GREEN & BLUE SOLUTIONS

CASALE

PLANTS FOR A NEW PLANET.
SINCE 1921.

www.casale.ch

PLANTS FOR A NEW PLANET

100 YEARS OF SHAPING THE FUTURE

Sustainability has inspired our business since 1921, and over the years we have never stopped looking forward. Our mission, 'plants for a new planet', underpins everything we do, inspiring us to create equipment that will guarantee a better future world for everyone. Day in, day out, we work hard to develop innovative and sustainable solutions, constantly evolving to meet the ever-changing needs of our clients. Building the future of the fertilizer industry together.

WITH A UNIQUE, DIVERSE AND GLOBAL VISION

We design, build and revamp the plants of the future and maintain, manage and monitor them using digital technology. Our cutting-edge approach involves all areas of the process: we help our clients to produce nitrogen- and phosphorous-based fertilizers, melamine and methanol, developing every aspect and component throughout the supply chain and at all stages of the plant's lifecycle.

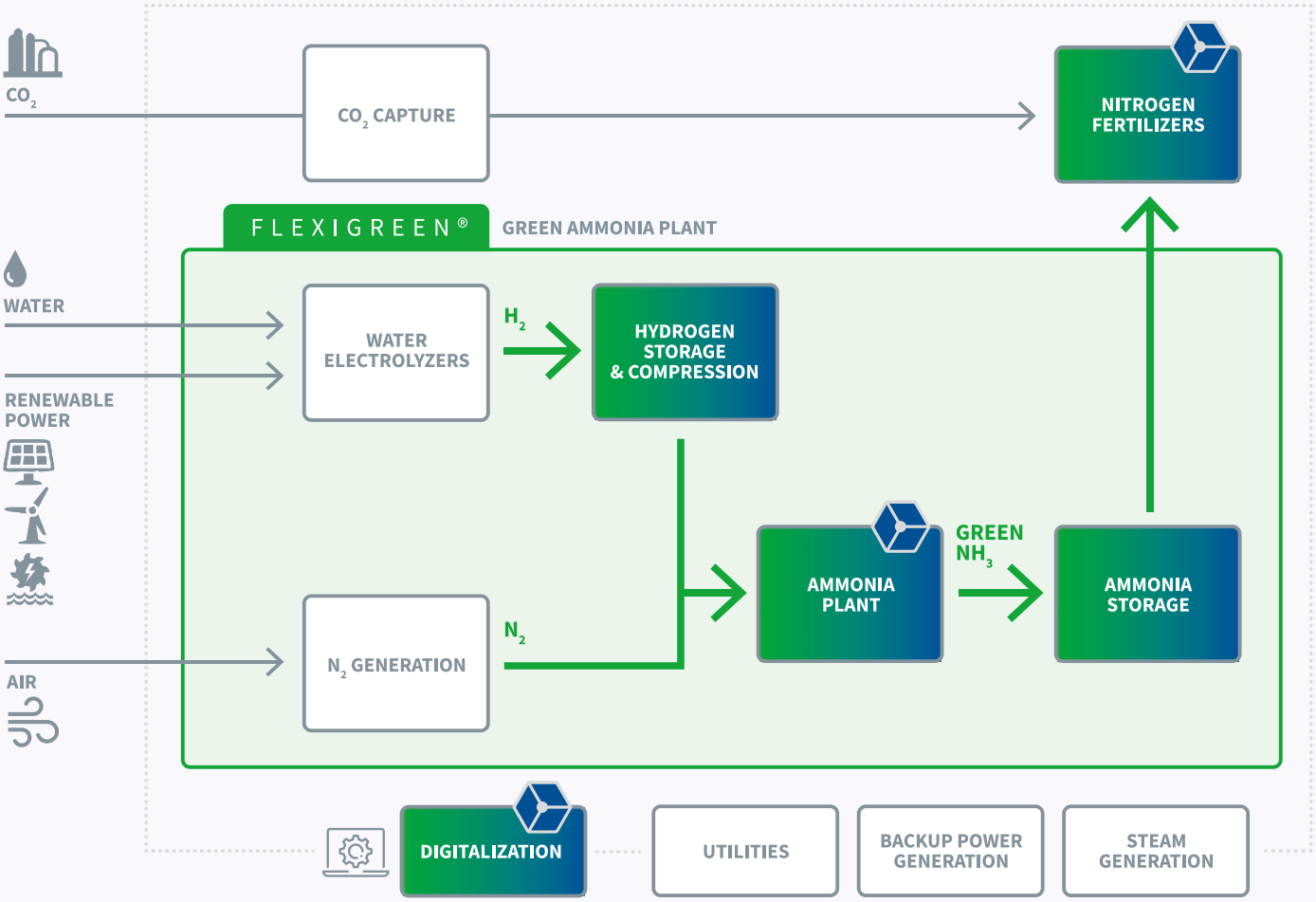
AND ONE PERSPECTIVE: ZERO EMISSIONS

All our efforts are directed towards creating highly efficient, reliable and safe plants with ever-lower emissions. We have been striving for years to develop blue and green technologies that produce drastic reductions in emissions, in every phase of building and maintaining the plants and at every step along the supply chain. **Now we're ready to reach zero.**

