Together, Power Plants and Greenhouses Can Feed Humanity

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Reusing wasted heat exhausted from power plant stacks can support endless greenhouses to help feed the world's population.

Artificial Intelligence (AI) and datacenters are coming and so are the natural gas power plants that will be required to provide continuous uninterruptible electricity to power a lot of these facilities. These power plants today can operate at well over 90% Energy Efficiency.

The natural gas power plant that has produced electricity can further benefit humanity via the waste exhaust that would normally be put into a chimney and vented into the atmosphere, which is a waste of heat and a waste of CO2.

Rather than exhausting hot gases up power plants chimneys, the exhaust can be utilized in greenhouses, typically through a cogeneration system. The recovered heat energy can be used to warm greenhouses, and the CO2 fertilizes the plants, and all contributes to feeding the world's population.

A Combined Heat and Power (CHP) power plant, also known as cogeneration, is a highly efficient energy system that simultaneously produces both electricity and useful heat from a single fuel source. The process involves using a "prime mover," such as a gas turbine or engine, to generate

electricity and then capturing the waste heat from the prime mover for thermal applications like heating or cooling buildings. This integrated approach significantly increases energy efficiency and reduces fuel consumption compared to generating heat and power separately, leading to lower operating costs and fewer carbon emissions.

The CHP process in the power plant involves treating the exhaust with catalytic converters to reduce any harmful components in the exhaust.

- **Exhaust Gas Treatment:** The exhaust gas is passed through a selective catalytic reduction (SCR)unit and an oxidation catalyst to remove pollutants like nitrogen oxides (NOx) and non-methane hydrocarbons (NMHC).

Within the combusted exhaust is heat energy that was not used to create electricity. The Sidel SRU Flue Gas Condenser was developed in the early 1980's to recover the waste heat energy from the exhaust of the boilers used to heat these commercial greenhouses.

Today, over 2.5 million square feet of Greenhouses are using this "recovery of wasted heat" technology every day for increasing energy efficiency and to provide cooled CO2. The cooled exhaust, CO2, is being used in commercial greenhouses for CO2 enrichment. Even the created water in the exhaust has a purpose. The Sidel SRU Flue Gas Condenser is being used today in many other applications such as processing plants, hospitals, petrochemical plants, universities, commercial laundries, and State prisons.

To make the most of the elements from future power plants combusted natural gas exhaust, a greenhouse becomes a perfect partner. The SRU recovered heat energy will be piped over and will be used to maintain the perfect growing environment for a multitude of different food crops. The CO2 in the exhaust will be piped over and injected into these growing environments as

a fertilizer that will increase fruit and vegetable size and quantity. The condensate water will have nutrients added and then be used to irrigate these crops.

To apply this technology in power plant applications is a natural forward progression. In Utah at the Current Creek power plant this technology is today being applied, heating 30 acres of commercial greenhouses owned by Houweling Nurseries.

All this happens because the owners of the power plant decided to improve their energy efficiency from 50% to 97% by redirecting the combusted exhaust and utilizing the heat energy and the CO2 and the water to better uses.

Utilizing the wasted heat in the exhaust from natural gas power plants can support endless greenhouses to help feed America and the world’s population.

The AI Centers, datacenters, power plants, and greenhouses will be operating for generations, providing good paying community jobs to parents, kids, and grandkids and food for the population.

The technology condensing flue gas heat recovery, provides beneficial use for heat and emissions that would otherwise be released into the atmosphere. This increases plant yield while reducing the economic costs of energy for the greenhouse.

Everyone WINS, with produced electricity and food.

- **Increased Plant Growth:** Elevated CO2 levels in greenhouses accelerate plant growth and increase harvest yields.
- **Reduced Energy Costs:** By recovering waste heat from the exhaust for heating, operating costs for the greenhouses can be significantly reduced.
- **Sustainable Operation:** This closed-loop system reuses byproducts, turning potential pollutants into a valuable resource for plant cultivation.

Greenhouse Benefits:

- **CO2 Fertilization:** The carbon dioxide from the exhaust is naturally used by the plants, a process known as CO2 enrichment, which can significantly boost plant growth and yield.
- **Heating:** The heat from the exhaust provides efficient heating for the greenhouse.

Utilizing the exhausted energy from power plant stacks is a Win-Win situation for all. All this is because the power plants improved their energy efficiency to 97% just by utilizing the exhaust – the heat and CO2 emissions. A good deal for everybody.

- The new AI Centers and datacenters are going to create a lot of new jobs.
- The new power plants are going to create a lot of local professional jobs.
- The new greenhouses will help feed the world's growing population and create hundreds of new good paying jobs for the local community.

Utilizing waste heat that is normally exhausted from power plant stacks can support endless greenhouses to help feed the world's population. It also reduces wasting natural gas.

Please share this information with teachers, students, and friends to encourage Energy Literacy conversations at the family dinner table.

[BIO: Sid Abma's company Sidel Systems specialized in the design and installation of warm water heating systems for the commercial greenhouse industry. His passion is to deliver maximum energy efficiency to everything.]

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