Recycling Plant for Municipal Solid Waste and Industrial/Commercial Waste for RDF AND SRF PRODUCTION

&

RCBC ROTATIONAL CASCADING BOILER COMBUSTION

State of the Art Thermal Conversion Boiler for Municipal Solid Waste (RDF) Industrial/Commercial Waste (SRF)

RECYCLING & FUEL PREPARATION

Proper design of a front-end system is obviously imperative for the successful operation of a fuel production facility. The key function of the pre-processing system is the segregation of the combustible components from the non-combustible components.

- Concept with MRF (Material Reclamation Facility) & Recycling
- Concept single pass shredding and ferrous metal removal for MRF and Commercial & Industrial Waste
- Concept preparation line with pre shredding, ferrous and non ferrous removal and secondary shredding for MSW and Commercial & Industrial Waste.

Municipal Solid Waste & Industrial/Commercial Waste

RDF PRODUCTION

RECYCLABLES

GLASS

HDPE

PAPER & OCC

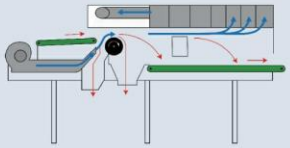
PET BOTTLES

MSW Feedstock Separation and Fuel Processing with and without material recovery.

- **Fuel Discharge and Storage**
  - Truck scale to weigh incoming material
  - Concrete floor (tipping floor), tractor-loader, concrete block bunkers
- **Material Recovery Facility (MRF)**
  - Conveyers, specialized equipment, and sorting line to capture recyclable and non-combustible materials (metal, plastics and electronics)
- **Recycle Storage and Shipment**
  - Compressing and Bailing of Recyclables
  - Shipping Docks

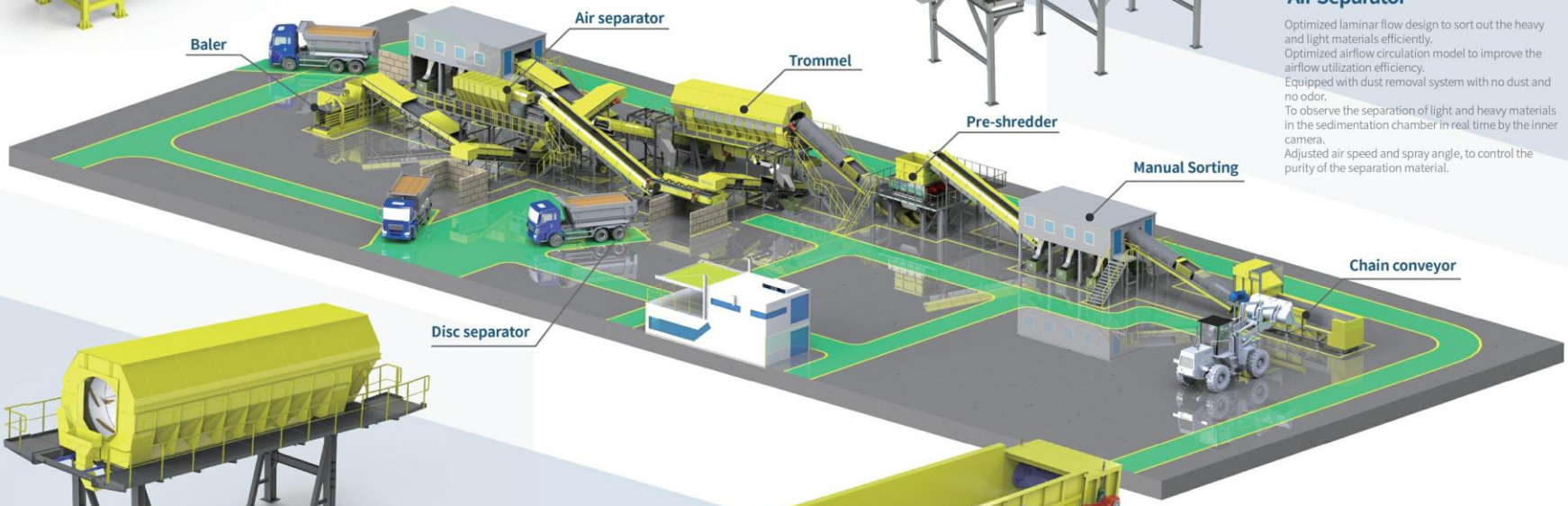
MSW Pre-shredder

Combination of broken bag and pre-shredding.
To shred the wood,plastic,fabric,furniture,metal and other material of the municipal waste.
The output size is about 200-300mm,which can solve the problem of blocking and winding,improve the sorting efficiency.
Imported blade steel from Europe,which is strong and durable.
Hard surfacing repairing blade,which greatly reduce the maintenance cost.
Modular design,easy for dis-assembly,assembly,and maintenanc



