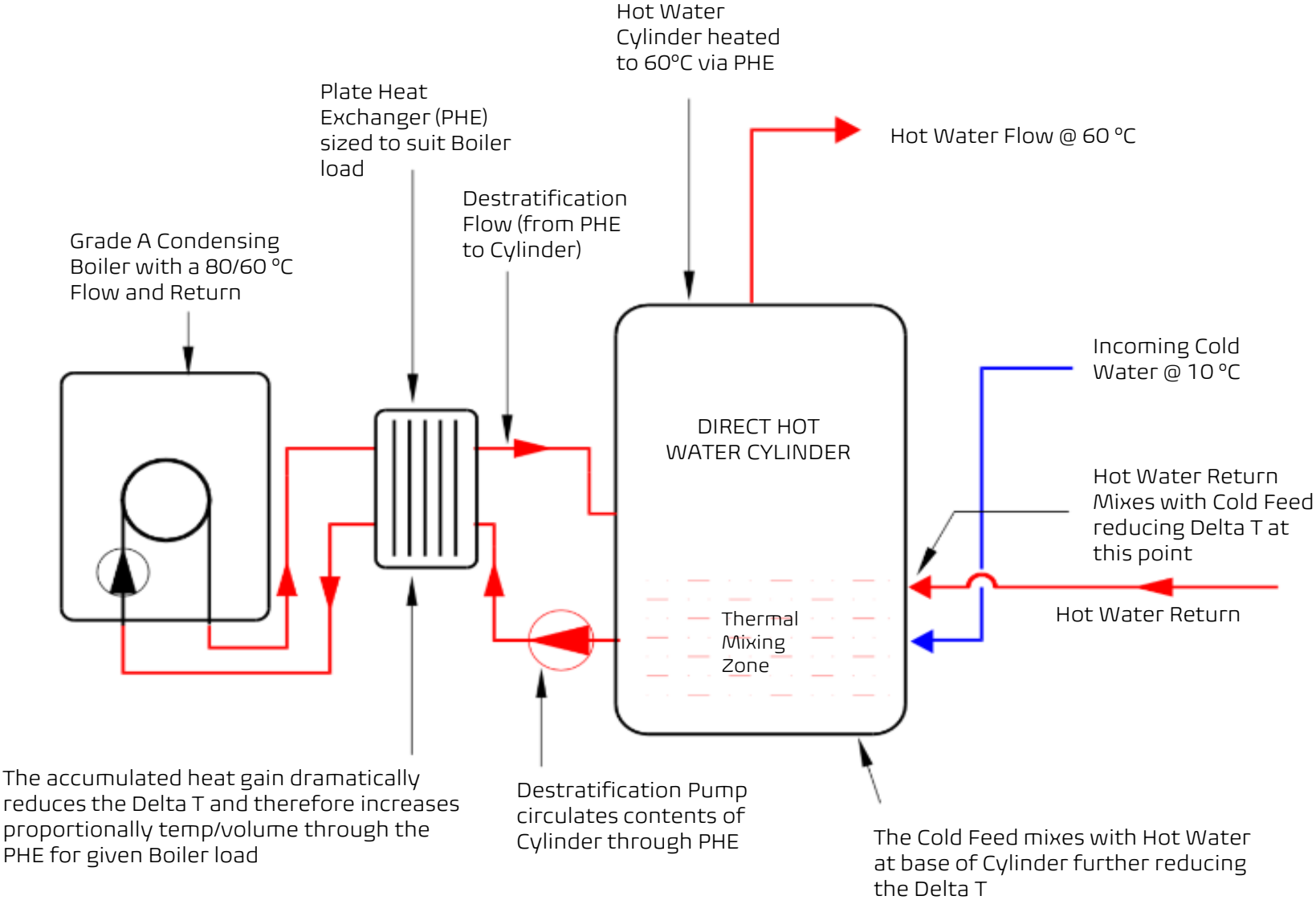




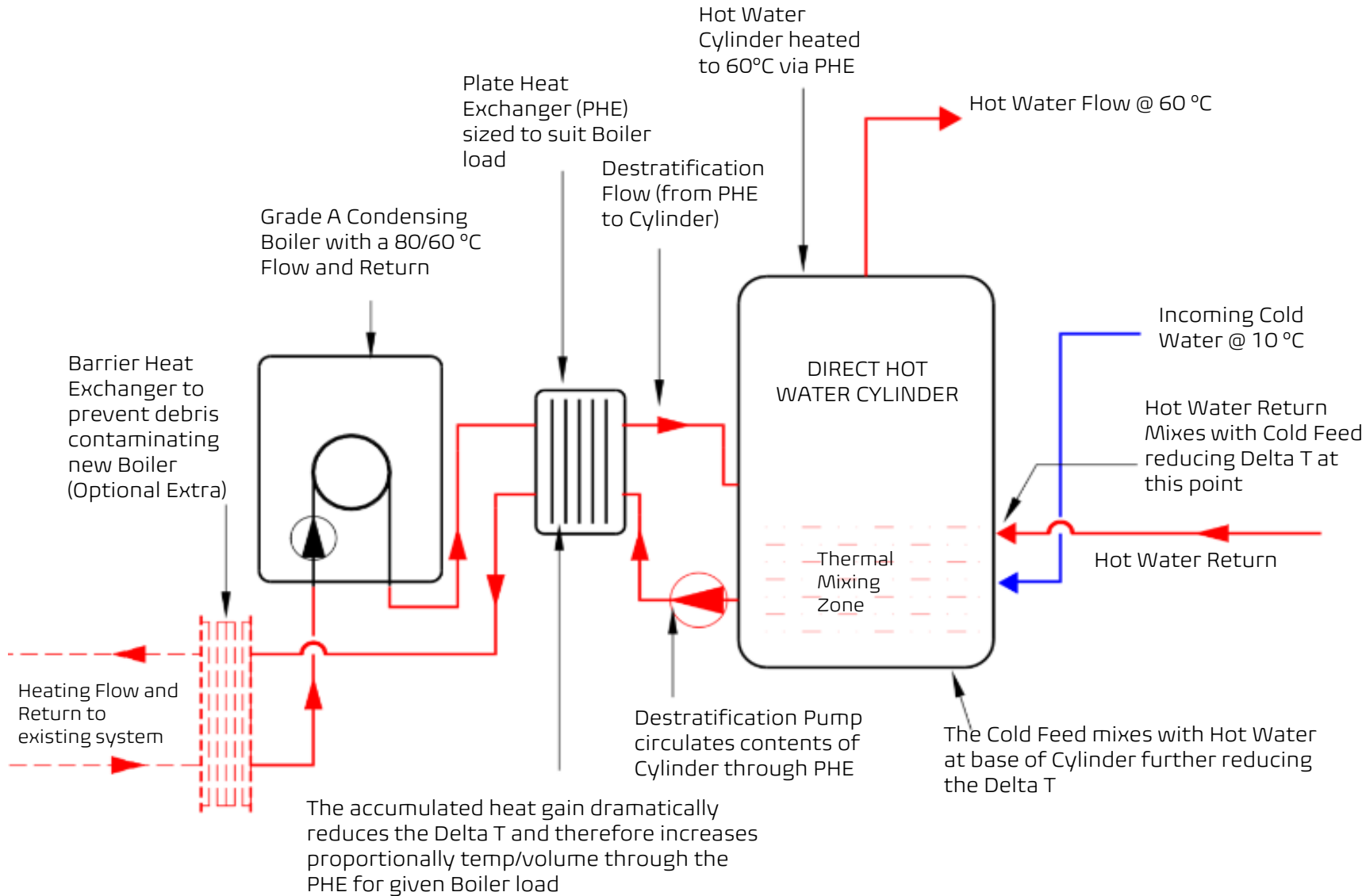
Design Principles



BLADE WATER HEATER HEAT TRANSFER DESIGN PRINCIPLE



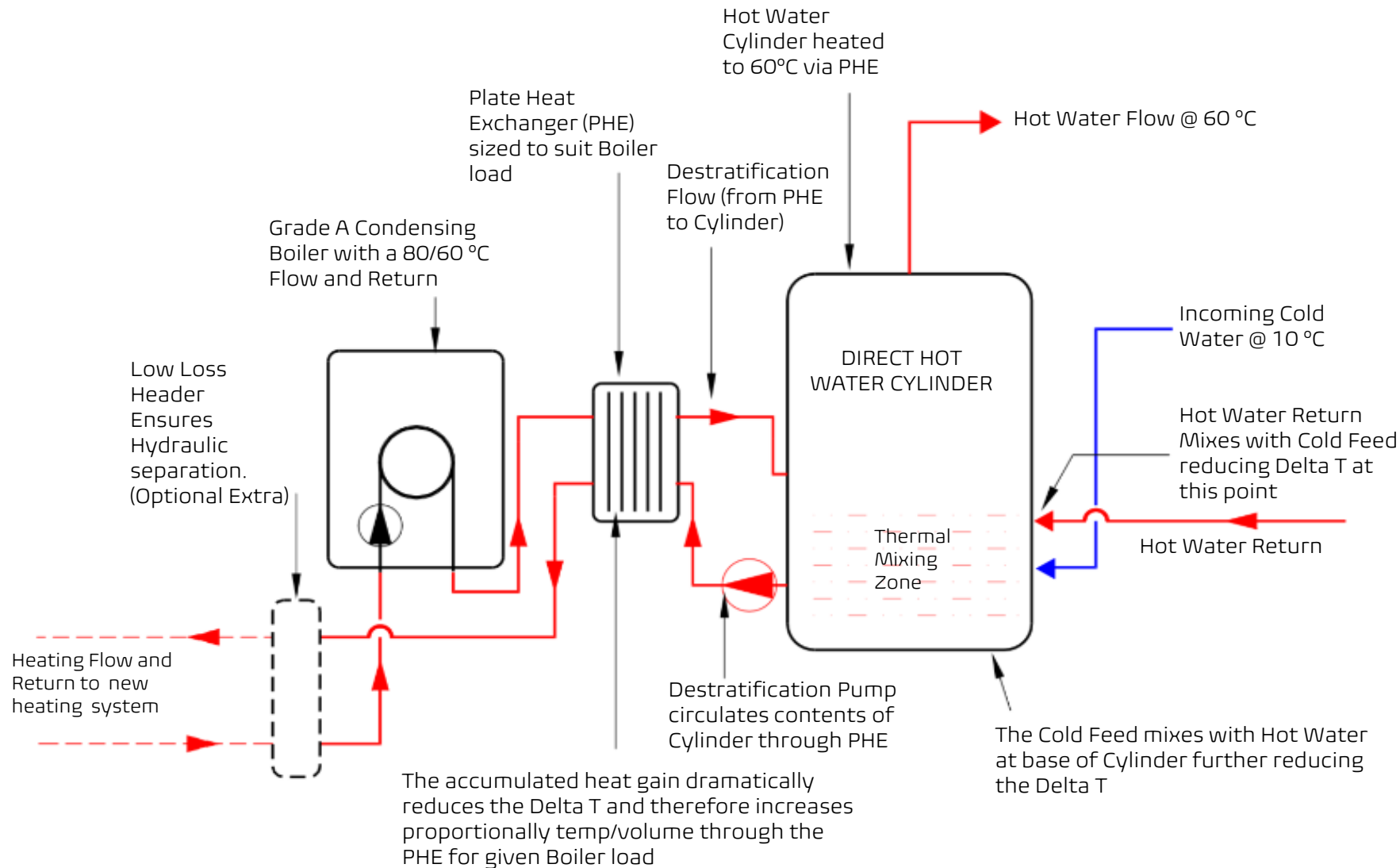
- The **Thermal Mixing Zone** is where the Delta T is reduced by mixing of the cold feed with DHW return thus increasing the temperature rise achievable in PHE thus speeding up Cylinder recovery time



