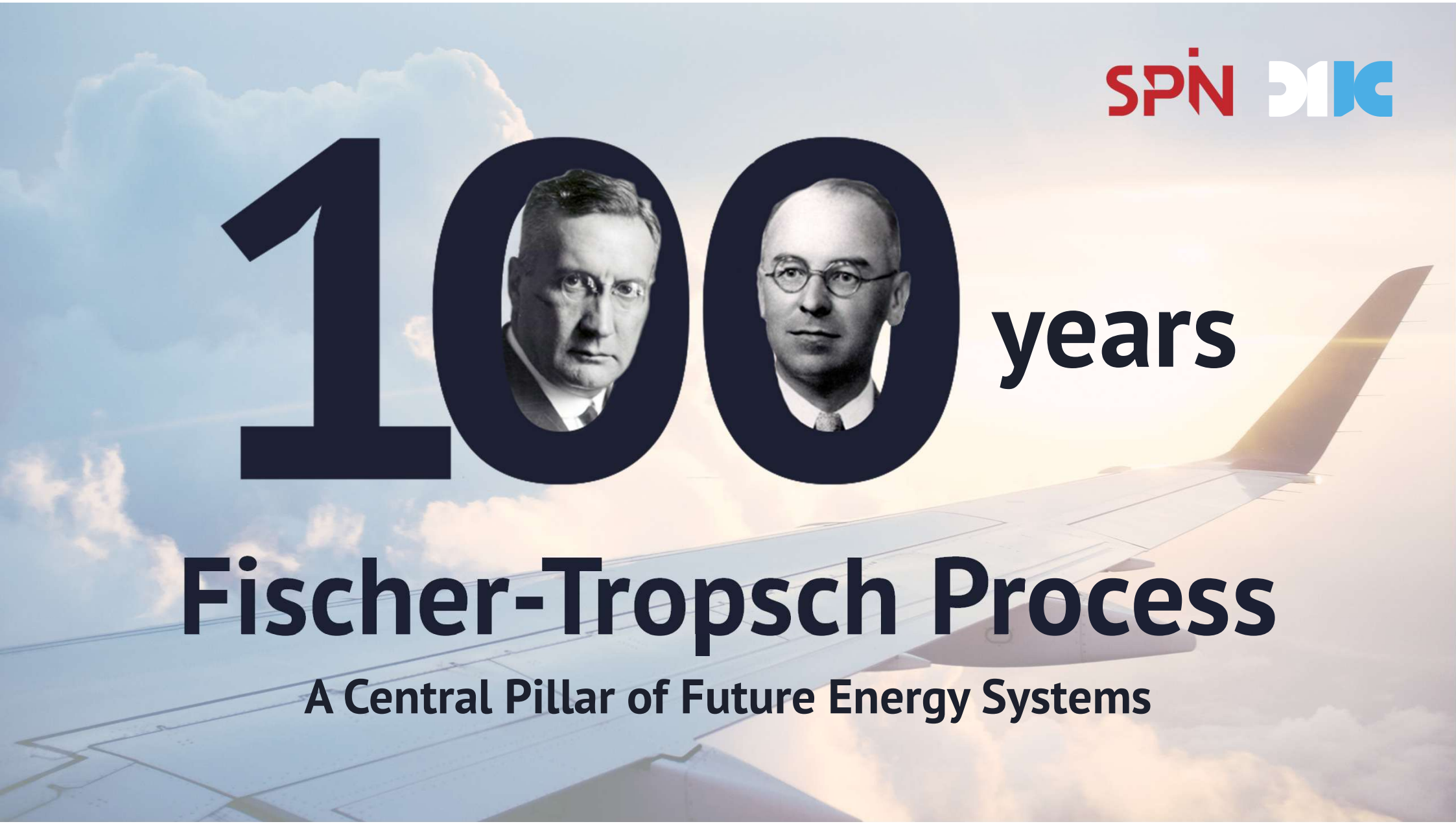

100
years
Fischer-Tropsch Process
A Central Pillar of Future Energy Systems


INERATEC
FUELING THE FUTURE

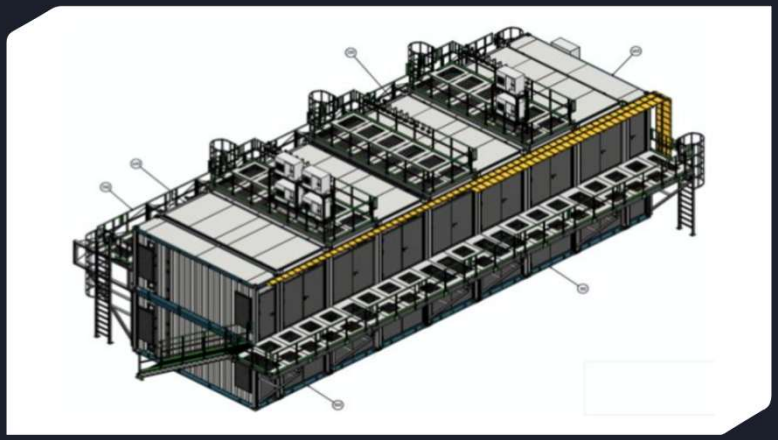
VISION

A liveable planet and access to affordable, reliable, sustainable and post-fossil energy for all. 

