



versalis

PROESA[®] technology and its retrofit role for decarbonization

Dario Giordano

Licensing Manager Green Chemistry

BIOFIT webinar

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Versalis at a glance



5200 employees



14 sites
(9 Italy, 4 Europe, 1 JV in Asia)



400 products



5,1 M€ turnover



6 research centers
~312 patents

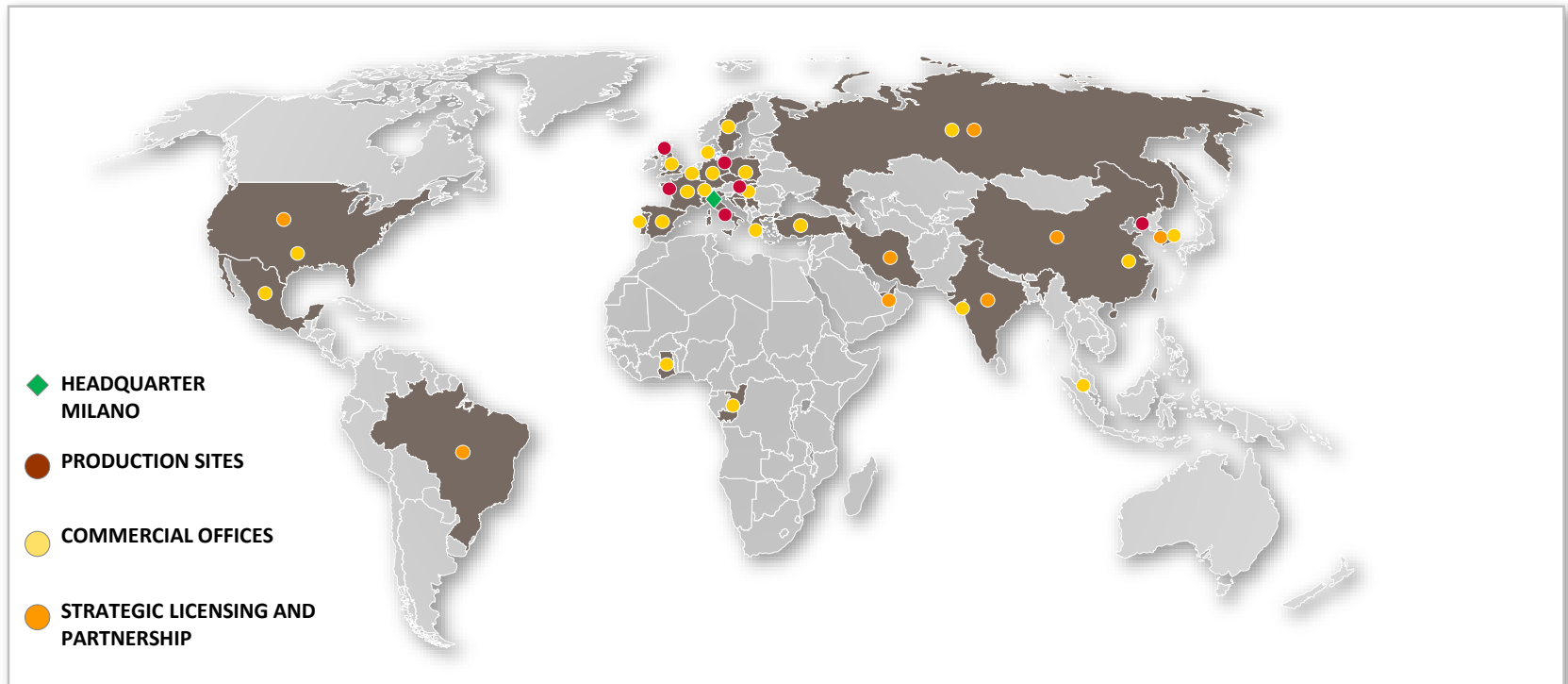
INTERMEDIATES

POLYETHYLENE

STYRENICS

ELASTOMERS

BIOTECH



With an integrated industrial platform, **Versalis (Eni)** – the leading Italian chemical company – has a large portfolio of about 400 products (+ 200 oilfield chemicals) and new chemical intermediates from renewable raw materials.

