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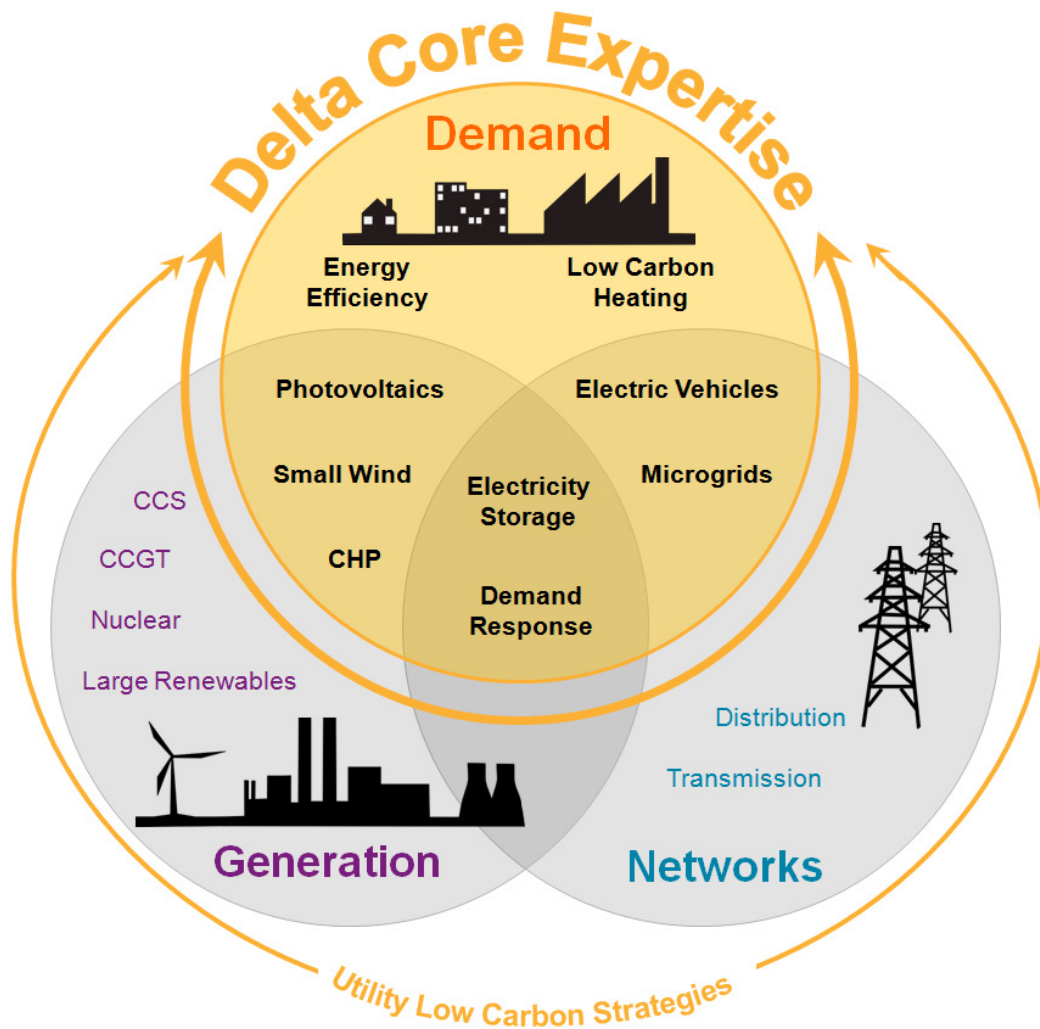
Retrofitting Heat Pumps

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2nd March 2011, Ecobuild

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Market expertise

Strategy & tactics

Clients

- ▶ Energy companies
- ▶ Manufacturers
- ▶ Finance sector
- ▶ Policy makers

Research products

- ▶ Micro-CHP Service
- ▶ Innovation Monitor Series
 - ▶ Residential ASHPs
- ▶ Utility energy services multi-client study
- ▶ Other
 - ▶ CHP Policy & Markets
 - ▶ Electric Vehicles
 - ▶ Electricity Storage