BLADE WATER HEATER RECOMMENDED HEATING OPTION FOR EXISTING SYSTEMS

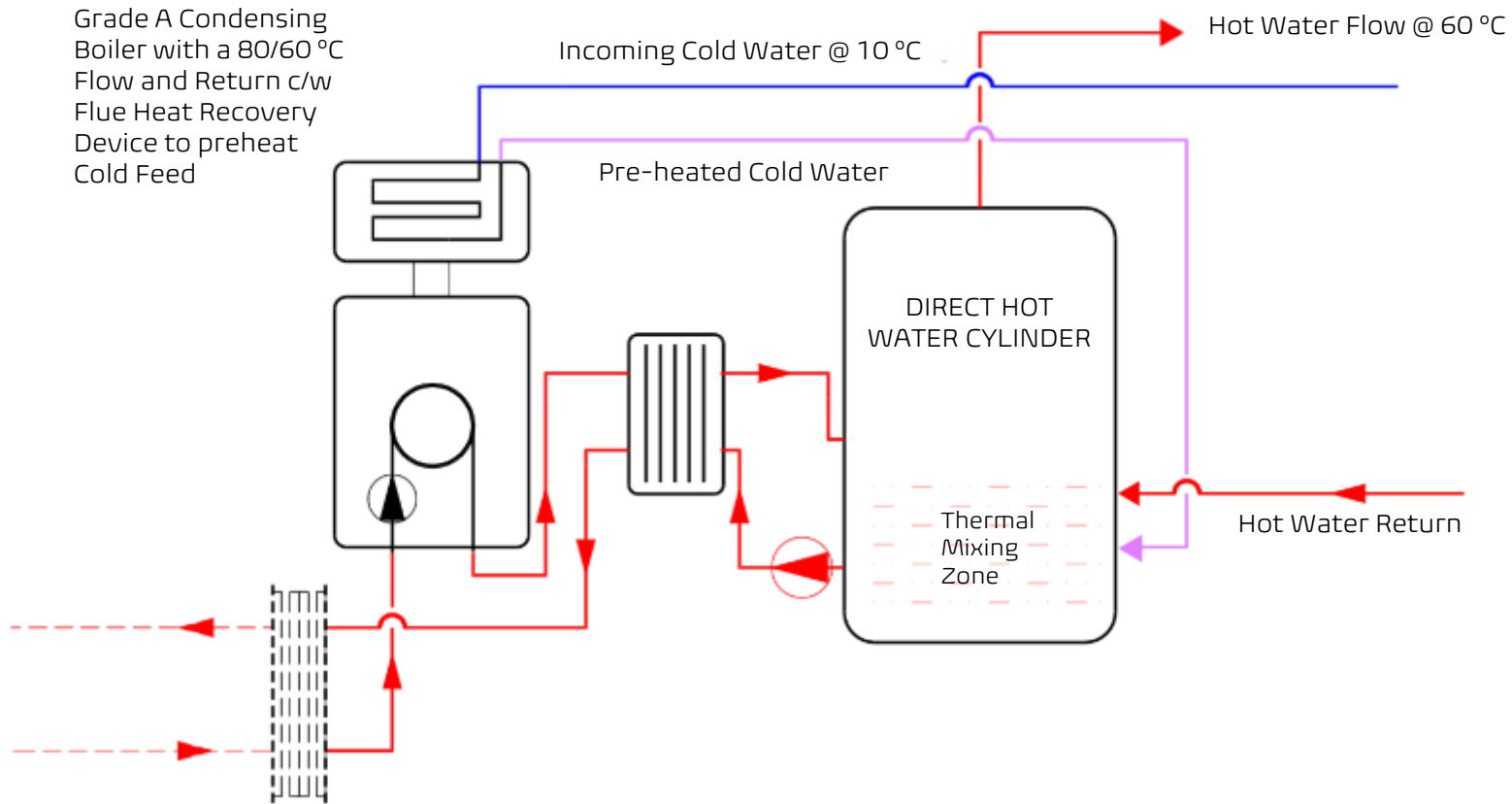
- This is the recommended method of connecting an existing space heating system to the Blade Water Heater.
- the Barrier Plate Heat Exchanger ensures no contamination of new Blade boiler with the old heating system.
- It also ensures a longer warranty

