Rural Energy

INTRODUCTION TO BIOMASS

Rural Energy
INSTALLING BIOMASS SINCE 2002

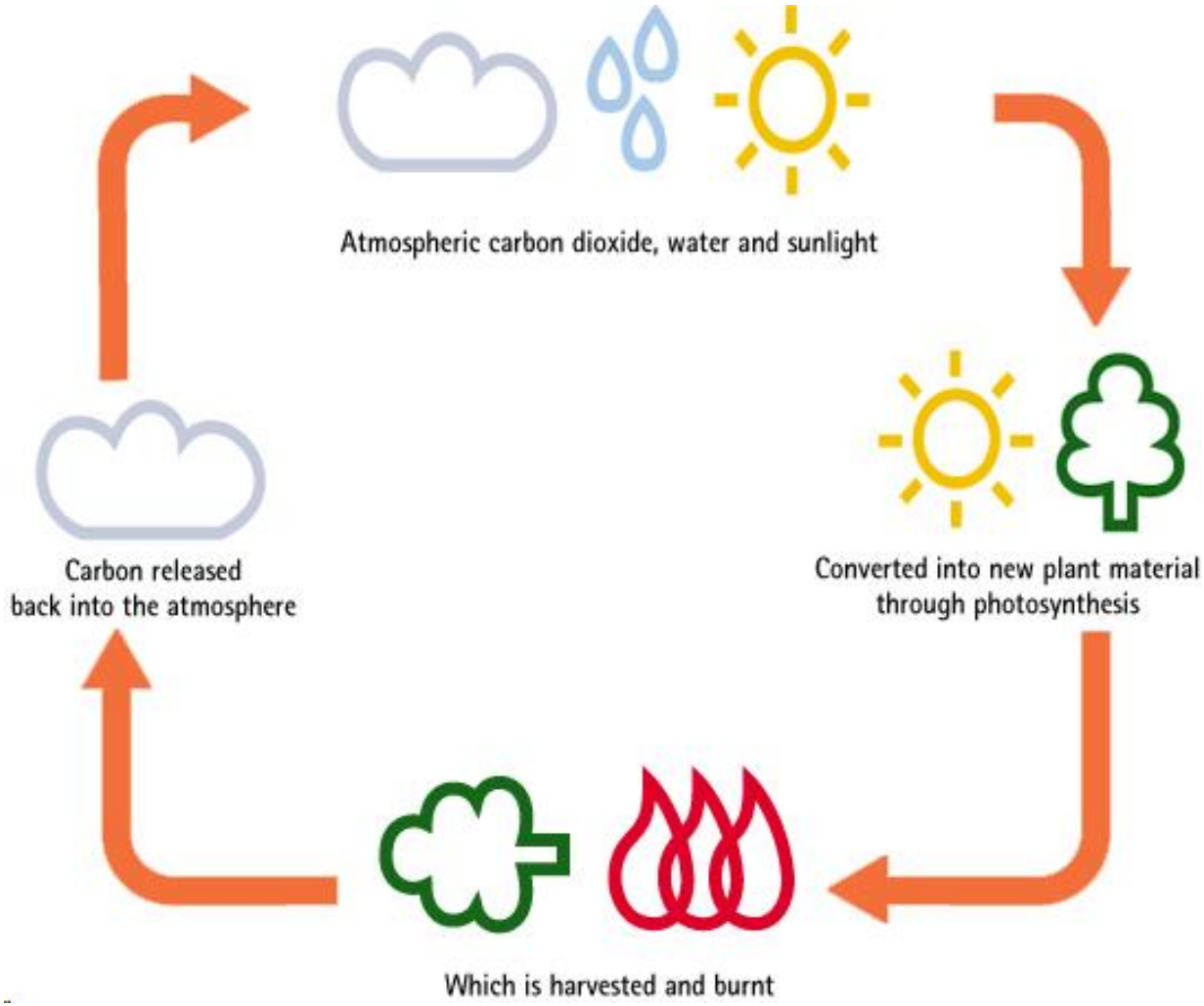
We will cover the following...