Consultancy

- ▶ Strategy development
- ▶ Market assessments, forecasts & tactics
- ▶ Technology assessment
- ▶ Innovation
- ▶ Policy analysis & assessment

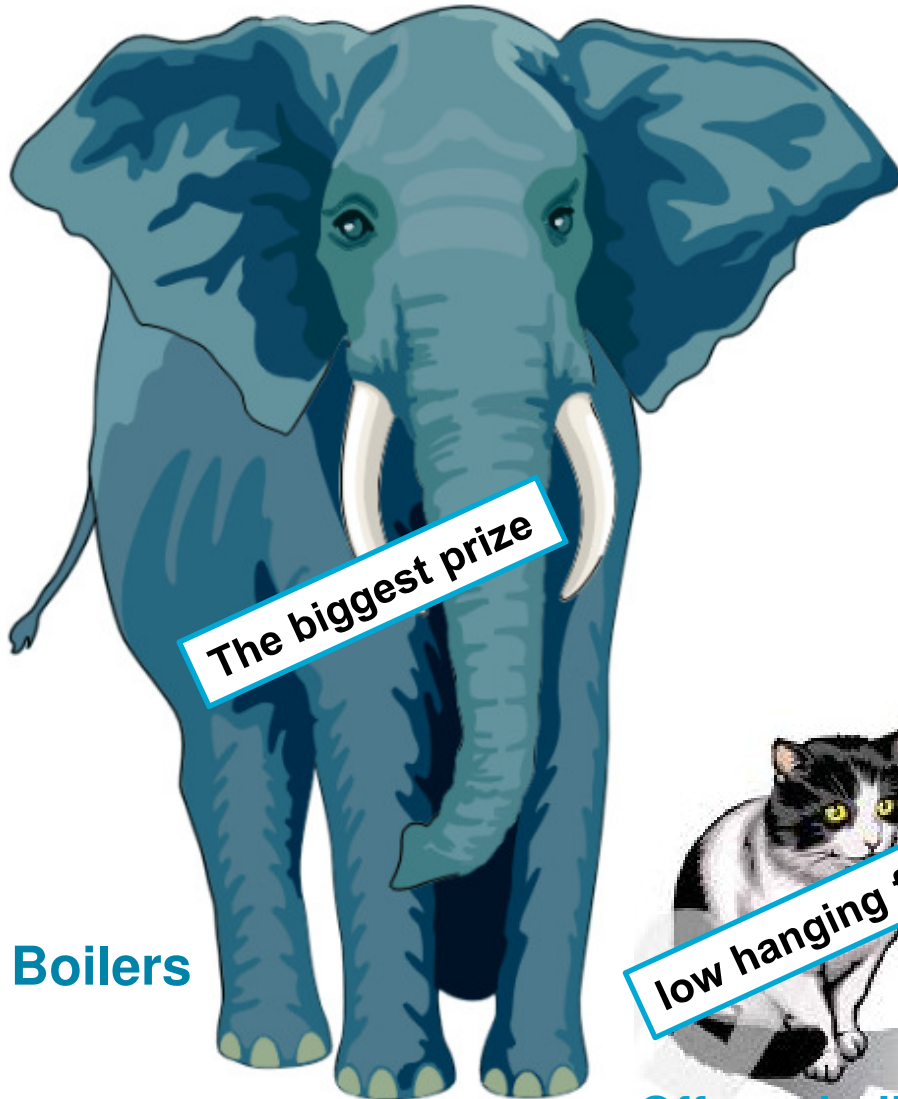
Summits

- ▶ 'Micro-CHP in Europe'
- ▶ 'Energy Services in Europe'
- ▶ 'Electricity Storage in Europe'

- ▶ The retrofit opportunity
- ▶ The cornerstones of a strong retrofit market
- ▶ Success in other markets?
- ▶ Conclusions

- ▶ **The retrofit opportunity**
- ▶ The cornerstones of a strong retrofit market
- ▶ Success in other markets?
- ▶ Conclusions