Versalis is an established licensor in the traditional chemical business



Phenol & Derivatives

- Cumene PBE-1™ Zeolite catalyst based*
- Phenol & Acetone*
- Acetone to IPA*
- Acetone to Cumene via IPA**
- High selectivity Cyclohexanone e KA-oil
- Ammoxymation with TS1™ Cyclohexanone and H₂O₂

Proprietary Catalysts

- Titanium Silicalite
- PBE-1® Zeolite
- PBE-2® Zeolite

DMC & Derivatives

- DMC & Derivatives via CO & MEOH*
- DPC*

Styrenics

- Ethylbenzene PBE-1/2® Zeolite catalyst based
- Styrene
- GPPS
- HIPS
- EPS suspension
- ABS in continuous mass
- SAN

Elastomers

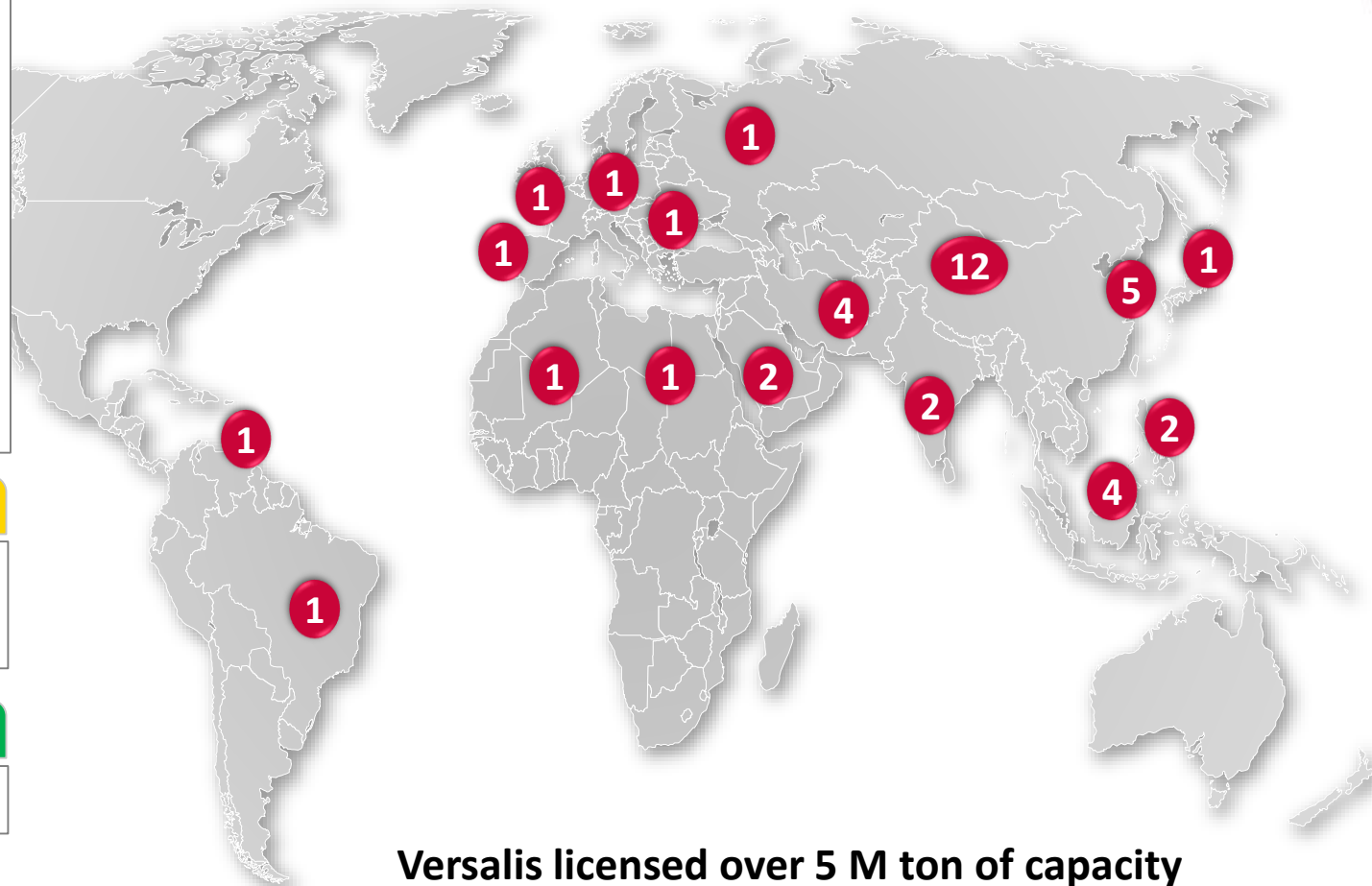
- e-SBR
- s-SBR
- high cis BR
- low cis BR
- NBR
- TPR
- EP(D)M
- HSL
- XSBR

