What is claimed is:

1. A staged gas injection system for a flare tip that can discharge waste gas into a combustion zone downstream from the flare tip, and the flare tip includes an inner tubular member disposed within an outer tubular member so as to form a pre-mix zone downstream from the inner tubular member and within the outer tubular member, the staged gas injection system comprising:

a first stage gas source, the first stage gas source being a source of first stage gas, wherein the first stage gas consists of alternative gas;

a first gas injection assembly, said first gas injection assembly being configured to inject ~~a~~ the first stage gas at a high flow rate and a high pressure into the inner tubular member of the flare tip and including:

a first gas injection nozzle fluidly connected to said first stage gas source from which said first stage gas is received by the first gas injection nozzle; ~~and~~

a second stage gas source, said second stage gas source being a source of second stage gas;

a second gas injection assembly, said second gas injection assembly configured to inject said second stage gas at a low flow rate and a high pressure into the inner tubular member of the flare tip and including:

a second gas injection nozzle fluidly connected to said second stage gas source from which said second stage gas is received by the second gas injection nozzle, wherein said first gas injection assembly and said second gas injection assembly are proximate to each other and oriented in the same direction ~~such that both said first gas injection assembly~~ such that said first gas injection assembly injects first stage gas into the inner tubular member of the flare tip and the second gas injection assembly injects second stage gas into the inner tubular member of the flare tip ~~and said second gas injection assembly inject gas into the inner tubular member of the flare tip~~, and wherein the low flow rate means the first gas injection assembly and second gas injection assembly are configured such that, on a per nozzle basis, the low flow rate is one-half or less than the high flow rate.

~~2. The staged gas injection system of claim 1, wherein said stage gas source comprises a first stage gas source which provides a first stage gas to said first gas injection assembly, and a second stage gas source which provides a second stage gas to said second gas injection assembly, such that said first gas injection assembly injects first stage gas into the~~

~~tubular member of the flare tip and the second gas injection assembly injects second stage gas into the inner tubular member of the flare tip.~~

2. ~~3.~~ The staged gas injections system of claim ~~2~~ 1, wherein ~~the first stage gas comprises steam and~~ the second stage gas comprises an alternative gas.

3. ~~4.~~ The staged gas injection system of claim ~~2~~ 1, wherein ~~the first stage gas comprises an alternative gas and~~ the second stage gas comprises steam.

4. ~~5.~~ The staged gas injection system of any preceding claim ~~claim 1~~, wherein said first stage gas ~~is steam~~ consists of air.

~~6. The staged gas injection system of claim 1, wherein said stage gas is an alternative gas.~~

5. ~~7.~~ ~~A~~ The staged gas injection system ~~for a flare tip that can discharge waste gas into a combustion zone~~ of any preceding claim, ~~and includes an inner tubular member disposed within an outer tubular member,~~ further comprising:

~~a first gas injection assembly, said first gas injection assembly being configured to inject gas at a high flow rate and a high pressure into the inner tubular member of the flare tip, and~~

~~a second gas injection assembly, said second gas injection assembly configured to inject gas at a low flow rate and a high pressure into the inner tubular member of the flare tip, and~~

a third gas injection assembly, said third gas injection assembly configured to inject gas at a low flow rate and a high pressure into the inner tubular member of the flare tip, and

wherein said first gas injection assembly, said second gas injection assembly and said third gas injection assembly are proximate to each other and oriented in the same direction such that said first gas injection assembly, second gas injection assembly and third gas injection assembly inject gas into the inner tubular member of the flare tip.

6. ~~8.~~ The staged gas injection system of claim ~~7~~ 5, wherein:

~~the first gas injection assembly includes:~~

~~a first stage gas source, said first stage gas source being a source of first stage gas;~~

~~a first gas injection nozzle fluidly connected to said first stage gas source such that said first stage gas is injected at a high flow rate and a high pressure by the first gas injection assembly into the inner tubular member of the flare tip;~~

~~the second gas injection assembly includes:~~

~~a second stage gas source, said second stage gas source being a source of second stage gas;~~

~~a second gas injection nozzle fluidly connected to said second stage gas source such that said second stage gas is injected at a low flow rate and a high pressure by the second gas injection assembly into the inner tubular member of the flare tip;~~

the third gas injection assembly includes:

a third stage gas source, said third stage gas source being a source of third stage gas;

a third gas injection nozzle fluidly connected to said third stage gas source such that the third stage gas is injected at a low flow rate and a high pressure by the third gas injection assembly into the inner tubular member of the flare tip.

7. ~~9.~~ The staged gas injection system of claim ~~8~~ 6, wherein ~~said first stage gas, said second stage gas, and~~ said third stage gas ~~are each~~ is an alternative gas.

~~10. The staged gas injection system of claim 8, wherein said first stage gas is steam, and said second stage gas and said third stage gas are each steam.~~

8. ~~11.~~ The staged gas injection system of ~~claim 7~~ any of claims 5 to 7, wherein the low flow rate for the second gas injection assembly means the first gas injection assembly and second gas injection assembly are configured such that, on a per nozzle basis, the low flow rate of the second gas injection assembly is one-half or less than the high flow rate, and the low flow rate for the third gas injection assembly means the second gas injection assembly and third gas injection assembly are configured such that, on a per nozzle basis, the low flow rate of the third gas injection assembly is one-half or less than the low flow rate of the second gas injection assembly.