BUSINESS MODEL

Technology Provider
Power-to-X-Plants

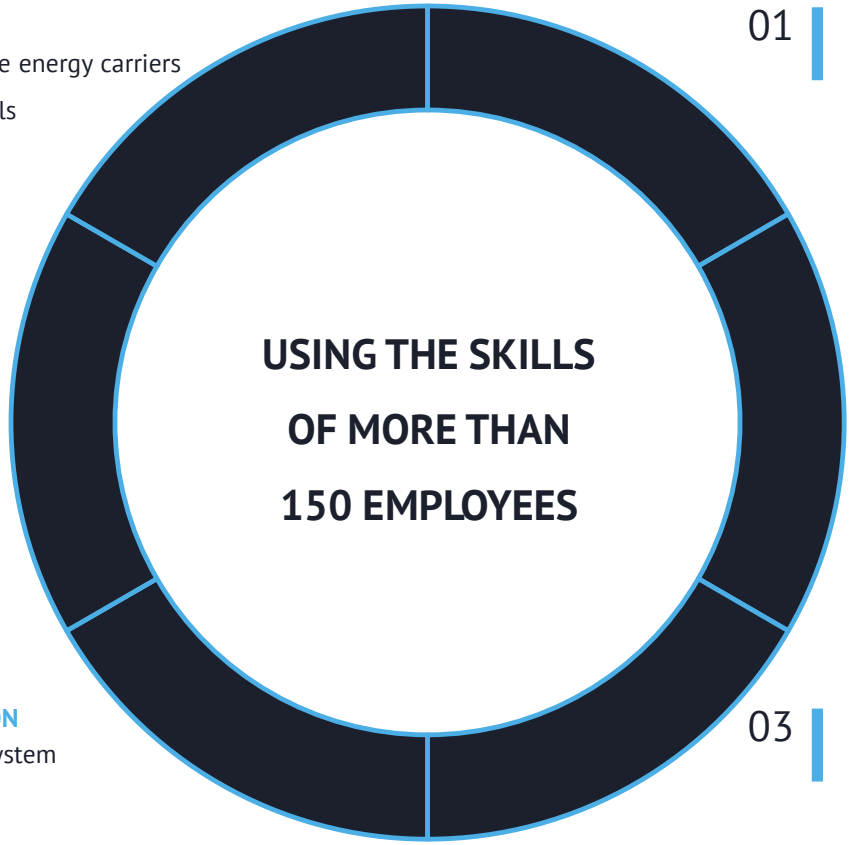
As a technology provider, we offer modular chemical plants for Power-to-X applications.



Fuel Supplier
e-Fuels & e-Chemicals

As a solution provider, we deliver norm-conform drop-in ready SAF (Sustainable Aviation Fuel), e-Diesel, e-marine diesel and e-gasoline as well as waxes as chemical feedstock.

SKILLS



06 **SALES**
of renewable energy carriers and materials

01 **DEVELOPMENT**
In the field of renewable energy carrier and material synthesis

05 **MAINTENANCE AND OPERATION**
Handling the whole plant life cycle

02 **ENGINEERING**
of turnkey plants

04 **REALISATION**
of overall system in the field

03 **PLANT CONSTRUCTION**
construction of turnkey modules in the field of micro-process reactors

SUCCESS STORIES

Sun to Liquid
Project Dawn

TASK:
Delivery of e-fuels and e-chemicals

TARGET:
Production of up to 0,16m liters per year
First industrial scale plant from Synhelion

Synhelion

STATUS:
Operational since 2024

LOCATION:
Jülich

SUCCESS STORIES

World‘s lagest Power-to-X Plant Frankfurt Höchst

TASK:
Delivery of e-fuels and e-chemicals

TARGET:
Production of up to 2.5m liters per year
Blueprint for worldwide operation of owned plants

STATUS:
Start of production: 2025

LOCATION:
Frankfurt/Main, Germany

PARTNERS: infraserv höchst, VTU, Ferrostaal

SUCCESS STORIES

Next scale plant Chile

TASK:
Delivery of e-fuels and e-chemicals

TARGET:
Production of up to 400m liters per year
Blueprint for worldwide operation of owned plants

STATUS:
Feasibility done: 2024

LOCATION:
Chile

DEFINITION WIKI

The Fischer-Tropsch synthesis (FT synthesis) is a large-scale, heterogeneous catalytic polymerization process to produce hydrocarbons.