Polyethylene

- LDPE
- EVA

Renewable

- PROESA®



Versalis licensed over 5 M ton of capacity

* Licensed through Lummus Technology (a McDermott Company)
 ** Close to commercialization

Circular economy: our strategic drivers



ADVANCED BIOFUELS

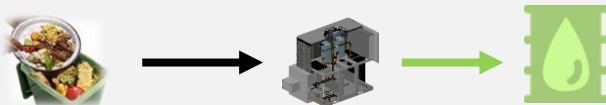
FUELS FROM BIOMASS



LIGNOCELLULOSIC WASTE

FUELS

BIO-OILS FROM WASTE



ORGANIC WASTE

BIO-OILS

NATURAL ENERGY METHANOL OBTAINED BY CO2

INNOVATIVE
&
SUSTAINABLE
SOLUTIONS



CHEMICALS

PRODUCT'S ECO-DESIGN

FEEDSTOCK DIVERSICATION

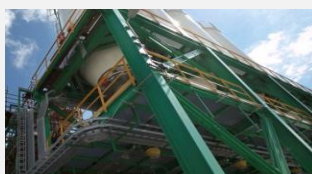
POLYMERS RECYCLING



GREEN CONVERSION



BIO-REFINERY



GREEN CHEMICALS

ENHANCEMENT
FOR
EXISTING ASSETS

REMEDIATION & RENEWABLES



REMEDIATION



RENEWABLES

PROESA® technology: a perfect solution for bio-run chemical plants



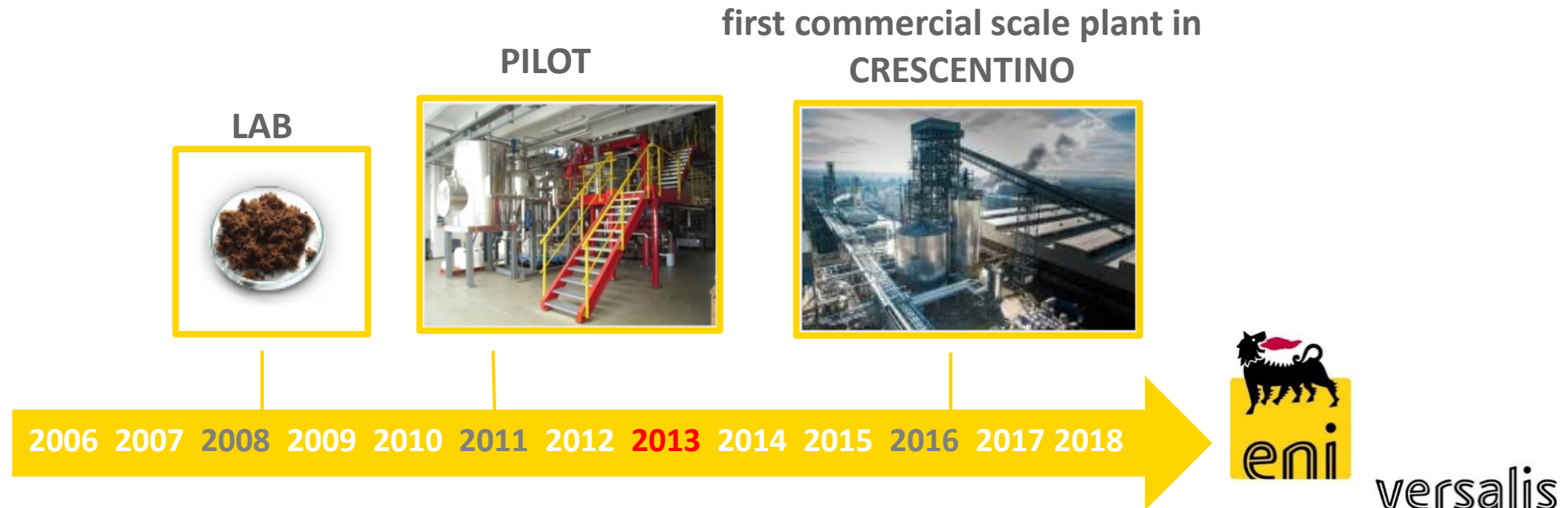
Non-food Biomass



PROESA™ Technology is the enabler of biomass based plants



PROESA® technology development to date ...