Air Separator

Optimized laminar flow design to sort out the heavy and light materials efficiently.
Optimized airflow circulation model to improve the airflow utilization efficiency.
Equipped with dust removal system with no dust and no odor.
To observe the separation of light and heavy materials in the sedimentation chamber in real time by the inner camera.
Adjusted air speed and spray angle, to control the purity of the separation material.



Trommel

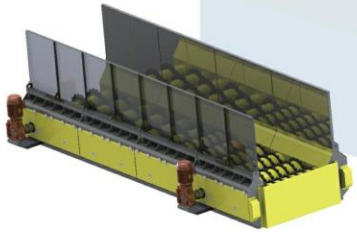
Inner broken bag blade to improve the sorting efficiency.
Four single point friction drive with supporting wheel, to ensure smooth operation and low noise.
Sealed trommel to prevent the leakage of the odor and dust.
Equipped with maintenance platform and several mainte_x0002_nance door,which is easy for maintaining.

Chain Conveyor

The Dosing drum break up material
Control the inputting steam
Speed changing
Variable Frequency Control
Steel board conveyor

Anti-Winding Disc separator

Anti-winding design
Break up the waste
Separate the organic and soil from the waste
Speed changing
Variable Frequency Control

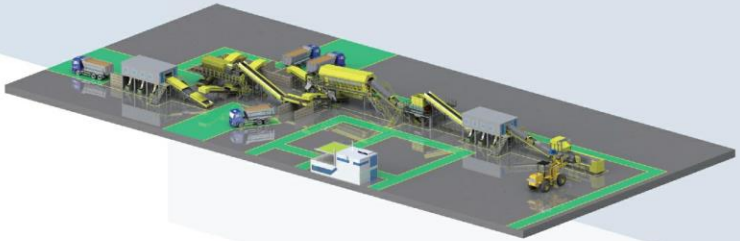


Magnetic Separator

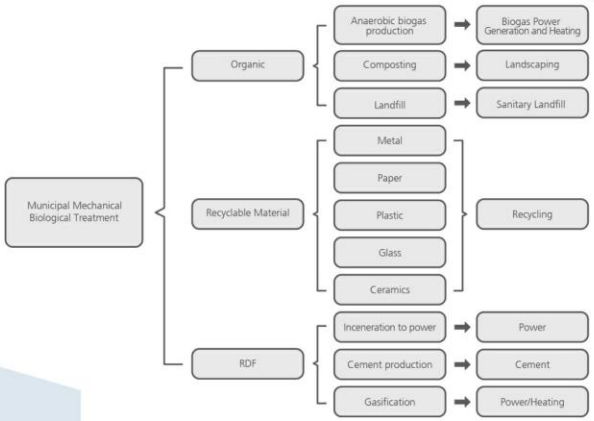
Separate the ferrous metal

FUSION®

Municipal Solid Waste/Landfill Waste Mechanical Sorting Line(to RDF)