- Why choose biomass?
- A basic understanding of biomass fuel types, biomass boilers, fuel stores and biomass heating circuits
- Boilers and their associated fuel feeds/stores up to 1MW
- Different biomass boiler types

CPD CERTIFIED
Construction CPD Certification Service
Collective Mark

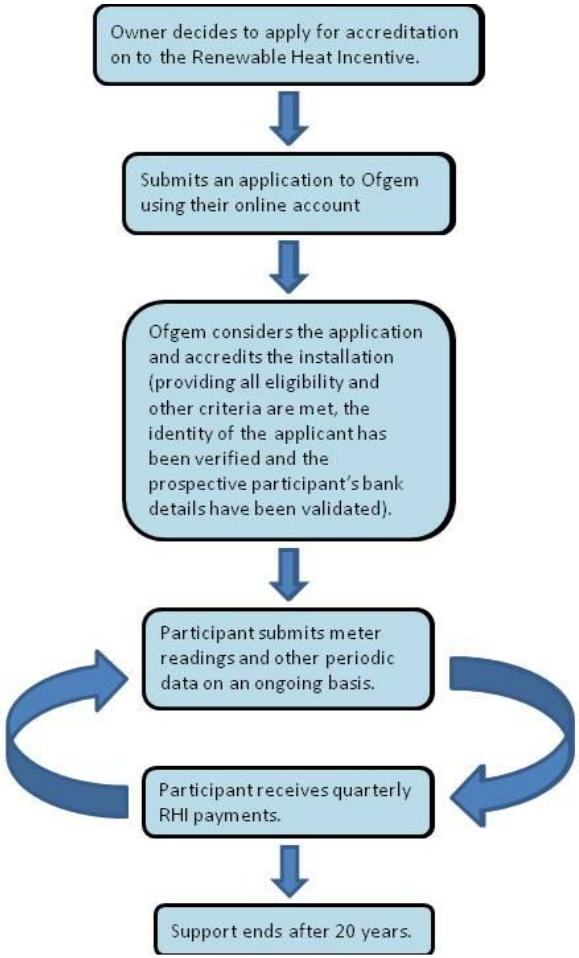
Rural Energy
INSTALLING BIOMASS SINCE 2002

Renewable – Reducing CO_2



Legislation – Renewable Heat Incentive

- The Renewable Heat Incentive (RHI) is a new Government environmental programme that provides financial incentives to increase the uptake of renewable heat.
- Broadly speaking it provides a subsidy, payable for 20 years, to eligible, non-domestic renewable heat generators based in Great Britain.
- Ofgem is responsible for implementing and administering the scheme on behalf of the Department of Energy and Climate Change.
- Currently, the Renewable Heat Incentive is open to parties in the non-domestic sector which includes industrial, commercial, public sector and not-for-profit organisations with eligible installations. A non-domestic installation is a renewable heat unit that supplies large-scale industrial heating right down to small community heating projects.
- http://www.ofgem.gov.uk/e-serve/RHI/Pages/RHI.aspx




FUEL TYPES

Introduction to Fuel

Raw Materials

- Short Rotation Coppice (SRC) and Short Rotation Forestry (SRF)
- Forestry thinning
- Logging residues
- Low quality trees
- Production waste
- Recovered/scrap wood

Final Products

- Wood chip
- Wood pellets
- Logs, off-cuts and briquettes

Commercially Used Fuels

Wood Chip

- G30/G50/W35 complying with ONORM M 7133
- Fuel is available in variable quality, size to G50, moisture to W50

Wood Pellet

- Pellets complying to ONORM M 7135 or DINplus criteria
- Available in 6mm and 8mm sizes

The Importance of Good Design

Critical in delivering an effective solution:

- Space available
- Building location
- Plant room location and access
- Local fuel suppliers
- Project budget
- Boiler output
- Other boilers (gas, oil or secondary biomass)
- Hopper/fuel store design
- Level of maintenance automation
- Level of plant monitoring

