is a major CO₂ emitter, with each ton typically releasing 2–4 tons of CO₂ depending on the process; fertilize



Impact

Innovative Drive

The project adopts a pioneering approach by combining new and mature technologies to integrate large-scale green ammonia production into the fertilizer sector; this innovative approach stems from the possibility of replacing fossil fuels

Economic Impact

Producing fertilizers with green ammonia meets CBAM and green-hydrogen certification standards, unlocking access to premium regulated markets

CO₂ Impact

Carbon impact — OCP Nutricrops imports ~1.8–2 Mt of ammonia annually; large-scale renewable-ammonia production in Morocco is expected to reach 3 Mt by 2032, enabling a yearly reduction of 6–8 million tons of CO₂ using >3 GW of clean mixed capacity (solar and wind) plus ~2.7 GWh of BESS in early phases *Using McKinsey's conventional ammonia emission range (1.9–2.6 t CO₂/t NH₃)



Green Hydrogen Value Chain Development Program in Rio Grande do Sul (H2V-RS)

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives

Boost H2V production and its value chain in Rio Grande do Sul through public policies, incentives, and subsidies, promoting the transition to a low-carbon economy

Institutions Involved

InvestRS; Department Of Environment And Infrastructure - State Government Of Rio Grande Do Sul; Governor's Office - State Government Of Rio Grande Do Sul; Civil House - State Government Of Rio Grande Do Sul

WG Alignment

Renewables

Case Maturity

Case Stage

Implemented, generating first results

Scalability

The program can be replicated in multiple Brazilian cities and states, prioritizing local energy production and allocating output to offtakers and local value chains, ultimately reducing CO₂ emissions

Impact

Innovative Drive

Funding calls often encourage R&D consortia, startups, and pilot projects, fostering innovation ecosystems; spillovers into adjacent sectors (fuel cells, synthetic fuels, carbon capture, industrial process optimization) add up to the project

Economic Impact

The program impacts local value chains by mobilizing capital toward R&D and innovation, industrial competitiveness, job creation, infrastructure development, and positioning the region as a competitive hub in the global energy transition

CO₂ Impact

RS Government: program estimated to reduce up to 8.4 million tons of CO₂ by 2040

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Harnessing tidal power with robust drive train solutions

Energy
Transition
case selection

Renewables

Overview

Case objectives

Estimates show 100 GW of near-shore tidal power is harnessable globally, but harsh underwater conditions remain a challenge. SKF supports tidal firms with durable, holistic rotating solutions

Institutions Involved

SKF; Local Government Organization; European Union Organization For Financial Support (Cf Green Deal)

WG Alignment

Renewables



Case Maturity

Case Stage

Implemented,

Risks Involved

Risk is related to permits and leases for seabed use - not getting approval or significant delays

Scalability

SKF's proven six-year turbine reliability supports global deployment; scaling from 6 MW to 59 MW+ shows strong potential to cut emissions and meet Paris goals through predictable, renewable ocean energy



Impact

Innovative Drive

SKF set a world record with 6+ years of uninterrupted turbine operation; its integrated 3 MW drivetrain and subsea-ready components offer a pioneering, low-risk solution for harsh marine environments

Economic Impact

Tidal stream energy is projected to add £17B to the UK economy by 2050; SKF's low-maintenance systems reduce lifecycle costs, supporting profitability and lowering LCOE

CO₂ Impact

SKF's powertrain technology reduces CO₂ lifecycle emissions by 30%

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Engie Hazelwood Rehabilitation Project

Energy
Transition
case selection



Australia
Renewables

Overview

Case objectives



The project involves the demolition of the former Hazelwood coal mine and coal power plant in Victoria, Australia, and the establishment of new energy infrastructure, notably a BESS facility

Institutions Involved



Engie; Mitsui & Co. Ltd.; Fluence; Eku Energy; Local Aboriginal Representation (GLAWAC); Community Groups; Local Council; Australian Minister For Environment; Victorian Minister For Environment, Minister For Resources, Minister For Water

WG Alignment



Renewables

Case Maturity

Case Stage



Implemented, generating first results

Risks Involved



Fire risk mitigation is one of the key issues of the rehabilitation project given the exposed coal

Scalability



BESS are central to grid sustainability and decarbonization objectives; they help reduce CO₂ emissions by bypassing the intermittency of renewable electricity such as wind and solar

Impact

Innovative Drive



The BESS implementation supports the rehabilitation of Hazelwood's former coal power plant and mine site; from this perspective, the development and design of this BESS facility is quite unique

Economic Impact



The battery's innovative design and the site's unique location provide potential to scale storage capacity quickly and cost-effectively to respond to network and market demand

CO₂ Impact



About 10% of the initial 1,600 MW capacity was re-deployed through a 150 MW BESS, while the former coal-fired power plant would emit 1.56 tCO₂ per MWh generated and accounted

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Hazelwood Rehabilitation Project

Huaneng “Yellow Sea No.1”: China’s First Wave-Resistant Floating Offshore Photovoltaic Platform

Engie

Energy
Transition
case selection



China
Renewables

Overview

Case objectives

To validate the floating offshore PV platform's endurance, power efficiency, maintenance, and weather resilience in hybrid wind-PV setups, establishing a technological pathway for scalable offshore renewable expansion.

Institutions Involved

World Economic Forum, China Huaneng Group

WG Alignment

Energy Efficiency, Renewables, Wind, PV, Cost reduction

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

Structural failure under extreme weather; significantly higher than anticipated LCOE

Scalability

A single floating PV platform generates ~472,000 kWh annually. When deployed at scale with proportional capacity allocation to co-located offshore wind, the integrated system will yield 1.29 billion kWh yearly, reducing over 1 million tons CO₂

Impact

Innovative Drive

This PV-wind hybrid cuts CAPEX/OPEX by sharing infrastructure, features a honeycomb-inspired hexagonal wave-resistant steel-plastic floater while enhancing modular scalability, and includes multi-system monitoring

Economic Impact

Reduces steel weight by 25% while the mooring system cuts anchor usage by >50%, collectively lowering total array CAPEX by ~3%

CO₂ Impact

1.29 billion kWh yearly for integrated PV-wind hybrid – effectively replacing 387,000 tons of standard coal while reducing CO₂ emissions by over 1 million tons.



Industrial Heat Pumps with Ceramic and Magnetic Bearings - a way to decarbonize operations

Energy
Transition
case selection



Sweden
Renewables

Overview

Case objectives

Industrial heat pumps can reduce emissions by more than 90% but with major challenges in reliability and efficiency due to demanding operation. Ceramic and magnetic bearings are the solutions

Institutions Involved

SKF in collaboration with research institutes

WG Alignment

Renewables, Energy Efficiency and Renewable Heat



Case Maturity

Case Stage

Implemented, generating first results, and mature for medium/high temperatures

Risks Involved

Termination of governmental funding and higher operational and maintenance cost

Scalability

Experience clearly show very good scalability and high CO₂ reductions are made



Impact

Innovative Drive

R&D needed to reach ultra-high temperatures

Economic Impact

Well aligned with private sector goals and IRR

CO₂ Impact

CO₂e emission reduction are in the order of 60% to 90%

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Innovation and sustainability for a Net Zero future: The role of new technologies and regulatory challenges

Energy
Transition
case selection

Renewables

Overview

Case objectives

Siemens Energy created the Blue Portfolio to replace SF6 with zero-carbon tech like vacuum interruption and Clean Air, showing its commitment to sustainability and innovation



Institutions Involved

Siemens Energy (SE)



WG Alignment

Renewables



Case Maturity

Case Stage

Mature, generating stable results



Risks Involved

Critical supply chain, market and price development, shortage of key personnel, and ESG requirements



Scalability

Impact of replacing SF6 equipment with clean, low-maintenance energy solutions aligned with global CO₂-reduction and sustainability goals



Impact

Innovative Drive

There are several initiatives to replace SF6 to reduce GWP impact, but they do not eliminate it completely; SE proposes a technology in which Global Warming Potential (GWP)= 0 and Ozone Depletion Potential (ODP) = 0



Economic Impact

Vacuum tech has higher initial CAPEX, but SF6 OPEX surpasses it by year three; in countries lacking sustainability incentives, utilities are still not encouraged to adopt “zero-impact” solutions like the Blue line



CO₂ Impact

Impact: ~8,300,000 tons of CO₂-equivalent saved; 1 kg of SF6 = 24 tons of CO₂; methodology: calculation of the SF6 emission rate based on the balance of SF6 usage in the factories to manufacture equi



External Links



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Engie Jirau Hydropower Plant.

