



TurnW2E™ Gasification:

Advanced technology for practical waste management and alternative energy generation

Making good technology better...

Gasification has been in use for many decades, from processes making “town gas” in the early 1900’s as fuel for street lamps, to today’s 500 MW coal gasification processes used to produce electricity in the United States. Years of assessment of these processes has yielded the design advancements in TurnW2E™ technology. Using the best elements of proven gasification technologies have resulted in the patent-pending developments in materials handling and processing, internal distribution systems, conversion and reaction processes, and vessel composition of TurnW2E™ Technology.

Practical – a small size turnkey package is a simple installation, with custom integration into existing infrastructure;

Reliable – the system technology has a 99.9% availability in typical use;

Efficient – processing almost any type of waste materials eliminates extra processing steps;

Safe – system runs at ambient pressure and produces CO₂ and water vapor, ash and metals for recovery and use;

Environmental – produces minimal to no contaminants of concern; replaces systems that produce carcinogens, contaminate water systems and release greenhouse gases;

Flexible – can process varied waste streams in combination without system modification;

Years of technology use have produced a simple waste elimination and renewable energy generation system in a profitable package, TurnW2E™ Gasification.

The BASICS

TurnW2E™ Gasification system is a series of basic units, which are designed to work together as one continuous operation. The systems are custom solutions for the client, but have at the core a standardized set of processes.

Applications

Municipal Solid Waste



Animal and Crop Wastes



Cellulosic Biomass



Industrial Wastes

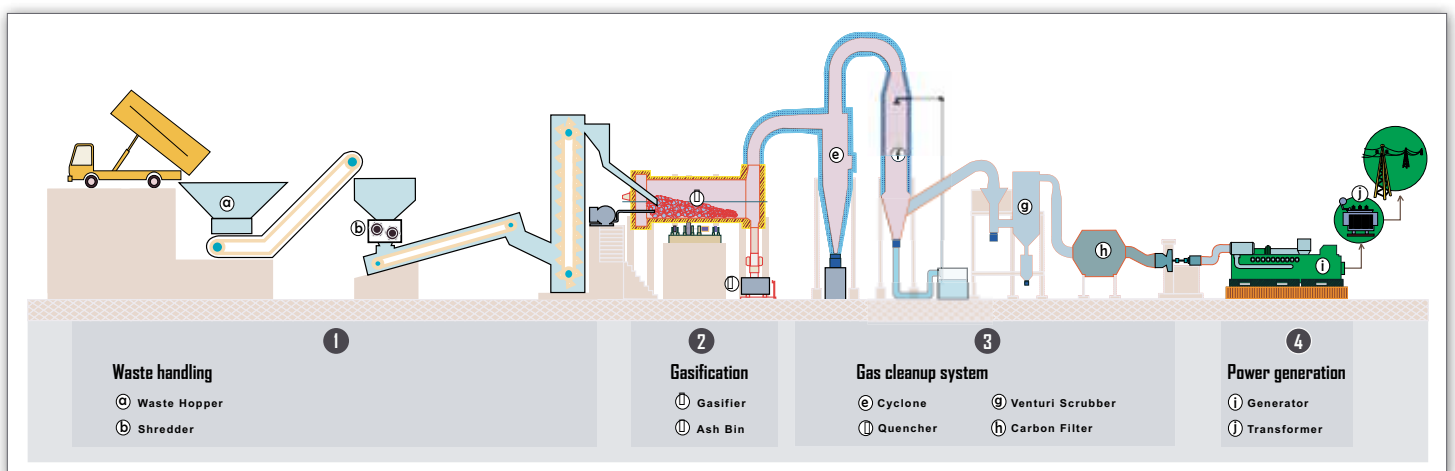


TurnW2E™ Gasification systems are able to process materials of varying sizes and combinations. General sizing less than 3 inches by shredding or other pre-processing is appropriate and allows for even process flow through the materials handling system and into the core processing unit. This flexibility allows for Municipal Solid Waste (MSW) applications to work quickly and efficiently.

