20 YEARS FOCUSING ON THE FUTURE
20 YEARS FOCUSING ON THE FUTURE
MAIN ACTIVITIES

- Development and implementation of industrial projects
- Development of equipment and systems for the agro-industry

Production of sugar, ethanol, sugar cane by-products and renewable energy from biomass
SCOPE OF SERVICES

- Consultancy and technical assistance
- Diagnosis of the industrial sector
- Industrial projects - conceptual, basic and detailed
- Process equipment design
- Project management
- Owner´s engineering
- New technology application to agro-industry
- Industrial due diligence
MARKETS

- Sugar and ethanol industries
- Cogeneration plants (CHP) for renewable energy from biomass
- Sugar cane by-products industries
- Food industries based on sugar
PARTNERS IN BRAZIL

Continuous vacuum pan
Vertical crystallizers
Massecuite reheaters
Falling film evaporators
Multitube dryer-cooler
Heavy duty shredder

Mechanical stirrer for batch pans
Agitation systems
Air conditioning system for sugar dryer optimization
PARTNERS IN BRAZIL

Sugar coolers with plate heat exchange technology.

Since 1998 there is a partnership with Projeto Âncora, a non-profit organization founded in 1995 and located in the Granja Viana in Cotia - SP, whose goal is to take children out from the streets to give them education.
PARTNERS IN BRAZIL

The National Laboratory of Science and Technology of Bioethanol (CTBE) is a national laboratory that invests in basic research and technological innovation to producing ethanol 2G, working with strategical partnerships.
CLIENTS

GREENFIELD PROJECTS

- Adecoagro (Angélica/Ivinhema)
- Biocom – Angola
- Bioenergy – Colombia
- Biosev (Continental)
- BP Biocombustíveis (CNAA – Ituiutaba/Itumbiara)
- Cerradinho (Porto das Águas)
- Dow/Mitsui (Santa Vitória)
- KETS - Mashkoor – Sudan
- Noble Group (Potirendaba)
- Nova Fronteira Bioenergia (São Martinho e PBio – Boa Vista)
- Raízen (Jataí)
- Santa Adélia (Interlagos)
- São Fernando
- SJC Bioenergia (São João e Cargill – São Francisco de Goiás)
- Odebrecht Agroindustrial (ETH – Água Emendada/Conquista do Pontal / Costa Rica / Eldorado / Rio Claro / Santa Luzia)
- Unialco (Vale do Paraná)
BIOMASS POWER PLANTS

- Included in Greenfield Plants (24 units)
- Citrosuco
- Goiasa
- Raízen (Barra, Bonfim, Costa Pinto, Ipaussú, Rafard, Univalem)
- Ingenio Tala – Mexico
- Ingenio Tres Valles – Mexico
- BP Biocombustíveis (Tropical Bioenergia)
# MAIN PROJECT LIST

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<th>T CANE/CROP</th>
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**LEGEND:**  
- **E** - Ethanol  
- **C** - Cogeneration  
- **S** - Sugar  
- **B** - Basic Engineering  
- **D** - Detailed Engineering
Usina Angélica – Grupo Adecoagro
Sugar, ethanol and renewable energy

Usina Angélica – Grupo Adecoagro
Distillery and vinasse concentration

Usina Angélica – Grupo Adecoagro
Juice concentration

Conquista do Pontal – Grupo ETH Bioenergia
Water treatment station
EXPERIENCE

SJC Bioenergia
Sugar, ethanol and renewable energy

SJC Bioenergia
Cane reception

SJC Bioenergia
Cane preparation

SJC Bioenergia
Steam generation
EXPERIENCE

Noble Group – Potirendaba
Boiling house and juice concentration

Iran – Bagasse steam hidrolysis

Usina Angélica
Grupo Adecoagro
Steam generation

Usina Boa Vista – Nova Fronteira
Fermentation
ENGINEERING PROJECT

STEPS

- Conceptual project
- Basic project
- Implementation/Detailing project
## ENGINEERING PROJECT

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<th>PARAMETERS</th>
<th>PROJECT IMPLEMENTATION METHOD</th>
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<tr>
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<td>Basic Project requirement</td>
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- **TK** Turn Key
- **PI** Packages Integrativos
- **EPCM** Engineering, Procurement and Construction Management
- **EPC** Engineering, Procurement and Construction
- **PBG** Performance Bond Guarantee
CONCEPTUAL PROJECT

- Data collection
- Design basis
- Main equipment sizing
- Process flow diagram - PFD
- Plot plan
- Capex and opex estimates
- Technical documents for environmental licenses
BASIC PROJECT

- Design basis
- Mass and energy balance
- Process Instrumentation Diagram (P&ID)
- Technical specifications
- Plot plan
- Main equipment biding
- Global evaluation of investment
IMPLEMENTATION/DETAILING PROJECT

- Process and instrumentation diagrams (P&ID)
- Equipment list
- Equipment technical specification
- Tender documents
- General arrangement of the installation
- Detailing projects
- Piping and installation project
- Stress analysis of piping
- Civil project
IMPLEMENTATION/DETAILING PROJECT

- Electrical project
- Automation and control project
- Fire fighting project
- As built documents
- Project book
- Document list
- Site technical assistance
- General management of engineering project

continued
Process Flow Diagram (PFD)
DOCUMENTATION

General arrangement
DOCUMENTATION

Piping drawings
DOCUMENTATION

Piping drawings
3D modelling
Piping drawing 3D modelling and physical installation
DOCUMENTATION

Detailing equipment project
DOCUMENTATION

Detailing equipment project
Piping stress analysis
Piping project (views)
PROCKNOR EQUIPMENT

Trayless clarifier
PROCKNOR
PROCKNOR EQUIPMENT

Multisat 2000 – Modular Evaporator
EQUIPMENT
Fives Lille do Brasil

Single pass evaporator

Falling film evaporator

Vertical Crystallizer
EQUIPMENT
Fives Lille do Brasil

Massecuite reheater

Continuous vacuum pan A, B and C massecuite
Thank you!

It is time for renewable energy. It is time for solutions considering PROCKNOR’s expertise.