



CENTRE FOR EFFICIENT AND
RENEWABLE ENERGY IN BUILDINGS



Kingston University London

RENEWABLE HEAT INCENTIVE

what is it and current issues?

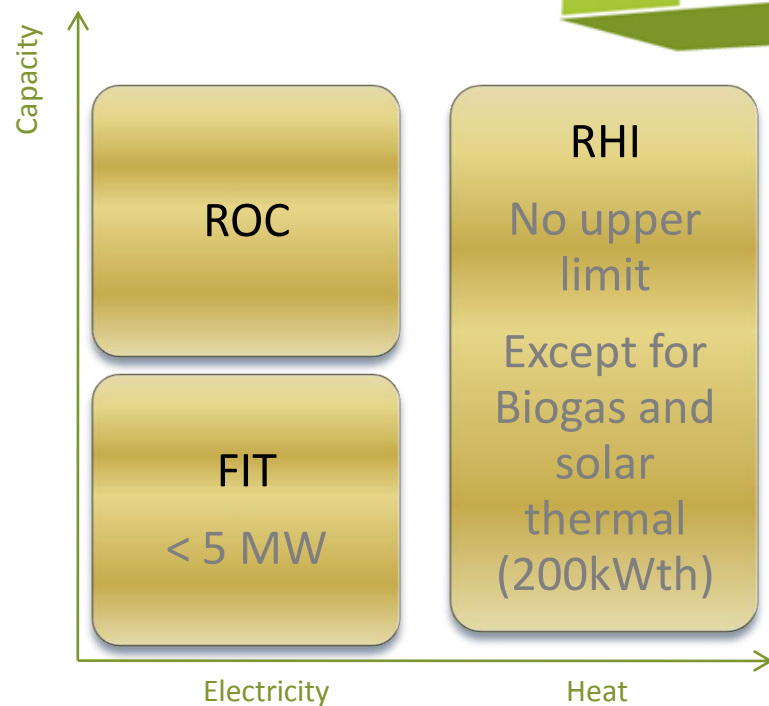
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what is it?

- what
- why
- timeline
- technologies
- eligibility
- mechanism
- who

What is RHI?

- Incentive scheme
- Set up by the government
- Earn fixed p/kWh heat produced
- Option to earn additional p/kWh by exporting heat if connected to district system
- Similar to Feed-in-tariff



Why?

Government

- Meets the government policy to reduce CO₂ emissions

Owner

- As a customer, continuous income stream for about 15-23 years.

Timeline

Phase 1

- Non-domestic
 - Long term tariffs aimed at big consumers
- Domestic
 - Replaces Heat Premium Payment
 - To subsidise capital investment from a fixed £15million budget

July 2011

Phase 2

- Domestic
 - Long term tariffs

Oct 2012

Phase 1 non-domestic

Eligibility

- Approved technology
- Installations of up to and including 45 kWhth will require MCS* for installation and equipment
- Biomass above 1 MWh must report quarterly on feedstock
- Heat meter - Class 2 requirements Annex M1-004 EU Measuring Instruments Directive (MID) 2004



* Microgeneration certification Scheme - <http://www.microgenerationcertification.org/>

Phase 1 non-domestic

Mechanism

- Preliminary accreditation by Ofgem
 - Technology, capacity and tariffs are agreed in principle
- **Owner** reports metered data (not as previously stated deemed data)
- RHI is paid to the **owner** of the heat installation
 - Bioethane – producer
- Quarterly payments over the fixed period

* Office for the gas and electricity markets - <http://www.ofgem.gov.uk>

Phase 1 non-domestic

Technologies

- *Biomass boilers (Including CHP* biomass boilers)*
- *Solar Thermal*
- Ground and Water Source Heat Pumps (heat only, COP >2.9)
- On-site Biogas combustion
- Deep Geothermal
- Energy from Municipal Solid Waste
- Injection of biomethane into the grid

* CHP – RHI on heat produced for running absorption chillers (cooling)

Phase 1 non-domestic

Tariff name	Eligible technology	Eligible sizes	Tariff rate (p/kWh)
Small biomass	Solid biomass; Municipal Solid Waste (incl. CHP)	Less than 200 kWth	<i>Tier 1:</i> 7.6 <i>Tier 2:</i> 1.9
Medium biomass		200 kWth and above; less than 1000 kWth	<i>Tier 1:</i> 4.7 <i>Tier 2:</i> 1.9
Large biomass		1000 kWth and above	2.6
Small ground source	Ground-source heat pumps; Water-source heat pumps; Deep geothermal	Less than 100 kWth	4.3
Large ground source		100 kWth and above	3.0
Solar thermal	Solar thermal	<u>Less than 200 kWth</u>	8.5
Biomethane	Biomethane injection & biogas combustion, except landfill gas	<u>Biomethane all scales;</u> <u>biogas < 200 kWth</u>	6.5

Phase 1 non-domestic

Tariff – Tier 1 and Tier 2 clarification

- Tier 1: calculations assumes that the biomass boiler will as a minimum only be required to run at full capacity only for 15% of the year. This equated to 1,314 peak load hours. Hence time under this hours is at Tier 1.
- Tier 2: is time above 1,314 peak load hours
- To avoid any incentive to generate excess or wasteful heat to purely maximise RHI payments.