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives



Demonstration that it is possible to implement infrastructure in the Amazon in a responsible way, following the highest, world-class social, economic, and environmental standards

Institutions Involved



Engie (40%); Eletrobras (40%); Mitsui (20%)

WG Alignment



Renewables

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



Climate Change risk proved not to be an issue, after the testing of the plant with the Hydropower Resilience Guideline, demonstrating resilience for the 5 scenarios of the IPCC for the region

Scalability



Brazil should develop pumped-storage hydro, which can provide long-duration storage and flexibility for the interconnected system, enabling intermittent renewables such as solar and wind

Impact

Innovative Drive



Pumped-storage hydro plants also decrease the risk of curtailment

Economic Impact



Investment in pumped-storage hydro plants is a competitive way to provide long-duration storage for the system

CO₂ Impact



Jirau is registered in the UNFCCC's Clean Development Mechanism since 2012, avoiding 6 million tons of CO₂e/year



Overview

Case objectives

The e.Solvay process is Solvay's technological breakthrough to produce more sustainable and competitive soda ash, reducing CO₂ emissions by 50% compared to the current process

Institutions Involved

Solvay

WG Alignment

Renewables

Case Maturity

Case Stage

Under implementation

Scalability

We aim to start industrial scale-up before 2030 and roll out until 2050

Impact

Innovative Drive

Electrochemistry is leveraged

Economic Impact

Process electrification protects local competitiveness in the EU ETS; local sourcing of green electricity brings security of supply, long-term price visibility, and freight-cost savings versus imported fossil fuels; the new process will increase reaction yield, reducing raw-material usage and energy consumption

CO₂ Impact

-50% compared to the current process



Neoenergia Noronha Verde Project

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives



Noronha Verde Project is an initiative aimed at decarbonizing the energy matrix of Fernando de Noronha by expanding renewable energy generation

Institutions Involved



Neoenergia

WG Alignment



Renewables

Case Maturity

Case Stage



Under implementation

Risks Involved



Fernando de Noronha faces licensing, logistics, weather, port limits, weak infrastructure, tourism pressures, and labor shortages

Scalability



It's a replicable project that reduces emissions by transitioning from diesel thermal generation to solar; if adopted by other companies in off-grid locations, it will contribute to Paris Agreement goals

Impact

Innovative Drive



First utility-scale off-grid solar plant with a battery storage system in Brazil

Economic Impact



Minimize environmental impacts from thermal generation and reduce average cost per MWh; strengthen sustainable tourism driven by decarbonization and ESG principles; develop diverse economic activities

CO₂ Impact



Considering that the Tubarão power plant, a diesel-based energy generator on Fernando de Noronha Island, emitted 21,433 tCO₂ in 2024, and that the project aims to reach 85% renewable energy on the island, we estimate an annual emissions reduction of 18,218 tCO₂; this is an estimate based on 2024 energy generation



Equinor Northern Lights

Energy
Transition
case selection



Norway
Renewables

Overview

Case objectives



First ever cross-border, open-source CO₂ transport and storage infrastructure network, offers companies across Europe the opportunity to store their CO₂ safely and permanently underground.

Institutions Involved



Equinor; Shell; TotalEnergies; Yara; Ørsted; Heidelberg Materials; Hafslund Celsio; Stockholm Exergi; Norwegian state (Gassnova); Norwegian Ministry of Petroleum and Energy; Research Institutions

WG Alignment



Renewables

Case Maturity

Case Stage



Implemented, generating first results

Risks Involved



TBD

Scalability



The Northern Lights project demonstrates scalability by providing a replicable model for CO₂ transport and storage. Its success in Norway/Europe can inspire similar CCS projects globally, supporting emissions reductions and Paris Agreement goals.

Impact

Innovative Drive



Northern Lights is the first open-access, cross-border CO₂ transport and storage network. Its pioneering offshore storage in geological reservoirs sets a global benchmark for CCS innovation and scalability.

Economic Impact



In its first phase, Northern Lights required government support to reduce the risks of launching CCS value chain, but as the project matures and scales, costs are expected to fall, making later phases more commercially attractive for European industries

CO₂ Impact



Cut emissions by storing at least 5 MtCO₂/year (vs. 1.5 Mt initially), equal to ~2.5 million fossil-fuel cars. First CO₂ volumes already injected in 2025.

External Links



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VALE

Rotor Sails

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives

Conduct a pilot test of Rotor Sails technology on a Valemax vessel to evaluate its effectiveness in reducing CO₂ emissions and fuel consumption.

Institutions Involved

VALE

WG Alignment

Renewables, Sustainable Fuels, Wind and Maritime sector.

Case Maturity

Case Stage

Implemented, generating first results.

Risks Involved

RTS can be limited by technical and environmental conditions.

Scalability

Currently, there are 5 vessels with Wind Assisted Propulsion on the fleet transporting Vale's products. The technology can be applied to most of market bulk carriers and iron ore carriers.

Impact

Innovative Drive

Vale was the first company to install Rotor Sails in very large ore carrier vessel in the world. The latest project includes the largest Rotor Sails in the largest ore carrier.

Economic Impact

Fuel and cost savings, boosting competitiveness in a carbon-constrained market.

CO₂ Impact

On average 6% reduction on fuel consumption, equivalent to approximately 3,000 tons of CO₂eq. per year.

External Links

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UK Export Finance Solar project in Turkey

Energy
Transition
case selection



Turkey
Renewables

Overview

Case objectives

Construction and operation of solar power plants at seven separate sites, with aggregate power-generating capacity of 390 MWp—the second-largest solar project in Turkey to date

Institutions Involved

UK Export Finance; KUKK; Kalyon Enerji; Standard Chartered Bank

WG Alignment

Renewables

Case Maturity

Case Stage

Under implementation: Two of the three project sites are completed and in operation, the third project site is ongoing and partially in operation at the moment.

Scalability

Turkey's second-largest solar project to date entails building and operating solar plants at seven sites with an aggregate capacity of 390 MWp

Impact

Innovative Drive

The reinsurance agreement between UK and Polish export credit agencies highlights the importance of risk-sharing, which creates the ability to support larger facilities

Economic Impact

Financing is guaranteed by UKEF with €122 million reinsured by Poland's ECA; the deal supports UK jobs in the renewable-energy supply chain and creates opportunities for Polish companies in Turkey; the project created 4,800 direct and indirect jobs during construction and 35 permanent operational staff

CO₂ Impact

The project has to date led to 450,000 tons of avoided emissions through 700,000 MWh of renewable electricity generated to date

External Links

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Overview

Case objectives

Eliminate the traditional use of diesel in the truck air-conditioning process and reduce our carbon emissions in the transportation of refrigerated products through the use of eutectic plates

Institutions Involved

Mondelez Brazil; Tecpet

WG Alignment

Renewables

Case Maturity

Case Stage

Implemented, generating first results

Scalability

Eutectic trucks can reduce emissions and promote efficient management aligned with the Paris Agreement; wide adoption drives sustainability in refrigerated transport

Impact

Innovative Drive

In summary, the Mondelez eutectic-plate truck case highlights innovation and differentiation through an alternative refrigeration technology that offers significant benefits in reduced emissions, noise, and energy consumption

Economic Impact

This project aligns with objectives by enabling CO₂e reductions without impacting costs; it ensures product quality, reduces emissions, and strengthens partnerships with logistics partners and customers

CO₂ Impact

We estimate that adopting this technology contributes to reducing greenhouse gas emissions by up to approximately 25% per truck, depending on the model, route, and other factors

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Technology Reduces Emissions in the LNG Sector: Innovations for Sustainability



Overview

Case objectives

Reduce CO₂ and NOx emissions generated by FSRU operations through installation of onboard reliquefaction technology. This system captures excess boil-off gas (BOG) and converts it back into LNG

Institutions Involved

Petrobras; Excelerate Energy; Wärtsilä Gas Solutions (WGS)

WG Alignment

Renewables

Case Maturity

Case Stage

Under implementation

Risks Involved

Risk is managed iteratively across all project phases. As engineering evolves, new system integration may reveal unexpected needs, addressed via strict change control and clear scope alignment

Scalability

This scalable case targets offshore assets to cut emissions from excess BOG burn during idle periods; equipment can be added to FSUs or FSRUs with long idle profiles and no regas or cargo sendout

Impact

Innovative Drive

This pioneering case applies compact reliquefaction tech to an FSRU—first of its kind; instead of burning BOG in idle mode, excess gas is recovered as reusable LNG, offering a scalable, low-emission solution for LNG vessel design

Economic Impact

For Excelerate, this project boosts daily charter rates via a fixed-value model, shielding revenue from market swings; it aligns with Petrobras' goals, enhancing efficiency and gas recovery and strengthening the long-term partnership

CO₂ Impact

CO₂ reduction depends on vessel mode—regas (gas sendout) or idle (no sendout); reliquefaction runs in idle mode; the table shows historical data from idle periods with zero gas sendout



Ternium Argentina S.A

Ternium's first wind farm (Vientos Olavarria)

Energy
Transition
case selection



Argentina
Renewables

Overview

Case objectives



Reduce Ternium Argentina's Scope 2 emissions by replacing up to 90% of grid electricity with a competitive renewable source (the first wind farm in Ternium's strategy)