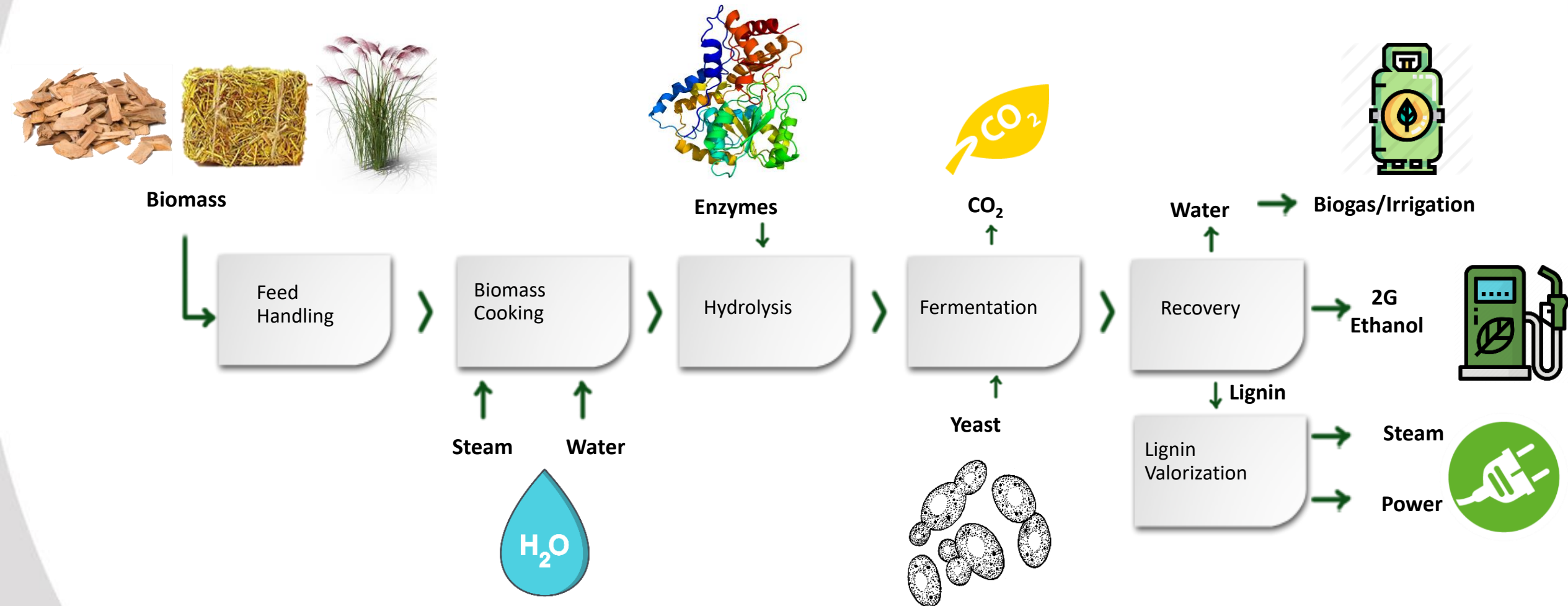
Biomasses: versatility of technology in the use of lignocellulosic biomasses (woodchips, energy crops, agricultural residues)

Partners: involvement of partners leader in the enzymes and yeasts fields

IP: totally in-house

Continuously improved technology: Versalis is the largest chemical company in Italy

PROESA® Technology - The Process Steps



PROESA®: the only technology proven at industrial scale



CRESCENTINO SITE

- Industrial unit located in Italy, based on **PROESA®** technology
- Start-up: 2013
- Includes ethanol section, power generation, biogas generation integrated with WWT
- Several biomasses used as plant feedstock
- Plant design capacity:
~ 25 kt/y (bio-ethanol)
- Lignin (co-product) used in a Biomass Power plant
- Green energy excess sold to the grid
- Zero liquid discharge