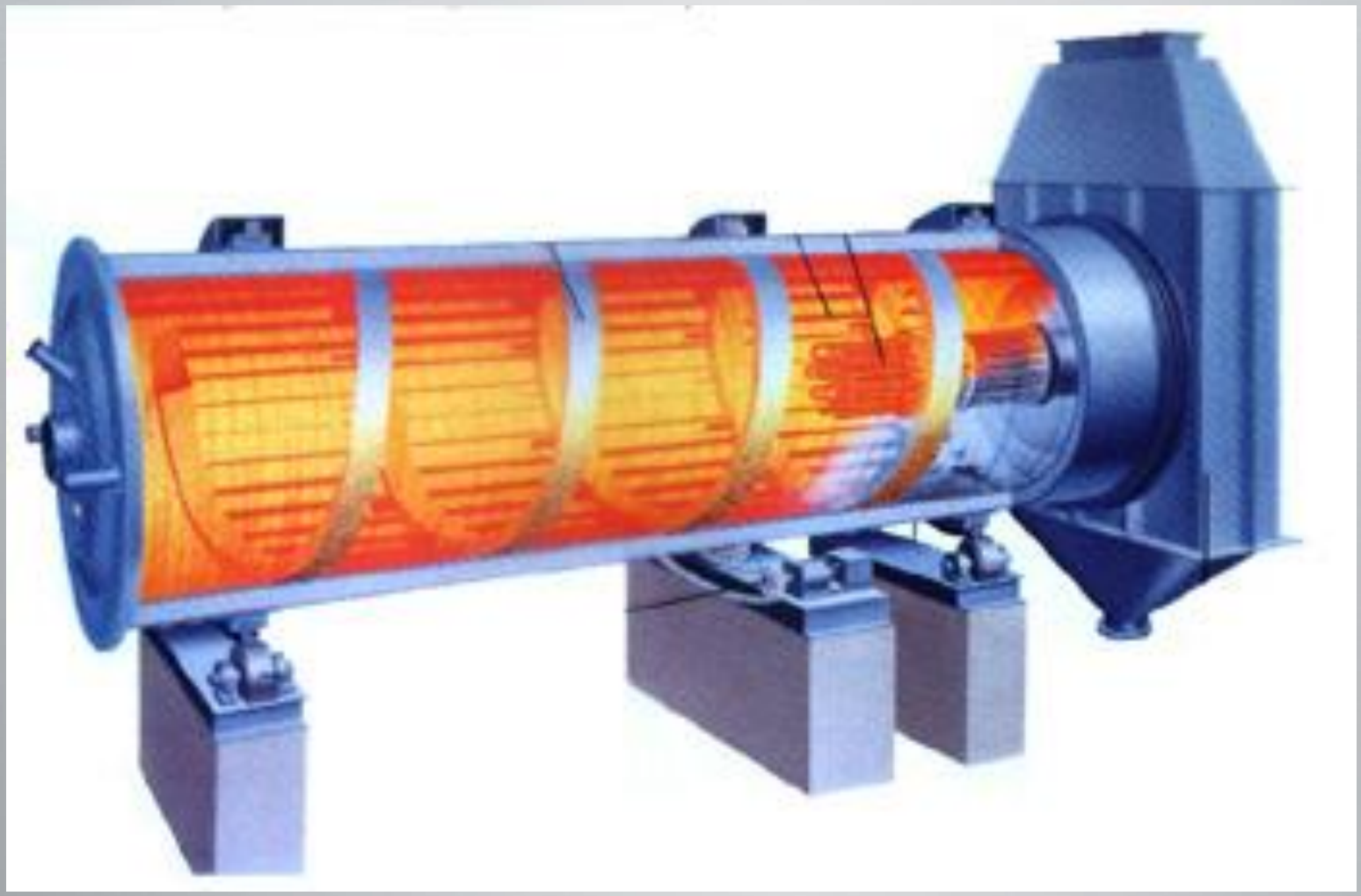


Resourceful



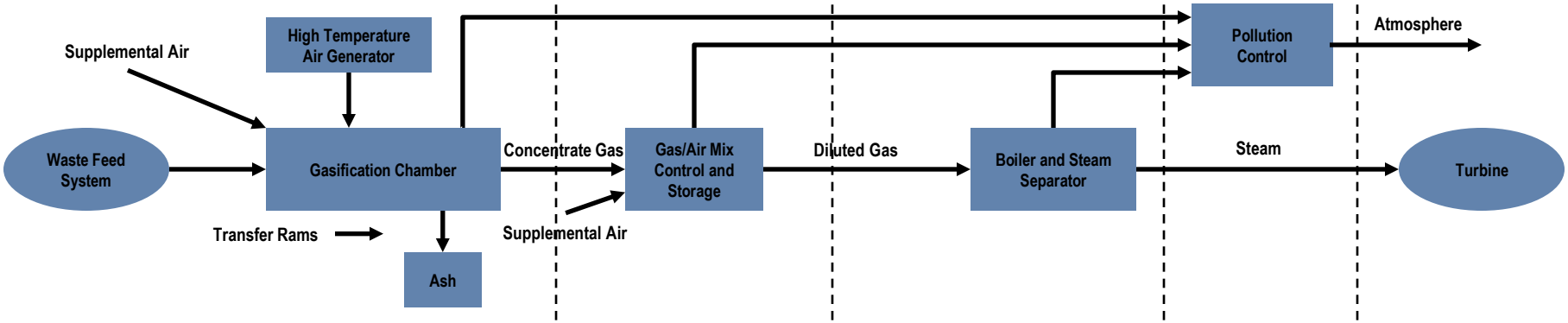
The MSW/Landfill sorting line is suit for municipal solid waste(MSW) or landfill waste sorting to RDF. By shredding, trommel screening, air separation and magnetic separation to sort out organic material, RDF (refuse derived fuel) and recyclables (metal, paper and plastic) automatically. The organic material can be used for composting, anaerobic production of methane or landfill, RDF can be used for incineration power generation, pyrolysis and gasification, etc., and recyclable material can be used for recycling, so as to effectively realize the recycling, harmless and reduction of municipal waste.