Institutions Involved



Ternium Argentina S.A.; Tecpetrol (Energy Transition Division); Vestas; Techint Engineering And Construction

WG Alignment



Renewables

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



Climate-related risks during construction, such as floods and temperature extremes which are critical on cement pouring timeline

Scalability



The case is 100% replicable across other energy-intensive industries, promoting cleaner energy sources where capacity factors are good, such as central and southern Argentina, Mexico, and Brazil

Impact

Innovative Drive



The case developed state-of-the-art wind-generation technology from a world-class provider (Vestas); owned renewable-energy generation in the steel sector is an innovative approach, especially in Latin America and the Global South; 100% of blades have noise minimization

Economic Impact



Estimated ROI of ~7%; this allows substituting a projected market electricity price of USD 70/MWh (conservative scenario) with a considerably lower internal cost of ~USD 15/MWh

CO₂ Impact



Vientos Olavarría Wind Farm is generating a significant environmental impact by directly reducing CO₂ emissions associated with the electricity consumption of Ternium Argentina's industrial operations

External Links



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Overview

Case objectives

LanzaJet is pioneering the development of the ethanol-to-jet (EtJ) production pathway, representing the world's next viable aviation fuel capable of facilitating the industry's energy-transition goal

Institutions Involved

LanzaTech

WG Alignment

Renewables



Case Maturity

Case Stage

Implemented

Risks Involved

Aviation fuel carbon intensity reduced 70% on average, with potential for carbon-negative outputs in future projects, leveraging methane and nitrous oxide feedstocks

Scalability

Funded exclusively on balance sheet over the last 15 years via strategic partnerships with shareholders across the SAF supply chain (LanzaTech, Suncor Energy, Mitsui & Co., British Airways/IAG, Microsoft Climate Innovation Fund, Breakthrough Energy, ANA, Shell, MUFG, Southwest Airlines, Airbus, Groupe ADP); also received grants from the US FAA, the UK Department for Transport, and Queensland State Government in Australia, among others



Impact

Innovative Drive

Our Freedom Pines US facility will create more than 250 total jobs and generate an estimated \$70 million in annual economic activity for the local economy

Economic Impact

Beyond Freedom Pines in the US, we aim for four more projects advancing beyond FID toward production across the UK, Australia, Japan, and India, each at 3x the scale of the US facility

CO₂ Impact

Repurposes waste and by-products from agricultural and food sectors, which otherwise are incinerated or landfilled, thereby delivering a circular and renewable fuel with positive ecological impact



Solvay

Transition from natural gas boiler to a biomass boiler, reducing by 40% the current CO₂ emissions of Solvay Paulínia Site in Brazil.

Energy
Transition
case selection



France
Renewables

Overview

Case objectives

Installation of a biomass boiler at Solvay's Paulínia site by 2027 to supply two-thirds of its steam consumption, cutting the site's GHG emissions by 40% vs 2021 and reducing reliance on fossil-fuel use

Institutions Involved

Solvay; Combio

WG Alignment

Renewables

Case Maturity

Case Stage

Under implementation

Risks Involved

Potential lack of availability of economic feasible biomass due to supply-demand market imbalance

Scalability

Adoption of a biomass model can cut GHG emissions, reduce fossil-fuel use, and foster local supply chains, supporting Paris targets and efficient resource use through renewable energy and sustainable biomass sourcing

Impact

Innovative Drive

Use of an energy-as-a-service model, with the consumer (Solvay) as steam off-taker and a leading sustainable biomass partner as investor, minimizing CAPEX required from the consumer

Economic Impact

Biomass available in Brazil is a more competitive energy source than natural gas and is sustainably accessible across regions, allowing operational-cost reduction

CO₂ Impact

Reduction of 140 kilotons of CO₂ emissions per year

External Links 

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YAK Electric Tractors

Tractors 100% electric

Energy
Transition
case selection



France
Renewables

Overview

Case objectives



Develop and manufacture 100% electric tractors to replace combustion machines in the field, reducing emissions and promoting the energy transition in the agricultural sector

Institutions Involved



YAK Electric Tractors

WG Alignment



Renewables

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



Adoption resistance, battery supply constraints, high upfront costs, poor rural charging infrastructure, and regulatory instability

Scalability



Electric tractors can replace millions of diesel machines globally; broad adoption enables significant CO₂ reduction and energy-efficiency gains, especially in small to mid-sized farms with low access to clean tech

Impact

Innovative Drive



First Brazilian company to develop 100% electric tractors; combines modular battery tech, lightweight design, and local production to deliver clean, affordable, autonomous-ready machinery

Economic Impact



Electric tractors reduce fuel and maintenance costs by up to 70%, offering 30–50% lower total cost of ownership; the model ensures profitability for both the manufacturer and end users

CO₂ Impact



Each electric tractor avoids ~32.4 tons of CO₂ per year vs diesel (9 L/h, 1,500 h/year), based on GHG Protocol emission factors (2.4 kg CO₂/L)

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Industrial Transition Accelerator Uberaba Green Fertilizer (UGF)

Energy
Transition
case selection



Brazil
Renewables

Overview

Case objectives



Atlas Agro is building Brazil's first green nitrogen fertilizer plant in Uberaba, using renewable energy and green hydrogen to serve the domestic agriculture market sustainably

Institutions Involved



Industrial Transition Accelerator / Mission Possible Partnership; Brazilian Investment Platform (BIP); ABIHV - Brazilian Hydrogen Industry Association; SInprifert - Fertilizer Raw Material Producers Association; Macquarie Asset Management; National Council For Fertilizers And Plant Nutrition

WG Alignment



Renewables

Case Maturity

Case Stage



Under implementation

Risks Involved



Construction delays, CAPEX deviations due to tariffs, fertilizer price drops, and risks of not securing adequate funding

Scalability



The plant will have a production capacity of 530 kilotons of ammonium nitrate per year, configured as a medium-scale plant; it will supply almost 3% of Brazil's nitrogen-fertilizer demand and avoid 1 million tons CO₂e per year

Impact

Innovative Drive



UGF will be one of the first vertically integrated green-hydrogen-to-green-nitrogen fertilizer plants in the world and the first in Brazil; Atlas Agro has filed two patent applications for process improvements that significantly reduce CAPEX and OPEX

Economic Impact



The plant's business case aligns with similar public projects; returns are confidential; the company obtained funding from Macquarie Asset Management at market conditions, demonstrating solid expected returns

CO₂ Impact



2 tCO₂e avoided per ton of final product; at full capacity, the plant will produce 530 kilotons of ammonium nitrate per year, resulting in 1.03 million tCO₂e avoided per year

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SUSTAINABLE
BUSINESS
COP30

Portfolio of Cases

Sustainable Fuels

Binatural 100% Sustainable Route

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives



Prove B100's viability in heavy logistics by cutting GHGs by 90% on a real route and enabling circularity by transporting raw materials with the same biodiesel

Institutions Involved



Binatural; Catto Transportes; DAF

WG Alignment



Sustainable Fuels

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



90% reduction in CO₂ emissions achieved by replacing fossil diesel with B100, measured using full life cycle assessment (LCA) methodology aligned with RenovaCalc and ISCC standards

Scalability



The project proves B100 is viable today; scalable to fleets, it cuts emissions, supports Paris goals, reduces diesel use, and leverages Brazil's existing infrastructure

Impact

Innovative Drive



Brazil's first fully B100-powered logistics route uses biodiesel to transport its own feedstock; it disproves engine myths and offers a scalable, local alternative to imported electric trucks

Economic Impact



The B100 route cut fuel and maintenance costs, boosted local value chains, avoided imports, and supported jobs; projected payback is under two years from fuel savings and RenovaBio tax benefits

CO₂ Impact



Switching heavy-duty transport from fossil diesel to 100% biodiesel (B100) cuts emissions by 99.4% per 330-km trip (0.3807 → 0.0023 tCO₂e). Replacing 52,335 L of diesel with 57,857 L of B100 avoids ~190.3 tCO₂e/year, a 99.7% fossil-emissions reduction. About 96.25 tCO₂ from biodiesel are biogenic, so they don't add to long-term atmospheric CO₂



Moeve

Andalusian Green Hydrogen Valley

Energy
Transition
case selection



Spain
Sustainable Fuels

Overview

Case objectives

The main objective is to become a major green-hydrogen production hub in Europe, preventing the emission of 6 million tons of CO₂ per year, which will accelerate the ecological transition

Institutions Involved

Moeve

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under planning

Scalability

The project is based on what Moeve calls “The H2 Ring,” in the “bass balance system,” allowing injection of different H2 types (electrolytic—the main one—BIO and RCF H2) to supply, in a base profile, different consumers (an energy park producing

Impact

Innovative Drive

The project received the maximum score when evaluated for EU Innovation Fund support; the H2 Ring concept and the way alkaline and PEM electrolyzers will be installed are the most innovative features

Economic Impact

With a €3 billion investment to boost energy autonomy and reduce emissions, the project promises considerable economic impact, with up to 10,000 jobs expected to be created

