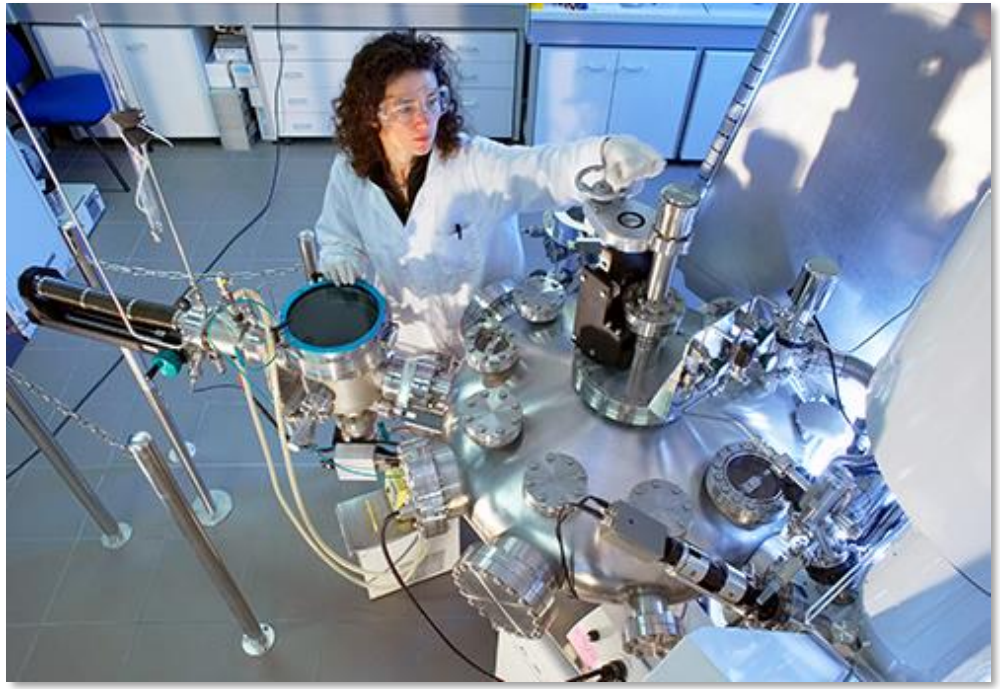


Workshop « Bioenergy in a Net Zero Future »