The RCBC System



Complex vs. Simple with MSW/RDF

Typical Gasification System



Gasification/Pyrolysis have tighter fuels specs much more difficult with MSW/RDF feedstocks, fuel moves via mechanical transfer thru the hot thermal conversion chamber for optimal syngas formation

Remaining carbon/ash can be recycled or disposed of at a landfill.

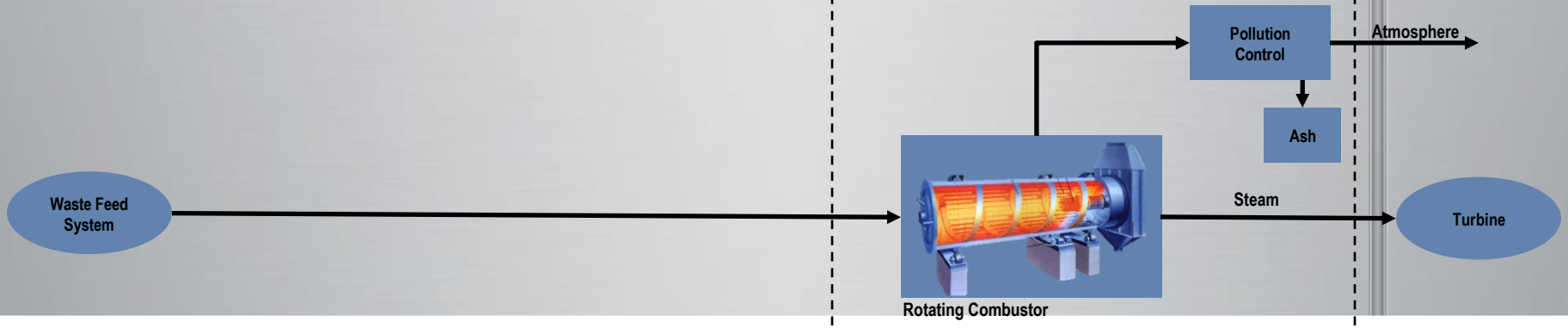
H2/CO Synthesis Gas is fed to an oxidizer or secondary burner to fire higher temperatures for steam generation

Gas/air mixture is fed to boiler and burned to generate steam. (Separated dirty gas discharged thru air pollution system)

Combustion gases go to pollution control system.

Steam routed to turbine or other use.

The RCBC System



Waste fed into rotating combustor/boiler where it is mechanically fluidized by the rotation design and mixed with emission controlling sorbents.

Waste mixture is cycled and recycled through combustion zone, producing controlled heat, which generates steam.

