The Opportunity
Sensation, one of the most innovative greenhouses in the Netherlands leading in flower quality and consistency is well known for a certain breed of flower called the Piña Colada, bright white in color, reminiscent of the cool drink on a hot summer day. Located in Tuil, Netherlands, the customer Sensation required an upgrade of their combined heat and power systems existing of two 1 MW engines, to increase efficiency, with integrated CO₂ recovery for fertilisation into the existing footprint. The CO₂ generation had to be taken into account for fertilizing of the plants while also ensuring climate temperature control needed to maintain the quality and consistency of each flower. Finally the customer also wanted the ability to operate in a microgrid mode if needed.

The Solution
Sensation turned to Siemens and there local Dutch Partner Dordtech for expertise and the SGE42-HM was the right solution to meet all requirements. The H Series Engines represent a new concept in engine design with advanced technology incorporated into the cylinder heads, valves, camshafts, and turbochargers. This enabled the customer to run 1MW of power in a microgrid configuration using a combined heat and power system with only a slight elevation in water temperatures, ensuring all environmental requirements were being met. Two SGE42-HMs engines, combined with a tailor-made heat exchange and control system designed and fabricated by Dordtech, were designed to operate in a microgrid configuration. The engines were also connected and actively integrated into the Dordtech exhaust gas cleaning system to deliver optimal power efficiency and CO₂ levels for the plants.

Benefits
Through this partnership, Siemens advised the customer, Sensation, that the gas utilization for a 2MW output with 2 SGE-42 HMs would achieve an efficiency of approximately 42%, savings of close to 10% on gas consumption compared to its existing system. In the first four months of operation, actual performance values indicated an increase in efficiency to 44%, with a calculated LHV of 8.61kWh/Nm³ measured over intervals containing an 80% power demand.

Project Summary
Project Name
Sensation Greenhouse
Customer
Kwekerij Sensation
Location
Tuil, Netherlands
Application
Combined Heat and Power (CHP) Plant
Products
Two SGE42-HMs
Electricity Generated
Nominally 2 MW of New Power
Even with the challenges of interconnecting systems and still having the ability to operate as a microgrid, the SGE42-HM demonstrated its ability as the right solution for our customer to maintain Sensation’s innovative position in the market, while ensuring reliability, efficiency and cost optimization.

One of the most admirable features of the SGE42-HM is the ability of the system to be easily modified into different configurations in terms of hardware, to offer the flexibility of integration into other system types. This flexibility along with the guarantee of a 42% increase in efficiency for the plant, made this partnership a technically innovative journey to ensure Sensation operates one of the most technologically advanced greenhouses on the market. The customer valued Siemens’ expertise, professionalism, and technical knowledge along with delivering on its guarantees, make Siemens a key solution provider and leader in the energy industry.

The Business
Siemens is among the largest suppliers of rotating equipment solutions worldwide. The company offers some of the most efficient and environmentally friendly technology platforms, products and services in distributed power generation for oil and gas, industrial, institutional, and commercial clients and rural electrification programs.

Our solutions include combined heat and power (CHP) systems, biogas-fueled gensets, hybrid systems (solar photovoltaic and engine-based gensets), biomass and waste-to-energy steam turbine generators, compressed air energy storage (CAES), and more. We are also developing new technologies that use fossil fuels and renewable energy resources more efficiently, such as our wave energy-based HydroAir® turbine.