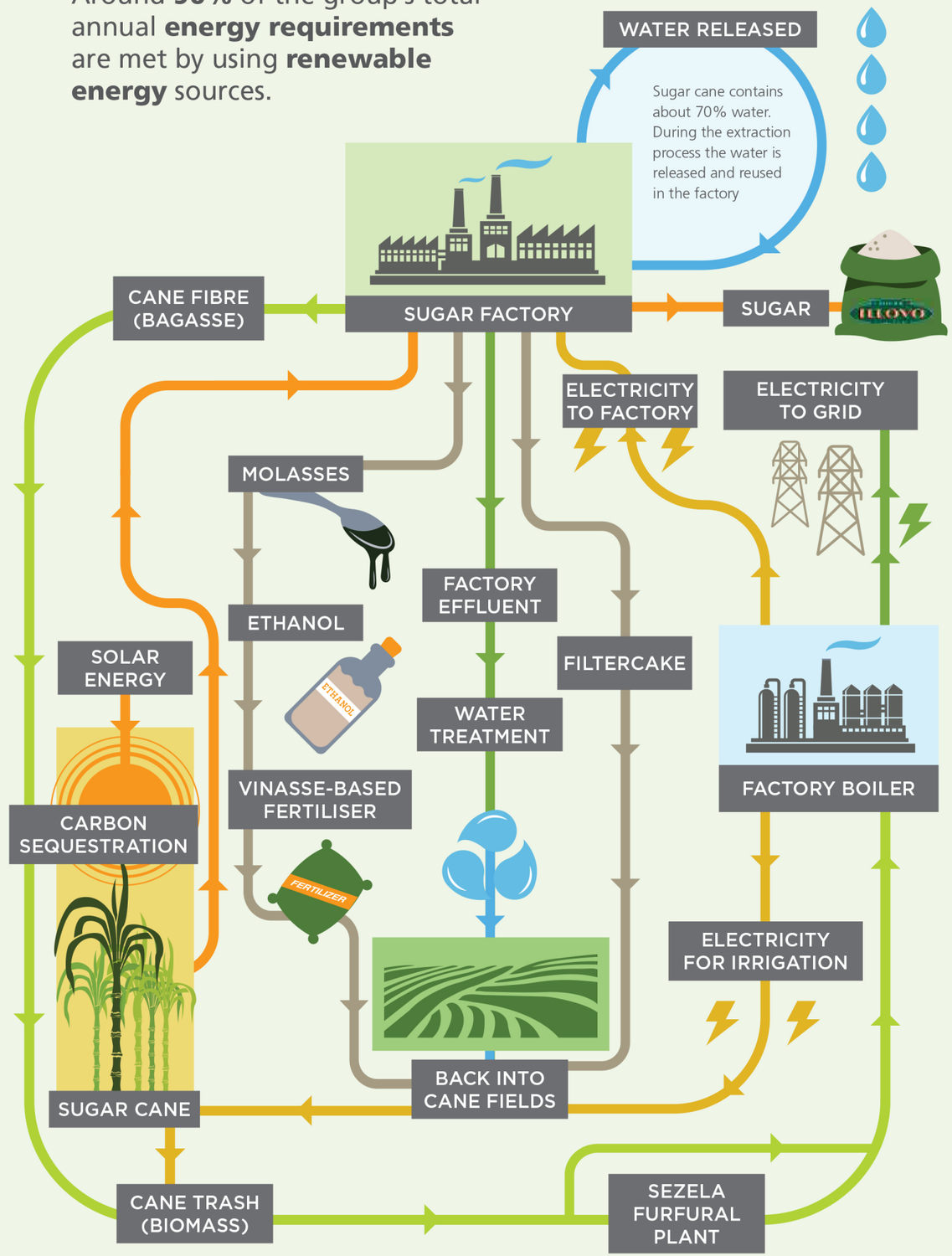
Illovo's integrated business sustainability model

Integrated sugar cane processing

1. Illovo's sugar milling complexes maximise the use of all input materials with very few waste products
2. Sugar cane contains between 13% and 15% sucrose, which is used in sugar mills to produce granulated brown and refined sugar
3. Cane fibre or bagasse, the fibrous residue following the sugar extraction process, is used as a bio-renewable fuel source in the factory boilers to produce steam for processing requirements and to generate electricity. Illovo aims to be power self-sufficient for factory and estate irrigation before exporting to national grids. In 2013/14, 90% of the group's power requirements were produced by the group's own installed electricity-generating capacity
4. At Illovo's operations in Swaziland and Malawi, cane trash is blended with bagasse to increase the volume of fuel feedstock for the boilers, thereby providing for increased electricity generation
5. Water contained in sugar cane amounts to between 68% and 72% of total content. During the extraction process, this water is released and recycled for use within the factory, reducing reliance on external water resources
6. At the Sezela downstream plant in South Africa, plant material in the bagasse is extracted to produce furfural and its derivatives. The resulting furfural reactor residue is returned to the sugar mill boilers as fuel:
   - Electricity from the sugar mill is then used to produce hydrogen by electrolysing water, after which the hydrogen is used to catalytically convert furfural to furfuryl alcohol
   - A furfural process side stream of natural solvents is further refined through a process of freeze crystallisation to produce food flavour chemicals
   - Furfural is also used as the active ingredient in our Agriguard, nematicide products
   - This core activity of the group produces low-volume, high-value products which contribute significantly to our total revenue stream
7. Organic and non-organic impurities captured in the form of "filtercake" during the manufacturing process are returned to the cane fields for use as a fertiliser
8. Molasses is a by-product of the sugar manufacturing process which Illovo ferments and then distils to produce potable alcohol for use as a neutral spirit for beverages and denatured spirits for the pharmaceutical, cosmetic and printing industries:
   - The vinasse by-product from ethanol fermentation is then evaporated to make a CMS liquid fertiliser that is applied on sugar cane and a variety of other crops including bananas, pastures and maize. Significantly, the application of CMS recycles important and increasingly expensive minerals back into the soils from which they were extracted

Sugar cane

1. Sugar cane is a large grass variety which grows well in tropical and sub-tropical climates across the globe absorbing around 18 tCO_2 per hectare per annum
2. Harvesting in the southern hemisphere takes place between April and December when the cane is 12 to 24 months old
3. Once harvested, the cane commences a new growing cycle from its existing roots; this re-growth is called a "ratoon". Replanting takes place only every seven to 10 years, minimising soil disturbance and exposure to wind and water erosion
4. Rainfed cane in South Africa, with industry yields of around 65 tons of cane per hectare, minimises the impact on subterranean water supplies
5. In the rest of Africa, where irrigated cane yields exceed 100 tons of cane per hectare, water for irrigation is sourced from secure and sustainable water resources such as large rivers, lakes and dams within permitted rights of use

Around **90%** of the group's total annual **energy requirements** are met by using **renewable energy** sources.