CO_2 potential of advanced biofuels

Jean-Philippe HERAUD

19/10/2023

IFP Energies nouvelles

ABOUT IFP ENERGIES NOUVELLES

A public sector **R&I** body

A **training** center

An industrial **group**

An international scope in the fields of energy, transport and the environment

1,549 people

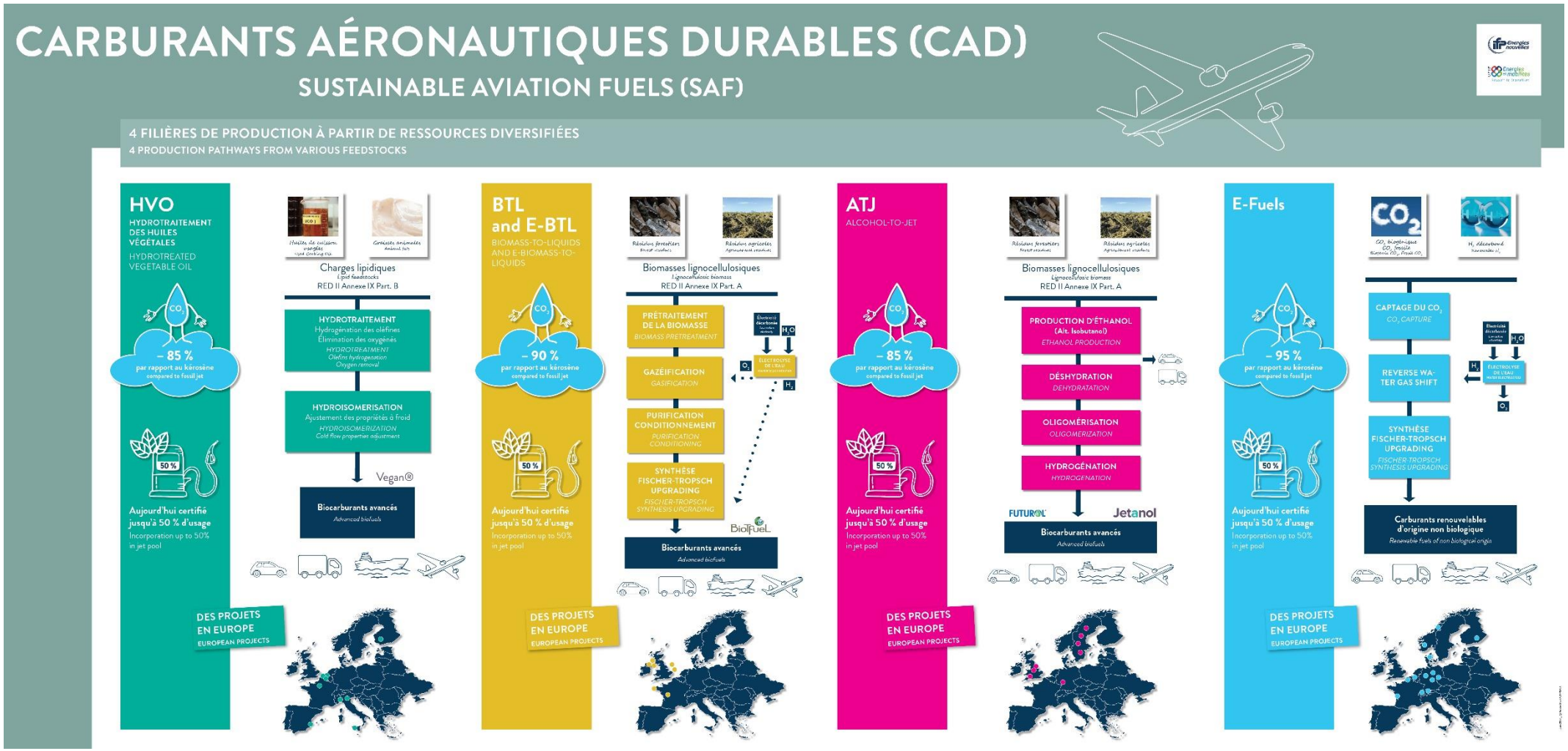
1,095 engineers and technicians dedicated to research

€121.2m budget allocation in 2022

€141.5m own resources in 2022

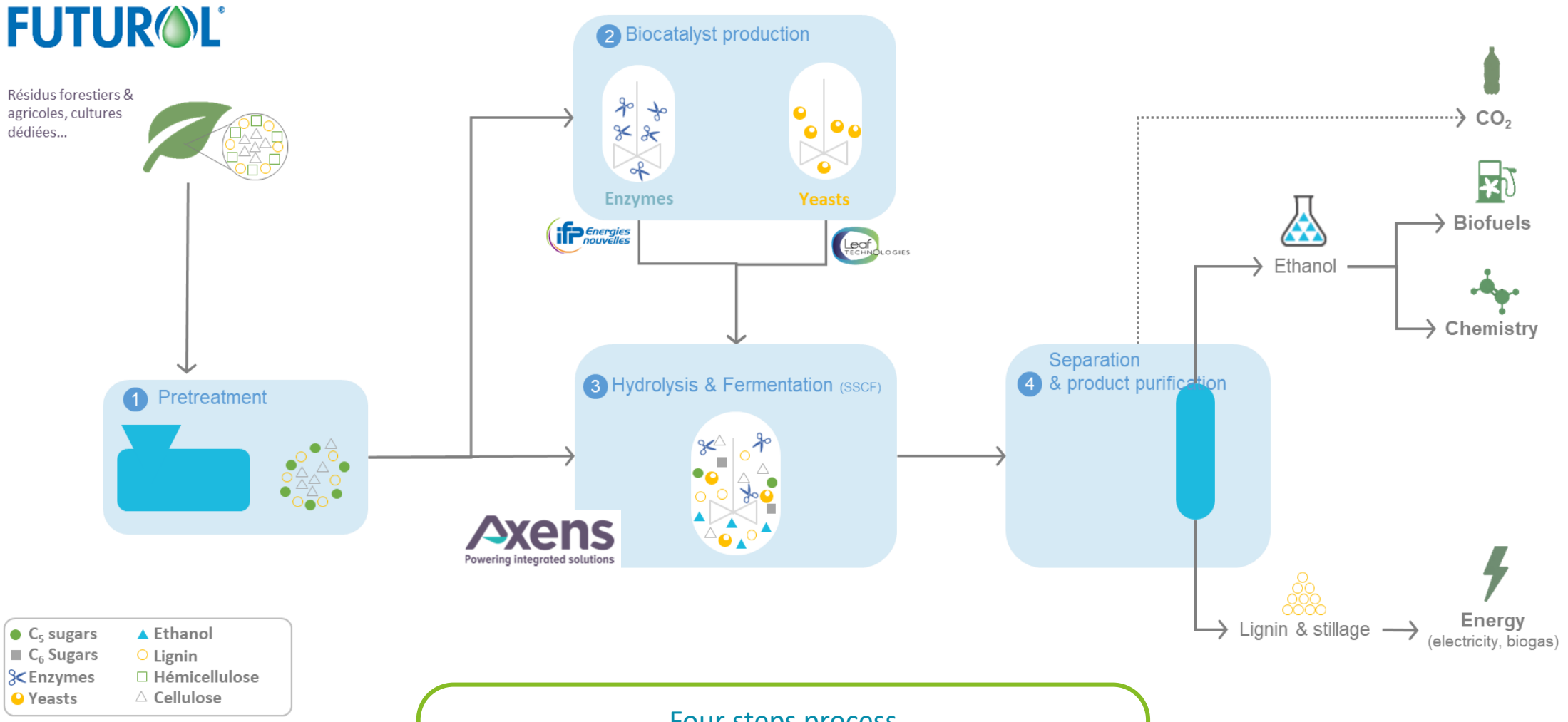
WHICH SYNERGY BETWEEN DIFFERENT PATHWAYS?