PROESA® technology retrofit capabilities – Strategic Drivers

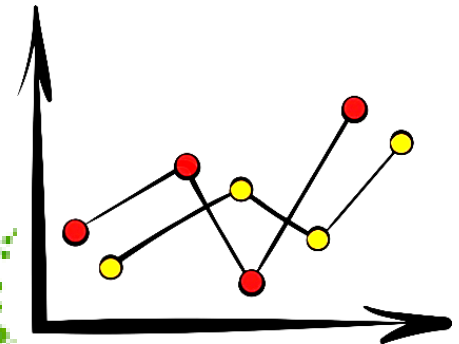


Sustainable development

Business diversification

Profitability enhancement

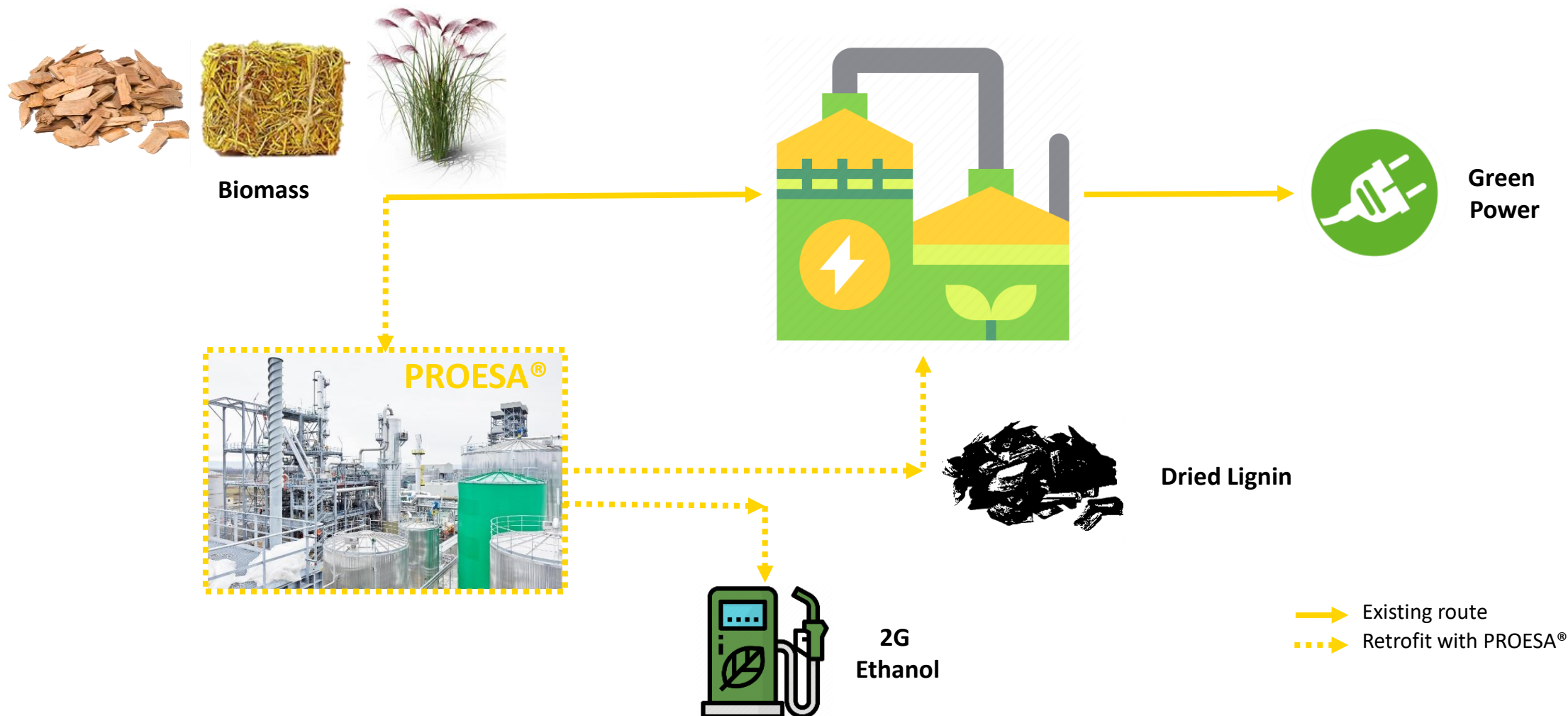
Transition to renewables



The biomass valorization is pivotal for the transition to a sustainable business and the retrofit approach is able to minimize the capital investment through the valorization of existing assets