The retrofit opportunity: Current UK market



The biggest prize

Boilers

Boilers

- 1.6 million boiler replacements / yr

Heat Pumps

- 14,000 heat pump installations / yr

Off-gas boilers

- ~150,000 replacements / yr



low hanging fruit

Off-gas boilers



Heat Pumps



Retrofit HPs

- ▶ The retrofit opportunity
- ▶ **The cornerstones of a strong retrofit market**
- ▶ Success in other markets?
- ▶ Conclusions

Cornerstones of a strong retrofit market

(1) Maximise
HP system
performance

Quality

**Right
System**

(2) The right
products for
retrofit

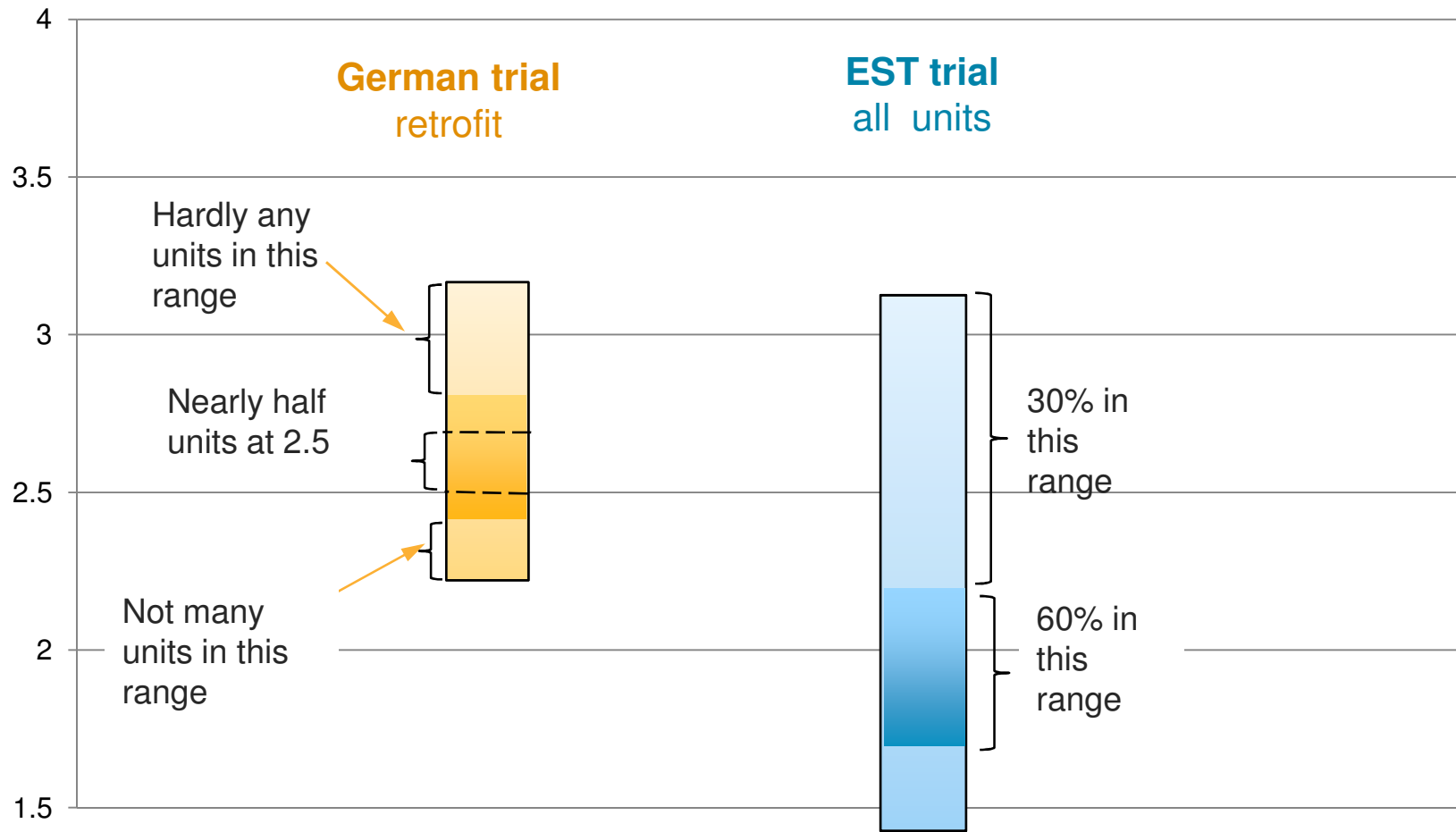
Marketing

**Customer
Proposition**

(3) Strong
economic
proposition

EST trial results compared to German trial – retrofit units

ASHP



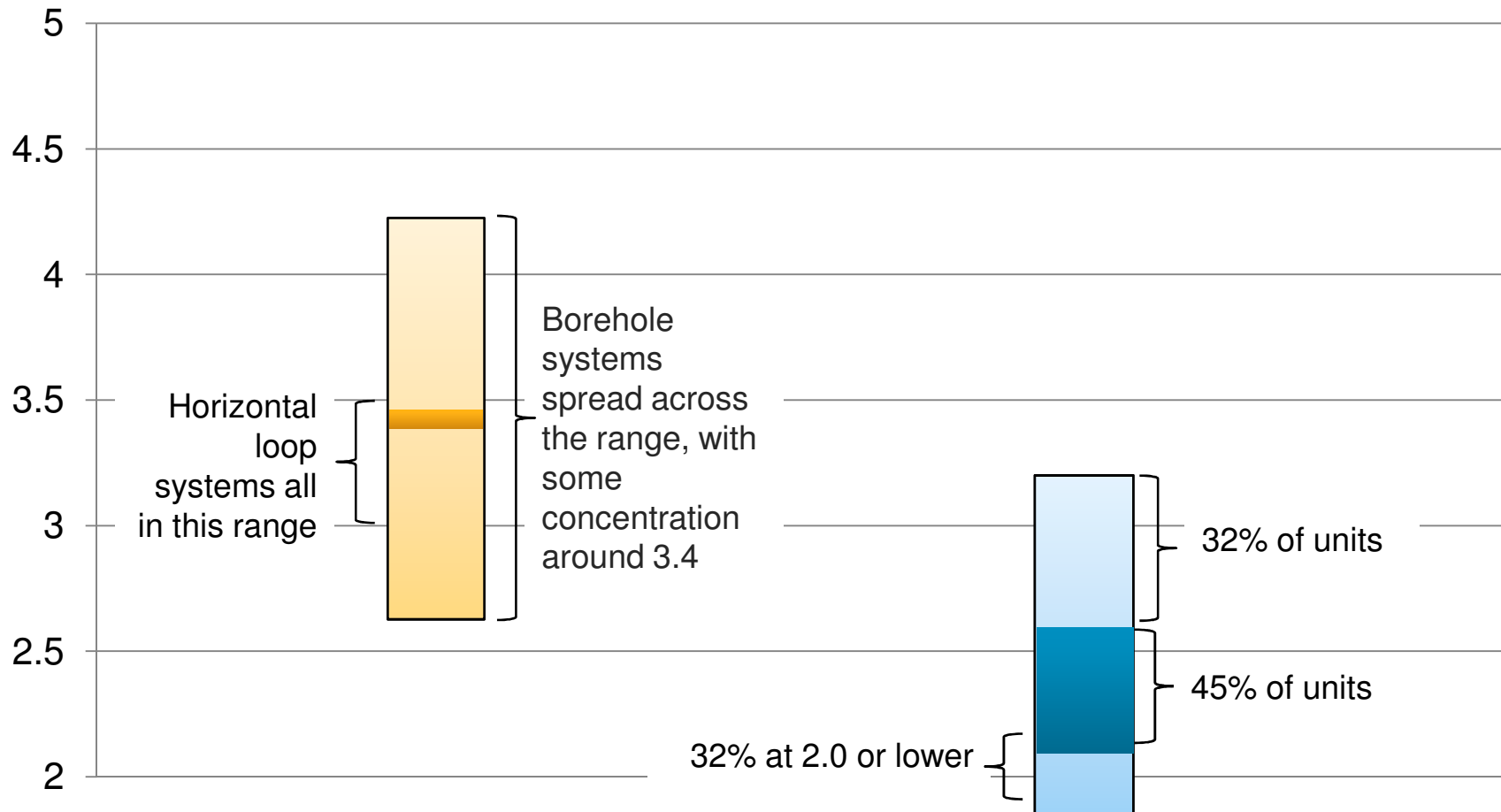
Fraunhofer ISE, 2010, EST, 2010

EST trial results compared to German trial – retrofit units

GSHP

German trial retrofit

EST trial all units



Fraunhofer ISE, 2010, EST, 2010