CO₂ Impact

The project avoids the emission of 6 million tons of CO₂ per year



Be8

Be8 BeVant®: Renewable Biofuel for a Low-Carbon COP30

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives

Deploy Be8 BeVant, a 100% renewable biofuel, to decarbonize logistics and mobility at COP30, demonstrating a scalable energy transition in Brazil

Institutions Involved

Be8

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Implemented, generating first results

Scalability

Be8 BeVant® is a 100% renewable drop-in fuel for diesel engines requiring no adaptation; when scaled, it enables up to 99.3% fossil CO₂ reduction (tank-to-wheel), aligned with Paris goals

Impact

Innovative Drive

Be8 BeVant® is a patented, 100% pure-use biofuel for diesel engines; it introduces a pioneering tank-to-wheel fossil CO₂ emissions methodology and holds innovative product and process patents

Economic Impact

Be8 BeVant® delivers a socio-environmental return ~15× higher than diesel, based on a macroeconomic model linking environmental gains to GDP; it is cost-effective and requires no engine adaptation

CO₂ Impact

Up to 99.3% GHG reduction (tank-to-wheel), low emissions, job creation, training, and a cost-effective, scalable solution that strengthens Brazil's bioeconomy

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Fueling Sustainability BECCS FS Project

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives



Capture and store biogenic CO₂ from second-crop corn ethanol fermentation in deep geological reservoirs, ensuring safe and permanent storage

Institutions Involved



Fueling Sustainability

WG Alignment



Sustainable Fuels

Case Maturity

Case Stage



Under implementation

Risks Involved



Credit monetization, licensing delays, operational failures, engineering integration, and regulatory uncertainties

Scalability



Captures biogenic CO₂ from second-crop ethanol and stores it permanently, creating real removals aligned with the Paris Agreement without expanding farmland

Impact

Innovative Drive



First BECCS in LatAm: breaks technical and regulatory ground in geology, licensing, engineering, and removal credits, bridging energy-sector gaps

Economic Impact



Despite limited incentives, aims for revenue via the voluntary market; synergy with ethanol helps reduce capture and storage costs over the long term

CO₂ Impact



The BECCS project avoids 423,000 tCO₂ annually through the capture and permanent storage of biogenic CO₂, equivalent to 55,000 trips around the Earth in a typical gasoline-powered car

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Biofuels in Alagoas: the potential of local energies in the decarbonization of industries

Energy Transition case selection



Brazil Sustainable Fuels

Overview

Case objectives

Implement the decarbonization roadmap of an E&C leader by ensuring the availability of 900 kton/y steam via eco-efficient biofuels: sustainable biomass, energy efficiency, and a green-hydrogen solution

Institutions Involved

Veolia; Braskem; Grune Energies By Veolia

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Implemented, generating first results

Scalability

A renewable mix of solutions reduces industrial emissions by replacing fossil fuels with biofuels and efficiency alternatives, promoting efficient resource use, creating new low-carbon local economies, and promoting sustainable synergies

Impact

Innovative Drive

Integrates green steam generation from biomass, advanced energy efficiency through turbine motorization, and onsite green hydrogen production, creating a pioneering, synergistic approach to bridge existing implementation gaps for low-carbon industry

Economic Impact

Concrete solution that meets competitiveness-sustainability-reliability criteria while guaranteeing heat availability to keep production running with achievable decarbonization goals and without increasing production costs for industry

CO₂ Impact

In 2024, the first full year of operation, 130,910 t CO₂e were erased according to GHG Protocol measurements; the amount is expected to grow with the new two phases

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InvestRS;

Biogás RS Program: boosting biogas production and waste-to-energy solutions through biodigesters in Rio Grande do Sul

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives



Promote the biodigester chain, manage organic/agricultural waste, reduce GHG emissions, and generate biogas, biomethane, CO₂, and fertilizers—harnessing the economic potential of circular energy conversion

Institutions Involved



InvestRS; Department Of Economic Development - State Government Of Rio Grande Do Sul; Department Of Environment And Infrastructure - State Government Of Rio Grande Do Sul

WG Alignment



Sustainable Fuels

Case Maturity

Case Stage



Under implementation

Scalability



By combining standardized processes, modular technologies, policy incentives, cooperative business models, and secured offtake markets, the program can be replicated in other Brazilian cities and states

Impact

Innovative Drive



This program creates scale and demand, lowering technology costs and valorizing agroindustrial waste—fostering investments in innovation and R&D, cross-sector innovation, digitalization, new bio-based products, and novel business models

Economic Impact



The program stimulates the creation of qualified jobs, lowers energy costs, generates new revenues for farmers and industries, and stimulates domestic manufacturing; over time, it positions the economy for export opportunities and rural development

CO₂ Impact



Although difficult to measure, this program avoids potent greenhouse gas emissions through capture and cuts relevant CO₂ emissions as it replaces fossil fuels and can substitute chemical fertilizers | Carbon impact — implementation of the 16 projects will contribute to an annual reduction of 118,300 tons of CO₂ through biogas generation, equivalent to 26,300 kWh/day of clean electric power

External Links



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Overview

Case objectives

A breakthrough solution cutting GHG emissions by producing biomethane from vinasse — replacing fossil fuels while promoting circular economy, renewable energy, and sustainable waste management.

Institutions Involved

Zeg Biogas e Energia S.A.; Zeg Biogás Aroeira SPE Ltda; Bioenergética Aroeira S.A.; BDMG

WG Alignment

Sustainable Fuels, Renewables, Biogas and Biomethane

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Regulatory delays, substrate supply variability, tech performance uncertainty, market demand fluctuations, and logistics/ infrastructure limitations for biomethane distribution

Scalability

Can be easily replicated in any mill processing over 1M tons/year

Impact

Innovative Drive

First biomethane-from-vinasse project to fuel cane trucks in Brazil. Also the first to develop national technology for sulfur removal in biogas purification

Economic Impact

Diesel is among the top 3 costs in ethanol production. Replacing it with biomethane improves margins, boosts resilience during price crises, and helps secure jobs and income in local communities

CO₂ Impact

CO₂ emissions reduced by 86% versus diesel, based on ANP/Finep data using Well-to-Wheel LCA. São Paulo case: 2,600 tCO₂/year avoided per 100 trucks fueled with biomethane.

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General Motors Biomethane implementation in a stamping automotive plant

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives



Implementation of biomethane at GM's stamping plant cut Scope 1 & 2 emissions by over 99%, replacing LPG used in the paint process. Gas from the Caieiras landfill is trucked using biomethane

Institutions Involved



General Motors

WG Alignment



Sustainable Fuels

Case Maturity

Case Stage



Implemented, generating first results

Risks Involved



Supply shortages and process interruptions

Scalability



Exchanging fossil fuel for renewable biomethane can be applied in other contexts if gas is available

Impact

Innovative Drive



First site with biomethane in manufacturing operations; construction done 100% by the biomethane supplier and diluted in the tariff

Economic Impact



The implementation of biomethane in Mogi das Cruzes, in the energy matrix of the paint shop ovens, generates estimated annual savings of US\$31,000 and a reduction of 838 metric tons of CO₂, contributing to energy cost stability and lower emissions

CO₂ Impact



Energy matrix using LPG transitioned to biomethane, resulting in -838 t CO₂e/year



BP Bioenergy

BP bioenergy Regenerative Agriculture Program

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives

Our ambition is to position bp bioenergy as a global reference in sustainable sugarcane, improving productivity, sugar content, irrigation, cost efficiency, and implementing Agriculture 4.0

Institutions Involved

BP Bioenergy

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Mature, generating stable results

Scalability

Its expansion could transform agribusiness by reducing dependence on mineral fertilizers, cutting carbon intensity, improving yields, and setting a benchmark for sustainable resource use

Impact

Innovative Drive

The case stands out by scaling nitrogen-fixing and P-solubilizing biologicals, localized vinasse use, digital agriculture 4.0 tools, and integrated composting, pioneering sustainable cane production

Economic Impact

With reduced input costs, higher productivity, and efficient resource use, the case delivers strong margins; financial analysis with NPV and IRR validates affordable, profitable implementation

CO₂ Impact

-47% carbon intensity of bp bioenergy's ethanol, using gasoline as reference (base 100)



ENERGY

Building trust in the transition to clean transport to reduce CO₂ emissions

Energy
Transition
case selection

Sustainable Fuels

Overview

Case objectives

The mobility sector is a key contributor to global CO₂ emissions. A functioning charging infrastructure is a mandate to accelerate the transition to e-mobility. Available is the powerful AI platform f

Institutions Involved

Energy Distributors; Charging Point Manufacturers; Charging Point Operators

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

No risks beyond normal business risks

Scalability

Available uses a standardized protocol and is compatible with most charge-point models and management systems; there are no technical limits to global expansion, and benefits multiply with each new charging station

