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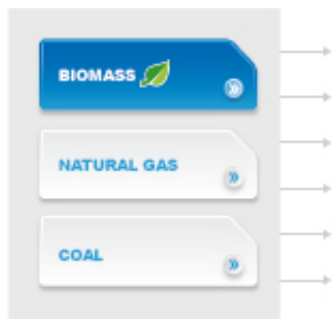
Biomass

Axens offers several technologies able to produce bio-based fuels and petrochemicals from a wide variety of biomass-derived feedstocks: **sugars** (1st generation), **lignocellulose** (2nd generation) and **renewable lipids and fats**.

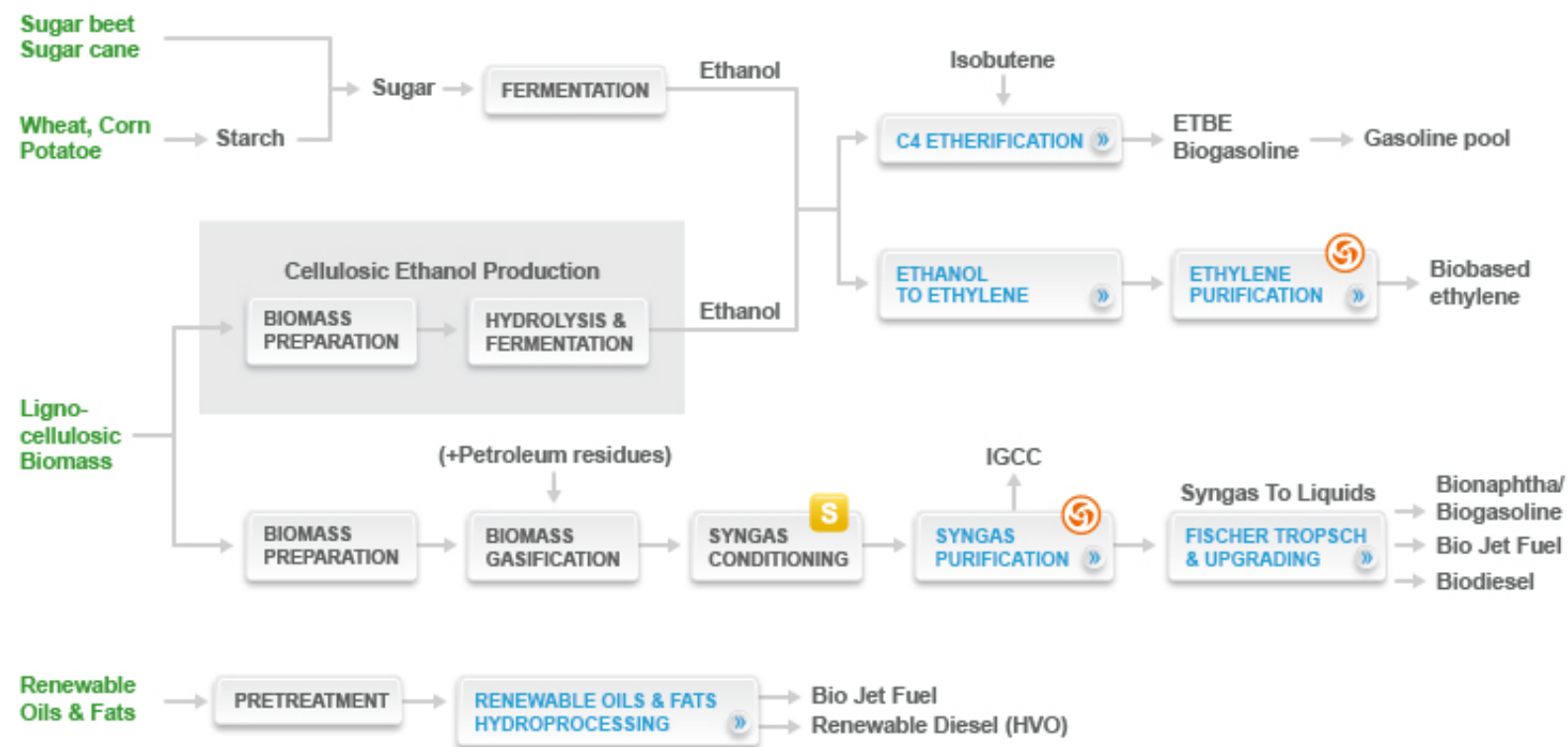
The **lignocellulose** present in numerous forms of biomass (straw, wood, branches, etc.) constitutes an attractive alternative feedstock to sugars, lipids and fats as it is not directly used for human consumption. Moreover, the quantity of lignocellulose that is available gives the potential to foresee the production of larger volumes of biofuels and petrochemical intermediates.

To this end, Axens provides:

- » [Atol™ Technology for the most profitable production of polymer grade bio-ethylene by dehydration of renewable ethanol.](#)
- » [Etherification processes that allows the production of ETBE \(Ethyl Tert-Butyl Ether\), TAME \(Tert-Amyl-Ethyl Ether\), respectively from ethanol and isobutene or reactive isoamylenes.](#)
- » [Gasel™ Technology Suite to enable the production of ultra-clean bio-liquid fuels \(BTL\), notably biojet fuel and biodiesel, through the Fischer-Tropsch conversion of synthesis gas \(H₂+CO\) produced by the gasification of lignocellulosic biomass.](#)



As for **renewable Oil & Fats** processing, Axens has pioneered the first-generation biodiesel market, which involves vegetable oils through a transesterification process. The limitation of biodiesel blending regarding cold flow properties has been overcome with the second renewable lipids upgrading routes in which Axens is active. It consists in hydropocessing renewable lipids for the production of high quality, paraffinic bio-jet fuel and biodiesel. For that purpose Axens is marketing its Vegan™ process.



LEGEND

DRYING & PURIFICATION <i>Axens offers adsorbents for each application with this symbol</i> <input type="button" value="ADSORBENTS"/>	SULFUR RECOVERY Acid Gas removal <input type="button" value="CLAUS"/> <input type="button" value="TGT"/> Sulfur	ETBE: Ethyl Tert-Butyl Ether HVO: Hydrotreated Vegetable Oil
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