



# Solar hot water in the East of England

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# Energy Saving Trust in the East

- Microgen Co-ordination
  - Zero Carbon Britain
  - Supply chain development and support
- ESTac's - Climate Energy
  - Norfolk, Suffolk & Cambridgeshire
  - Hertfordshire, Bedfordshire and Essex
  - Act on CO<sub>2</sub> 0800 512 012 free phone line
  - Energy, Transport, Water and Waste

# Why use solar technologies?



- Sun's radiation
- 60% compared to equator
- Irradiation on 1 m<sup>2</sup> (kWh)
- 1,200 to 900 kWh
- Domestic roof angles

# Different solar technologies?

- Solar thermal hot water panels
- Photo voltaic arrays
- Passive solar design
- Active solar heating



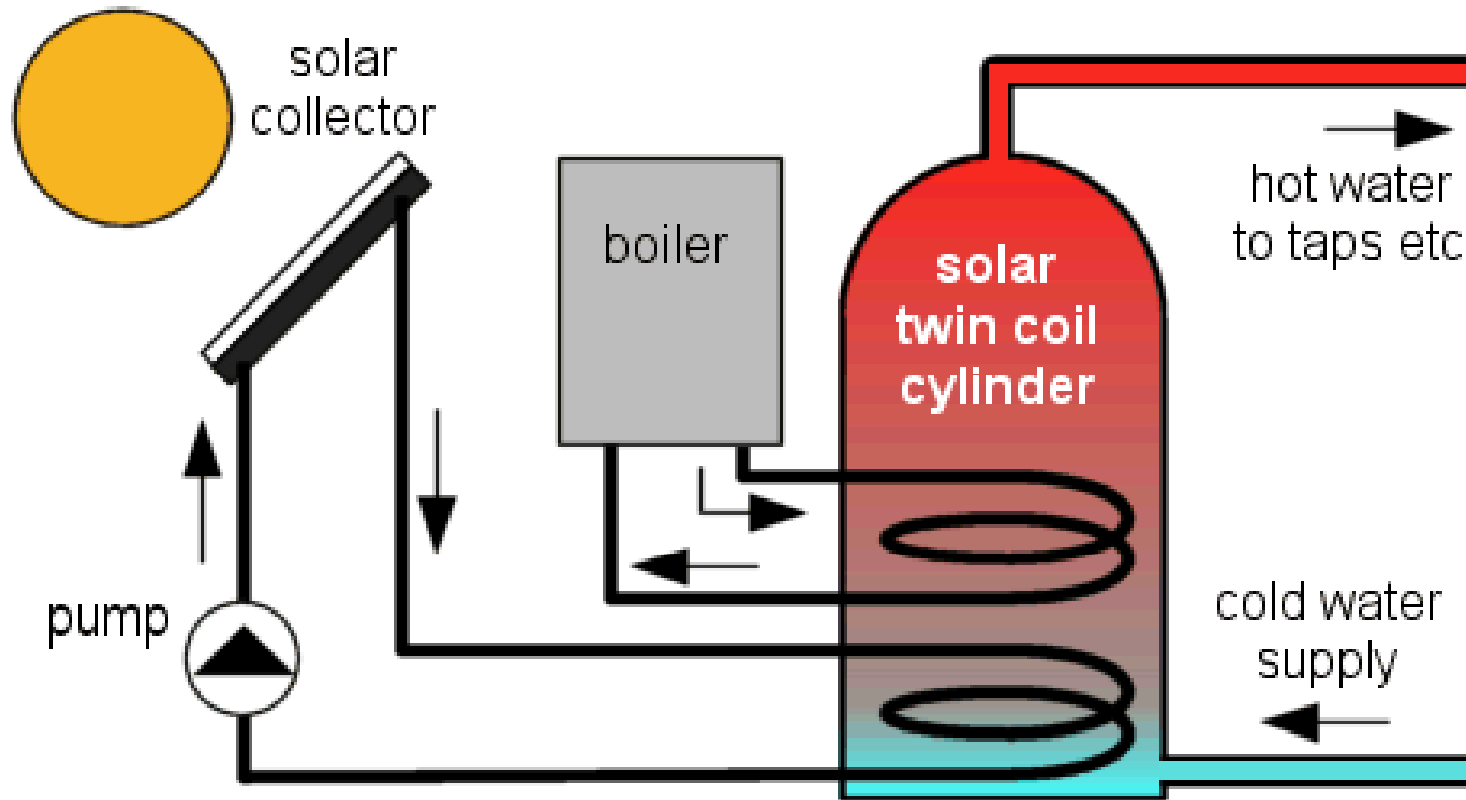
# What is solar thermal?