BLADE WATER HEATER RECOMMENDED HEATING OPTION FOR NEW SYSTEMS



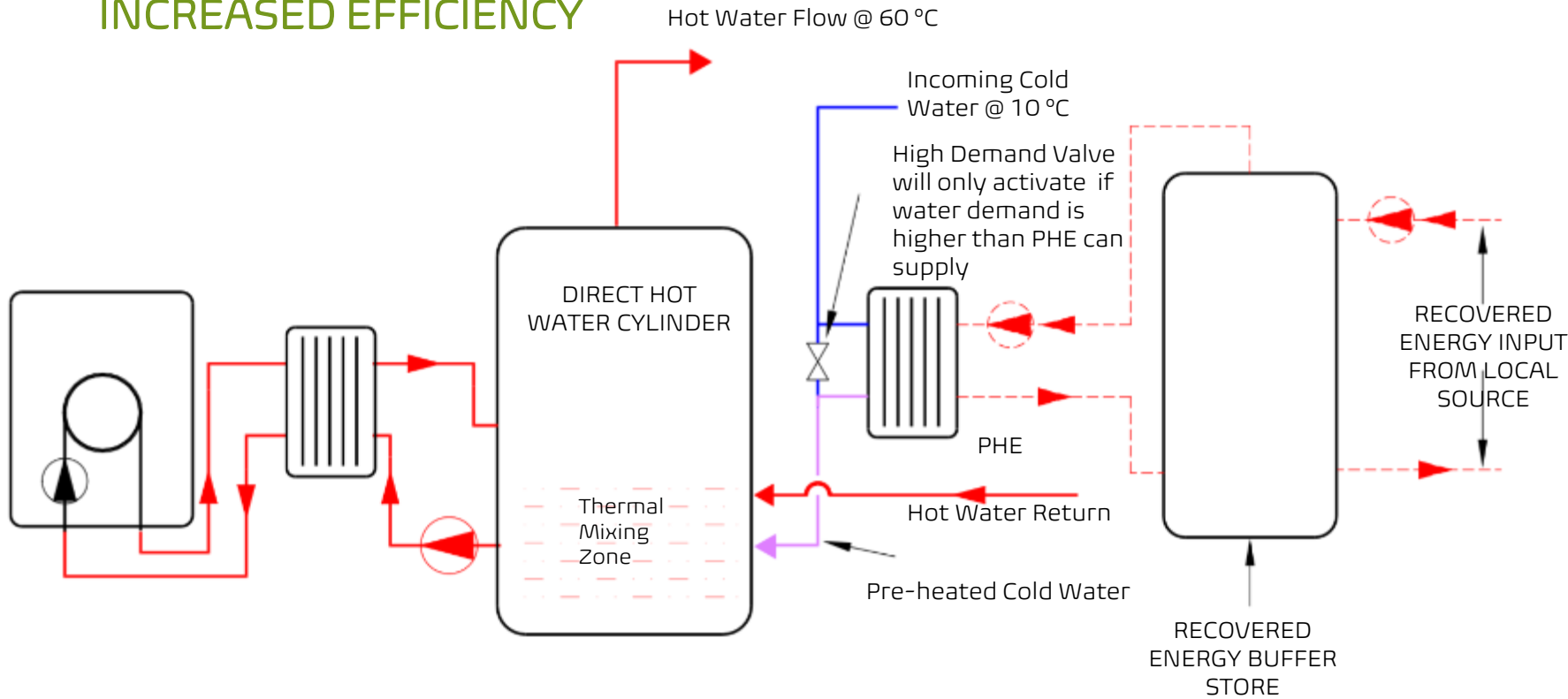
- This is the recommended method of connecting new space heating system to the Blade Water Heater.
- The Low Loss Header enables hydraulic separation between the boiler and heating circuits
- Improves performance of Blade Water Heater by keeping PHE continuously hot.