Renewable energies



CO2 FROM ADVANCED ETHANOL PRODUCTION

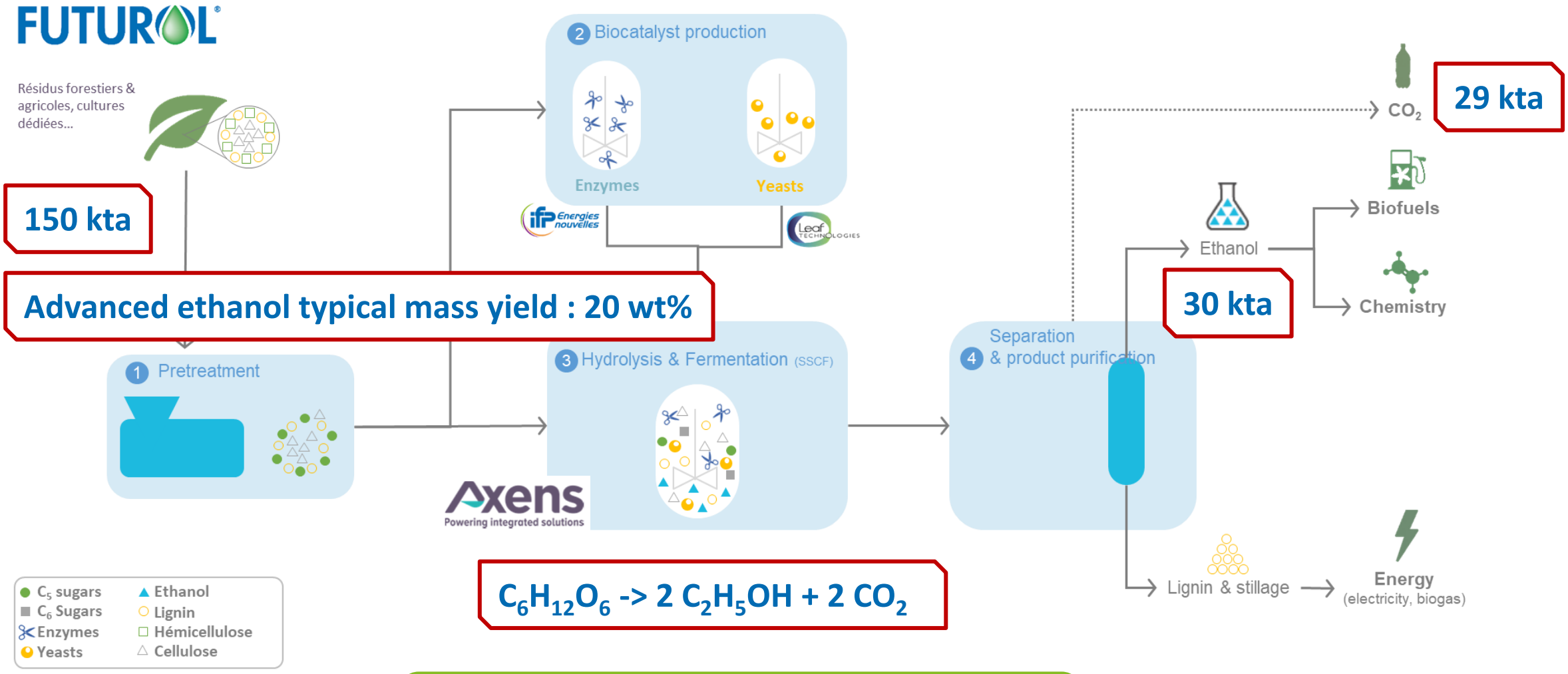
Renewable energies



Four steps process
Energetic products hub

CO2 FROM ADVANCED ETHANOL PRODUCTION

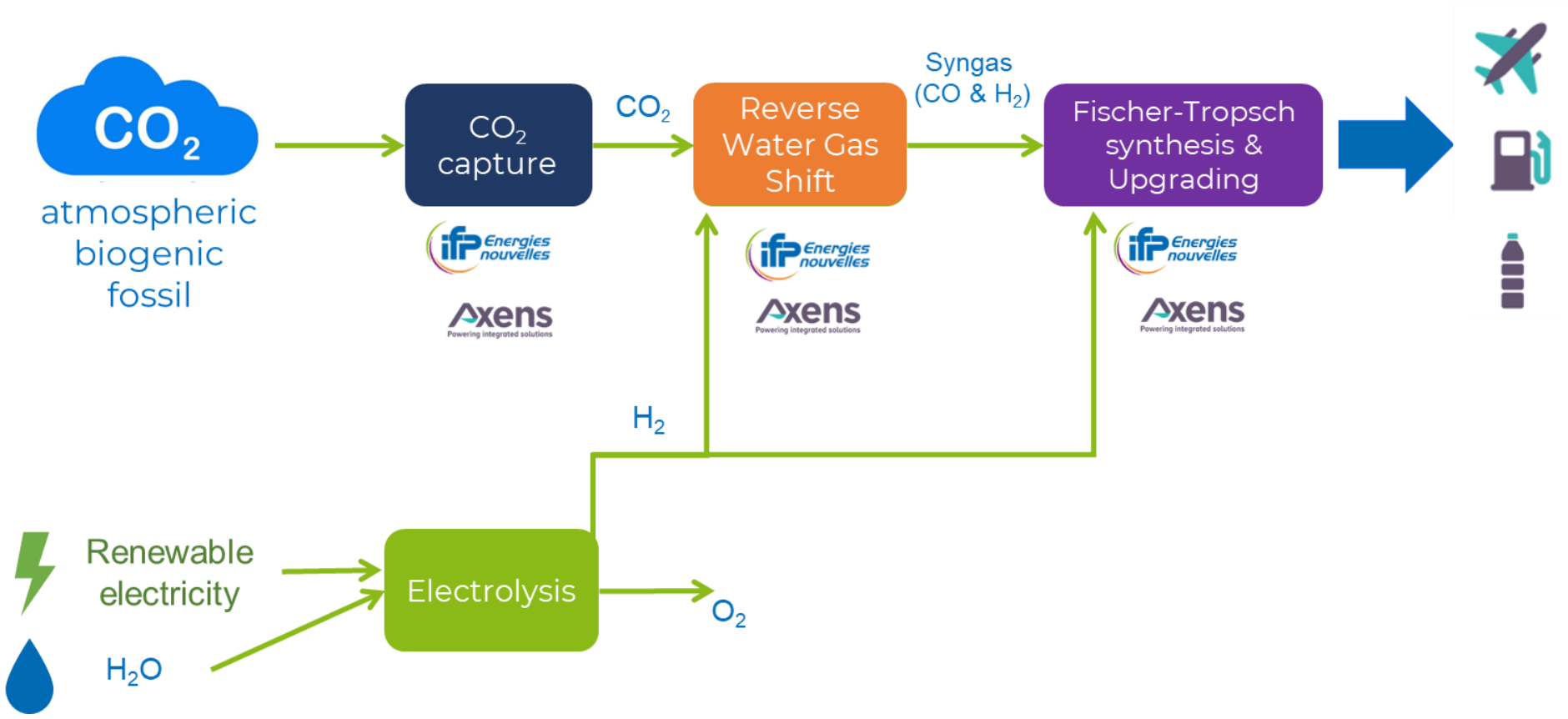
Renewable energies



Same amount of CO_2 than ethanol

E-FUELS CO2 UTILIZATION

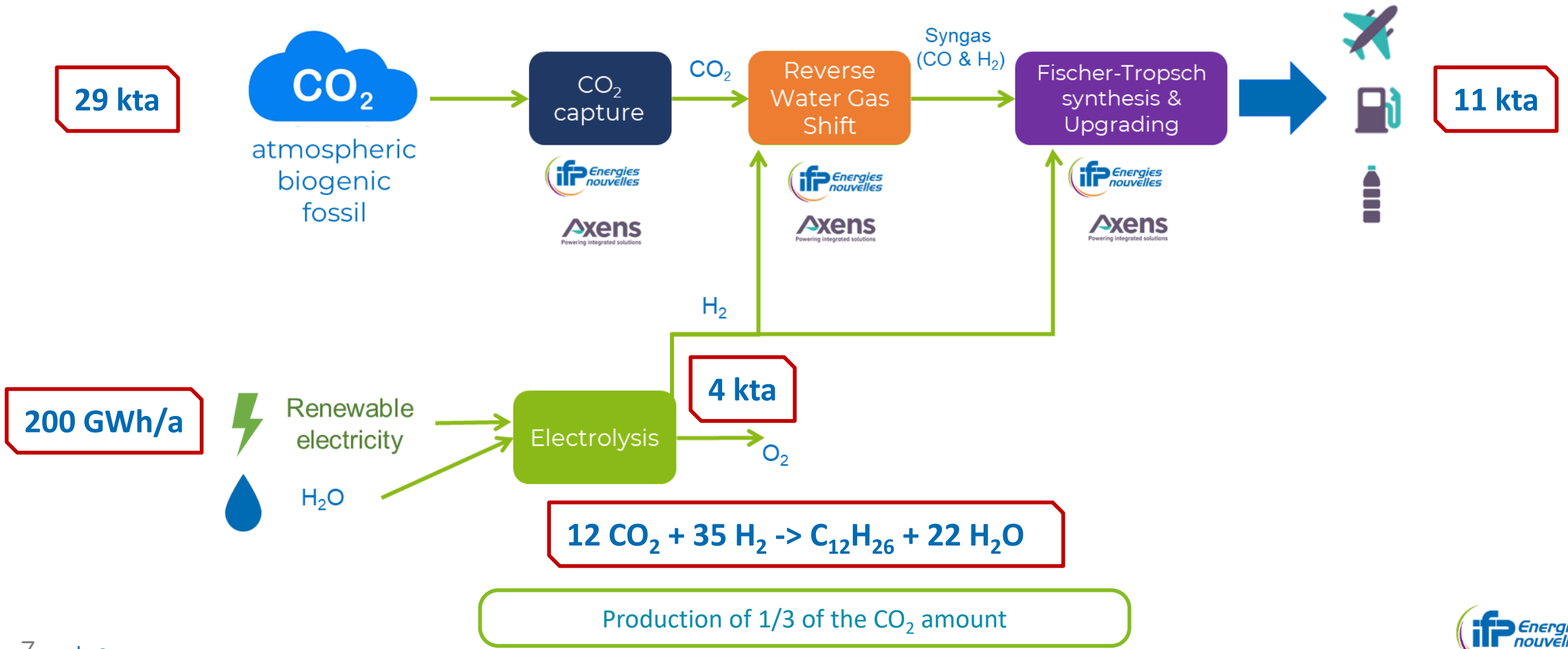
Renewable energies



Four steps process
Energetic products hub

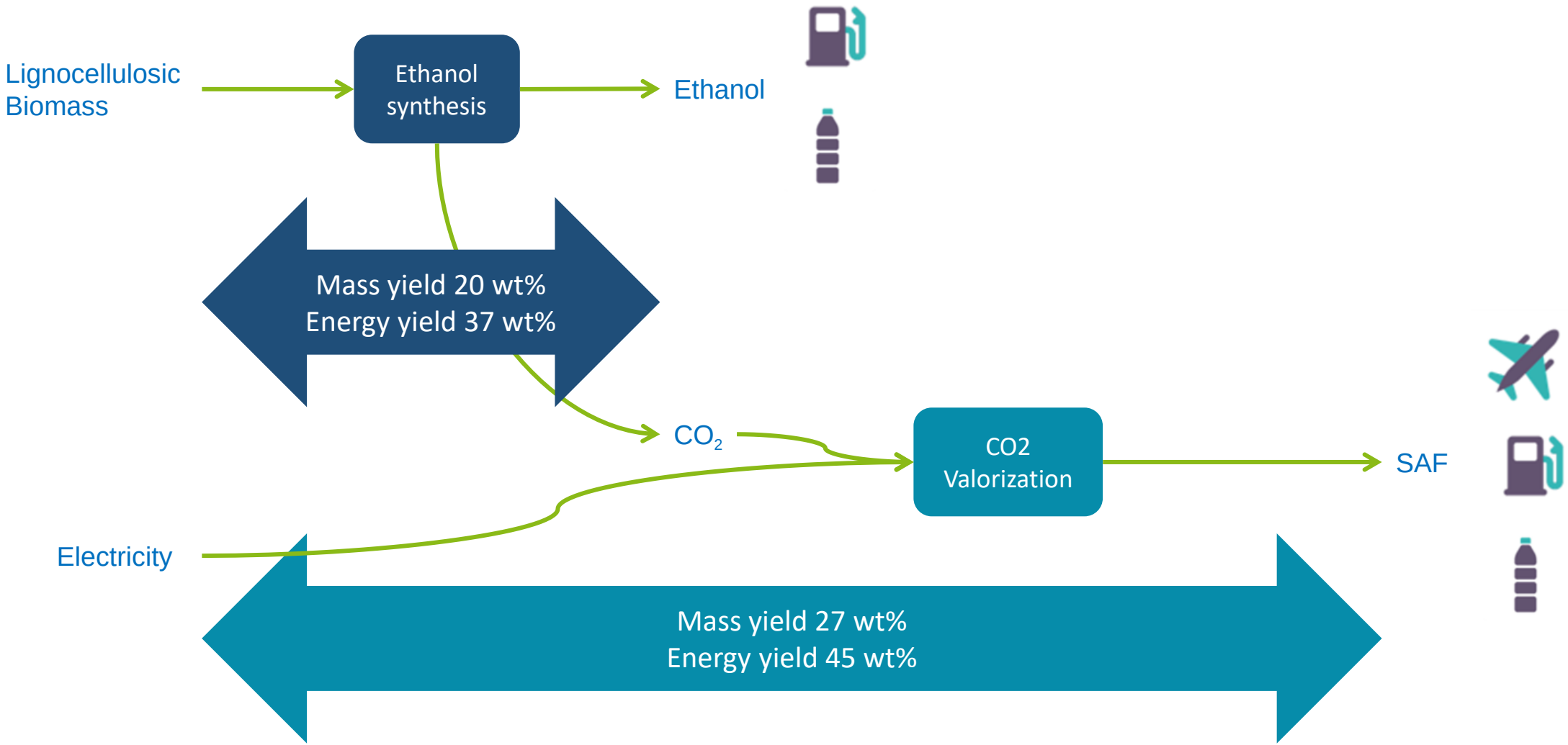
E-FUELS CO2 UTILIZATION

Renewable energies



GOOD COMBINATION OF ETHANOL AND E-FUELS