Cornerstones of a strong retrofit market

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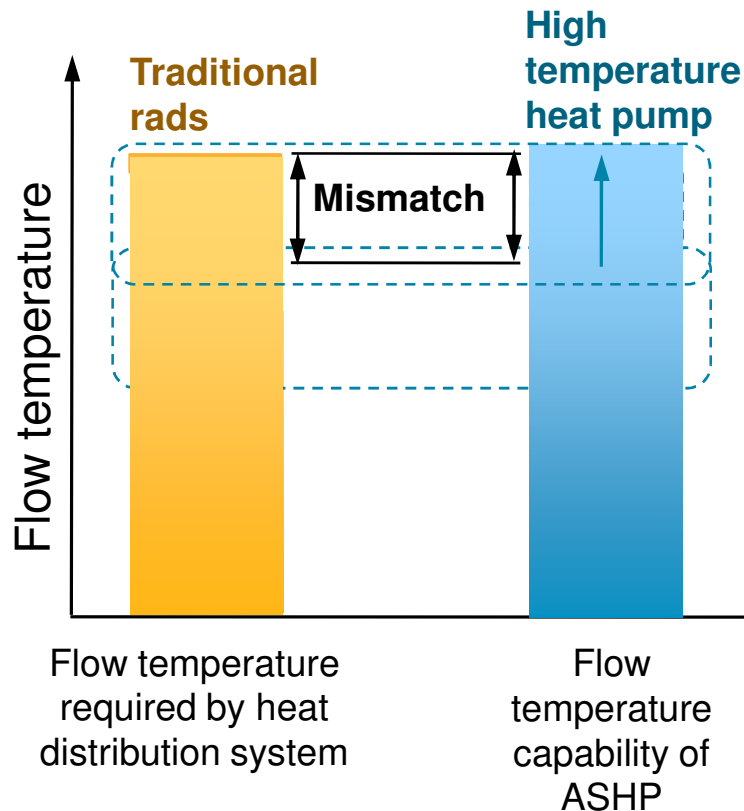
Technology: Development of HP systems suitable for retrofit

Solution 1:

Replace radiators, &/or development of lower temperature rads

Solution 2:

Development of heat pumps which can reach high flow temperatures...



High temperature Heat Pumps



Key challenges:

- ▶ Cost
- ▶ Efficiency at high flow temperatures

CO₂ heat pumps

Key challenges:



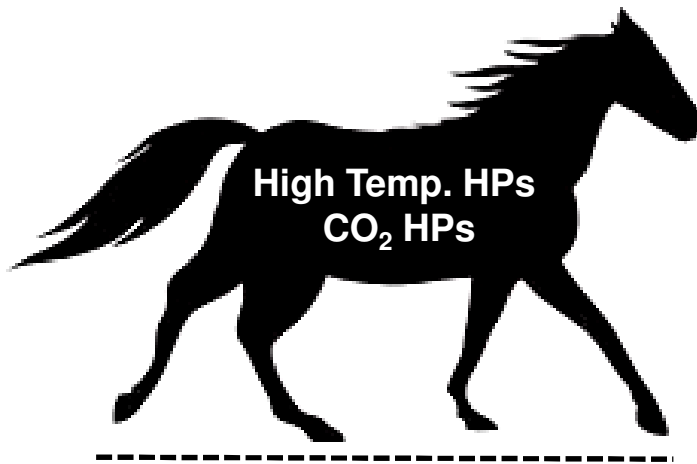
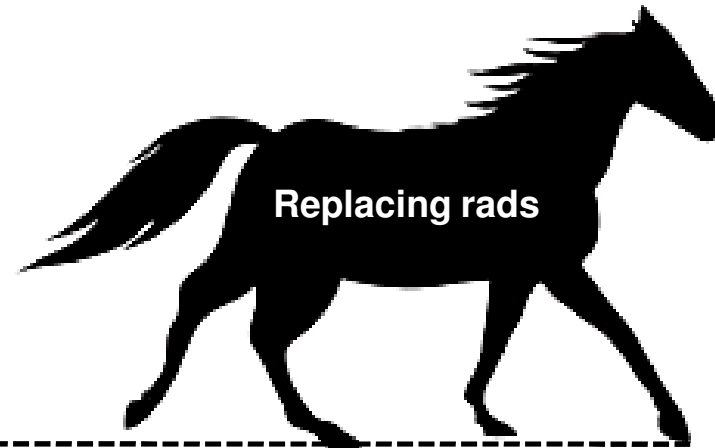
- ▶ Testing & accreditation
- ▶ Cost
- ▶ Efficiency with space heating

Which technologies can solve the retrofit challenge?

The current market:

Low temperature rads + ordinary heat pumps lead the way

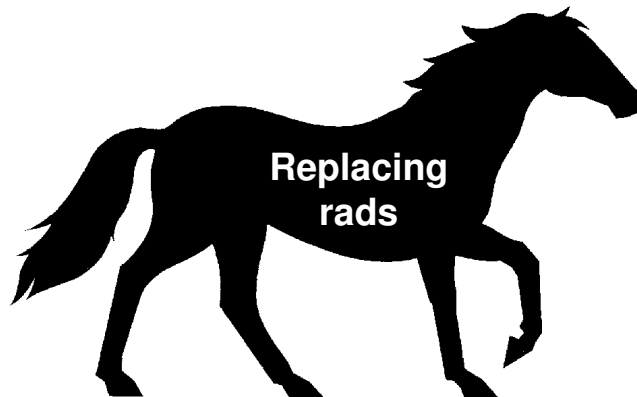
- ▶ They are the cheapest option



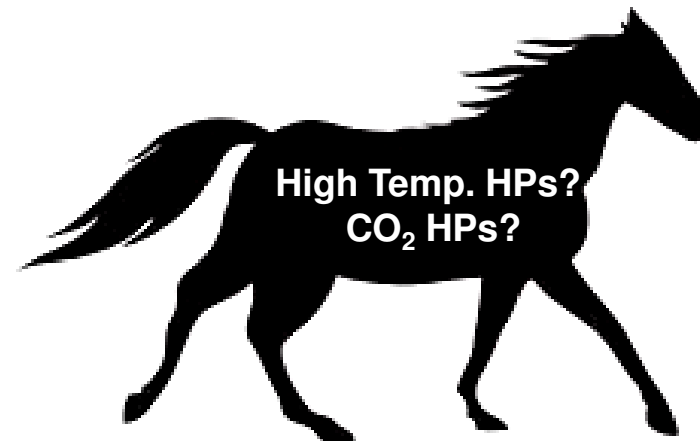
Which technologies can solve the retrofit challenge?

The future market:

Technology innovation is bringing new products to the market, which have the potential to unlock the retrofit potential.



- ▶ Costs must come down
- ▶ Accreditations & testing must be complete
- ▶ Efficiencies must be maximised