CASALE

GREEN AMMONIA PLANTS

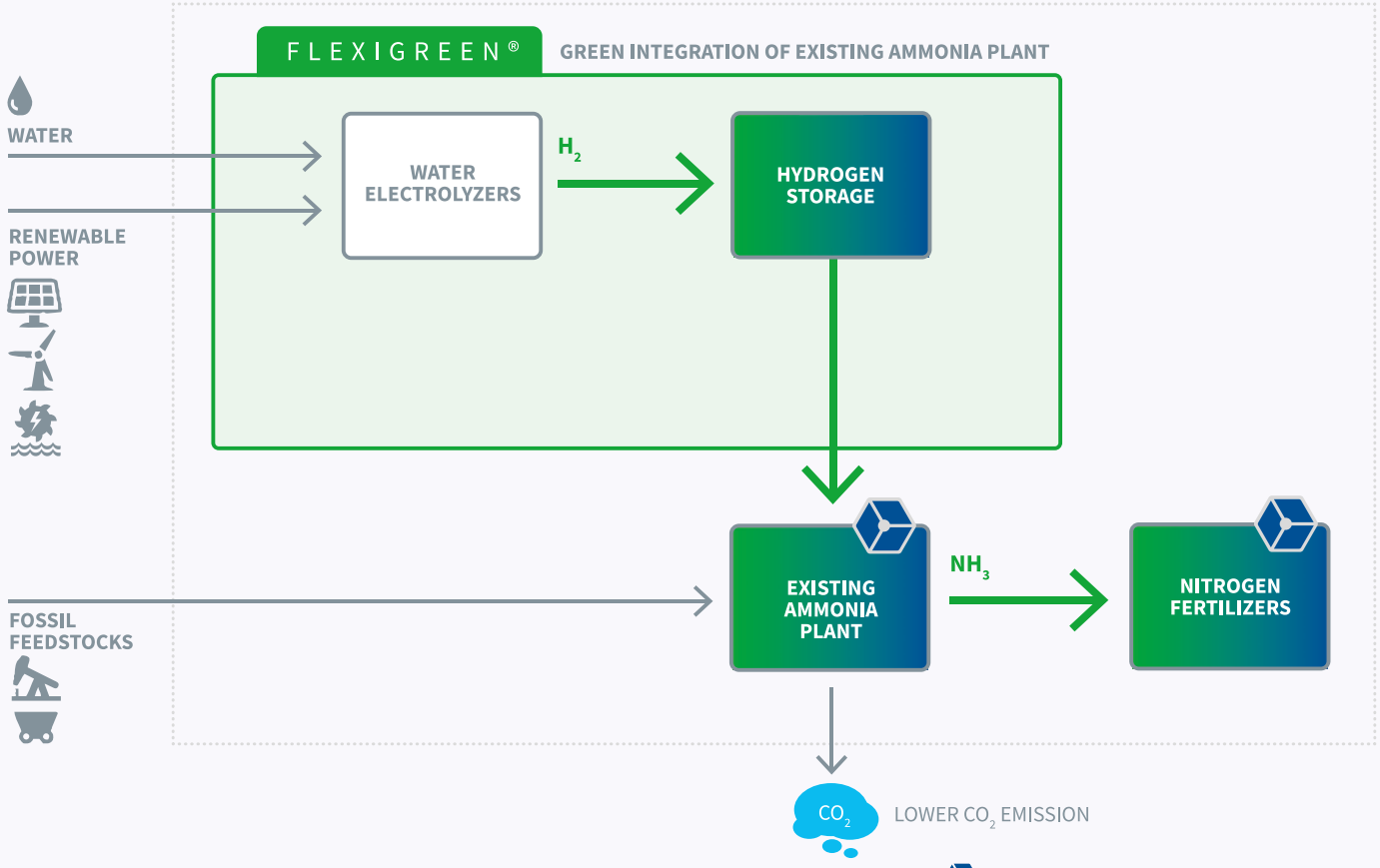
Casale has designed and revamped hundreds of ammonia plants over the years. Drawing on this experience, we can design custom green ammonia plants with a capacity of anything from a few MTD to a few thousand MTD, with optimized CAPEX and OPEX.



Casale scope of work for a Green Ammonia Plant. Proprietary technologies/solutions are indicated with

HYBRIDIZED GREY AMMONIA PLANTS

Revamping a traditional (grey) ammonia plant through 'green hydrogen integration' can drastically reduce energy consumption and the facility's carbon footprint. **Casale**'s approach minimises alterations to the existing layout, based on the amount of hybridization required and the existing plant's design.