The Importance of Good Design

Hopper Size Requirement

- 1kg wood chip @ 30% gives 3.5kWh
- 1kg wood pellets @ 10% gives 4.7kWh

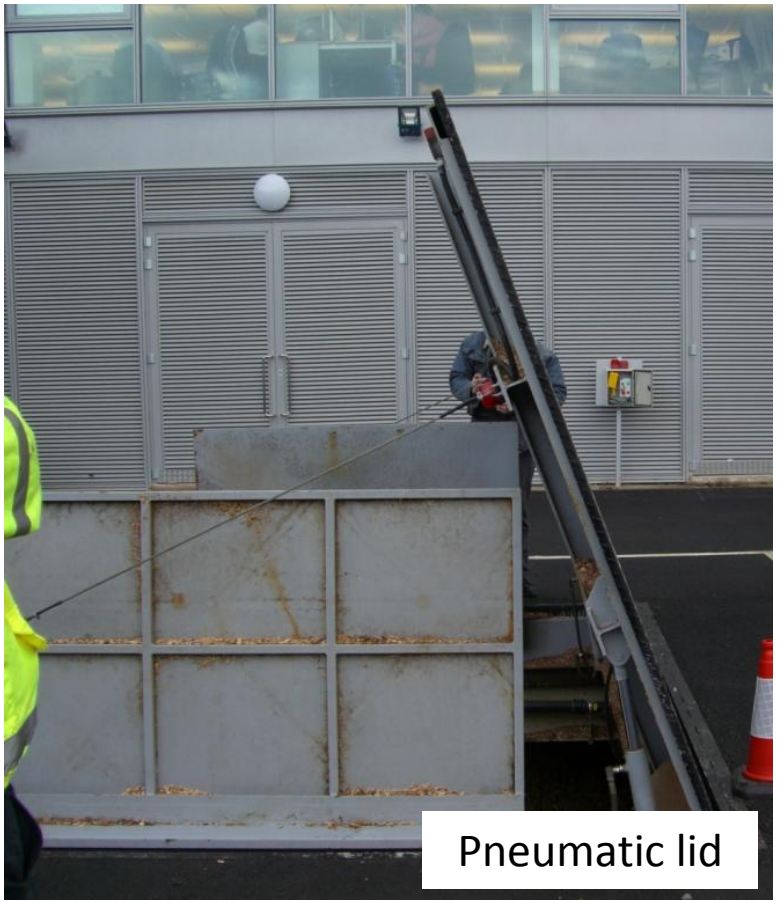
Qty required	Wood chip	Wood pellets
Per day	0.6T 2.8m3	0.4T 0.67m^3
Per week	2.9T 14.1m^3	2.2T 3.4m^3
Per Month	13T 62m^3	9.8T 15m^3
Per Year	117T 560m^3	88T 134m^3

Design Considerations

Hopper Location: Chip

- A negative height differential ideal:
  - Subterranean fuel store
  - Fuel delivery ramp
- Can be on the same level, above or below the plant room
- Filling screws can be used to maximise storage