- In this process, carbon monoxide adsorbed on cobalt- or iron-containing catalyst surfaces is hydrogenated with hydrogen.
- The reactions occur at temperatures of approximately 150 to 350 °C and pressures of 1 to about 25 bar.
- The process encompasses the production of synthesis gas, its conversion into Fischer-Tropsch products, and their subsequent processing. Coal, natural gas, biomass, or organic waste are available as feedstock sources for generating the synthesis gas.

FT EXPLAINED SIMPLY

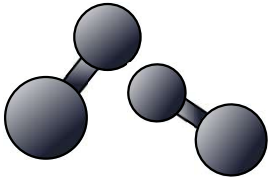
Natural Gas

Coal

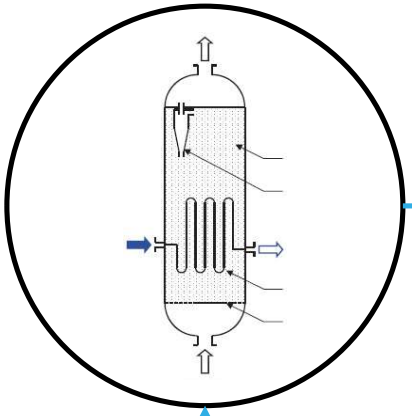
Biomass

Gasification

Synthetic gas



Fischer-Tropsch Synthesis



short-chain olefins

Fibers, rubber, plastic

Gasoline Diesel

Fuels

Waxes

Lubricants and waxes

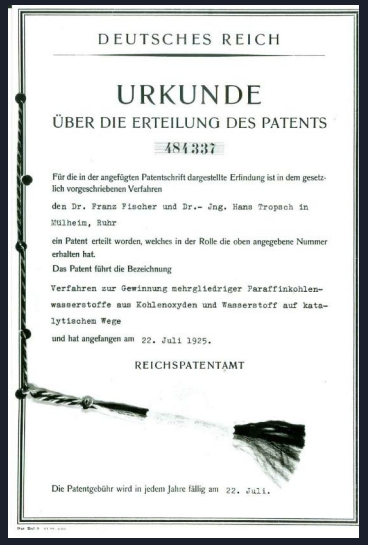
Oxygenate α-olefine

Surfactant detergents

THE PATENT REQUEST

What happend in 1925

The German chemists Franz Fischer and Hans Tropsch developed the process at the Kaiser Wilhelm Institute for Coal Research in Mülheim an der Ruhr (presently Max Plank Institute) and filed a patent application in 1925.



DEUTSCHES REICH

URKUNDE

ÜBER DIE ERTEILUNG DES PATENTS

484337

Für die in der angefügten Patentschrift dargestellte Erfindung ist in dem gesetzlich vorgeschriebenen Verfahren

den Dr. Franz Fischer und Dr.- Ing. Hans Tropsch in Mülheim, Ruhr

ein Patent erteilt worden, welches in der Rolle die oben angegebene Nummer erhalten hat.

Das Patent führt die Bezeichnung

Verfahren zur Gewinnung mehrgliedriger Paraffinkohlenwasserstoffe aus Kohlenoxyden und Wasserstoff auf katalytischem Wege

und hat angefangen am 22. Juli 1925.

REICHSPATENTAMT

Die Patentgebühr wird in jedem Jahre fällig am 22. Juli.

