

**2024 June 18th**

**Nous combustibles sostenibles per a mobilitat i Transport.**

**Technip Energies : Our International View  
and Experience**

# Technip Energies at a glance

Listed on <b>Euronext Paris</b> Stock Exchange	Headquartered in <b>Paris</b>	<b>65+</b> Years of operations
<b>€6B</b> Full year 2023 adjusted revenue	A leading Engineering & Technology company for the Energy Transition	<b>€15.7B</b> Backlog at end 2023
<b>~15,000</b> Employees in 34 countries	<b>25+</b> Leading proprietary technologies	<b>450 projects</b> Under execution

# An organization supporting our strategy and ambition

A laser focus on developing and capturing new business

## Gas & Low Carbon Energies



- LNG
- Blue H<sub>2</sub> & derivatives
- Offshore
- Early Engagement Gas

## Sustainable Fuels, Chemicals & Circularity



- Ethylene
- Biofuels, fuels & petrochemicals
- Biochemicals & circularity

## Decarbonization Solutions



- CO<sub>2</sub> management

## T.EN X Consulting & Products



- Genesis
- PMC - Project Management Consultancy
- Operations & Maintenance Consulting (OMC)
- Loading Systems
- Life Sciences
- Mining & Metals

One T.EN Delivery global organization

# 2023 – T.EN & John Cockerill to create Rely

A new company accelerating green H<sub>2</sub> industrialization



- T.EN joining forces with a leading electrolyzer provider.
- Unique combination of technology, engineering, and equipment manufacturing know-how.
- Industrially and geographically complementary, cultural alignment.

## An integrated solutions provider for green H<sub>2</sub> and Power-to-X

### Asset light model

Preferred access to electrolyzer stack supply

### Innovation platform

Technology and proprietary equipment development to unlock green H<sub>2</sub> solutions

### Asset lifecycle offering

From conception to Operations & Maintenance

## Building T.EN's future core aligned with net zero goals



# NExBTL

One of the largest renewable fuels plant in the world



Biofuels  
Project



**Contract:** EPCm

**Award:** 2008

**Delivery:** 2011 / 2024

**Client:** Neste Oil

**Location:** Netherlands

**ISBL License:** NESTE



## Key figures

Production: 800,000 t/a (Revamp 1,3 MM)

Now Duplicating up to 2,6 MM



Technip Energies delivered a plant in Maasvlakten area, in the western part of Port of Rotterdam and close to other chemical plants, which offers a number of synergy opportunities with other facilities.

# DNExBTL

One of the largest renewable fuels plant in the world



Biofuels  
Project



**Contract:** EPCm  
**Award:** 2008  
**Delivery:** 2010 / 2024  
**Client:** Neste Oil  
**Location:** Singapore  
ISBL License: NESTE

 **Key figures**

Production: 800,000 t/yr  
Increasing up to 2,1 MM Tm.



Technip Energies delivered a plant which was integrated into the existing industrial infrastructure area, and makes use of local site utilities, port and storage services. Singapore plant extension to 1,3 Mta has been awarded to Technip Energies in December 2018.



# Total Energies



**Phoenix Project. The first reconverted biorefinery in France converting vegetable and used cooking oils to renewable oils**

Biofuels Project



**Contract:** EPsCm

**Award:** 2016

**Delivery:** 2019

**Client:** TotalEnergies

**Location:** France

**HVO:** AXENS

**PRETREATMENT:** Alfa Laval

## Key figures

Capacity: 500 KTA of hydrotreated vegetable oil (HVO) with feedstock constituted by crude palm oil (CPO), used cooking oil (UCO), animal fat and palm fatty acids distillates (PFAD)



Technip Energies was awarded a contract for the reconversion of La Mède refinery, the first biorefinery in France to convert vegetable and used cooking oils to renewable oils. The facility has a production capacity of 500 KTA of hydrotreated vegetable oil.

# Total Energies

## Galaxie Biojet



**Contract:** EPsCa

**Award:** 2022

**Delivery:** 2025

**Client:** TotalEnergies

**Location:** France

UOP / Desmet Ballestra

 **Key figures**

- Capacity: HVO 210 kty Biojet & 51 kty biodiesel
- HEFA Licensor: UOP
- Package providers: PTT Desmet Ballestra and Callidus for Thermal Oxidizer

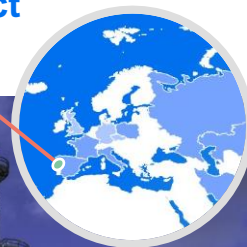


The first biorefinery in France from FAME and used cooking oils to renewable fuel





### Biofuels Project



**Contract:** FEED + EPCM's

**Award:** 2021

**Delivery:** 2025

**Client:** Galp

**Location:** Portugal

**Licensors:** Axens & Technology

### Key figures

New HVO Unit (Biofuels) to produce 270kTPA bio-diesel and bio-jet based on renewable feedstock (animal fat, vegetable oils, etc.) in Galp's Sines refinery



New HVO Unit (Biofuels) to produce 270kTPA bio-diesel and bio-jet based on renewable feedstock (animal fat, vegetable oils, UCO, etc.) in Galp's Sines refinery