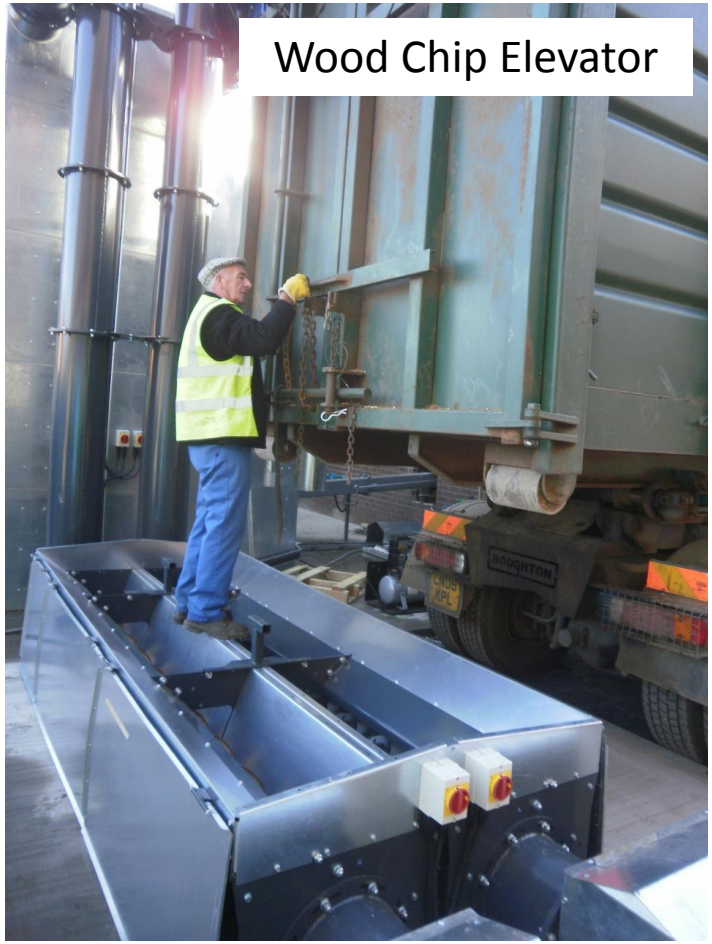
Fuel Store Lids



Above Ground Chip Stores

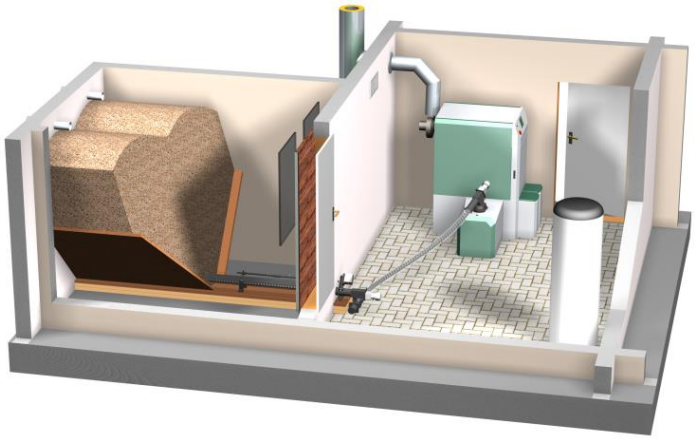

Octagonal


Hook Bins


Wood Chip Elevator

Design Considerations

- **Hopper Location: Pellet**
- Wood pellets are pneumatically delivered
- Can be on the same level, above or below the plant room
- Can be located several meters away from the delivery vehicle
- Doesn't need to be next to an external wall



