

De Smet Engineers & Contractors and the Vegetable Oil Industry



Your project is...

- ✓ *Building a new plant...*
- ✓ *Revamping existing units...*

...and you would like it to be implemented efficiently

- ✓ *Avoiding extra expenditures and overruns...*
- ✓ *With the most appropriate technologies...*
- ✓ *With the advice and assistance of professionals...*
- ✓ *In compliance with the tightest quality standards.*



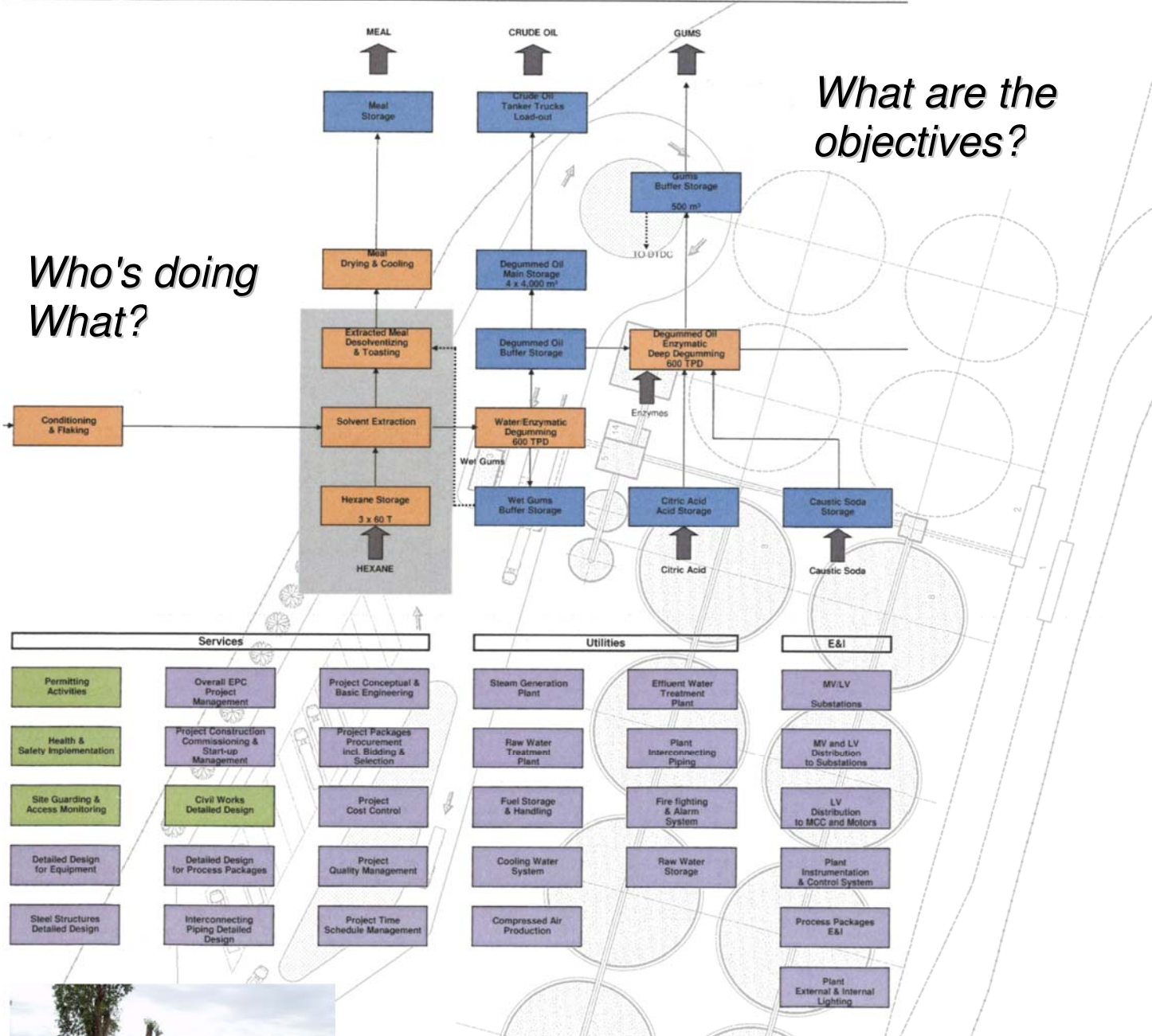
De Smet Engineers & Contractors (DSEC) is your partner for:

- ✓ *Technical and commercial assessments*
- ✓ *Selection of appropriate technologies*
- ✓ *Utilities engineering and interfaces design*
- ✓ *Civil engineering and structural steel design*
- ✓ *Selection and purchase of equipments*
- ✓ *Equipments reception and quality survey*
- ✓ *Equipments transport to the site*
- ✓ *Coordination of all related project activities*
- ✓ *Plant automation standardization*
- ✓ *Supervision of civil engineering and erection works*
- ✓ *Plant start-up and commissioning*
- ✓ *Plant management assistance*



A well defined project:

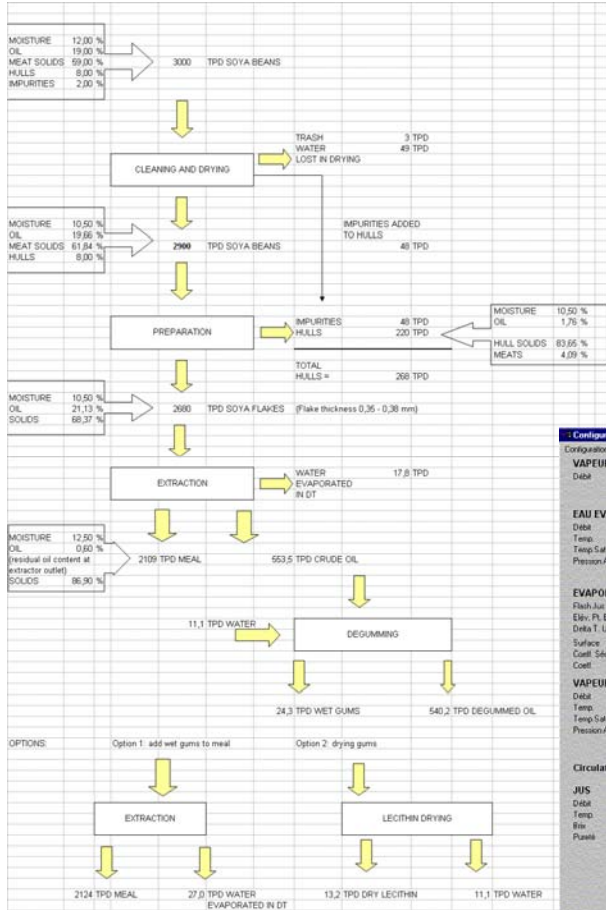
3,000 TPD Soybean Crushing Plant - 600 TPD Refinery
Preliminary Project Block Diagram



How is the site?

Establishing a constructive dialogue

Efficient installations:



Optimization of:

- ✓ processes
- ✓ storage
- ✓ utilities

Configuration						
VAPEUR PRELEVEE						
Débit	kg/s	1.20	1.48	1.00	18.77	5.83
EAU EVAPOREE						
Débit	kg/s	20.92	21.03	21.41	21.89	6.53
Temp.	°C	132.2	126.5	118.5	114.0	107.3
Press.Abs.	Bar(a)	1.29	1.26	1.17	1.12	1.04
Press. Abs.	Bar(a)	2.39	2.39	1.94	1.53	1.17
EVAPORATEUR						
Flash	kg/s	0.44	2.29	3.99	0.43	2.31
Evap. P.	°C	0.54	0.85	1.20	0.34	2.54
Delta T.	°C	4.98	4.64	5.63	4.51	3.32
Surface	m ² /1000 TBU	0.52	0.53	0.57	0.51	0.38
Coef. Sécur.		0.90	0.90	0.90	0.90	0.90
Coef.	Kcal/m ² .°C	1951	1809	1486	1952	1152
VAPEUR DE CHAUFFE						
Débit	kg/s	20.78	19.67	19.71	21.82	5.95
Temp.	°C	145.8	132.2	126.5	118.5	114.0
Temp. Sat.	°C	136.8	131.9	126.0	117.6	112.0
Press. Abs.	Bar(a)	-0.05	2.06	2.29	1.41	1.04
Press. Abs.	Bar(a)	3.30	2.06	2.29	1.41	1.04
Circulation des Jus						
Vans	4	1	2	3	4	5
Entrée	Sortie	Entrée	Sortie	Entrée	Sortie	Entrée
Débit	kg/s	122.38	100.16	90.03	50.03	27.62
Temp.	°C	114.0	132.2	126.5	118.5	114.0
Press.	°C	14.54	17.70	22.33	30.28	47.52
Press.	°C	91.77	91.77	91.77	91.77	91.77