BLADE WATER HEATER FLUE HEAT RECOVERY OPTION FOR INCREASED EFFICIENCY



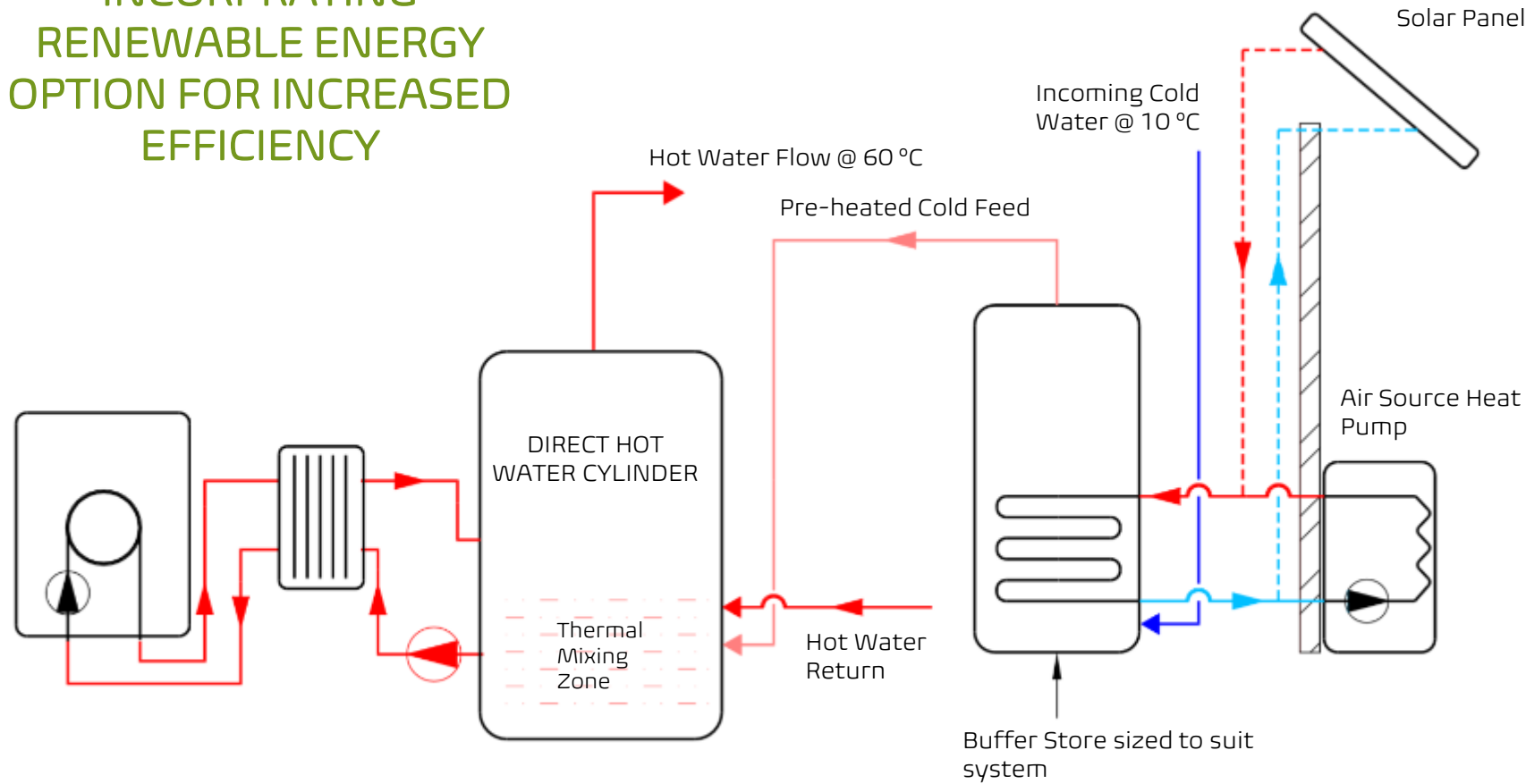
- The decrease of the Delta T by pre-heating the cold feed greatly increases the performance and efficiency of the Water Heater
- The boiler uses less gas to achieve the desired hot water temperature.
- The benefit of the Flue Heat Recovery is increased if the Water Heating is used to also provide heating