A v-profile in construction

Pellet Silos

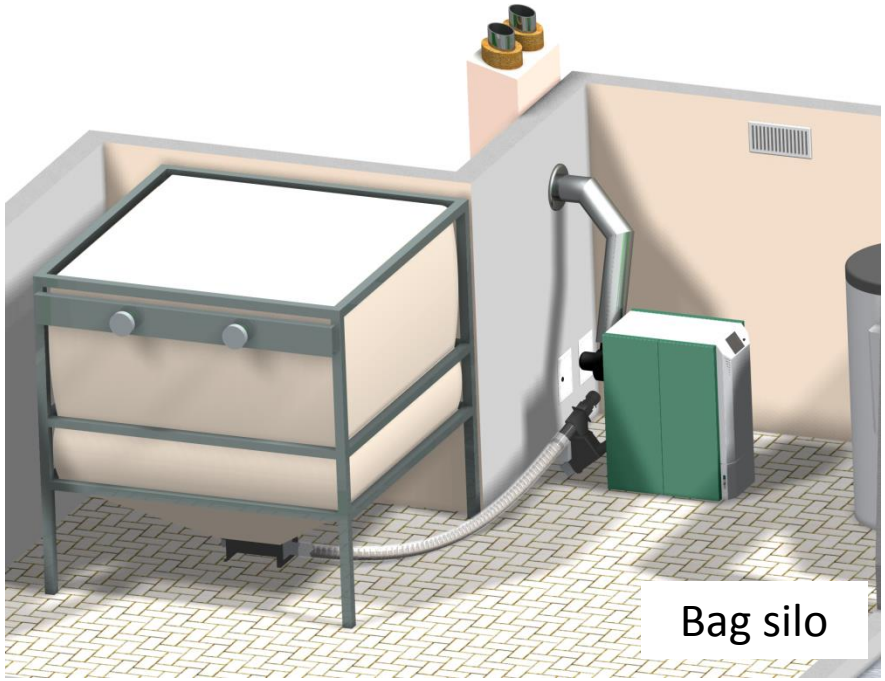

Bespoke


Standard v-profile


Built in v-profile

Standard Silo

Pellet Silos



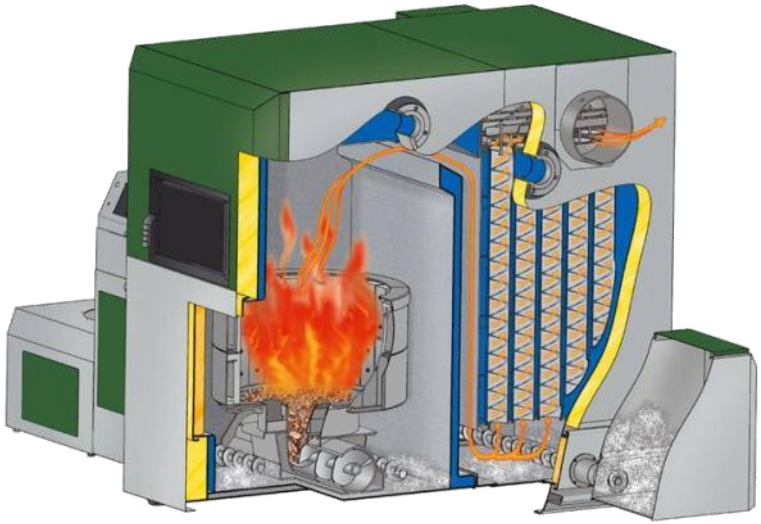
Bag silo

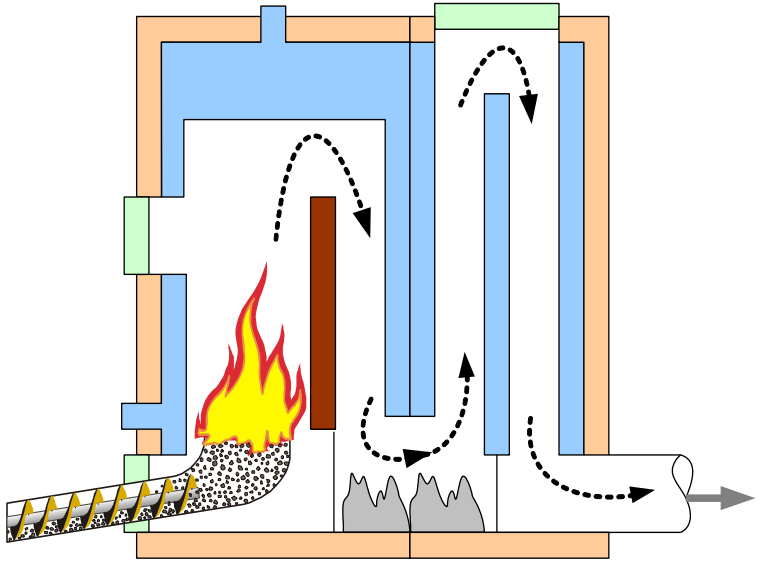
Octagonal fuel store

BOILER TYPES

Underfeed

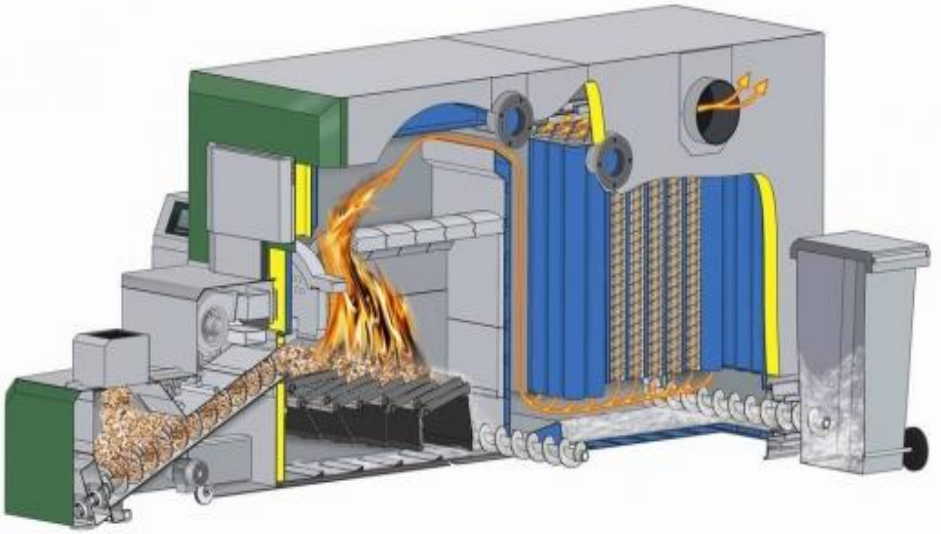
- Typically 60-500kW
- Suited to dry fuels e.g. wood pellets