Savings in consumptions:

- ✓ water
- ✓ energy
- ✓ reagents

Reducing wastes:

- ✓ zero effluents
- ✓ incineration

STORAGE TANK DATA SHEET (C)

PROJECT : **Pasapa** LOCATION : **Medan**
 OFFER NO : **06/2007** DAILY ABS. MIN. AIR TEMP (Deg C) : **25**
 COUNTRY : **INDONESIA** DAILY AVER. MIN. AIR TEMP (Deg C) : **30**

TANK DATA	
SECTION :	INSULATED OIL
TANK ITEM :	548ZOL
CAPACITY (t) :	1.489
INSULATED :	YES
STIRRER :	NO
STEAM COIL :	YES
TEMP (Deg C) :	132
WATER COIL :	NO
TEMP (Deg C) :	90
TEMP (Deg C) :	70

TRANSMISSION COEFFICIENT	
NON INSULATED TANK WALLS (Kcal/m ² .h.C) :	25
INSULATED TANK WALLS (Kcal/m ² .h.C) :	100
TANK BOTTOM (Kcal/m ² .h.C) :	10
COIL WITH STIRRER (Kcal/m ² .h.C) :	140
COIL WITHOUT STIRRER (Kcal/m ² .h.C) :	100

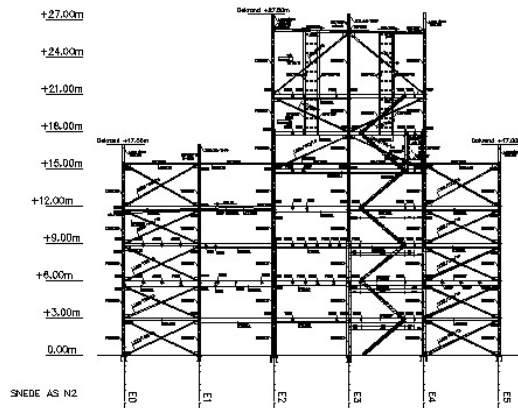
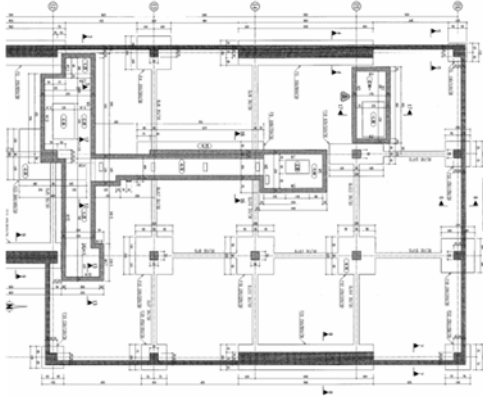
SIZING AND ENERGY CONSUMPTION	
1. Maximum heat losses with tank full and of at (Deg C) :	35 (Kcal/h) : 86.669 Steam (Kg/h) : 167
2. Maximum heat demand for full tank re-heating including possible re-melting - steam (Deg C) :	20 (Kcal/h) : 139.610 Steam (Kg/h) : 270
3. Total maximum heat demand (Kcal/h) :	226.179 Steam (Kg/h) : 437
4. Coil dimensioning :	
4.1. Delta T h (Deg C) :	100
4.2. Coil exchange surface (m ²) :	16 Water Flow (m ³ /h) : N.A.

SUMMARY	
1. ALT 1: All tanks full with minimum average outside temperature (Kg/h) :	502
2. ALT 2: All tanks full with minimum average outside temperature except half full & empty (Kg/h) :	251
3. ALT 3: Re-heating of tank(s) only after shut-down (Kg/h) :	437

Meeting the customer's needs

Global and accurate engineering:

Civil engineering



Steel structure



Material storage and handling



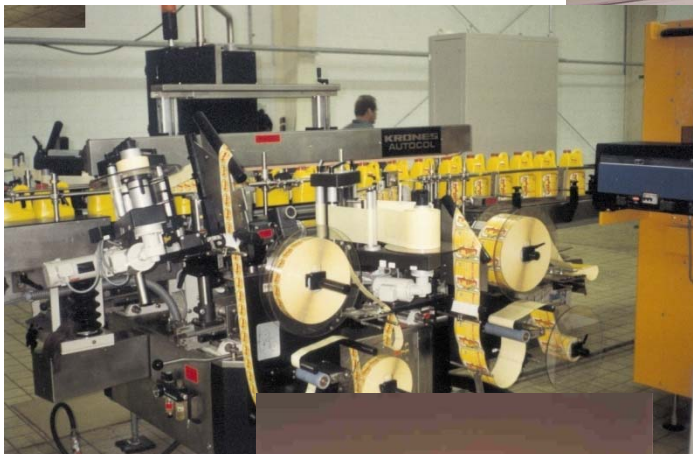
Utilities (steam production, compressed air generation, effluent water treatment, fire fighting, electricity distribution,...)

Every small detail is important!

Appropriate auxiliary units:



From raw material storage...



...to finished products packaging...

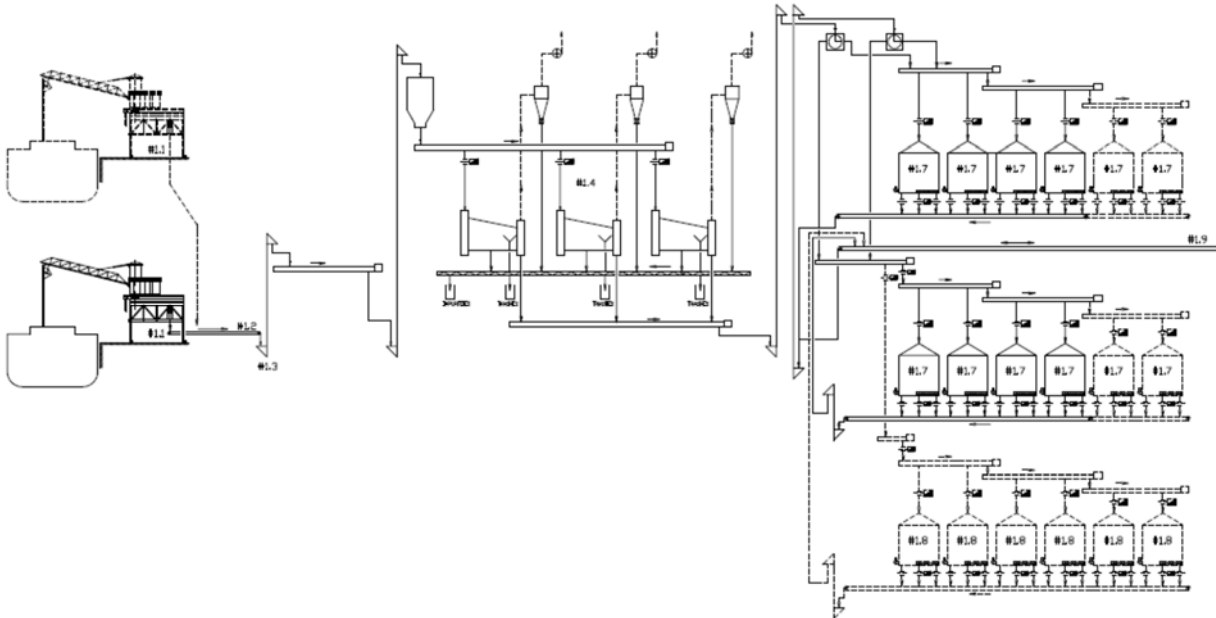


...DSEC selects equipment all over the world

Equipment at the best quality/price ratio

Other DSEC skills:

✓ *Technical analysis*



✓ *Budgetary assessments*

EQUIPMENT PRICE SUMMARY

SECTION	DESCRIPTION	Total Eqpt	Total Eqpt	Total Eqpt
		Cost Price local (EUR)	Cost Price import (EUR)	Cost Price EUR
W500	DEGUMMING	0	703.315	703.315
T5/600PS	PRE-TREATMENT AND BLEACHING	0	362.496	362.496
W1000	WINTERISATION	0	463.465	463.465
800 QPU	QUALISTOCK DEODORISER	0	573.013	573.013
R AUT	REFINERY AUTOMATION	0	147.756	147.756
5400CPort	CRUDE OIL STORAGE IN THE PORT	63.969	75.247	139.216
5400CPortU	PORT TANKS FARM UTILITIES	0	77.000	77.000
5400CPlant	CRUDE OIL STORAGE IN THE PLANT	144.337	92.788	237.126
5400R150	REFINED OILS AND FATS STORAGE	0	194.375	194.375
5400SSG	SOAPSTOCK AND GUMS STORAGE	18.319	38.902	57.220
5400AO	ACID OIL STORAGE	27.775	39.310	67.085
5400 CHEM	CAUSTIC SODA STORAGE	11.582	67.752	79.334
1600BM1	1-1 BOTTLES MANUFACTURING	0	279.250	279.250
1600BM2	5-1 BOTTLES MANUFACTURING	0	225.967	225.967
1600BF1	BOTTLES FILLING AND PACKAGING 1-1	0	567.640	567.640
1600BE2	BOTTLES FILLING AND PACKAGING 5-1	0	75.000	75.000
1600BF3	200 l DRUMS FILLING	0	69.406	69.406
1600U	BOTTLING AND PACKAGING UTILITIES	0	281.002	281.002
5600	WATER COOLING SYSTEMS	0	108.525	108.525

MODEL FOR CALCULATION OF PROFITABILITY OF AN OIL REFINING PLANT				A/ bottling
Refining Capacity	400	ton crude oil/day		1600BE2
Usage	350	days/year		1600BF3
Type of oilseeds	sunflower	% production bottled		1600U
% production bottled	50	%		5600
A. ASSUMPTIONS INSTALLATION				
	Investment in 000 EUR	Years of use	Depreciation in 000 EUR	Direct staff man/24 h
CRUDE OIL STORAGE	116,5	20	6	1,5
DEGUMMING - NEUTRALIZATION	564,5	20	28	1,5
BLEACHING	332,5	20	17	1,5
WINTERIZING	435	20	22	1,5
DEODORIZING	552	20	28	1,5
SUBTOTAL REFINING	2000,5		100	7,5
REFINED OIL STORAGE	112,5	20	6	1,5
ACID OIL STORAGE	21,5	20	1	0
GUMS/SOAPSTOCK	22	20	1	0
BOTTLES MANUFACTURING	954	20	46	6
FILLING AND PACKING	1041	20	52	15
UTILITIES FOR CONDITIONNING	512	20	26	9
SUBTOTAL OIL STORAGE AND CONDITIONING	2563		133	22,5
STEAM PRODUCTION	0	20	0	0
COOLING TOWERS	90,5	20	5	0
COMPRESSED AIR	34,5	20	2	0
INTERCONNECTIONS	39,5	20	2	0
ELECTRICITY INSTALLATION	219	20	11	0
WASTE WATER TREATMENT	183,5	20	9	0
PROCESS CONTROL	0	20	0	0
FIRE FIGHTING	127	20	6	0
LABORATORY	46	20	2	3
WORKSHOP	22,5	20	1	6
SUBTOTAL UTILITIES AND AUXILIARIES	762,5		38	9
SUBTOTAL EQUIPMENT	5426		271	39
FREIGHT AND INSURANCES	379,8	20	19	
SITE WORKS SUPERVISION	588	20	29	
ENGINEERING AND PROJECT MANAGEMENT	375	20	19	