# SAF Projects: Production Technologies approved

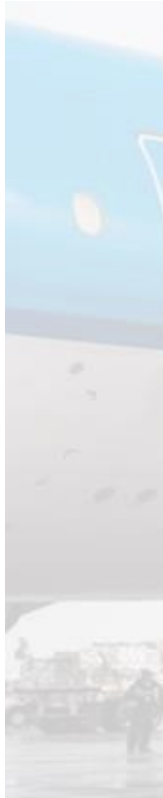


TABLE 4-1  
Conversion processes  
approved by ASTM  
International  
(Source: ICAO GFAAF, 2018)

	Annex	Conversion Process	Abbreviation	Possible Feedstocks	Blending ratio by Volume	Commercialization Proposals
ASTM D7566	1	Fischer-Tropsch hydroprocessed synthesized paraffinic kerosene	FT-SPK	Coal, natural gas, biomass	50%	Fulcrum Bioenergy, Red Rock Biofuels, SG Preston, Kaldi, Sasol, Shell, Syntroleum
	2	Synthesized paraffinic kerosene produced from hydroprocessed esters and fatty acids	HEFA-SPK	Bio-oils, animal fat, recycled oils	50%	World Energy, Honeywell UOP, Neste Oil, Dynamic Fuels, EERC
	3	Synthesized iso-paraffins produced from hydroprocessed fermented sugars	SIP-HFS	Biomass used for sugar production	10%	Amyris, Total
	4	Synthesized kerosene with aromatics derived by alkylation of light aromatics from non-petroleum sources	SPK/A	Coal, natural gas, biomass	50%	Sasol
	5	Alcohol-to-jet synthetic paraffinic kerosene	ATJ-SPK	Biomass from ethanol or isobutanol production	50%	Gevo, Cobalt, Honeywell UOP, Lanzatech, Swedish Biofuels, Byogy
ASTM D1655	Annex	Co-processing		Fats, oils, and greases (FOG) from petroleum refining	5%	



# SAF Projects Overview worldwide for coming years

## For the Period 2020 – 2023:

- Approx. 12 projects achieved FID (Final Investment Decision) Status.
- Mainly HEFA and Co-Processing.
- The total Green SAF production will be approx. 3,7 MM TM per year.

## For the Period 2024 – 2025:

- Approx. 10 HEFA Projects will achieve FID Status.
- The total Green SAF production will be approx. 4,0 MM TM per year.
- Approx. 25 Projects using other technologies will achieve the FID Status.
- Winner technologies will be FT-SPK; Alcohol to Jet; Biogenic CO<sub>2</sub> to Liquid & Biogenic gases to Liquid.
- The total Green SAF production will be approx. 3,5 MM TM per year.

# SAF Projects: Project Execution Highlights

## For All types of Projects:

- **Not to be very optimistic on CAPEX estimation and Business Model.**
- **Conceptual Engineering Frozen is a MUST before advance to next Project Chapters.**
- **To have a good knowledge of the SAF Market and SAF Actors is extremely important.**
- **To assure Financing, Public funds, Raw Materials sources contracts and Off Take volumes.**
- **To share the Project Risk with the appropriate partners.**
- **To look for Experienced Licensors and Experienced EPC contractors. Not only for the ISBL units but also for the PTT unit.**

# SAF Projects: Project Execution Highlights

## For Brownfield Projects:

- Clear Technical Baseline for adaptation of present units to SAF project.
- To assure the right metallurgy and present integrity status of Vessels, Piping, Rotary Equipment and Instrumentation of the existent unit.
- No to be optimistic on CAPEX for Units conversions. Surprises may arise during project execution. Consider Cash Flow impact of Fossil Units long shutdowns required for the project.
- Operations Teams involvement in very early stages.
- Conceptual Engineering frozen is a MUST.

## For Greenfield Projects:

- SAF Production is a very serious business. New arrivals companies has to be well prepared for that. (*“It is not the same to produce oranges than producing Orange Juice”*).
- To choose the right experienced Licensor and the right experience EPC contractor is the Key for the right project execution. Not only for SAF units but also for PTT units.



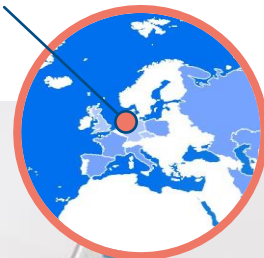


**Thank you**

# SkyNRG

## DSL-01 Project. First European Sustainable Aviation Fuel plant

Biofuels  
Project



**Contract:** FEED

**Award:** 2018

**Delivery:** Phase 1: 2020 & Phase 2: 2023

**Client:** SkyNRG

**Location:** Delfzijl, The Netherlands

**ISBL :** Haldor Topsoe

**PTT:** Desmet Ballestra (20) ARA (23)

### Key figures

DSL-01 Project. Europe's first sustainable aviation fuel plant

This project will enable the industry to reduce dependence on fossil fuel



Technip Energies performs a FEED and open book estimate for a SAF plant that uses Used Cooking Oil, animal fat and waste oils as feedstock