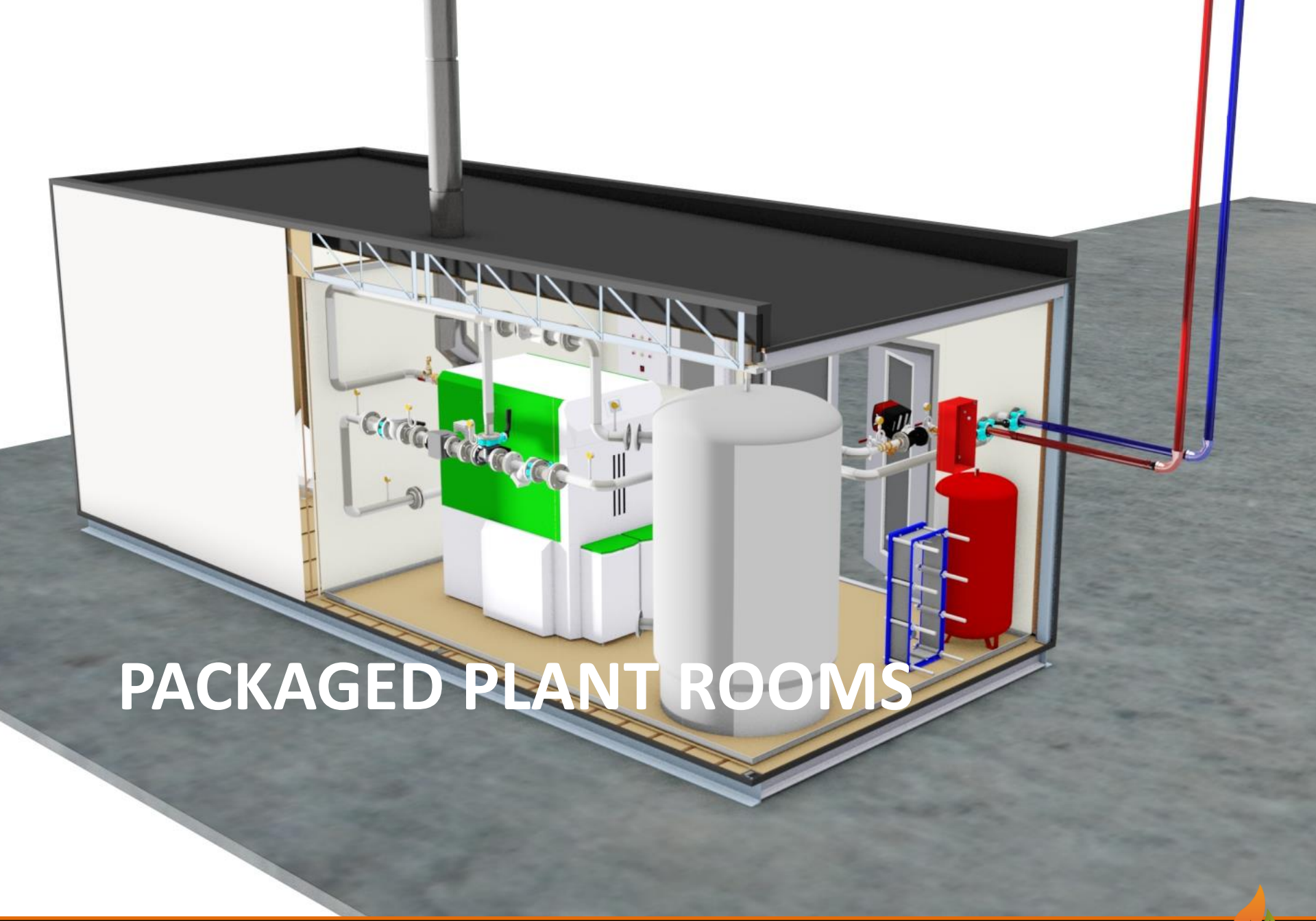




Stepped or Moving Grate

- Typically 150kW+
- Accepts a greater range of fuel specification e.g. varying MC
- Good air/fuel mixing