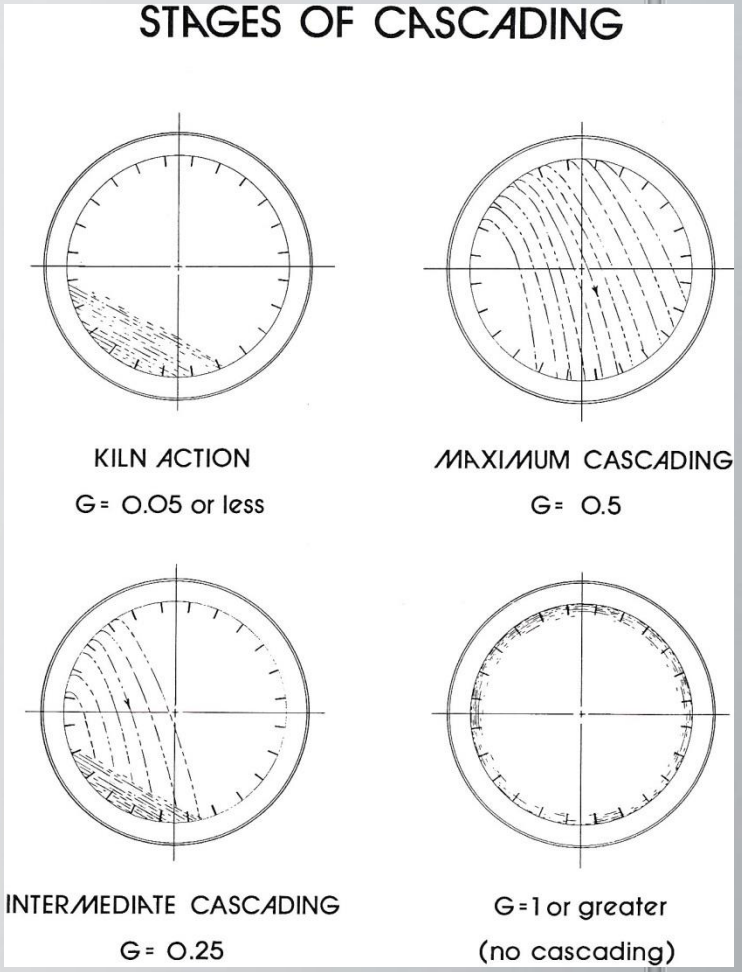
Steam routed to turbine or other use.

The RCBC Waste-to-Energy Features

- Simple - Proven rotary design used in cement kilns and dryers
- Reliable – Patented Cascading fuel bed Combustion Boiler
- Efficient – Total Combustion with Maximum Thermal Extraction
- Variable – Auto-adjust RPM for wide range of fuels variability
- Scalable – Similar to Peaker Plants, modular design
- Benefits:
  - No fuel costs; rather, fuel may constitute additional income stream
  - Flexible fuel requirements: municipal waste, biomass, coal, wood, etc.
  - No moving parts within high-temperature zone (minimal maintenance)
  - Technology facilitates near-total waste reduction, near ZERO landfill
  - Reduced greenhouse gas emissions relative to landfilling of waste
  - Ash has beneficial uses (soil augmentation; construction materials)
  - Large or Small systems, high efficiently at low waste volumes

Cascading Bed Combustor – Patented Magic

- Fuel prep for ideal moisture dispersion and sizing
- Drying and Ignition occur in the rotating cylinder
- Variable RPM allows the fuel to cascade, facilitating the mixing of air, fuel and hot char resulting in more complete and faster combustion
- Reverse Archimedes Screw design is recursive returning hot fuel from back to front (up to 300x)
- Fuel and sorbents are recycled internally to help obtain greater carbon utilization and acid gas capture
- Designed for maximum thermal extraction or complete carbon burnout with integrated boiler or Heat Recovery Steam Generators