Impact

Innovative Drive

Available uses AI in the form of a self-trained neural network, built initially on data from 20,000+ charge points, to analyze behavior patterns, detect anomalies, and predict failures up to a week in advance

Economic Impact

We predict failures before they happen, fix issues automatically, and give charging point operators the insights needed to boost successful sessions by up to 12.5%; the result: higher uptime and reduced time and service costs

CO₂ Impact

Available improves EV charging to lower CO₂ by: (1) avoiding driver detours via fewer outages, (2) boosting charger utilization to cut CO₂ per kWh, and (3) reducing service visits with predictive maintenance. Savings: ~28 tCO₂/yr from detours, ~20–25 from efficiency, ~140 from fewer service calls (>170 tCO₂/yr total)

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Overview

Case objectives



Transform residual biomass into sustainable oils and fuels, accelerating decarbonization and building resilient, circular value chains

Institutions Involved



Cemvita Inc.; InvestRS

WG Alignment



Sustainable Fuels

Case Maturity

Case Stage



Under implementation

Risks Involved



Feedstock volatility, regulatory uncertainty, financing delays, and risks in technology scale-up

Scalability



The FermWorks model is modular and replicable, enabling rapid adoption by multiple companies, reducing lifecycle emissions, supporting sustainability goals, and promoting efficient, circular use of resources

Impact

Innovative Drive



The world's first industrial plant using engineered microbes to convert waste into low-carbon oils and fuels, FermWorks sets a global precedent with its modular, co-location model for circular decarbonization

Economic Impact



The project delivers strong returns with expected IRR above 25% and competitive CAPEX; its modular design lowers implementation costs while creating jobs and attracting private and public investment

CO₂ Impact



Projected annual abatement under ISCC/EPA pathways, validated by LCA models

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CO₂CHEM – Development of Technological Alternatives for Production of Green Hydrocarbons from CO₂



Overview

Case objectives

Build, commission, and operate a pilot plant using intensified unit operations to convert CO₂ into hydrocarbons—mainly diesel—via PEM, RWGS, PSA, and Fischer-Tropsch

Institutions Involved

Repsol Sinopec Brazil; Senai Firjan; University Of São Paulo (USP); Hytron (Neuman & Esser Group)

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Uncertainties in process efficiency, system integration, and potential operational challenges in CO₂ conversion to sustainable fuels

Scalability

The project has strong scaling potential to cut emissions by converting CO₂ into sustainable fuels; it boosts resource efficiency by using CO₂ as feedstock and supports the circular economy and clean energy

Impact

Innovative Drive

The project is innovative due to the scale of its pilot plant in Brazil, aiming to assess the potential of CO₂ conversion technology; it provides valuable insights into scaling up and refining processes for future commercial applications

Economic Impact

The project's economic impact lies in creating new markets for sustainable fuels, reducing carbon-capture costs, and driving innovation, aligning with private-sector profitability by enhancing green-technology adoption

CO₂ Impact

The project uses 1 ton of CO₂ per year to produce 20 L/day of syncrude, with carbon balance and capture efficiency assessed, using renewable energy to ensure a carbon-neutral fuel

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Several Private Companies

De-risking and scaling up of synthetic fuel production

Energy
Transition
case selection

Sustainable Fuels

Overview

Case objectives

Boost the production of synthetic fuels through technology development and scaling of the different technologies, reducing investment risk and applying lessons learned

Institutions Involved

Several Private Companies

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under implementation

Risks Involved

Technological risks in electrolyzers and synthetic fuel production, integration issues, high EU energy prices, and regulatory inconsistencies across sectors

Scalability

A large-scale implementation of synthetic fuels reduces GHG emissions, meets climate goals, leverages infrastructure, and boosts innovation and the green economy

Impact

Innovative Drive

The process scheme and the integration of the novel technologies selected have never been implemented at this scale, converting this demo plant into a first of a kind and one of the biggest plants to produce synthetic fuel using CO₂ as a raw material

Economic Impact

Although costs are currently high, industrialization and economies of scale should reduce them over the next decade; abundant raw materials and declining renewable-energy costs support long-term sustainability

CO₂ Impact

Replacing fossil fuels with synthetic fuels results in net-zero CO₂ emissions from vehicle use and an 80–95% reduction in CO₂ emissions across the entire production chain



Decarbonization mining and railroad at Vale trough Biodiesel

Energy Transition case selection



Brazil Sustainable Fuels

Overview

Case objectives

Mining industry uses 8% of Brazil's diesel. Vale aims to cut Scope 1 emissions by 33% by 2030, using biodiesel blends above the mandatory specifications in the diesel used to fuel its trucks and locomotives.

Institutions Involved

Vale

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under implementation

Risks Involved

Adjustments to current legislation with ANP, competitive pricing, consistent fuel availability and quality near sites, stability of biodiesel in large volumes, potential impacts on engine performance

Scalability

By using higher biodiesel blends, Vale cuts CO₂ (2.34 kg/l), aligns with the Paris Agreement, and leads mining's energy shift, setting an example for large-scale sustainable practices.

Impact

Innovative Drive

Vale, OEMs and Research Centers drive innovation by using high biodiesel blends in mining and rail, linking agriculture and mining to boost sustainability, tech, and social impact in Brazil's energy transition.

Economic Impact

Preliminary results show that a regulated carbon market in Brazil is crucial to achieving economic viability. Furthermore, it will be necessary to mitigate the cost impact of high-biodiesel-content Type B diesel.

CO₂ Impact

Burning one liter of diesel releases approximately 2.9 kg of CO₂. Biodiesel, however, can reduce these emissions by up to 90%, depending on factors such as the feedstock used, production process, and logistics involved.

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Overview

Case objectives



e-SAF is a synthetic drop-in fuel substitute to conventional fossil-based fuel. It offers a remarkable 90%+ carbon footprint reduction to conventional jet fuel and is a crucial pathway to decarbonizing aviation

Institutions Involved



SAF+ INTERNATIONAL GROUP

WG Alignment



Sustainable Fuels, Renewables and Aviation

Case Maturity

Case Stage



Under planning

Risks Involved



Risk of not getting funding for FEED studies of first plant

Scalability



Typical plant is reproducible in many sites and countries to yield SAF that is ICAO-CORSIA compliant

Impact

Innovative Drive



SAF+ IG's conversion process uses industrial or ocean-captured CO₂ to produce e-SAF. Thanks to its compatibility with existing jet fuel infrastructure, much less investment is required, and a proprietary digital twin allows a 10% CAPEX reduction on future plants

Economic Impact



Based on Refuel EU mandate projected pricing, potential for 588M\$ NPV at 3.2 years payback for 781M\$ CAPEX

CO₂ Impact



According to LCA analysis, CI reduction of 89gCO₂e/MJ to less than 9gCO₂e/MJ of jet fuel. Since e-SAF is not based on fossil crude, the carbon remains in the crust of the earth by a substitution effect

External Links



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Overview

Case objectives

Our hydrogen-based DRI with SOEC electrolyzer offers a breakthrough to decarbonize hard-to-abate sectors, particularly steel. Green iron is a gateway to scale net-zero beyond hydrogen as fuel

Institutions Involved

BNDES - National Bank For Economic And Social Development; Vale; Green Energy Park

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under planning

Risks Involved

Conceptual study highlights risks tied to large-scale hydrogen-based DRI technology and Brazil's evolving regulatory framework

Scalability

Potential 80% cut in EU steel emissions: new route emits 0.4 tCO₂/t vs 2 tCO₂/t today; fully aligned with the Paris Agreement, it offers a scalable solution for a hard-to-abate sector responsible for 7% of global GHG emissions

Impact

Innovative Drive

Unlike hydrogen-as-fuel uses, green iron production employs hydrogen as a chemical reductant; heat recovery boosts SOEC efficiency, making it up to 30% higher than conventional alkaline electrolyzers

Economic Impact

Preliminary estimates: NPV US\$171M (full equity), 11-year payback, and 18.2% IRR; with tax benefits and financing, NPV reaches US\$414M and IRR 31.3%, based on future market prices and expected ETS carbon-credit valuation

CO₂ Impact

In 2024, EU-27 steel emits ~200 Mt CO₂/year (~5% of the EU total). This project aims to cut 80% of that — reducing emissions by 160 million tons annually

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Ciplan

Elephant grass as alternative to recover degraded lands and mitigate CO₂ emissions through the substitution of fossil fuels in Cement Production

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives



Partner with small farmers to convert degraded land into elephant grass biomass production, increasing rural income and substituting fossil fuels to mitigate CO₂ emissions in cement production

Institutions Involved



Ciplan; EMBRAPA - Brazilian Agricultural Research Corporation

WG Alignment



Sustainable Fuels

Case Maturity

Case Stage



Under implementation

Risks Involved



Risks include low productivity of small farmers and volatile fertilizer prices

Scalability



Ciplan cement company demands more than 1,500,000 Gcal of thermal energy; just 10% of it needs more than 1,000 hectares of elephant grass, impacting more than 100 local families

