

The invention concerns a method for dehydrating an ethanol feedstock into ethylene, then oxidising the ethylene into ethylene oxide, comprising a step of vaporising a feedstock comprising said ethanol feedstock and at least a portion of a stream of dilution water comprising recycled ethanol so as to produce a vaporised feedstock, a step of dehydrating a mixture comprising said vaporised feedstock and a vaporised stream of dilution water comprising ethanol, a step of separating the effluent from the dehydration step into an effluent comprising ethylene and an effluent comprising water, a step of purifying at least a portion of the effluent comprising water and separating same into at least one stream of treated water and one stream of dilution water comprising ethanol, a step of recycling and vaporising at least a portion of the stream of dilution water comprising ethanol from the separation step, by partial or total vaporisation in an exchanger by means of a heat exchange with a quenching stream from the oxidation step, said quenching stream, after cooling, then being recycled to the reactor(s) of the oxidation step, and a step of oxidising the ethylene in the effluent comprising ethylene into ethylene oxide, this oxidation step comprising at least one tubular oxidation reactor cooled by vaporising said quenching stream.