9. ~~12.~~ A staged gas injection system for a flare tip that can discharge waste gas into a combustion zone downstream from the flare tip, comprising:

a first stage gas source, the first stage gas source being a source of first stage gas, wherein the first stage gas consists of alternative gas;

a first gas injection assembly, said first gas injection assembly being configured to inject ~~a~~ the first stage gas at a high flow rate and a high pressure into the combustion zone and including a first gas injection nozzle fluidly connected to said stage gas source from which said first stage gas is received by the first gas injection nozzle; ~~and~~

a second stage gas source, said second stage gas source being a source of second stage gas;

a second gas injection assembly, said second gas injection assembly configured to inject said second stage gas at a low flow rate and a high pressure into the combustion zone and including a second gas injection nozzle fluidly connected to said second stage gas source from which said second stage gas is received by the second gas injection nozzle,

wherein said first gas injection assembly and said second gas injection assembly are proximate to each other and oriented in the same direction such that said first gas injection assembly injects first stage gas into the combustion zone and said second gas injection assembly injects second stage gas into the combustion zone, ~~both said first gas injection assembly and said second gas injection assembly inject gas into the combustion zone,~~ and wherein the low flow rate means the first gas injection assembly and second gas injection assembly are configured such that, on a per nozzle basis, the low flow rate is one-half or less than the high flow rate.

~~13. The staged gas injection system of claim 12, wherein said stage gas source comprises a first stage gas source which provides a first stage gas to said first gas injection assembly, and a second stage gas source which provides a second stage gas to said second gas injection assembly, such that said first gas injection assembly injects first stage gas into the combustion zone and said second gas injection assembly injects second stage gas into the combustion zone.~~

10. ~~14.~~ The staged gas injections system of claim ~~13~~ 9, wherein ~~the first stage gas comprises steam and~~ the second stage gas comprises an alternative gas.

11. ~~15.~~ The staged gas injection system of claim ~~13~~ 9, wherein ~~the first stage gas comprises an alternative gas and~~ the second stage gas comprises steam.

12. ~~16.~~ The staged gas injection system of ~~claim 12~~ any of claims 9 to 11, wherein said first stage gas ~~is steam~~ consists of air.

~~17. The staged gas injection system of claim 12, wherein said stage gas is an alternative gas.~~

13. ~~18.~~ ~~A~~ The staged gas injection system ~~for a flare tip that can discharge waste gas into a combustion zone~~ of any of claims 9 to 12, further comprising:

~~a first gas injection assembly, said first gas injection assembly being configured to inject gas at a high flow rate and a high pressure into the combustion zone, and~~

~~a second gas injection assembly, said second gas injection assembly configured to inject gas at a low flow rate and a high pressure into the combustion zone,~~

a third gas injection assembly, said third gas injection assembly configured to inject gas at a low flow rate and a high pressure into the combustion zone, and

wherein said first gas injection assembly, said second gas injection assembly and said third gas injection assembly are proximate to each other and oriented in the same direction such that said first gas injection assembly, second gas injection assembly and third gas injection assembly inject gas into the combustion zone.

14. ~~19.~~ The staged gas injection system of claim ~~18~~ 13, wherein:

~~the first gas injection assembly includes:~~

~~a first stage gas source, said first stage gas source being a source of first stage gas;~~

~~a first gas injection nozzle fluidly connected to said first stage gas source such that said first stage gas is injected at a high flow rate and a high pressure by the first gas injection assembly into the combustion zone;~~

~~the second gas injection assembly includes:~~

~~a second stage gas source, said second stage gas source being a source of second stage gas;~~

~~a second gas injection nozzle fluidly connected to said second stage gas source such that said second stage gas is injected at a low flow rate and a high pressure by the second gas injection assembly into the combustion zone;~~

the third gas injection assembly includes:

a third stage gas source, said third stage gas source being a source of third stage gas;

a third gas injection nozzle fluidly connected to said third stage gas source such that the third stage gas is injected at a low flow rate and a high pressure by the third gas injection assembly into the combustion zone.

~~20. The staged gas injection system of claim 19, wherein said first stage gas, said second stage gas, and said third stage gas are each steam.~~

~~21. The staged gas injection system of claim 19, wherein said first stage gas is an alternative gas, and said second stage gas and said third stage gas are each an alternative gas.~~

15. ~~22.~~ The staged gas injection system of ~~claim 18~~ either claims 13 or 14, wherein the low flow rate for the second gas injection assembly means the first gas injection assembly and second gas injection assembly are configured such that, on a per nozzle basis, the low flow rate of the second gas injection assembly is one-half or less than the high flow rate, and the low flow rate for the third gas injection assembly means the second gas injection assembly and third gas injection assembly are configured such that, on a per nozzle basis, the low flow rate of the third gas injection assembly is one-half or less than the low flow rate of the second gas injection assembly.