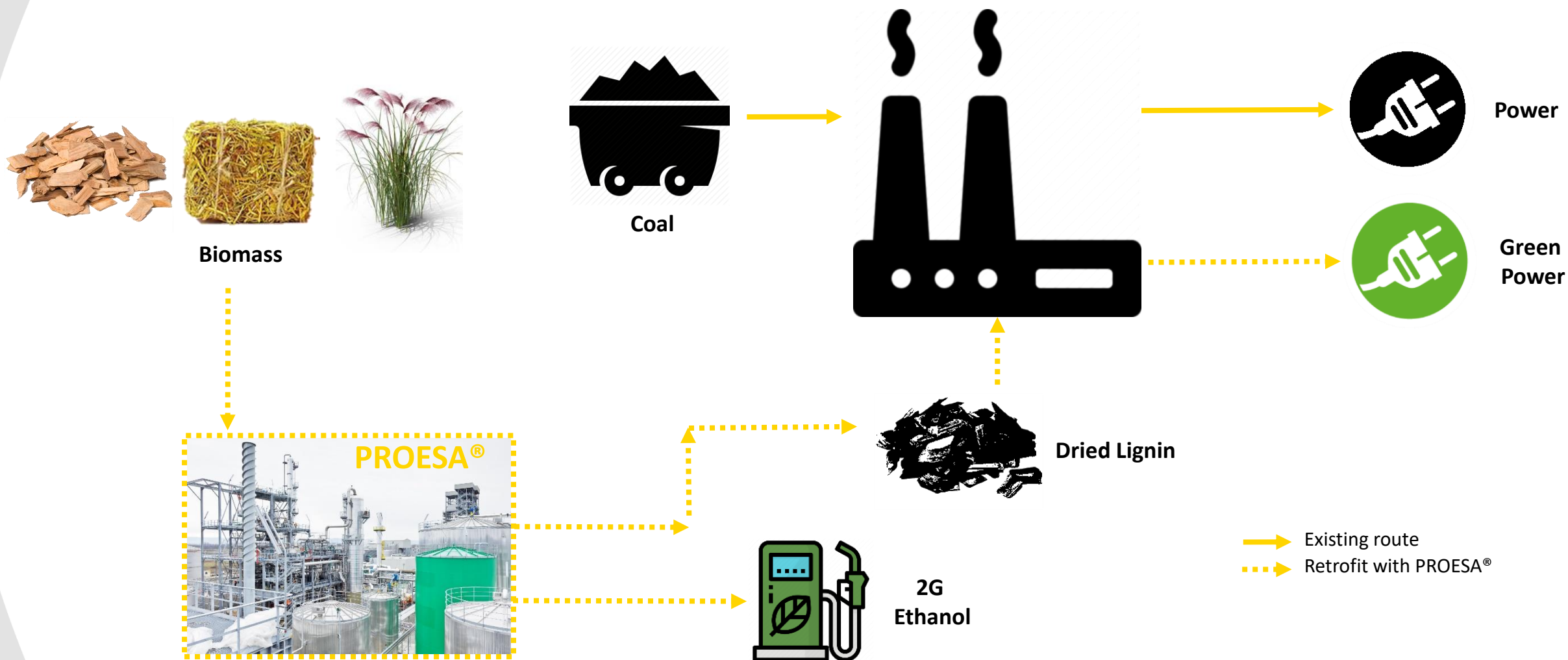
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Retrofit Option – Biomass Power Station