✓ *Investment advisory services (business plan)*

Your partner from the beginning

Some of our references: Studies

PRODUCT	CUSTOMER	COUNTRY	SUBJECT	YEAR
Soya	Nutris	Algeria	Preliminary studies and CAPEX elaboration of a 5,000 TPD crushing plant with refining unit	2015
Soya	Groupe Mazouz	Algeria	Preliminary studies and CAPEX elaboration of a 3,000 TPD crushing plant with refining unit	2014
Rapeseed	Cargill	Belgium	Basic & detailed engineering studies and CAPEX elaboration of a 4,300 TPD extraction unit	2014
Soya	Soybean Crushing & Derivatives	Saudi Arabia	Basic engineering study and CAPEX elaboration of a 3,000 TPD crushing plant	2014
Lecithin	Cargill	The Netherlands	Basic engineering study and CAPEX elaboration of a refining unit	2013
Oils	KARE International	Angola	Basic engineering study and CAPEX elaboration of a refining unit	2013
Sunflower	LDC	Ukraine	Basic engineering study and CAPEX elaboration of a 1,500 TPD crushing plant	2012
Soya	KOU GC	Algeria	Preliminary studies and CAPEX elaboration of a 5,000 TPD crushing plant	2011
Soya	La Belle	Algeria	Preliminary studies and CAPEX elaboration of a 4,000 TPD crushing plant with refining unit	2011
Sunflower	Central EU Biofuels	Hungary	Preliminary studies and CAPEX elaboration of a 1,200 TPD crushing plant with refining including biodiesel production unit	2009
Soya	Westcom	Nigeria	Preliminary studies and CAPEX elaboration of a 5,000 TPD crushing plant with refining	2008
Sunflower	CIG Biodiesel	Austria	Preliminary studies and CAPEX elaboration of a 1,200 TPD crushing plant with refining including a biodiesel production unit	2008
Oils	AE Biofuels America	Argentina	Preliminary studies and CAPEX elaboration of a 800 TPD biodiesel production plant	2008
Oils	Biofuel	Belgium	Preliminary studies and CAPEX elaboration of a 300 TPD biodiesel production plant	2007
Oils	Ineos Chlor	Belgium	Preliminary studies and CAPEX elaboration of a 2 x 800 TPD biodiesel production plant	2007
Rapeseed	European Biofuels	The Netherlands	Preliminary studies and CAPEX elaboration of a 4,000 TPD crushing plant including biodiesel production	2006
Soya	Muuga Sojatehas	Estonia	Basic engineering study and CAPEX elaboration of a 1,500 TPD crushing plant	2006

Some of our references: Turnkey installations



Yanbu Oil Mill – K.S.A.:

Construction of a complete soybean crushing plant with harbour transfer and storage facilities.

Capacity: 2,200 TPD soybean.

Investment value: 60 M€.



Rosendaal Energy, Sluiskil – The Netherlands:

Turnkey construction from greenfield of a biodiesel production plant.

Capacity: 250,000 TPY biodiesel.

Investment value: 45 M€



Dutch BioDiesel – The Netherlands:

Turnkey construction from greenfield of a biodiesel production plant.

Capacity: 250,000 TPY biodiesel.

Investment value: 50 M€.



Ineos Enterprises, Baleycourt – France:

Turnkey construction from greenfield of a crushing plant (rapeseed) including a biodiesel production unit.

Capacity: 1,200 TPD rapeseed;

2 x 100,000 TPY biodiesel.

Investment value: 100 M€.



KOG Edible Oils – The Netherlands:

Civil engineering and erection works of a palm oil refining and fractionation plant.

Capacity: 1,000 TPD palm oil.

Investment value: 20 M€.

**DSEC is present all over the world
for 30 years**



DE SMET ENGINEERS & CONTRACTORS is a privately held limited liability company incorporated in Belgium in 1989. It has an established reputation as a general contractor, specializing in the agro-industrial field where it is a fully-integrated world class provider of engineering, procurement and construction services.

It brings a compelling business offering that combines excellence in execution, safety, cost containment, experience and reliability with particular care towards energy saving and sustainability.

Sugar as well as **Oils & Fats** have been the core of **DE SMET ENGINEERS & CONTRACTORS's** fields of activity. A major diversification towards the **Biofuels, Biochemicals** and **Agrochemical** industries has now taken place, based on its specific competence in agro-industrial engineering and project management acquired over the years.

DE SMET ENGINEERS & CONTRACTORS provides the industry with general contracting services from project management (**EPCM - Engineering, Procurement and Construction Management** or "*For and on Behalf*" operations) to full turnkey construction (**EPC - Engineering, Procurement and Construction**) allowing industrial operators to concentrate on their production commitments.

From conceptual study to vocational training, **DE SMET ENGINEERS & CONTRACTORS** has the ability and skill to **successfully complete large turnkey projects on brown- or greenfields**, all within the pre-established budget and delivery time, in a variety of geographical environment.



DE SMET S.A. ENGINEERS & CONTRACTORS

Watson & Crick Hill

Building J – Box 8

Rue Granbonpré, 11

B-1435 Mont-Saint-Guibert - Belgium

Tel.: 32 (0)10 43 43 00 - Fax: 32 (0)10 43 43 11

E-mail : info@dsengineers.com

<http://www.dsengineers.com>