Impact

Innovative Drive



Currently the main biomass comes from wood; elephant grass produces more biomass per area and is not used in cement production; Ciplan established a partnership with Embrapa (elephant-grass developers) to ensure a reliable analysis and methodology

Economic Impact



The case aligns with the Vicat Group Decarbonization Plan by substituting fossil fuels with biomass to reduce CO₂ in cement production; land 20 km from the plant: NPV USD 3,946/ha, IRR 75%, payback two years

CO₂ Impact



The quantification of CO₂ emissions mitigation is under analysis to certify the numbers according to international standards | Carbon Impact – Annual reduction of 55.858 tons of CO₂ through the partial substitution of Petcoke by Elephant Grass biomass in the burning process of cement production



All Cement Companies In The Sector

Energy Transition | How the cement industry is transforming and becoming a solution for waste mng

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives



Drive the level of thermal substitution in the cement sector through alternative fuels, promoting environmental sustainability by reducing CO₂, improving cost efficiency, and enabling proper waste management

Institutions Involved



All Cement Companies In The Sector;
Brazilian Portland Cement Association

WG Alignment



Sustainable Fuels

Case Maturity

Case Stage



Under implementation

Risks Involved



Operational, technical, regulatory, economic, and social risks considered

Scalability



When adopted by multiple cement plants, coprocessing waste can cut CO₂ emissions by almost 15%, reduce reliance on fossil fuels, and optimize natural-resource use, supporting Paris Agreement goals

Impact

Innovative Drive



The initiative pioneers the use of diverse alternative fuels in cement production, combining waste management, energy efficiency, and emission reduction, with innovative monitoring ensuring consistent performance and scalability

Economic Impact



The initiative supports cement-sector profitability by reducing fuel costs and import dependence; efficiency gains generally offset implementation costs, with NPV and IRR showing positive financial returns

CO₂ Impact



Reduce ~3 Mt of CO₂ annually, measured by the GHG Protocol, supporting large-scale sustainability goals



Ethanol Reformer: Development and technological upscaling to produce 500 Nm³/h of Low Carbon Hydrogen



Overview

Case objectives

Manufacture the 50 Nm³/h ethanol reformer for vehicle refueling and, in a second phase, upscale to 500 Nm³/h of H₂ for an industrial plant and develop an engineering project for 5000 Nm³/h

Institutions Involved

Hytron - Energy And Industrial Gases Ltda.; Shell Brazil Petroleum Ltda.; ANP - National Petroleum, Gas And Biofuels Agency; FIRJAN - Federation Of Industries Of The State Of Rio De Janeiro; Raizen Energia S.A.

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Risks inherent to technological development

Scalability

The technology produces renewable H₂ with low emissions using bioethanol, reducing dependence on natural gas in H₂ production; it also values local biomass, promoting a circular economy and sustainable resource management

Impact

Innovative Drive

The main innovation of the project is the development of a steam-reforming reactor to use ethanol through a multitubular, convective technology utilizing computational optimization

Economic Impact

The bioethanol reforming system adds value by replacing fossil H₂ with low-carbon H₂, encouraging agricultural chains to expand biomass use; bioethanol acts as a hydrogen carrier, reducing logistics costs

CO₂ Impact

Using bioethanol instead of natural gas for H₂ can reduce emissions by 50% or more, with great potential to achieve net-negative emissions

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Overview

Case objectives

France KerEAUzen is a low-carbon e-kerosene production platform in Normandy, France. 70,000 tons of e-kerosene destined for civil aviation will be produced annually

Institutions Involved

Engie; Air France - KLM; Haropa Port; Normandy Region; Just Transition Fund

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under implementation

Risks Involved

Thanks to the very limited footprint of the e-kerosene, the project is expected to save 230 000 tCO₂ a year

Scalability

The project is mostly privately funded, with contributions from the Normandy Region and the EU's Just Transition Fund

Impact

Innovative Drive

Project turnover is projected to be €450M annually; moreover, European legislation on SAF (sustainable aviation fuels) will increase profitability prospects in the coming years

Economic Impact

Construction of the total facility should not exceed three years (2027–2030)

CO₂ Impact

The e-kerosene production process relies on transforming recycled CO₂ from the Le Havre industrial area; total saved emissions should represent 230,000 tCO₂ a year



From Pilot to Impact: Scaling HVO for a Low-Carbon Future

Overview

Case objectives

Ferrovial is making progress in decarbonizing its value chain by using HVO to reduce emissions on construction sites. A transformative strategy that accelerates the path to net zero

Institutions Involved

Repsol; Massachusetts Institute Of Technology (MIT)

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

Reluctance of subcontractors to use this type of fuel, fuel price and availability, and lack of subsidies or incentives

Scalability

Ferrovial has created an expert group studying HVO adoption, seeking synergies across key regions and suppliers, and advising the supply chain (including subcontractors and customers)

Impact

Innovative Drive

The project is innovative due to its scalability across regions and its short-term impact; HVO's compatibility with all machinery enables fast emission reductions, making it a key tool for sustainable construction

Economic Impact

HVO's cost impact varies by region, but its main value lies in decarbonization and meeting investor sustainability demands, making it a strategic choice despite uncertain direct economic returns

CO₂ Impact

In Madrid, a 93.1% reduction in CO₂ emissions compared to the use of fossil fuels; in Heathrow, a 91% reduction compared to the use of fossil fuels

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Overview

Case objectives

Promote energy transition and autonomy in schools by installing biodigesters that convert organic waste into biogas and biofertilizer. It also works as a tool for environmental education

Institutions Involved

Engie Brazil; Brazilian Association Of Biogas And Biomethane; Engie Foundation; Biomovement; Energy Assistance France

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Local engagement gaps, technical maintenance challenges, and limited funding mitigated through training, monitoring, and partnerships

Scalability

The project uses simple, low-cost technology and can be easily expanded to other communities, institutions, and countries, supporting global climate goals and SDGs 2, 7, 11, 12, and 13; nationwide it could potentially avoid around 110,000 tCO₂/year

Impact

Innovative Drive

The project's innovation lies in its plug-and-play biodigester—low-cost, modular, and easy to install without specialized labor; combined with corporate volunteering and education, it creates a scalable model for clean energy and community impact

Economic Impact

With R\$25,400 investment (including installation), each biodigester generates daily biogas and biofertilizer; payback can be one year if selling biofertilizer, or ~5.5 years via gas savings; it reduces costs and fosters local entrepreneurship

CO₂ Impact

Each unit avoids 1 ton CO₂ per year by replacing LPG with biogas and avoiding transport emissions normally from diesel trucks; the method follows HomeBiogas' GHG offset model using caloric value

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Volkswagen Truck & Bus

Fueling the Future: Biofuel Integration from the Ground Up

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives



Increase the volume of biofuel through HVO addition in the first fill of Volkswagen Truck & Bus vehicles during the production process, before delivering them to retail/dealers

Institutions Involved



Volkswagen Truck & Bus; Vibra Energia

WG Alignment



Sustainable Fuels

Case Maturity

Case Stage



Implemented

Risks Involved



Filling truck and bus fleets with 10% HVO diesel reduces about 253 tCO₂e per year, supporting cleaner and more sustainable transport

Scalability



Own funding

Impact

Innovative Drive



With HVO in the first fill, VWTB delivers trucks that cut emissions and add immediate value—lower environmental costs, a competitive edge in bids, and a sustainable example; savings and business opportunities right from the company

Economic Impact



VWTB maintains a plan to gradually increase HVO in its first fill beyond legislation, ensuring compliance with decarbonization goals and policies

CO₂ Impact



HVO diesel reduces emissions, promotes public health, and drives the green economy; its adoption in Brazil combines environmental sustainability, job creation, and reduced dependence on fossil fuels



Green Puffs: Green Inhalers with Near-Zero Climate Impact



Overview

Case objectives

Driving healthcare decarbonization with near-zero inhalers that cut emissions, fight global warming, and deliver safe, effective, accessible, and green respiratory care to millions of patients.

Institutions Involved

Lupin Limited

WG Alignment

Energy Efficiency

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Stakeholder adoption, regulatory delays, patient resistance, supply chain issues, higher initial costs may impact adoption and scalability of green inhalers.

Scalability

With over 500 million inhaler users globally, green inhalers can cut carbon emissions by up to 90%, enabling pharma's contribution to Paris Agreement Goals and promoting sustainable respiratory care across health systems worldwide.

Impact

Innovative Drive

Use low-GWP tech to cut emissions by 90%, with sustainable lifecycle design. This innovation pioneer's high quality, climate-safe inhalers without compromising care, bridging healthcare and climate action.

Economic Impact

Show medium-to-long-term ROI via efficiency, brand value, and global reach. They reduce regulatory risks and create market differentiation, tapping rising demand for climate-conscious healthcare.

CO₂ Impact

Propellant accounts for 41% of Lupin's carbon footprint currently at >400,000 tons CO₂. Green inhalers have potential to reduce ~90% of these emissions.