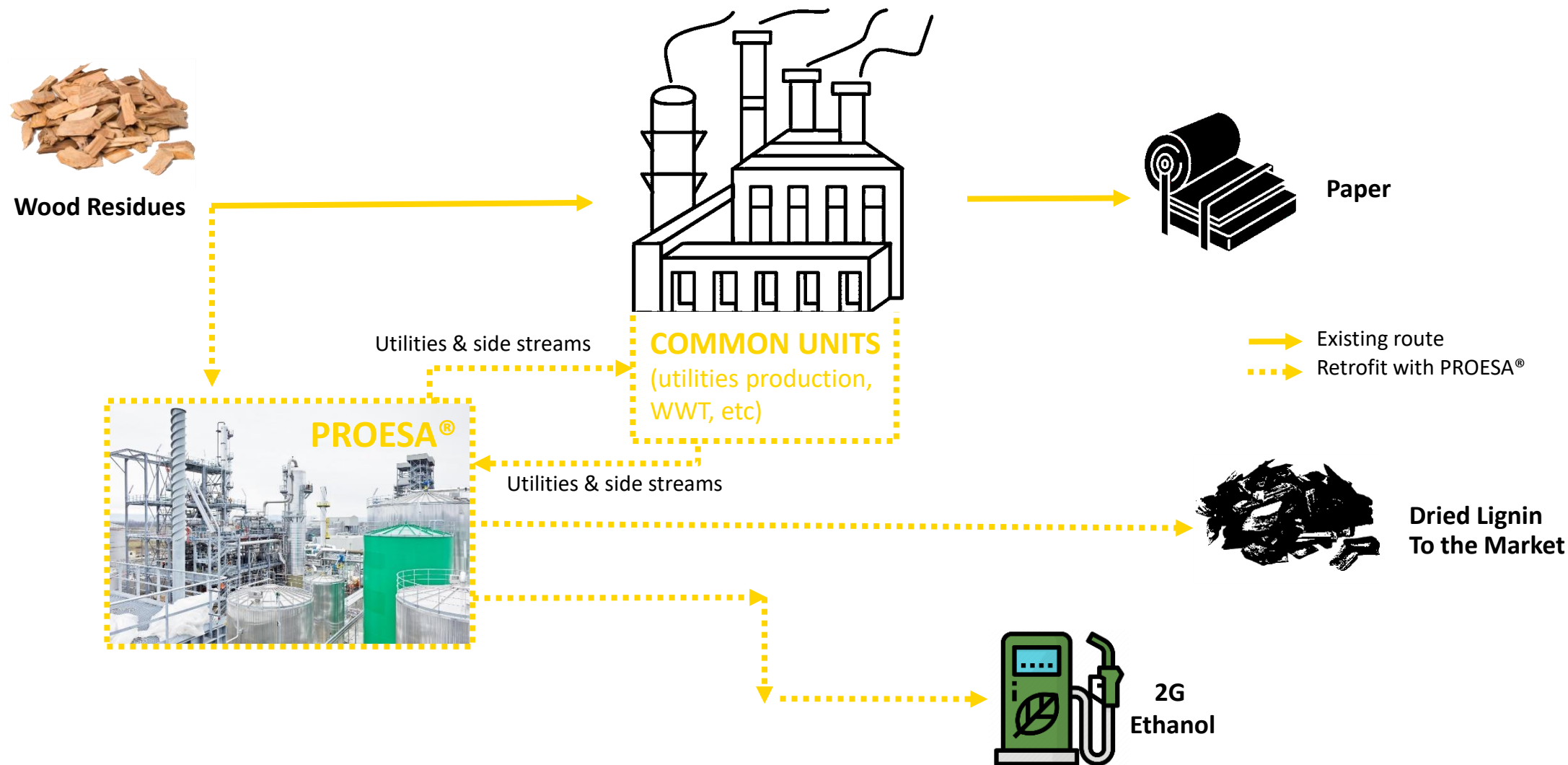
Taking advantage of the existing logistic, the retrofit with PROESA® for a Biomass Power Plant, would allow, with an optimized investment, to diversify the business improving the resilience of the overall complex

