Summary

The present disclosure is directed to a method and system for controlling dynamic operation in a chemical or fuel plant, preferably a Power-to-X (PtX) plant via a DCS (distributed control system), to address the problem of fluctuation in the supply of renewable power in case said power is periodically curtailed from the grid, where no power is exported to the grid. This curtailed operation may also be due to a safety issue, such as a fire or a malfunction. Said plant comprises one or more electrolyzers for converting water into hydrogen and can produce one or more of ammonia, synthetic alcohols such as methanol or ethanol, or dimethyl ether (DME) or synthetic hydrocarbon(s) such as synthetic fuels (e.g. jet fuel and/or kerosene) or such as substitute natural gas (SNG) (e.g. methane).

Electrolyzers use about 80-90% of total power and balance power consumers (chemical or fuel plant (e.g. Ptx), nitrogen generation, utility systems, etc.) take the remaining approximately 10-20%.

The present disclosure provides for improvement in reliability, reduction in installation costs, as well as remote monitoring.

In one aspect, the present disclosure refers to a Power-to-X plant for producing chemicals and fuels, said plant comprising:

a) A first feed stream and an optional second feed stream;
b) A connection to one or more sources of electrical power;

c) An electrical section, arranged to receive at least a portion of said electrical power, said electrical section comprising a transformer, a switch gear and one or more power factor correction – and harmonic filter systems.

d) A feed processing and/or synthesis section; and

e) A DCS computerized control system,

arranged so that one or more of said feed stream(s) are converted into chemical- or fuel-rich stream(s), in said feed processing and/or synthesis section.

In another aspect, the present disclosure refers to a method for operating a plant for production of chemicals and fuels, as described herein wherein at least a first feed is converted into a chemical- or fuel-rich stream, in said feed processing and/or synthesis section using electricity generated at least partially from renewable power and wherein a DCS computerized system controls power factor correction - and harmonic filter system and/or equipment for active and/or passive power factor compensation.

In another aspect, the present disclosure refers to a computer-implemented method for operating a plant as described herein, monitoring a method as described herein and optimizing operation by comparing collected data with target data.

Description of the Invention

The present invention is a method, system and computer-implemented method for controlling dynamic operation of chemical plant, preferably a PTX plant.