RED II – HVO AND CO-PROCESSING

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INTEGRATING CLIMATE INTO STRATEGY
Taking into account anticipated market trends

Global energy demand
Mboe/d

IEA 2°C scenario*

300

Renewables
Nuclear
Coal
Oil
Natural gas

2017
2040

* IEA Sustainable Development Scenario

Focusing on oil projects with low breakeven

Expanding along the gas value chain

Developing profitable & sizeable low carbon electricity business
PROMOTING SUSTAINABLE BIOFUELS

Biofuels world consumption
Mboe/d

Leading European biofuel distributor in 2018 with 2.4 Mt/y

Entering M&S business in Brazil, a major biofuel market

Starting-up HVO production in La Mède based on sustainable vegetable oil

Early biogas positions (France, Netherlands, US)

Supportive government policies

Source: IEA scenarios - SDS, NPS (in millions of barrels equivalent)
GROWING DEMAND FOR BIODIESEL WORLDWIDE

Source: IEA

World Biodiesel demand: 0.6 Mboed in 2017

Legend:
- Biodiesel in Mt/y
  - HVO -----
  - FAME -----

- USA
  - Soybean

- UE-28
  - Rapeseed

- Latin America*
  - * Brazil, Argentina

- Asia**
  - ** China, Indonesia, Malaysia (FAME)
  - Singapore (HVO)

- EU
  - Rest of the world

Demand (2017)

- USA
  - 35Mt

- EU

- Argentina/Brazil

- China, Indonesia, Malaysia

- Rest of the world
CO-PROCESSING BIO FEEDSTOCK: HOW DOES IT WORK?

Opportunity to incorporate Bio-Feedstock

Co-processing of Bio-Feedstock

EXISTING INSTALLATIONS

PRODUCT A
PRODUCT B
PRODUCT C
PRODUCT D

CERTIFICATION (MASS BALANCE)

Bio-allocation

«CERTIFIED RENEWABLE» PRODUCT A
PRODUCT B
PRODUCT C
PRODUCT D

BIOFUELS
Biogasoline & Biodiesel

Mass Balance Allocation
Not allowed

Renewable CHEMICALS
Certified polymers

Allowed
LA MÈDE BIOREFINERY

France’s first world-class bio refinery, one of the biggest in Europe.

€275M Investment
Redeployment of the site to an activity that will drive growth. Bio-units will start up in 2018.

500 kt/year of HVO to meet growing demand for biodiesel.

Technology that can process all types of oil: vegetable, used and residual.

1. Pretreatment
Pretreatment removes any contaminants in the oil that could damage the catalyst in the downstream HVO unit.

2. Reforming Unit
The existing unit will remain in operation to produce the hydrogen needed for HVO unit operations, and high-octane-number gasoline stock for aviation fuel in particular.

3. HDT Section
The oil is hydro-treated to produce motor fuel.

4. HDI Section
Hydrosomerization improves the fuel’s cold resistance.

5. Biodiesel

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