Source: Max-Planck-Institute

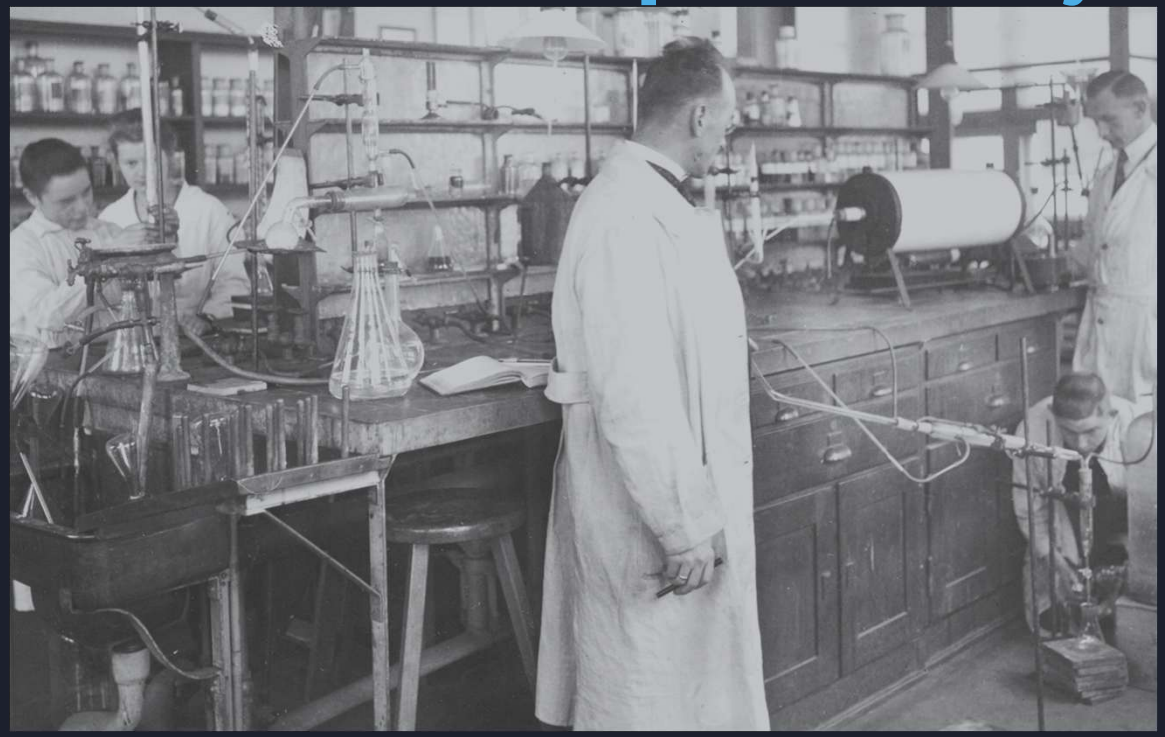
Franz Fischer
Source: Max-Planck-Gesellschaft

Hans Tropsch
Source: Max-Planck-Gesellschaft

Source: Max-Planck-Institute

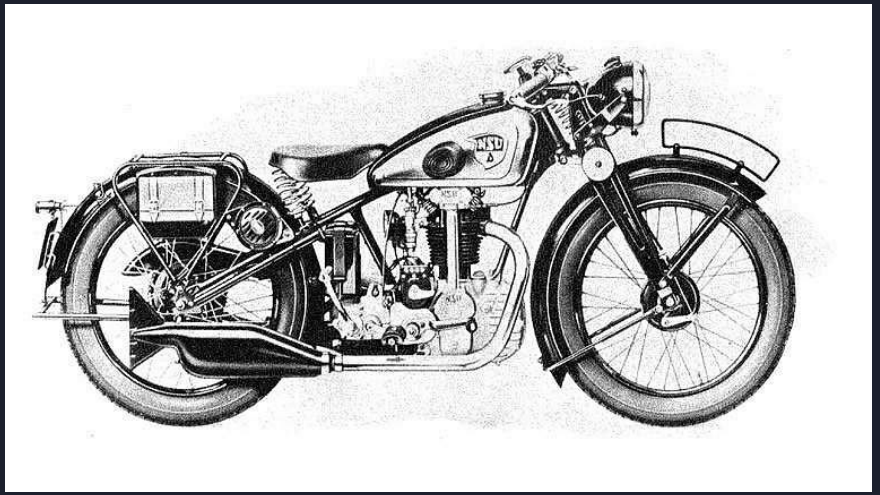
THE RESEARCH

“The first step is always the hardest.”



