



Renutech Dynamics is at the forefront of **renewable energy solutions**, specializing in **Industrial Heat Pump solutions** and **Water and Sludge Treatment System** that aim to transform energy efficiency and sustainability within various industrial processes. With over 20 years of expertise in heat pump and sludge treatment technology, we are committed to delivering innovative systems that not only meet but exceed the unique requirements of our clients across multiple sectors.

Our mission is to strive to be the global leader in renewable energy technology, collaborating with communities, governments, and industry partners to create and develop advanced technology solutions. Our goal is to foster a world where renewable energy powers our lives while preserving the planet.

Industrial Heat Pump Systems

Renutech Dynamics offers **Industrial Heat Pump Systems** designed to enhance energy efficiency across industrial processes. Our heat pumps leverage renewable energy technology to extract heat from low-temperature sources, such as ambient air, water, or waste heat, and convert it into high-temperature outputs suitable for various applications.

Key Features:

- **High Efficiency:** Our systems achieve coefficients of performance (COPs) ranging from 1.7 to 5.0, allowing for significant energy savings.
- **Waste Heat Recovery:** Capable of upgrading low-grade waste heat, our heat pumps facilitate the recovery and reuse of thermal energy, reducing reliance on traditional energy sources.
- **Versatile Applications:** Suitable for industries including food processing, chemical manufacturing, pharmaceuticals, and data centers, our heat pumps can provide both heating and cooling solutions.

Benefits:

- **Cost Savings:** By replacing conventional boilers, our heat pumps not only lower operational costs but also contribute to emissions reduction.
- **Environmental Impact:** When powered by renewable electricity, these systems offer zero-carbon heating solutions, aligning with global sustainability goals.



Water and Sludge Treatment Systems

In addition to heat pump technology, Renutech Dynamics is proud to introduce the **Sludge Drying and Pyrolysis System** and **RRS[®] Thermal Hydrolysis Sludge Treatment System**. This innovative technology addresses the challenges of waste management by efficiently treating organic solid wastes, including municipal sewage sludge and food waste.



Process Overview:

- **Thermal Hydrolysis:** This process breaks down sludge structures, converting bound water into free water for easier removal. It enhances the volatility of sludge water and increases the specific surface area for improved treatment efficiency. **Mechanical Dehydration:** Following thermal hydrolysis, our system reduces moisture content to below 30%, achieving over 70% volume reduction compared to traditional methods.
- **The Sludge Drying and Pyrolysis System** operates in two main stages. **Drying:** The system utilizes thermal drying to reduce the moisture content of sludge. This is achieved through controlled heating, which evaporates water and prepares the sludge for further processing. **Pyrolysis:** Following drying, the dried sludge undergoes pyrolysis—a thermochemical decomposition process that occurs in the absence of oxygen. This process converts organic materials in the sludge into biochar, syngas, and oils, effectively reducing waste volume and producing valuable byproducts.

Key Advantages:

Thermal Hydrolysis:

- **Energy Efficiency:** The RRS[®] system requires only 300 calories to remove 1 kilogram of water—over 60% less than conventional thermal drying technologies.
- **Versatility:** Capable of processing various organic solid wastes without chemical additives, it supports sustainable disposal and utilization practices.
- **Rapid Implementation:** The system can be operational within six months, minimizing downtime and maximizing efficiency.
- **Complete Harmlessness:** The high-temperature treatment effectively eliminates pathogens, ensuring safe disposal and stabilization of treated sludge.



Key Advantages:

The Sludge Drying and Pyrolysis System:

- **Volume Reduction:** Significantly decreases the volume of waste sludge, facilitating easier handling and disposal.
- **Energy Recovery:** The pyrolysis process generates syngas, which can be used as a renewable energy source.
- **Environmentally Friendly:** Reduces greenhouse gas emissions compared to traditional disposal methods like landfilling or incineration.
- **Resource Recovery:** Produces biochar, which can be utilized as a soil amendment or carbon sequestration agent.

Applications:

- **Municipal Sewage Treatment Plants:** Efficiently processes sewage sludge for safe disposal or reuse.
- **Industrial Wastewater Treatment Facilities:** Treats industrial sludge to minimize environmental impact and recover valuable resources.
- **Food Processing Plants:** Handles organic waste generated from food production processes.
- **Agricultural Waste Processing:** Can be used to manage livestock manure and other agricultural residues.

Renutech Dynamics is committed to fostering a sustainable future through innovative technologies that not only meet today's industrial needs but also contribute positively to the environment.

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