Cornerstones of a strong retrofit market

(1) Maximise
HP system
performance

Quality

**Right
System**

(2) The right
system for
retrofit

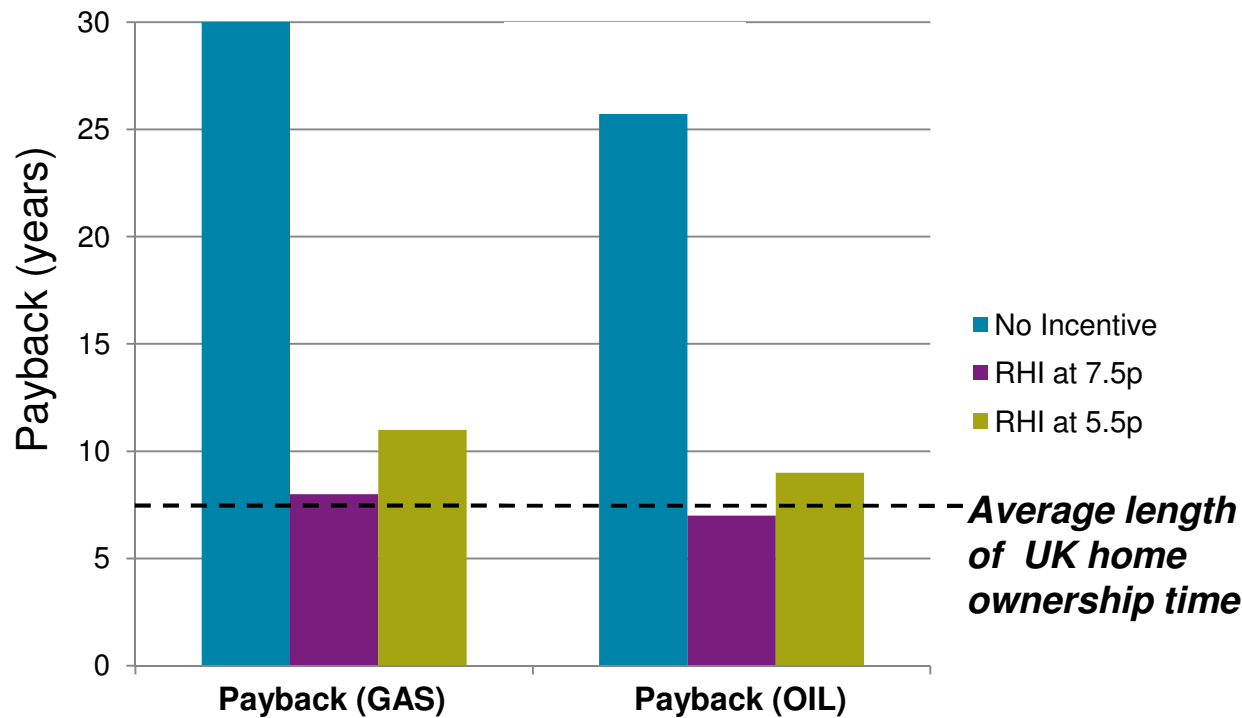
Marketing

**Customer
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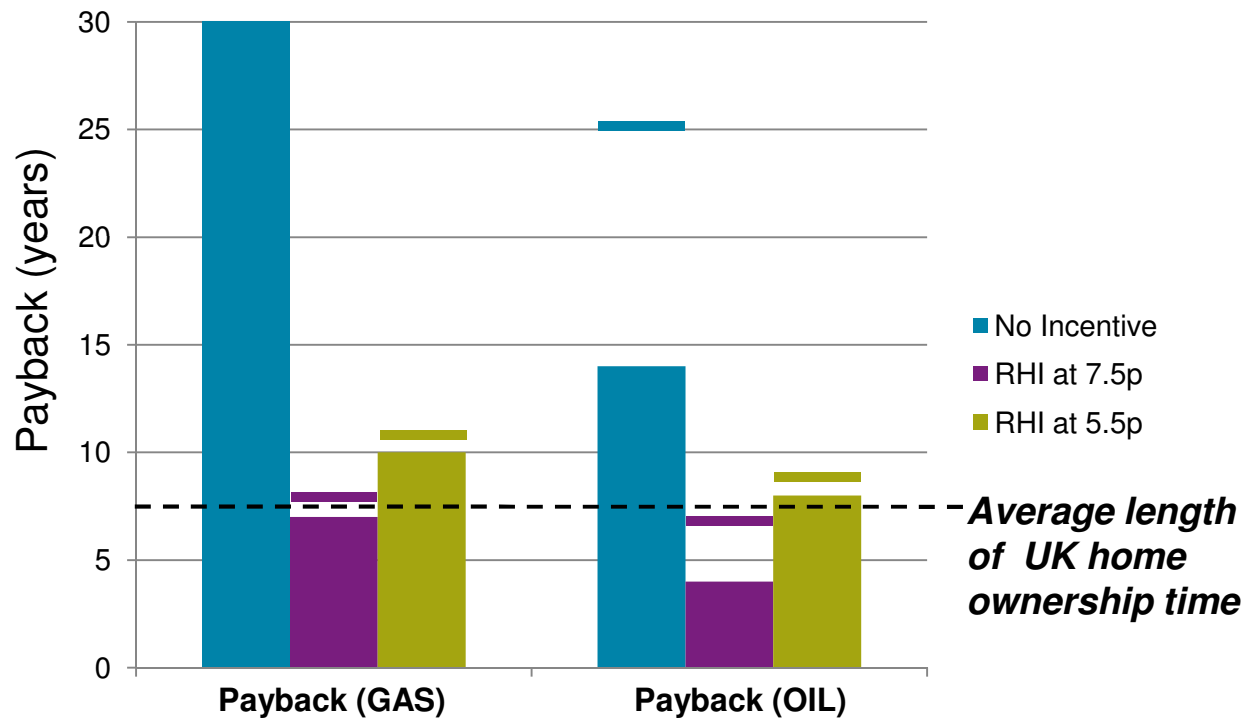
The impact of the RHI: Simple payback for heat pumps vs gas and oil