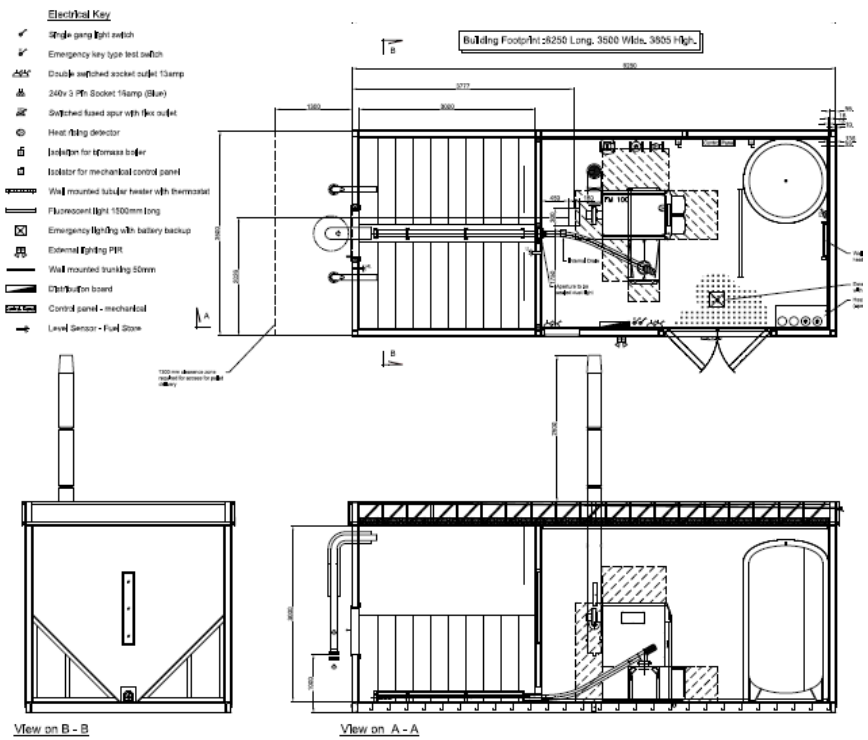


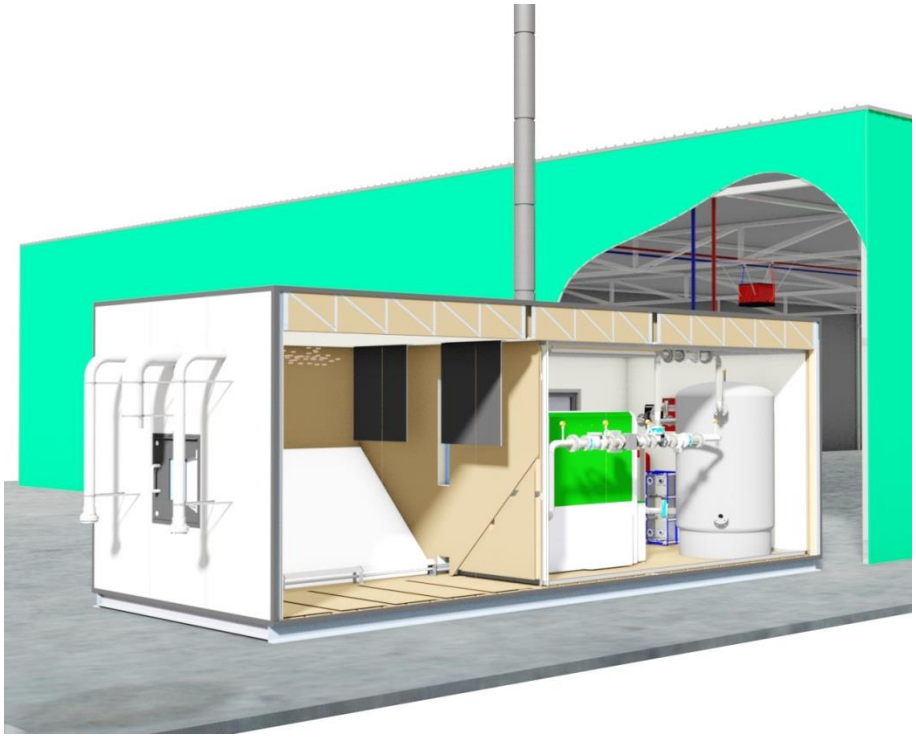

PACKAGED PLANT ROOMS

Why Use a Packaged Solution?

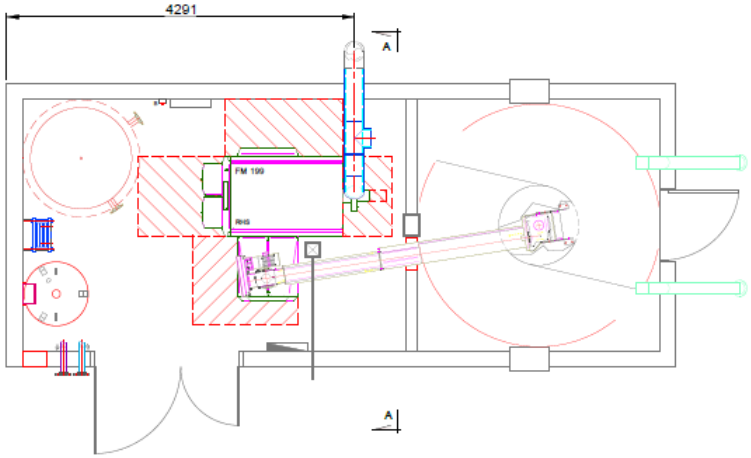
- Offsite construction
  - No hot works
  - Controlled environment
  - On site time minimal
- No Space on site
  - Compact
  - Flexible
  - Cost effective construction
- ESCOs
  - Can be removed from site

