#### **KEY FIGURES DSEC**





300 M€ Latest project value



500+
Projects completed
in 65+ countries





## BIOFUELS INDUSTRIES



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Serving the World Biofuels industry

www.dsengineers.com

### Process integrator dedicated to Agro-processing industries

**De Smet Engineers & Contractors (DSEC)** is a private company located in Belgium, created in 1989:

- Acting as an engineering & general contractor company specializing in the agro-industrial and bio-based industry fields,
- Fully integrated world-class provider of project management, engineering, procurement and construction services.

**DSEC carries out projects from their initial conceptual stage** (audits and engineering studies) up to complete delivery, including commissioning and performances demonstration (turnkey management - EPCM or full turnkey construction - EPC).

DE SMET

#### **Bioethanol**

### Bioethanol production plants solutions

DSEC has successfully built complete **bioethanol** production plants using cereals, sugar beet and sugar cane :

- Autonomous ethanol plants using starch-type raw materials (maize, wheat, manioc, etc.) or sugar cane with by-product recovery units.
- Extra Neutral Alcohol (ENA) production unit, as well as technical, pharmaceutical or spirits alcohol, etc.
- Optimisation of process parameters in existing plants to improve viability, yields and cogeneration efficiency

DSEC offers a global approach to **Ethanol production**, with the aim of improving the economic viability and environmental footprint of the entire plant:

- CO<sub>2</sub> scrubbing and recovery
- Vinasse concentration
- Incineration of condensed molasses solubles (CMS)
- Aerobic and anaerobic treatment of wastewater
- Biogas production (methanisation CNG)

DSEC handles all the facilities involved in bioethanol production, depending on the type of feedstock.



# Biodiesel and HVO production

DSEC extends its activities in the Edible Oils & Fats sector to **Biodiesel plants construction** as a natural complement to Oilseeds processing.

Biodiesel Production covers **Vegetable Oils** and **Used Cooking Oil (UCO)** pre-treatment and Transesterification units as well as vertically integrated facilities with oilseed extraction plant.

The pre-treatment of crude Vegetable Oils or UCO for the production of **Hydrotreated Vegetable Oil (HVO)** Biodiesel can also be contemplated.

### Implementing External Technologies and beyond

- Capability to develop full projects from feedstock handling to product conditioning, including offsites and construction works
- Full understanding of Technology Providers' downstream requirement through DSEC's large experience in the agro industry (filtration, evaporation, separation, drying, chromatography, ion exchanges...)
- Experience in assessing and validating all stages of process development and products definition so as to reach a comprehensive concept before effective project start (Pilot ➤ Demo ➤ Industrial)

#### **DSEC** is your partner for...

#### **PROJECT DEFINITION**

- PDP development based on technical process description from supplier & client
- Technical & technological assessments
- Selection of appropriate technology & unitary operation
- Integration of an add-on into & existing facility
- Utilities engineering & interfaces design
- CAPEX & OPEX development

#### PROJECT IMPLEMENTATION

- Overall Project Management including cost control, scheduling
- Detailed Design of all activities (Civil & Structure, piping, E&I...)
- Procurement of equipment & materials
- Workshop quality control & FAT
- Expediting services
- Integration of all related project activities
- Plant automation standardization
- Site activities management including implementation of site HSSE
- Plant commissioning & start-up assistance

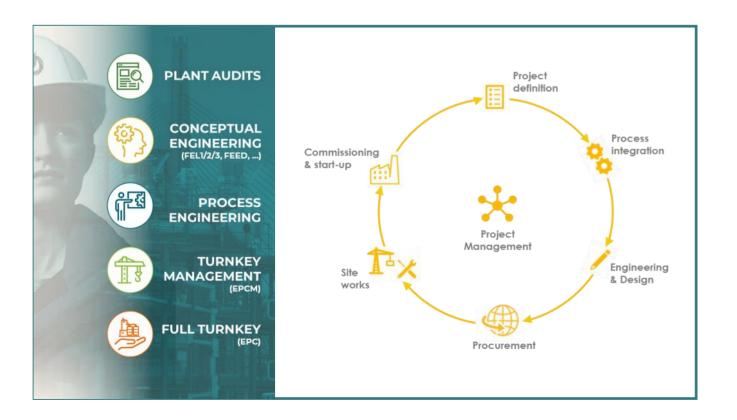


Reliability through experience

# DSEC's Assets for the Biofuels Industry

- Efficient Integration of new developments and flexibility in dealing with changing environments
- Strong track record accumulated for more than 30 years, working in 65+ countries and completing more than 50 Large Scale Projects (which major biofuels projects referenced are listed opposite)
- Integrated, robust, validated process and final product definition, before transfer of technology
- Repeated experience with key industry players, Client IP protection
- Focus on efficiency and energy saving
- Full independence from equipment suppliers allowing optimization of projects' Global Sourcing Strategy
- Execution of all downstream process units applicable such as: filtration, evaporation, separation, drying, chromatography, ion exchange, ...
- Familiar with all types of raw material: seeds, grain, molasses, beet, bagasse, wood, ...

#### MEETING OUR CUSTOMER'S NEEDS



## Industrial References in Biofuels Industries

PRODUCT	CUSTOMER	COUNTRY	CAPACITY	CONTRACT	YEAR
Conversion & capacity increase of an ETHANOL plant from molasses to corn	Alco NCP	South Africa	Undisclosed Capacity	EP+CM 50 M€	2021
Revamping of the complete BIOETHANOL production plant from corn	Acabio	Argentina	From 150,000 m <sup>3</sup> to 270,000 m <sup>3</sup>	EPCM 50 M€	2020
Complete BIOETHANOL production plant with cogeneration from corn	Acabio	Argentina	150,000 m³/year	EPCM 140 M\$	2014
Complete BIOETHANOL production plant with cogeneration from sugar cane	Addax Bioenergy	Sierra Leone	80,000 m³/year + 20 Mwe	EPCM 130 M€	2014
Complete BIOETHANOL production plant with cogeneration from wheat	Biowanze	Belgium	300,000 m³/year	EPC 250 M€	2011
Greenfield of a BIODIESEL production plant from multi feedstock	Dutch BioDiesel	Netherlands	2 x 250,000 TPY	EPC 50 M€	2011
Greenfield of a BIODIESEL production plant from multi feedstock	Rosendaal Energy	Netherlands	250,000 TPY	EPC 28 M€	2009
Complete BIOETHANOL production plant construction from wheat	Alco Bio Fuel	Belgium	150,000 m³/year	EPC 80 M€	2006
Greenfield BIODIESEL production unit with crushing plant from rapeseed	Ineos Enterprises	France	2 x 100,000 TPY	EPC 100 M€	2006