**BLADE WATER HEATER
EXTERNAL HEAT
RECOVERY OPTION FOR
INCREASED EFFICIENCY**



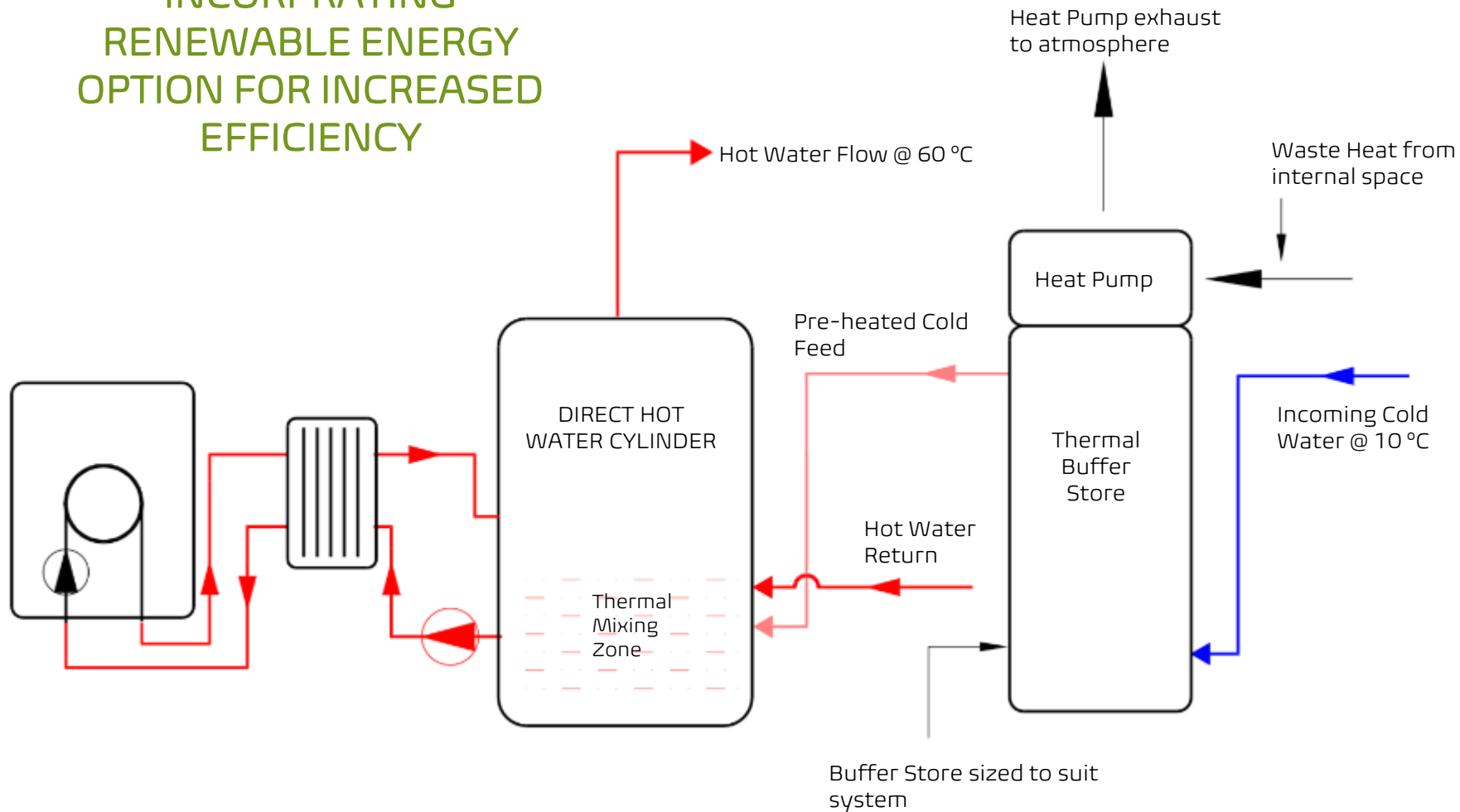
- The decrease of the Delta T by pre-heating the cold feed greatly increases the performance and efficiency of the Water Heater
- The boiler uses less gas to achieve the desired hot water temperature.
- The recovered energy can come from a variety of sources including refrigeration plant, laundry equipment and many other factory processes.