Phase 1 non-domestic

Tariff – Tier calculation: example*

A biomass boiler rated at **250kWth** operates for 7 hours/day in winter and 3 hours/day in summer, i.e. **1,825 hours** in total over the year.

This size of boiler is classified as '**Medium Biomass**'.

Therefore, **Tier 1** tariff of **4.7p/kWh** for the first **1,314** hours and the **Tier 2** tariff of **1.9p/kWh** for the other **511** hours

$$\begin{aligned} &1314 \times 250 \times \text{£}0.047 = \text{£}15,439.50 \\ + &511 \times 250 \times \text{£}0.019 = \text{£} 2,427.25 \end{aligned}$$

$$\underline{\text{Total} = \text{£}17,866.75}$$

*<http://www.rhinentive.co.uk>

Phase 1 domestic

Eligibility

- Projects will be fairly distributed across GB
- Constant monitoring of performance to feed back to enhance phase 2
- Good EPC homes
- Owner should be willing to record and report performance
- Incentive will focus on other alternatives to gas

Heat Technology	Payment per installation
Air source heat pumps	£850
Biomass boilers	£950
Ground source heat pumps	£1,250
Solar water heating	£300

Phase 2 domestic

Tariff rate - proposed

Technology	Scale	Tariffs (pence/kWh)	Tariff lifetime (years)
Small installations			
Solid biomass	Up to 45kW	9	15
Biodiesel (restricted use)	Up to 45kW	6.5	15
Biogas on-site combustion	Up to 45kW	5.5	10
Ground source heat pumps	Up to 45kW	7	23
Air source heat pumps	Up to 45kW	7.5	18
Solar thermal	Up to 20kW	18	20
Medium installations			
Solid biomass	45kW-500kW	6.5	15
Biogas on-site combustion	45kW-200kW	5.5	10
Ground source heat pumps	45kW-350kW	5.5	20
Air source heat pumps	45kW-350kW	2	20
Solar thermal	20kW-100kW	17	20
Large installations			
Solid biomass	500kW and above	1.6-2.5	15
Ground source heat pumps	350kW and above	1.5	20
Biomethane injection	All scales	4	15

Who reaps the benefit?

- Owner is defined as “the individual who paid for the installation of the equipment”
 - In the case of biomethane, it is the producer!
- “individual in possession of the plant”
 - Hire purchase agreement
 - Conditional sale agreement
 - Or similar arrangements
- Owner is not the operator scenario
 - If the owner has retained rights and liability

current issues?

- are there any?

clarity?

- technology
- tariffs and tiers
- metering
- ownership

Technologies

Considered for phase 2

- Air source heat pumps
- Direct air heating (kilns)
- Solar thermal >200 kW
- Biogas >200 kW
- Bioliquids

Excluded

- Co-firing of biomass with fossil fuel
- Exhaust air heat pumps
- Transpired solar thermal panels
- Fossil fueled CHP
- Waste heat from fossil fuel

Tariff and Tiers

- No published tariff for
 - On-site Biogas combustion
 - Deep Geothermal
 - Energy from Municipal Solid Waste
- Tier calculations for quarterly metered billing?

Meter

- Payment will be based on metered heat – not deemed as originally proposed
- Getting the meter right:
 - Heat meters
 - Measurement unit in MWh or kWh
 - Calculation based on flow rate and temperature difference
 - Installation must be correct and properly commissioned (cases exist of poorly sited flow meters and temperature sensors)

Meter

- Getting the meter right: *con...*
 - For glycol/water mix systems (e.g. solar thermal or heat pumps) meters are calibrated according to concentrations
 - Important to get the specification right
 - QA
 - Class 2 requirements Annex M1-004 EU Measuring Instruments Directive (MID) 2004
 - In some circumstances, independent site report by competent person

Ownership

examples

Examples

District heating scheme

- The owner of the equipment could benefit from the RHI provided:
- The heat produced is from a renewable heat equipment
- The scheme does not already benefit from ROC

Commercial building

- Landlord (owner) benefits from RHI even if he leases out the maintenance contract to third party.
- i.e if the owner has taken rights and liability.

Examples

CEREB

- Solar thermal plant and GSHP plant
- Funded by LDA & HEFCE
- Equipments are owned by LSBU
- Eligibility?
- No – LSBU did not buy the system

Multi residential

- Owner could be social landlords and housing associations
- If installing renewable heating equipment in individual households then
- **NO**
- If installing as a central plant or district system then
- **YES**

Reference

- <http://www.rhincentive.co.uk/>
- <http://www.decc.gov.uk>
- [Renewable Heat Incentive March 2011, DECC](#)
- [Renewable Heat Incentive Scheme: frequently asked questions](#)