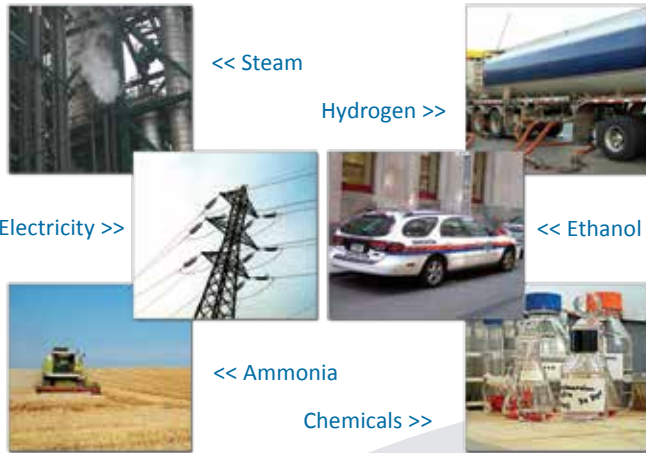
“ through the use of its innovative reactor design, TurnW2E™ Gasification can accommodate varied materials with different moisture contents, providing distinctive feedstock flexibility for a gasifier, and still produce consistent syngas.”

How it works:

Feedstock materials are preprocessed, then enter the vessel through a feed system; the stream is reacted, using oxygen or air, and heat; the conversion process produces ash, which is removed to a hopper for recycling; and syngas, which is a gas comprised of CO and H₂, which is then cleaned through a three-step gas cleanup process, which yields a syngas for combustion that is cleaner burning than natural gas.



Products:



AVAILABLE ENERGY FROM WASTES		
ENERGY FORM	MSW PROCESSED	ENERGY PRODUCT GENERATED
Steam	100 Tons/Day	23 Tons/Hr
Electricity	100 Tons/Day	5 MW (Gross)
Hydrogen	100 Tons/Day	6000 kg/day
Ammonia	100 Tons/Day	35 Tons/day

NO DIOXINS/FURANS

- All chlorine in waste reduced to HCl
- No free Cl_2 formation permitted (free Cl_2 is precursor for dioxins/furans)
- HCl easily scrubbed by water prior to combustion of syngas in boiler

The Advantages of TurnW2E™ Gasification

Physical

- Small footprint, plant size of less than an acre (40,000 sq. ft. for 50 Tons/Day)
- Rapid plant setup - orders can be delivered as soon as 6 months from land acquisition
- Design variations are minimized by using standardized core systems
- Standard core system simplifies plant maintenance
- System operations are straightforward – operator training is fundamental and provided by W2E

REDUCED CO₂

- Over 70% of waste generated from renewable sources such as biomass
- CO₂ replaces growth of new biomass
- Process eligible for carbon credits

Economic

- Typical return on investment of 2 to 5 years
- Can increase the profitability of transfer facilities and landfills
- Enables an institution or industrial facility to stabilize their operating costs for the basic utilities of waste disposal and energy

REDUCED NO_x

- All fuel bound nitrogen is reduced to elemental N₂ or NH₃ or HCN
- NH₃ and HCN are scrubbed
- Literally zero contribution of fuel bound N₂ for NO_x
- Low/medium btu produces lower thermal NO_x than natural gas due to lower flame temp
- Expected NO_x <25 ppm

Overall Environmental

- Waste transportation costs eliminated or vastly reduced by distributed locations of small-footprint plants
- Energy security for community or facility by generating energy near to end-user

SO_x ELIMINATED

- Sulfur in waste converts to H₂S
- H₂S removed as CaS/CaSO₄
- Traces removed with sponge iron
- Almost zero SO_x emission

- Environmental protection through responsible waste management
- Energy security from domestic sources
- Clean power in a sustainable package
- TurnW2E™; the cornerstone of a secure distributed energy strategy, locally and globally



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Waste to Energy Systems