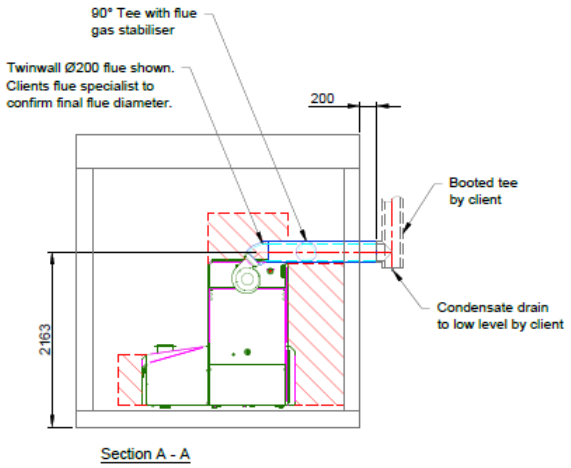
Fuel Store Choices: Wood Pellet





Fuel Store Choices – Internal Chip





Finishes

High Spec Finish

Anti-Vandal Finish

Timber Finish

Internal Finish

QUESTIONS?

Contact Us

- 0203 189 0654
- info@ruralenergy.co.uk

- Who to talk to

REA Renewable Energy Association

WHA Wood Heat Association

Department of Energy & Climate Change

ofgem