Retrofit Option – Coal Power Station



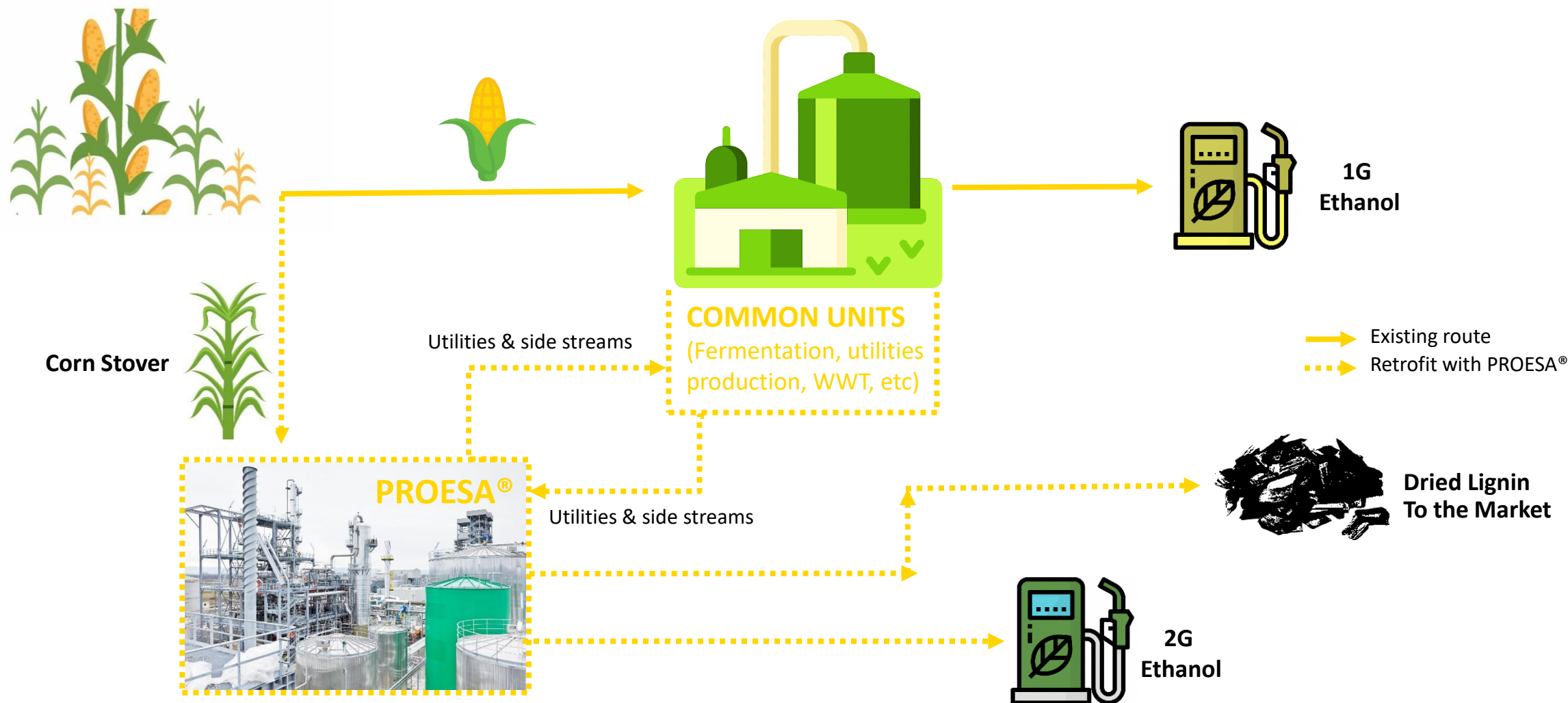
Taking advantage of the existing assets, the retrofit with PROESA® for a Coal Power Station, would allow, thanks also to an optimized investment, to lead the business towards a sustainable route

Retrofit Option – Pulp Mill Plant



Taking advantage of the existing assets, the retrofit with PROESA® for a Pulp Mill Plant, would allow, with an optimized investment, to diversify the business improving the profitability of the overall complex

Retrofit Option – 1G Ethanol Plant



Taking advantage of the existing assets and logistic, the retrofit with PROESA® for a 1G Ethanol Plant, would allow, with an optimized investment, to diversify the business improving the profitability of the overall complex and enhance the sustainability of the whole value chain through the valorization of the agricultural residues

An aerial photograph of an industrial facility, likely a refinery or chemical plant, taken at dusk or night. The scene is dominated by several large, cylindrical storage tanks, some of which are illuminated from within, casting a warm glow. A complex network of pipes, walkways, and structural steel is visible throughout the site. In the background, a tall distillation column or similar vertical structure is prominent. The sky is a deep blue, and distant city lights are visible on the horizon. A large, semi-transparent yellow circle is overlaid on the left side of the image, containing white text.

*READY TO BE
THE CORE OF
YOUR
INDUSTRIAL
PROJECT*

dario.giordano@versalis.eni.com