Source: Max-Planck-Institute

Fuel testing with NSU motorcycle

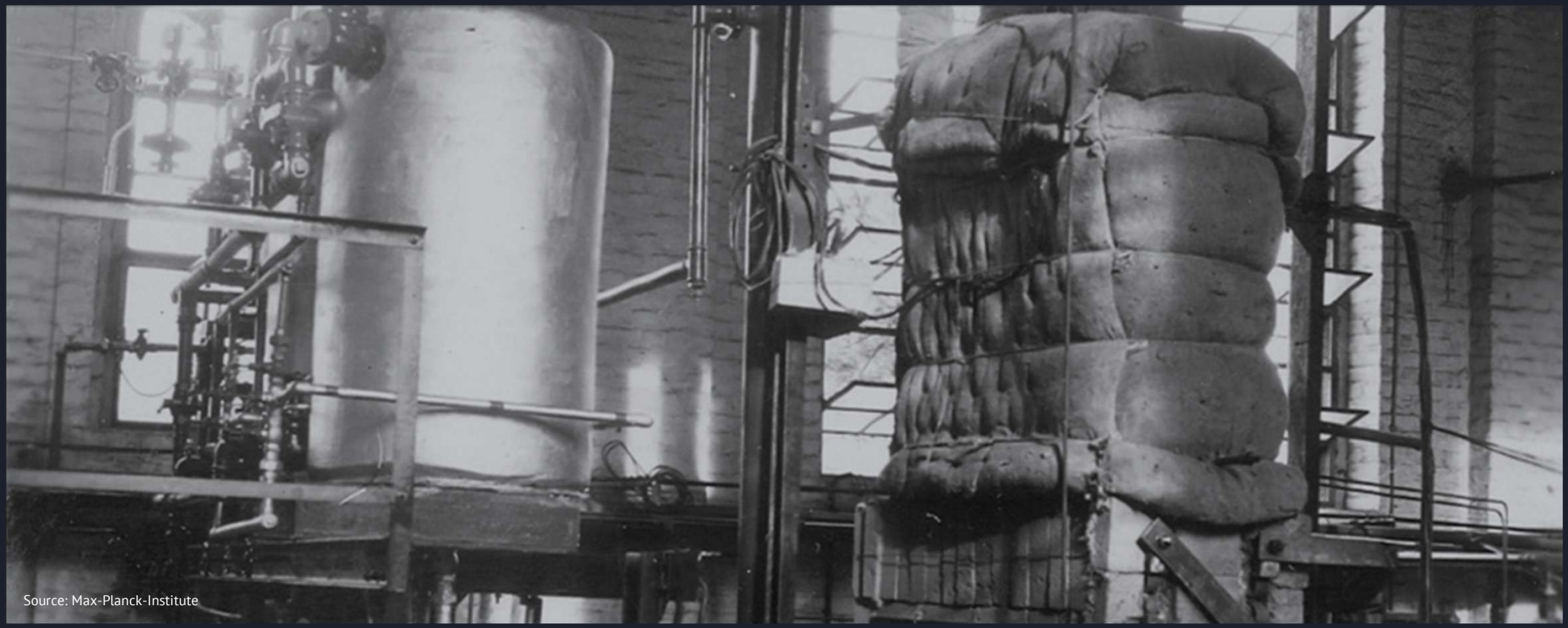


THE PRODUCT

SOURCE: MAX-PLANCK-INSTITUTE

TEST FACILITY

Fischer-Tropsch test facility at technical scale



Source: Max-Planck-Institute

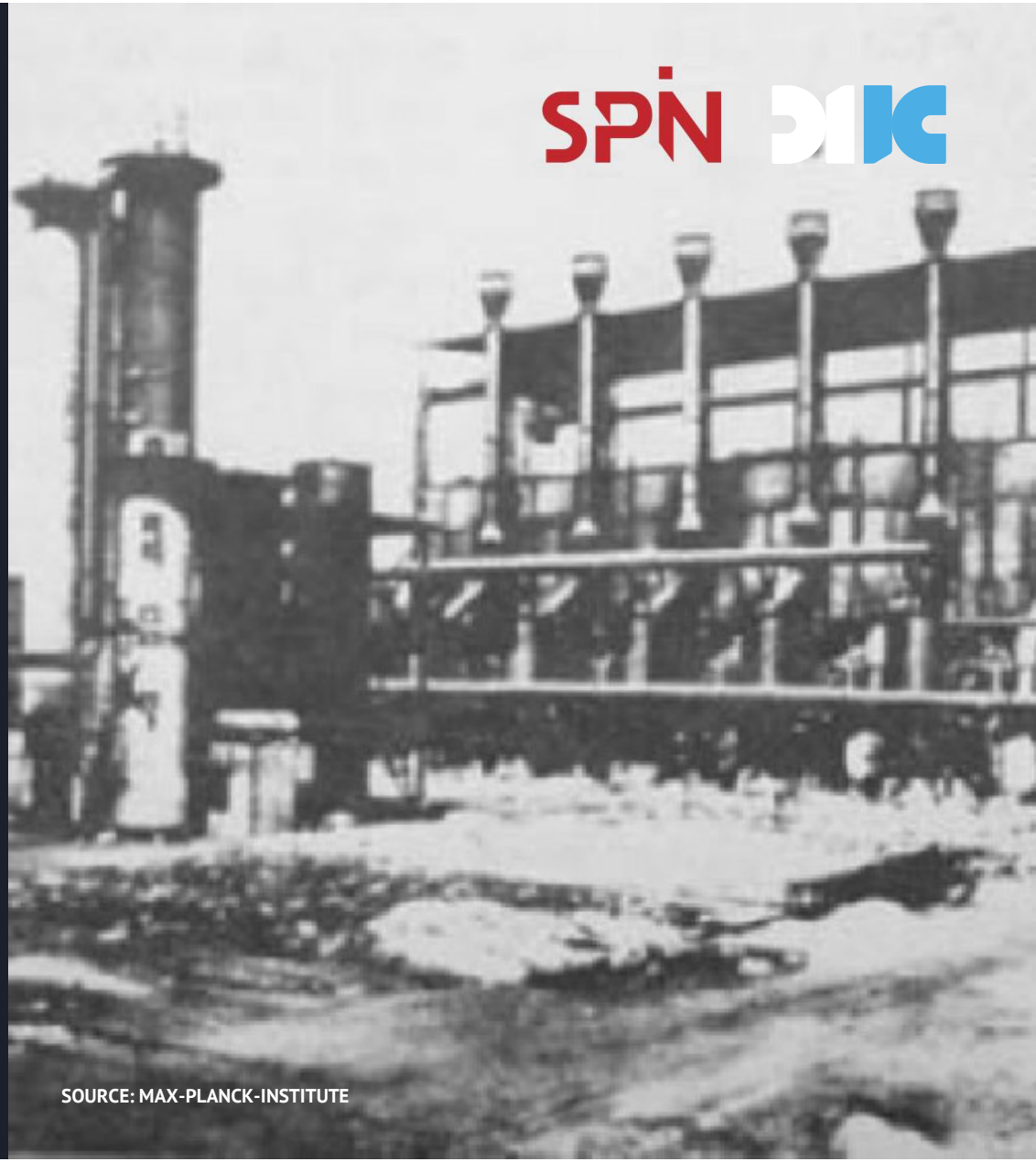
THE PATENT REQUEST

What happend in 1936

First Fischer-Tropsch plant was operated by Ruhrchemie AG in Oberhausen, Germany, in 1936 after acquiring exclusive patent rights to the FT process in 1934.