BLADE WATER HEATER INCORPORATING RENEWABLE ENERGY OPTION FOR INCREASED EFFICIENCY



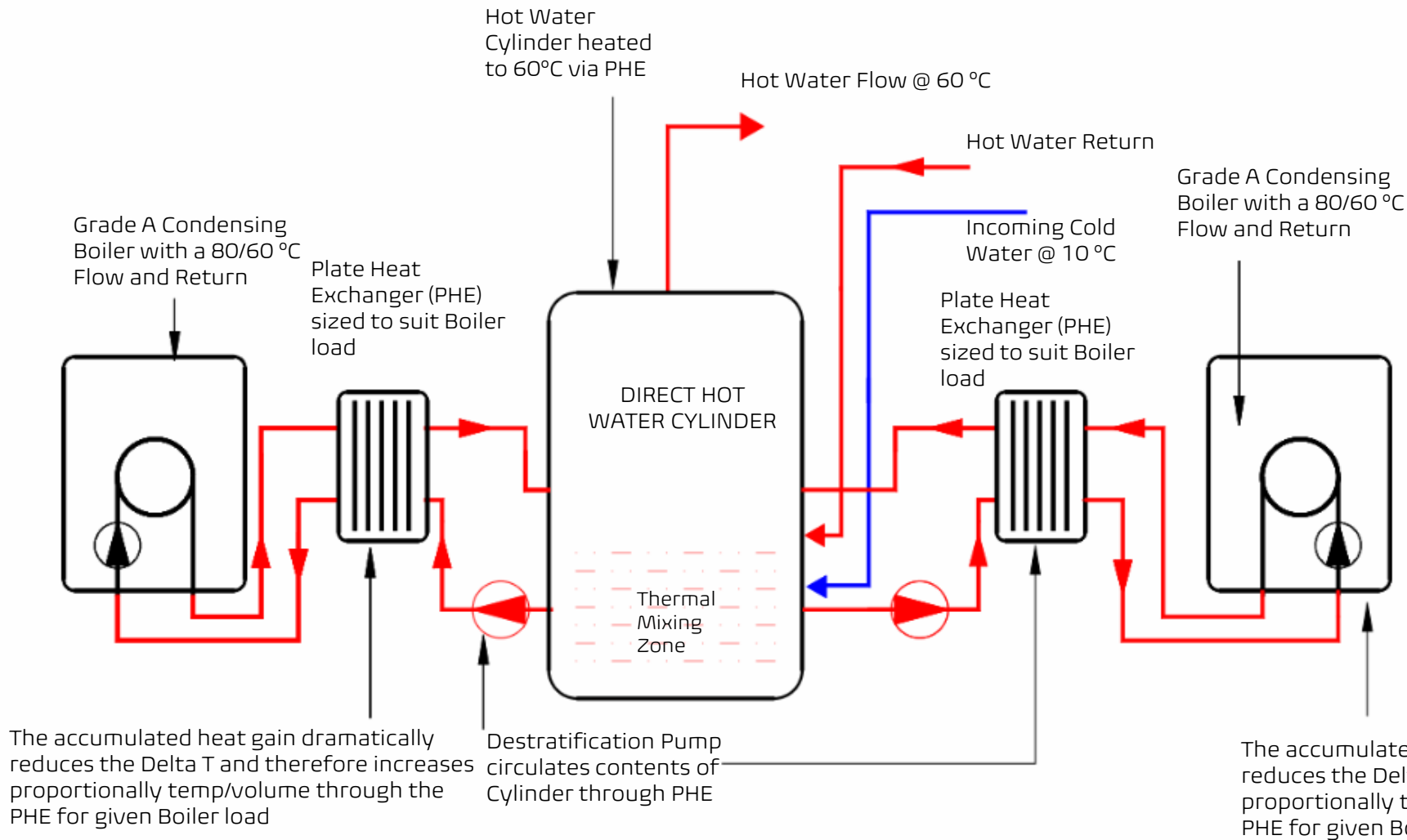
- The decrease of the Delta T by pre-heating the cold feed greatly increases the performance and efficiency of the Water Heater
- The boiler uses less gas to achieve the desired hot water temperature.
- The renewable energy can come from a variety of sources including Heat Pumps, Solar Panels or any renewable source that can be integrated into the design.

