DSEC & BIO-BASED INDUSTRIES

FROM PILOT / DEMO TO INDUSTRIAL PLANT:
Reliability through Experience

In today's struggle between fossil and renewable feedstock's alternatives for the bio-chemical industry, **De Smet Engineers & Contractors (DSEC)** strongly believes that an integrative upstream production of sugar will be the key for profitability. Depending on the context, those sugars can either be produced through 1st generation processes using e.g. beet/cane extraction, wheat/corn wet milling or through 2nd generation technologies via biochemical conversion of cellulosic materials. Also, the choice between realizing the required industrial tool as an add-on to an existing plant or as a greenfield facility has to be carefully analyzed on both CAPEX and OPEX aspects.

Thanks to its longstanding experience in implementing large scale agro industrial projects, DSEC fully masters all unit operations typically used in the bio-based industry such as fermentation, separation, purification, drying and other related processes, including aseptic design and is therefore the ideal partner when contemplating new investments in the field, more particularly when up-scaling pilot/demo unit to full size facilities.
This technical expertise combined with Project Management capabilities acquired over more than 25 years allows DSEC to support its customers in establishing their projects, **reducing construction risk**, respecting **on time completion** and guaranteed performances(*) within an **agreed budget**.

Acting as **a Process Integrator**, DSEC's skills encompasses a unique know-how in adequately designing all off-sites and utilities (including optimized energy co-generation design) that are the key for full plants efficient operation.

(*) Back to back process guarantees for "not state of the art" technologies

MEETING OUR CUSTOMER´s NEEDS through flexible contractual set-up

- **Engineering & Technical Assistance**
- **For & On Behalf Management (EPCM, EPCM+®)**
- **Semi Turnkey Construction (EP+CM)**
- **Full Turnkey Construction (EPC)**

INDUSTRIAL REFERENCES in the BIO-BASED CHEMICALS & COMMODITIES PRODUCTION

PRODUCT	CUSTOMER	COUNTRY	CONTRACT	YEAR
AMINO ACID	Eurolysine	France	EPCM Brownfield plant	2015 > 2016
2G BIO-FUEL, ISOBUTENE	Global Bioenergy / Undisclosed / Granbio	Germany / Brazil / Australia / France	Audit, Pre-FEED, FEED studies, Cost estimates, Engineering services	2014 > 2016
CORN & WHEAT WET MILLING / MALTOSE / FRUCTOSE	Biowanze CropEnergies (Südzucker) / Promaiz / ACA / Undisclosed	Belgium / Argentina / Ukraine / Saudi Arabia	EPC for 1 Greenfield Wet Milling at Biowanze Pre-FEED studies, Cost estimates	2006 > 2016
INULINE (FRUCTOSE)	Orafti-Beneo (Südzucker) / Cosucra (Groupe Warcoing) / EastAgro Don Ltd	Belgium / Chile / Russia	EPCM for various Brownfield plants and 2 EPC Greenfield plants, Engineering services	2000 > 2016
BIO-ETHANOL	Südzucker / Alco Bio Fuel / ACA / Addax	Belgium / Argentina / Sierra Leone	EPC / EPCM for 4 Greenfield plants	2007 > 2015
LACTIC ACID	Galactic	Belgium	Engineering services	2013
BETAÏNE	Danisco France	France	EPC Greenfield plant	2010 > 2012

DSEC´s ASSETS FOR THE BIO-BASED INDUSTRY

- Strong track record accumulated since more than 25 years, working in 42 countries and completing more than 50 Large Scale Projects,
- Integrated, robust, validated process and product definition before transfer of technology (Pilot → Demo → Industrial),
- Repeated experience with key industry players,
- Highly skilled & committed team, including experts from the industry and specialists in several processes: PLA, Glucose, Fructose, Amino and Organic Acids, ...
- 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 for the Bio-Industry like: filtration, evaporation, separation, drying, chromatography, ion exchange, ...
- Familiar with all types of raw material: seeds, grain, molasses, beet, chicory, bagasse, wood, straw, ...
- Reliable partner during the entire construction life of your project, from process design definition up to final completion and handing over.

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