This small-scale plants had 52 reactors operated at atmospheric pressure, with a production capacity of 85 Mio. Liter per annum.

By 1938, nine plants with a combined production capacity of about 660 Mio. Liter per annum were in operation.

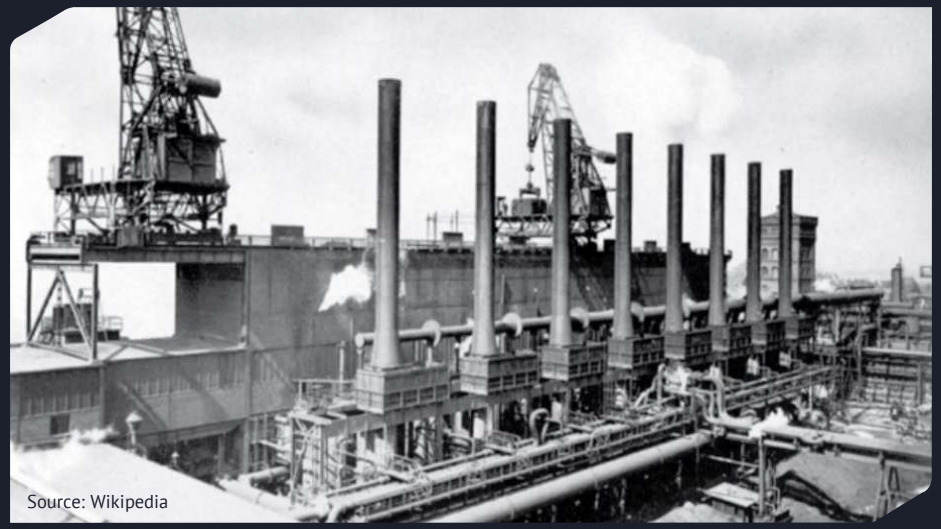


SOURCE: MAX-PLANCK-INSTITUTE

KRUPP & SASOL I

1953

Krupp-Treibstoffwerk Wanne-Eickel
Coal based GtL plant



Source: Wikipedia

1955

Sasol I (South Africa)
Coal based GtL plant

Source: Sasol

SASOL II + III

1980: Sasol II+III (South Africa)