RCBC
Easy Operations for Fast and Effective Burnout

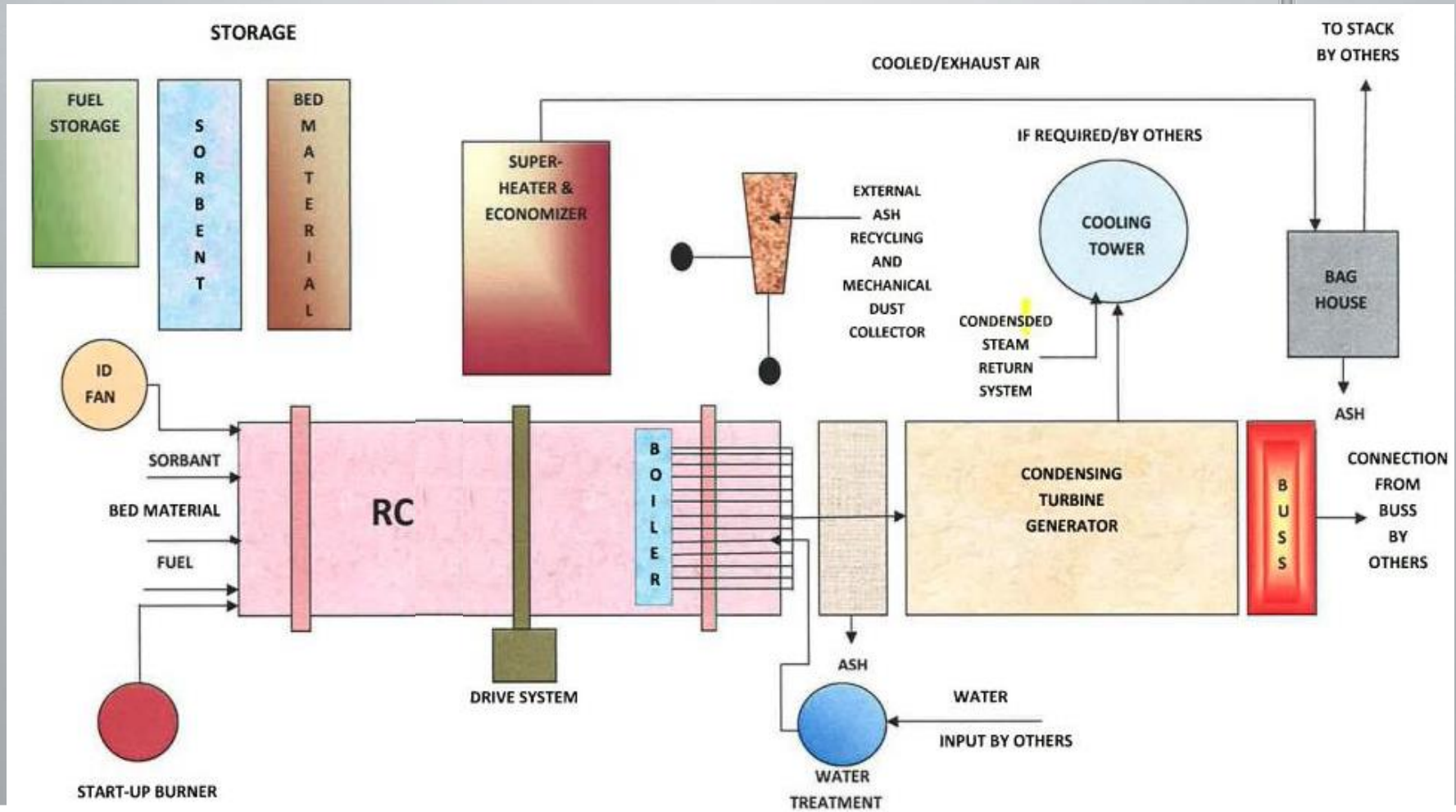
- Rotational speed of the cylinder varies 8-20 RPM based on btu, volume, moisture, airflow, temperatures and desired carbon/ash ratio
- Limestone (Calcium Carbonate) is added to control acid gases
- Combustor temperature is monitored and controlled by adjusting fuel and air injection rates
- External heat exchanger (super-heater) to transfer additional heat for steam and reduce temperature of exhaust gas

RCBC Current Options

Length (feet)	45
Internal Diameter (feet)	12
Nominal Capacity (pounds steam/hour x 1,000)	15, 30, 60
Steam Temperature (degrees F)	825
Steam Pressure (psia) or Saturated Steam (psia)	865 250
Feedwater Temperature (degrees F)	240
Maximum Combustion Gas Temp (degrees F)	1,650
Combustor Discharge Temp (degrees F)	1,400
Discharge Temp to Baghouse (degrees F)	300
Combustion Gas Flow Range (pounds/hour)	70,000 – 95,000

Typical Fuels
• High Sulfur Coal • Coal Wastes • Refuse Derived Fuels • Municipal Wastes • Semi-Densified Refuse Derived Fuels • Fluff-ASR • Carpet and Carpet Scrap • Wood Wastes • Tires and Rubber Wastes • Oils, Solvents, and Industrial Sludges • Mixtures of Above

Rotating Combustor – Waste to Energy Process



RCBC - Static or Portable

The Most Efficient, Economically and Ecologically Sensible Waste-To-Energy Solution on the U.S. Market

- Low Capital Cost:
  - Simple Design (Boiler Reactor with an Archimedes Screw)
  - Low Temperature Process
  - No Complex or Costly Chemical Scrubbing Equipment for Exhaust Gases Required Unit Meets EPA Standards and Regulations Regarding Air Quality Requirements For Emissions and Particulate Matter
- Ultra-Low Operational Cost:
  - Input Feeder Fuel May Vary "On The Fly" without Shut-Down or Batch Changes
  - No Costly Chemical Scrubbing Agents, Electrodes or Specialized Parts
  - Burner Contains Zero Moving Parts– Results in Less Repair / Maintenance Down Time
- The Most Efficient and Complete Burn of ANY Process:
  - 98% Carbon Destruction possible
  - Ash Residual Use Potential in Paving, Construction Blocks, Soil Augmentation

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