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L'Oréal Greenbound - Decarbonizing our operations

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives

L'Oréal presents GREENBOUND case, aiming to reduce scope 3 absolute emissions in 28% by 2030 (vs 2019), using biogas to decarbonize its logistics operation, stimulating a renewable biofuel market

Institutions Involved

L'Oréal

WG Alignment

Sustainable Fuels, Renewables, Biometano and Renewable Heat

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

The gap between biomethane demand, production and distribution network is a currently bottleneck to be developed trucks adapted to fuel

Scalability

The scalability extends beyond Brazil's borders, allowing it to be a catalyst to a low-carbon economy

Impact

Innovative Drive

The disruptive nature comes from fostering circularity (waste to renewable fuel) and pioneer application on logistic fleet operation, creating the first dedicated fuel station and the use of technologies to monitor and optimize the emission reduction

Economic Impact

The project provides economic benefits through greater price stability for biometane compared to fossil fuels, protecting against market fluctuations and providing long-term economic advantages

CO₂ Impact

Biofuel generated by organic waste decomposition, belongs to a circular process by nature, has potential to reduce CO₂ emissions by 78% compared to fossil fuels as source (well-to-wheel) for logistic

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Harvesting the Future: Ethanol-Powered Agricultural Machinery

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives

Develop ethanol engines for agri-machinery, starting with sugarcane harvesters, replacing diesel with crop-based fuel produced on-site, and expand to corn ethanol tractors as the next step

Institutions Involved

CNH Latin America

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under implementation

Risks Involved

Field tests may show higher fuel use than diesel, which could affect adoption, but optimizations aim to ensure efficiency

Scalability

Ethanol engines can cut emissions by 90% vs diesel; using ethanol from sugarcane mills in their own fleets creates a closed loop; CNH plans to expand this equipment, boosting adoption across crops

Impact

Innovative Drive

CNH pioneers ethanol engines in heavy agri-machinery; FPT's OTTO engines and adapted systems (fuel, exhaust, electronics) close a key gap in sustainable farming tech

Economic Impact

Diesel accounts for 30% of bioenergy crop (sugarcane and corn) production costs; ethanol cuts fuel expenses, boosting mill profits

CO₂ Impact

Ethanol reduces CO₂ emissions by at least 70% per km/hour; in cars it totals 500M tons since 2003; in agricultural machinery the potential is also huge and still needs to be calculated

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Fueling Sustainability Intermediate Corn Crop Ethanol

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives



Scale second-crop corn ethanol production with full traceability and low-carbon footprint, supporting sustainable bioenergy growth without land expansion

Institutions Involved



Fueling Sustainability

WG Alignment



Sustainable Fuels, use of degraded land and hard-to-abate sectors

Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



Potential regulatory changes affecting biofuel incentives; volatility in commodity prices (corn and ethanol) impacting margins; climate variability influencing second-crop yields; supply chain disruptions in feedstock logistics.

Scalability



Its a replicable project that will reduce emissions by making energy transition: from thermal power generation (diesel) to solar generation

Impact

Innovative Drive



Combines traceable supply chain, zero land expansion, low LUC risk, renewable cogeneration, and CORSIA certification — pioneering sustainable intensification for scalable low-carbon fuels.

Economic Impact



Integrated model with diverse revenues, low feedstock costs, and strong EBITDA ensures high returns. Green Bonds confirm competitive NPV and IRR.

CO₂ Impact



In eight years of operation, avoided 3,954,128 tCO₂



Macauba, from seed to fuel, an innovative and sustainable energy solution



Overview

Case objectives

Integrated production of SAF/HVO at scale from macauba, a Brazilian feedstock produced on 180k ha of degraded land, enabling clean, cost-competitive fuels with fossil parity and full sustainability

Institutions Involved

Acelen Renewables

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under implementation

Risks Involved

High CAPEX, regulatory misalignment, feedstock limitation, low offtake predictability, and scarce incentives may hinder SAF financial viability

Scalability

The scalable macaúba SAF/HVO integrated model restores degraded land, captures 60+ Mt CO₂, enables low-carbon aviation, promotes regenerative agriculture, and empowers rural livelihoods through inclusive agriculture

Impact

Innovative Drive

Backed by global R&D partners, Acelen Renewables drives a tech-powered, open-innovation ecosystem with local development of technology and agtech in a vertical model to produce SAF/HVO at scale

Economic Impact

The project ensures returns via an integrated value chain using high-oil-productivity feedstock on degraded land and co-product commercialization, supporting a competitive SAF production cost of USD 40/bbl

CO₂ Impact

Over 60M tons of CO₂ captured via Macauba cultivation on degraded land, based on life cycle analysis (LCA) aligned with international carbon accounting methodology for Improved Agricultural Land Manag

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Senai Institute Of Innovation In Biomass

Macrofuel - Energy use of pyrolytic bio-oil from aquatic macrophytes for biofuel production

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives



Transform aquatic macrophytes into bioenergy, enabling the most appropriate destination of this biomass as a drop-in fuel in diesel engines

Institutions Involved



Senai Institute Of Innovation In Biomass;
CTG Brazil

WG Alignment



Sustainable Fuels

Case Maturity

Case Stage



Implemented, generating first results

Risks Involved



Aquatic plant overgrowth risks turbine integrity by blocking intakes, lowering hydraulic efficiency, inducing cavitation, and accelerating wear

Scalability



Using the generated biofuel to power the companies' own generators strengthens economic viability; the pilot plant validated the concept and technologies, and the data obtained enables the design of larger-scale

Impact

Innovative Drive



It is based on the importance of minimum-impact management to maintain the aquatic ecosystem until its adequate reuse, through thermal conversion of these aquatic macrophytes into biofuel (for which a patent was granted in Brazil and the USA)

Economic Impact



The project investment was R\$10 million, with break-even in month 59, payback in month 68, and operational profitability of 51%, with ROI of 1.38% per month after 120 months; the plant's estimated production is 12,000 liters per day

CO₂ Impact



Approximate annual reduction of 2.8 million tons of CO₂, based on removing aquatic plants for conversion into bio-oil and converting 60–80% into renewable biofuels

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MDC Energia and its biomethane projects: transforming waste into sustainable fuel for the future



Overview

Case objectives

By upgrading biogas from landfills into biomethane, we prevent methane from being released into the atmosphere and foster a circular economy by transforming environmental waste into a renewable fuel

Institutions Involved

MDC Energia

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

Biogas output may fall in heavy rain or drought, affecting delivery; minor risk of flammable substance leaks posing health or environmental threats

Scalability

By producing biomethane from residues, the company doesn't compete with raw materials used for food; given proven technology and replicability, it can scale nationally to become one of the most relevant producers globally

Impact

Innovative Drive

Since 2012, MDC Energia has been developing biomethane projects with a dedicated in-house engineering team; we adapt imported equipment and integrate different technologies in house, being the first in Brazil to produce biomethane at commercial scale

Economic Impact

Considering the green premium in the biofuel price and natural gas prices, these projects can yield IRRs above 20% to shareholders, with sustainable long-term impact for all involved

CO₂ Impact

In addition to reported emissions reductions, the projects generate environmental attributes such as carbon credits and renewable gas guarantees of origin (GAS-RECs)

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Ternium Brazil

Natural gas replacement using biomethane from a landfill at stationary combustion sources at Ternium's integrated steel plant

Energy Transition case selection



Brazil Sustainable Fuels

Overview

Case objectives

Ternium Brazil started using biomethane to replace fossil natural gas in its stationary combustion sources, improving sustainability, reducing CO₂e emissions, and adding value to waste management

Institutions Involved

Ternium Brazil; Gas Verde

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Mature, generating stable results

Risks Involved

Health fears from landfill origin and doubts on calorific value proved unfounded; information asymmetry was resolved

Scalability

The project is applicable and can scale in any medium- to large-scale city landfill near any industry that consumes natural gas; distance should be under 50 km to be net-positive in GHG reductions

Impact

Innovative Drive

This was an unprecedented case introduced in a heavy-industry steel company in Latin America; it is an innovative project that could inspire many other industries worldwide with similar conditions, given close distance and high natural-gas prices

Economic Impact

Ternium's negotiations achieved paying the same price as fossil natural gas (market)

CO₂ Impact

83,872 tCO₂e since operations began in 2019 until Dec 2024 (annually third-party verified), net GHG emission reduction

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Overview

Case objectives

Develop and scale the world's first 100% biomethane-powered tractor, supported by a robust ecosystem that connects producers to biodigestion, upgrading, logistics, and financial viability in the field

Institutions Involved

CNH - New Holland; Sebigas Cotica; Air Liquide; Gas Futuro; Geoenergética; 3DI; Master Biogas; PlanET

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Financial incentives uncertain, Brazilian legislation under development, high project costs, and government bureaucracy

Scalability

The biomethane tractor and its support ecosystem can be replicated across agricultural sectors; already expanding in Latin America, it has global potential in regions with agribusiness and organic waste