Coal based GtL plant

Source: Wikipedia

METHAN TO LIQUID

1992
Sasol technology in south Africa and Borneo together with Shell Methan based GtL plant

Source: Sasol

PEARL GTL

In 2011

TECHNOLOGY
Natural gas to liquid

PRODUCTION
World biggest FT-plant, up to 7000 Mio. liters per year

CAPEX
>24‘000 Mio. USD

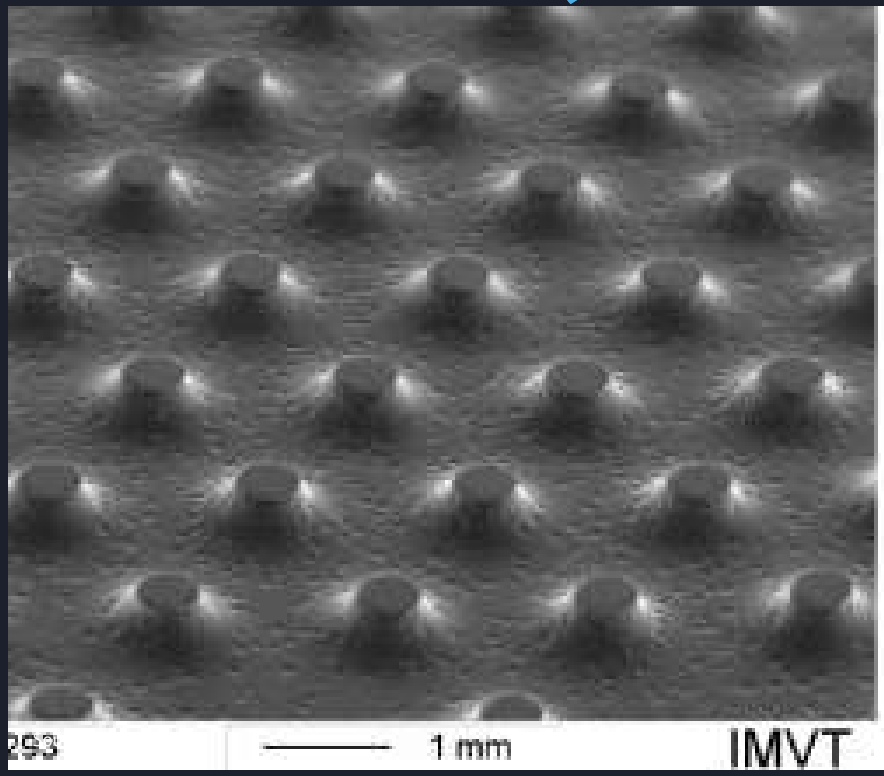
STATUS
Start of production: 2011

LOCATION
Ras Laffan, Qatar

OWNER
Qatar Energy & Royal Dutch Shell

Source: Sasol

2010 Development on disruptive micro structured reactors at KIT (Karlsruhe)



DISRUPTIVE TECHNOLOGY

2024

36.000 Liter/h

Source: Wikipedia

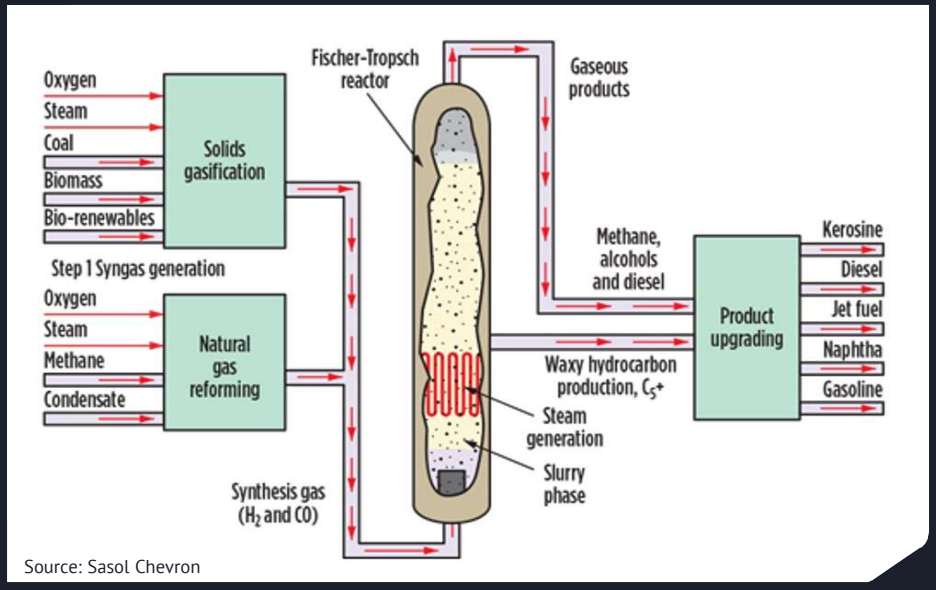
2024

60 Liter/h

DISRUPTIVE TECHNOLOGY

2024

Slurry technology (Sasol)



Source: Sasol Chevron

2024

Microstructured reactors (INERATEC)