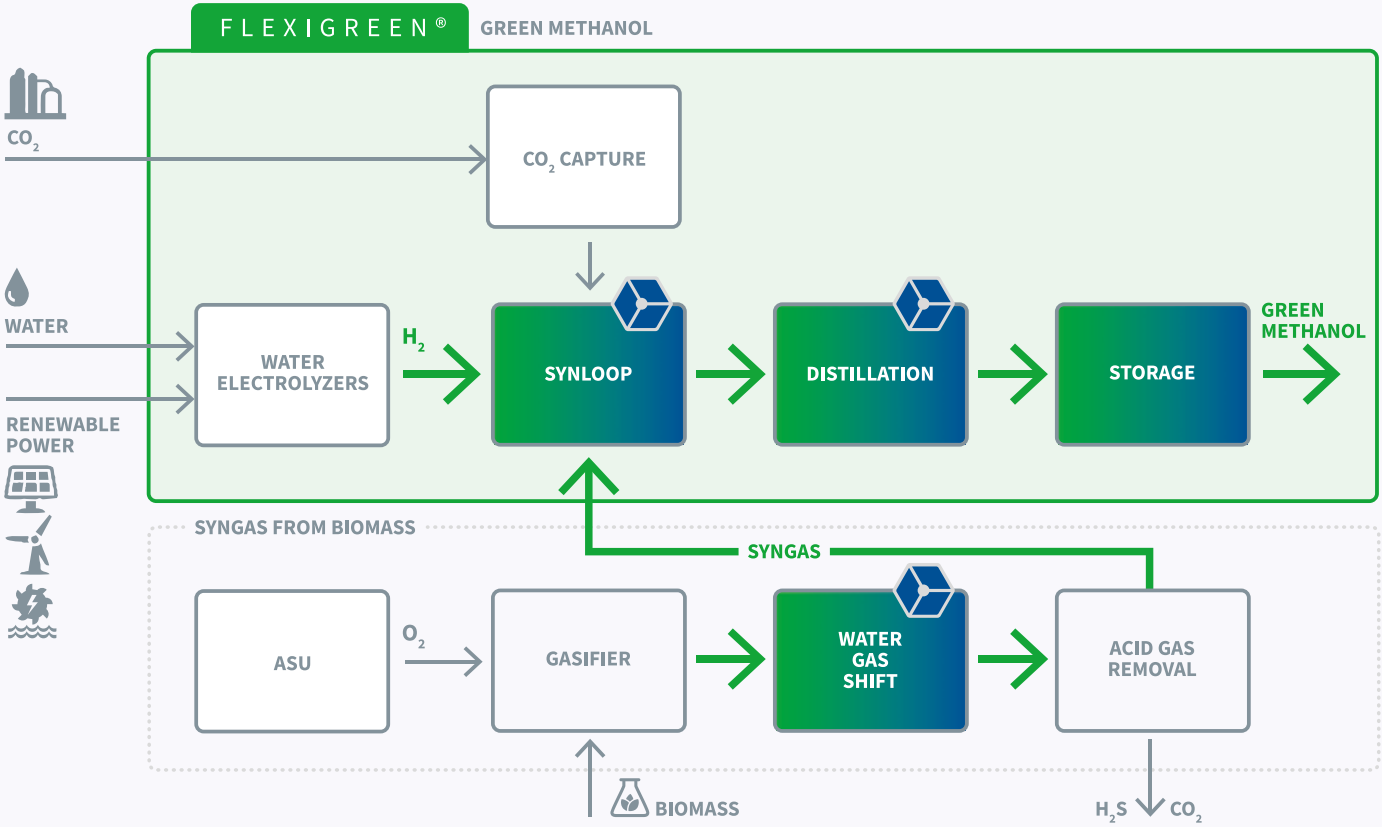


Casale typical scope for a hybridization project. Proprietary technologies/solutions are indicated with

GREEN METHANOL

There are three routes to producing ‘green’ methanol (bio-methanol): biological (anaerobic digestion), thermo-chemical (gasification) and electrofuels (power-to-gas). Biomass gasification involves a methanol plant similar to the 20 coal gasification plants **Casale** has built.

Casale can supply the CO-shift section, synthesis loop, distillation and storage for these types of plants. Depending on the methane content of the make-up gas, the purge gas can also be processed in an ATR unit equipped with a process gas saturator that uses distillation bottom water to minimize liquid effluents.



BLUE AMMONIA AND BLUE HYDROGEN

Blue ammonia and blue hydrogen - produced through carbon capture and sequestration (CCS) - are an attractive proposition in the transition to decarbonized fuels.

Blue Ammonia A6000CC is a single-train carbon capture process suitable for capacities of over 6,000 MTD of ammonia. Adding a CO2 recovery section to the primary reformer flue gas transforms a standard ammonia plant into a blue ammonia plant, with very high CO2 sequestration (above 95%).

A6000CC by combining efficient technologies and long-term experience, enables manufacturers to reduce greenhouse gas emissions and fight global warming.

Casale Blue Ammonia technology can be used, besides for building new plants, also for converting existing grey ammonia plants to blue ammonia production.

Blue Hydrogen H10000CC is a patented **Casale** process designed to achieve high capacity and high efficiency and to reduce heat generation. It is limited to the pre-heating stage of the process, which produces most of the carbon emissions to stack.

The syngas produced is further processed in a shift section, then purified in a CO2 removal section to produce blue hydrogen.

Casale SA | Via G. Pocobelli 6 | CH - 6900 Lugano | T + 41 91 6419200 | info@casale.ch | www.casale.ch