BLADE WATER HEATER INCORPORATING RENEWABLE ENERGY OPTION FOR INCREASED EFFICIENCY



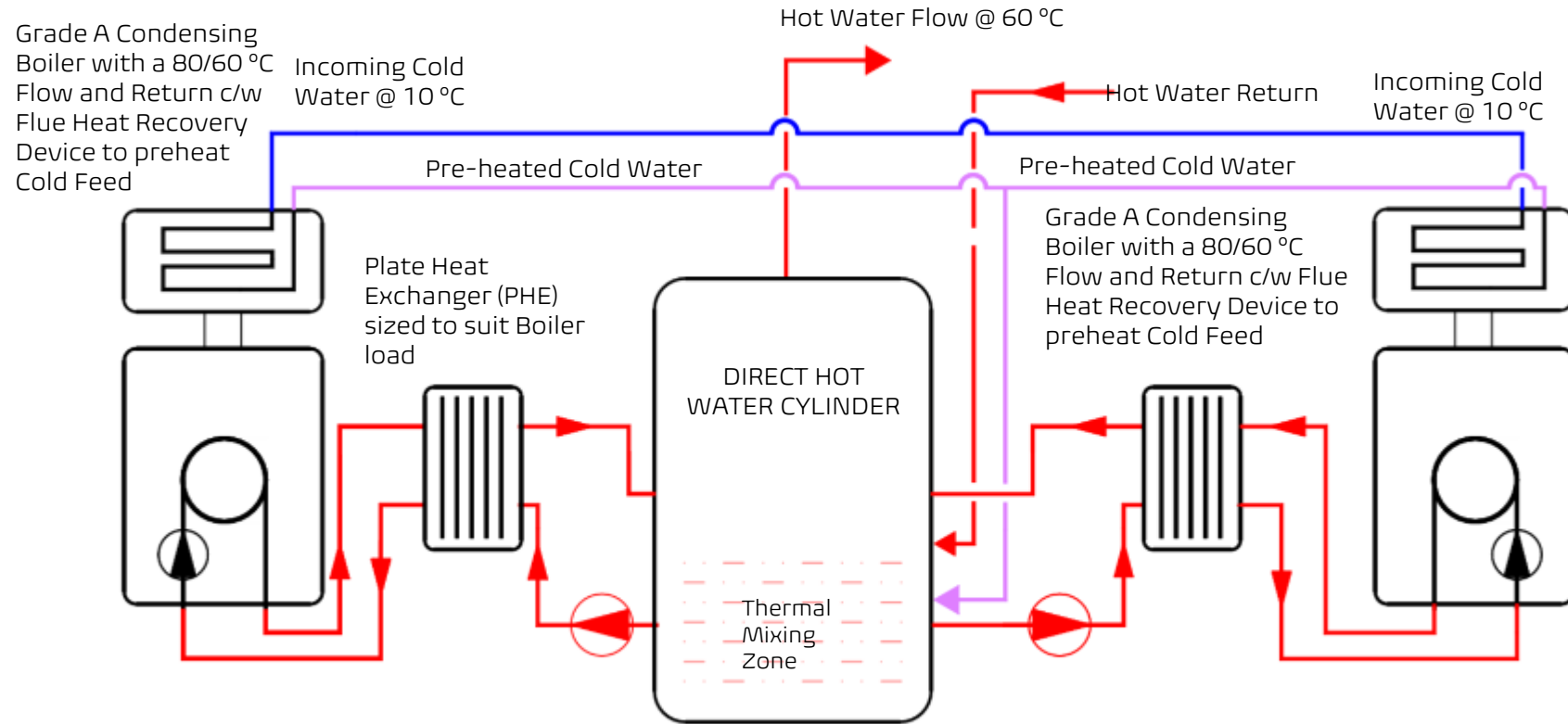
- The decrease of the Delta T by pre-heating the cold feed greatly increases the performance and efficiency of the Water Heater
- The boiler uses less gas to achieve the desired hot water temperature.
- The renewable energy in this example an exhaust air source heat pump has be integrated into the design.

BLADE TWIN WATER HEATER FOR LARGER SYSTEMS or FAULT TOLERANCE



- Blade Twin suitable for clients who require:-
- Higher DHW output
- A larger heat load.
- A degree of fault tolerance

BLADE TWIN PLUS WATER HEATER FOR LARGER SYSTEMS or FAULT TOLERANCE



NOTE
The benefit of the Flue Heat Recovery Device is dramatically increased if used on a system incorporating space heating

- Blade Twin Plus suitable for clients who require:-
- Higher DHW output
- A larger heat load.
- A degree of fault tolerance
- Better energy efficiencies