Source: INERATEC

USP NEW TECHNOLOGY

- Highly compact technology (80 time smaller)
- Load flexibility 30%-100%
- Project de-risking by numbering-up
- H_2 and CO_2 efficiency >98%
- Energy efficiency >62%
- High yield of e-SAF

TOMORROW

Oilfield of the future

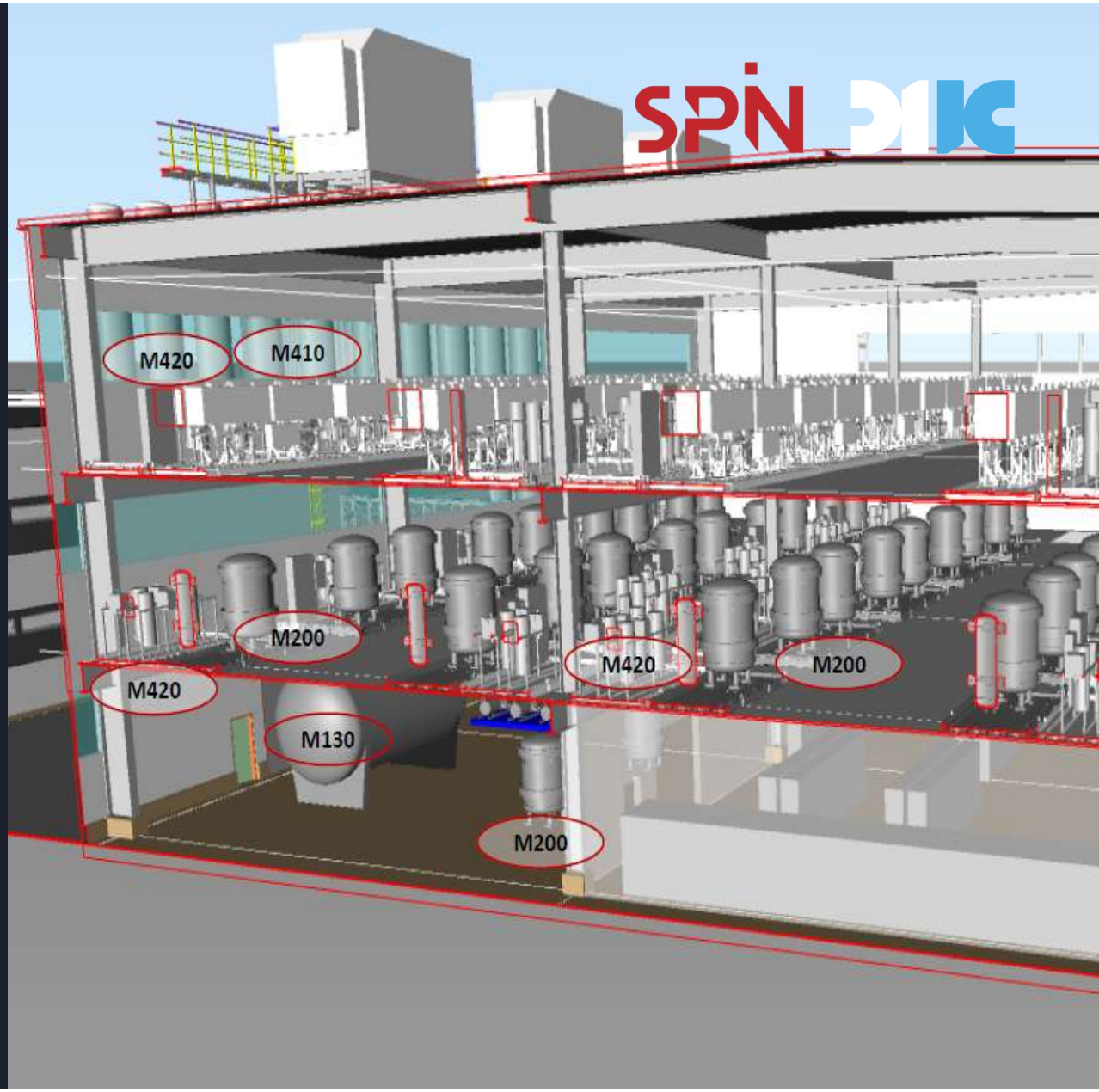
TECHNOLOGY
Power to liquid, Waste to Liquid, Biomass to Liquid

PRODUCTION
up to 30 Mio. liters per year

CAPEX
>300 Mio. USD

STATUS
Start of production: 2028

LOCATION
Decentralized



GET TO KNOW US

Get in touch now.

Christian Bersier

CEO

Christian.bersier@ineratec.ch

P. +41 79 238 41 71

INERATEC Schweiz AG

Gönhardweg 2

5000 Aarau

Switzerland

www.ineratec.com

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