Renewable energies



THE E-BTL A WAY TO MAXIMISE BIOGENIC CARBON

Renewable energies

Lignocellulosic Biomass

150 kta

Pretreatment → Gasification → Water Gas Shift → Syngas purification → Fischer-Tropsch Synthesis & Upgrading

$H_2/CO = 0.6$

CO_2 **115 kta**

$H_2/CO = 2.0$

30 kta

Water gas shift process use to adjust the H2/CO ratio

THE E-BTL A WAY TO MAXIMISE BIOGENIC CARBON

Renewable energies

Lignocellulosic Biomass

150 kta

Pretreatment

Gasification

$H_2/CO = 0.6$

Syngas purification

$H_2/CO = 2.0$

Fischer-Tropsch Synthesis & Upgrading

60 kta

O_2

550 GWh/a

Electricity

Water

Electrolysis

H_2

11 kta

Maximization of biogenic carbon

SYNTHESIS

Renewable energies

- Different pathways for advanced biofuels are ready for industrial deployment
- Advanced biofuels unit will be a source of biogenic CO_2
- Integration of different technologies will allow to maximize biogenic carbon use in final products
- Others utilities, streams could be integrated (steam, water, …)

Innover les énergies

Retrouvez-nous sur :

www.ifpenergiesnouvelles.fr

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