- Solar thermal hot water not solar water heating
- Hot water production in UK = 8%
- Demand constant throughout the year
- Useful contribution in non optimal months
- Two types - Fully filled and Drainback
- Direct system (open loop) - *freezing*
  - Water used at the taps is circulated through the system
- Indirect system (closed loop) - *antifreeze solution*
  - Heat transfer fluid is used instead

# System Components

- Solar Collectors - flat plate panels or evacuated tubes
- Hot water tank - extra heat exchanger
- Control Set - Control Panel, Sensors, Pump
- Safety Set - Pressure release valves, Expansion vessel
- Connections - Copper or stainless steel flexi-pipes
- (A-frame - for flat roof installations)

# Typical System



# How it works

- Converts solar radiation into hot water
- Heating fluid and anti-freeze
- Pumped to heat exchanger
- Hot water to cylinder then to the taps
- Summer - direct hot water
- Winter - mains water pre-heater

# Solar collectors

- Evacuated tubes
  - Direct flow
  - Heat pipe (vertical only)
- Unglazed plastic collectors (uninsulated)
- Flat plate



# Building specific

- Estimated hot water usage
- The percentage of solar contribution to the annual hot water load
- Geographical location
- Orientation
- Inclination of roof
- Type of collector
- Minimum  $\frac{3}{4}$  m<sup>2</sup> per person

# Savings & Costs

- Manufacturers savings 500 kWh per m<sup>2</sup>
- At least 50% annual hot water needs
- More for electrically heated homes
- Basic vented system £3,000 to £5,000
- Plus access costs
- EST field trials of 100 properties nationally

# Maintenance

- Virtually no routine maintenance
- No annual service
- No panel cleaning
- Control panel diagnostics & warnings
- Prolonged non-use in summer - fail safes

# Quality and Standards

- MCS
  - Microgeneration Certification Scheme
- Installation companies and products
- Access to the proposed RHI payments
- REAL Assurance
- Trading Standards - OFT schemes



# Renewable Heat Incentive

- Act of Parliament, Consultation ended, still being developed
- Scheme in place from June 2011 & grandfathered
- 12% ROI all technologies except solar thermal @ 6%
- Deemed on small scale (calculated not metered)
- Applies to New Build and Retrofit. Audited by Ofgem
- Payments yearly <45kW & quarterly >45kW
- Proposed back-dated to 15th July 2009 if certificated installer
- MCS up to 45 kW

# Proposed RHI payment

Technology	Scale	Tariffs (pence/kWh)	Tariff lifetime (years)
	Small	Installations	
Solar thermal	Up to 45kW	18	20
	Medium	Installations	
Solar thermal	45kW - 500kW	17	20

- Typical system 3 m<sup>2</sup> = 1,500 kWh deemed output
- 1,500 x £0.18 = £270
- Indicative heating fuel saving = £50
- Total annual saving = £320
- Assumed payback = 11 years

# Domestic market

LCBP grants awarded - Apr to Nov 2009

Technology	Total
Air Source Heat Pump	37
Ground Source Heat Pump	30
Solar Photovoltaic	86
Solar Thermal Hot Water	135
Wind Turbine	12
Wood Fuelled Boiler System	8
Totals	308

# Frequently asked questions?

- Will I need planning permission?
- Will I need Building Regulation sign off?
- Will the panels damage my roof?
- Which type is best?
- Do they work with combination boilers?

Thanks

Questions?