Impact

Innovative Drive

Reinforcing its position as a leader in clean energy, New Holland remains the only brand with a 100% biomethane-powered tractor already commercially available on the market

Economic Impact

Saving up to R\$5 per liter of diesel replaced, with direct impact shown by IRR, TCO, and payback from client-specific feasibility studies, and indirect impact on economic security vs oil-price volatility

CO₂ Impact

With T6.180 Methane Power, up to 84% CO₂ reduction is achieved compared to Stage V diesel engine limits, and up to 216% considering total CO₂ saving with fugitive methane

External Links

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Overview

Case objectives



Open up the green hydrogen economy in Finland through an industrial-scale 20 MW production facility, alongside innovative European large-scale e-methane production

Institutions Involved



P2X Solutions Oy

WG Alignment



Sustainable Fuels



Case Maturity

Case Stage



Mature, generating stable results

Risks Involved



Funding uncertainty and challenges typical for an early-stage company, risks associated with deploying new, large-scale technologies, normal safety related risks, like explosion of hydrogen, as well as other hazards at the production site

Scalability



Industrial scale and the target of the company is to scale up 100 MW modular production. One of the few European industrial-scale projects that have been materialized due to market demand



Impact

Innovative Drive



This pioneer project represents the first large scale e-methane production so far in Europe. It introduces a pioneering approach by integrating existing technologies into a commercially viable business cases

Economic Impact



Demonstrate that green hydrogen economy can be viable, with first customer contacts already signed and delivered

CO₂ Impact



Supports Finland's 10% emission reduction target



Pelletizing decarbonization at Vale through Biomethane

Energy Transition case selection



Brazil Sustainable Fuels

Overview

Case objectives

Vale plans to replace natural gas with biomethane in pellet plants, cutting CO₂ emissions with a renewable fuel that matches natural gas properties and supports carbon removal

Institutions Involved

Vale

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under implementation feasibility study

Risks Involved

Ensuring competitive pricing compared to natural gas price. Securing consistent fuel supply and quality near operational facilities. GHG Protocol could not accept the use of origination certificates

Scalability

Vale's use of biomethane cuts ~2 kg CO₂/m³, aligns with the Paris Agreement, and leads mining's energy shift, inspiring large-scale adoption of low-carbon practices

Impact

Innovative Drive

Vale, with OEMs and partners, links mining and agriculture to drive Brazil's energy transition, delivering technical, economic, environmental, and social benefits

Economic Impact

Preliminary results show that a regulated carbon market in Brazil is crucial to achieve economic viability. Furthermore, it will be necessary to mitigate the cost impact of using biomethane, which has a higher price than natural gas

CO₂ Impact

Each cubic meter of natural gas emits approximately 2 kg of CO₂ when burned. Biomethane, on the other hand, can reduce about 99% of natural gas emissions, which means almost 2 kg of CO₂ avoided

External Links

Link 01

Link 02

Grupo Iquine

Reduction in the Use of Fossil Fuels

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives

Reduce fossil fuel consumption



Institutions Involved

Grupo Iquine



WG Alignment

Sustainable Fuels



Case Maturity

Case Stage

Mature, generating stable results



Risks Involved

More refueling stops needed



Scalability

Our initiative aims to reduce the carbon footprint, contribute to SDG 13 and sector goals (ABRAFATI), and help the Group meet its climate targets



Impact

Innovative Drive

We recognize that this is still little adopted and accepted in the corporate world, but we understand its relevance and high potential for positive impact, making it not only necessary but strategic for sustainable transformation



Economic Impact

Our initiative involved variable investment based on refueling efficiency and the average ethanol price relative to gasoline; despite the change, there was no significant budget impact, demonstrating economic viability



CO₂ Impact

The direct impacts on CO₂ emissions are already noticeable: we recorded a reduction of 118.54 tons of CO₂ equivalent, the result of a strategic guideline supported by Grupo Iquine



External Links



Link 01

Scaling up renewable fuels production to allow progressive substitution of conventional fuels for transport



Overview

Case objectives

Scale up renewable fuels to progressively replace conventional fuels in road, air, and maritime transport through technology development and industrial transformation

Institutions Involved

Repsol

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Regulatory uncertainty, access to new feedstocks, technological challenges, cost competitiveness, and differences in international policy frameworks

Scalability

Since 2011 co-processing projects have scaled up, enabling construction of a first-of-a-kind plant for 100% renewable fuels; another plant is under construction repurposing an existing facility; each plant cuts 750–900 kt/year of CO₂

Impact

Innovative Drive

They include advanced technologies that transform waste into high-quality renewable fuels, enabling immediate use in current engines and transport systems without infrastructure changes

Economic Impact

This mature technology leverages modernization of existing assets (retrofit) to accelerate production and secure attractive raw materials, with IRR above 25% and payback under four years

CO₂ Impact

We avoid up to 1.65 Mt CO₂/year: 900,000 t from Cartagena (operational) and 750,000 t from Puertollano (in progress), both calculated under RED Directive principles

External Links

Link 01

Link 02



Overview

Case objectives

Assess the potential of deep saline aquifers in the Paraná Basin for long-term CO₂ storage through reservoir characterization, modeling, and pilot-scale well drilling and testing

Institutions Involved

Geological Survey Of Brazil; Petrobras; Fundação De Apoio Ao Desenvolvimento Da Computação Científica (FACC)

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under implementation

Scalability

Supports large-scale CO₂ storage near high-emission areas; methodology can be replicated in other sedimentary basins

Impact

Innovative Drive

It is the first in Brazil to assess real storage potential with physical data and pilot wells, moving beyond theoretical modeling

Economic Impact

Enables CCS investment-readiness near industrial clusters; funded by Petrobras with potential to attract further private investment; NPV and IRR will be estimable after July 2026

CO₂ Impact

Supports future CCS deployment with an estimated 462,000 Mt CO₂ theoretical capacity; mitigation depends on project expansion based on verified storage potential





Overview

Case objectives

The hybrid truck, developed by VWTB and Suspensys, combines a diesel engine and an electric axle with smart traction. It automatically manages power use based on route and battery, optimizing fuel consumption

Institutions Involved

Volkswagen Truck & Bus; Suspensys

WG Alignment

Sustainable Fuels

Case Maturity

Case Stage

Under implementation

Risks Involved

Hybrid truck efficiency depends on smart traction; risks tied to route conditions and fuel optimization

Scalability

This project can be developed by different OEMs and countries as another solution for long-distance decarbonization, especially in countries where long-distance road transport is a relevant option in the mix

Impact

Innovative Drive

Innovative technology enables fuel reduction in extra-heavy long-haul trucks, improving CO₂ footprint and performance—without requiring special charging infrastructure; it meets Brazil's demand for sustainable, efficient transport and boosts sales

Economic Impact

New technology enables a 10% fuel-consumption reduction, improving vehicle performance and durability; it meets Brazil's demand for sustainable transport and drives sales by combining efficiency with environmental responsibility

CO₂ Impact

This prototype can run for kilometers without recharging, with automatic energy management; it can cut CO₂e emissions by up to 10% and features an upgraded aerodynamic package for greater efficiency



Volkswagen Truck Fuel Flex: moved by 100% Brazilian Biofuel

Energy
Transition
case selection



Brazil
Sustainable Fuels

Overview

Case objectives

Development of Volkswagen commercial vehicles certified for B100 biodiesel operation, performance, durability, and emissions reduction, in partnership with biofuel producers and logistics operators

Institutions Involved

Volkswagen Truck & Bus; JBS; Be8; MWM; Vibra Energia

WG Alignment

Sustainable Fuels



Case Maturity

Case Stage

Implemented, generating first results

Risks Involved

Development of Volkswagen commercial vehicles certified for B100 biodiesel operation, performance, durability, emissions reduction, in partnership with biofuel producers and logistics operators

Scalability

The use of B100 can reduce CO₂e emissions by up to 80% compared to fossil diesel; this can be used as a benchmark for other OEMs, consumers, and countries



Impact

Innovative Drive

The pioneering use of B100 in Brazil drives the energy transition, strengthens the national biofuel industry, and promotes sustainability; developing B100-compatible vehicles also supports climate goals and fosters innovation in transportation

Economic Impact

Offering B100-certified commercial vehicles boosts sales by meeting growing demand for sustainable solutions in Brazil, while ensuring performance and durability with pure biodiesel

CO₂ Impact

75–80% reduction on a well-to-wheel basis





SUSTAINABLE
BUSINESS
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Annex

Annex A – Disclaimer



The information presented in this booklet is the sole responsibility of the institutions that submitted the cases. All case descriptions reflect the information shared directly by the applicants.

The primary source for the evaluations described herein was the submitted cases; however, in certain instances, additional publicly available information from websites and/or official documents was consulted.

Where specific information was not provided by the applicants, the Working Group applied its best judgment to interpret missing parts, taking into account the context of each case.





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