SPF of 2.5



The impact of the RHI: Simple payback for heat pumps vs gas and oil

Increase SPF to 3: Increasing HP efficiency by 0.5 significantly reduces payback times



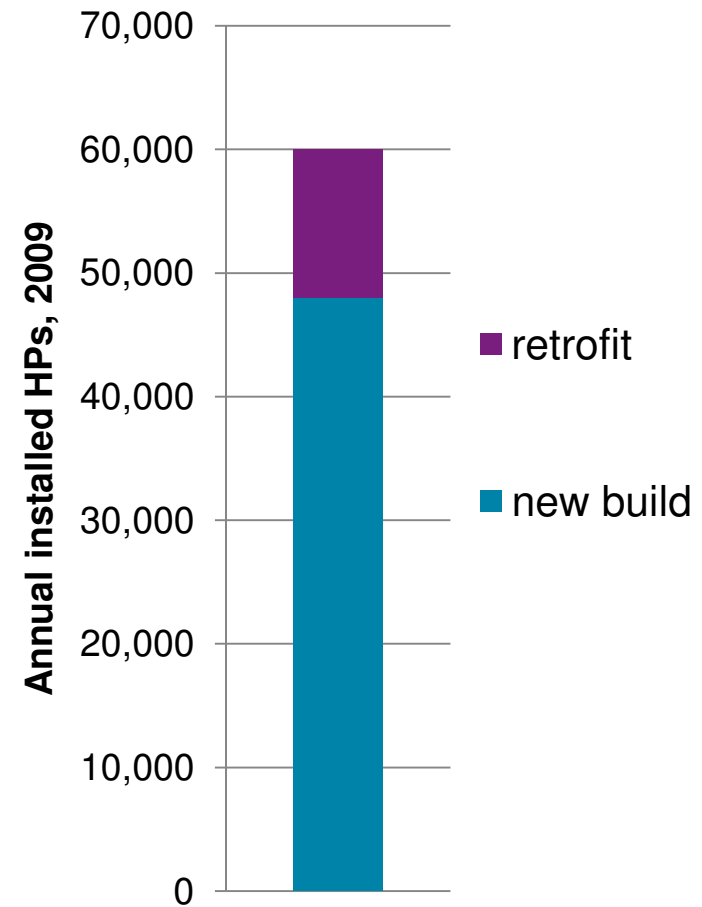
- ▶ The retrofit opportunity
- ▶ The cornerstones of a strong retrofit market
- ▶ **Success in other markets?**
- ▶ Conclusions

Learning from other markets



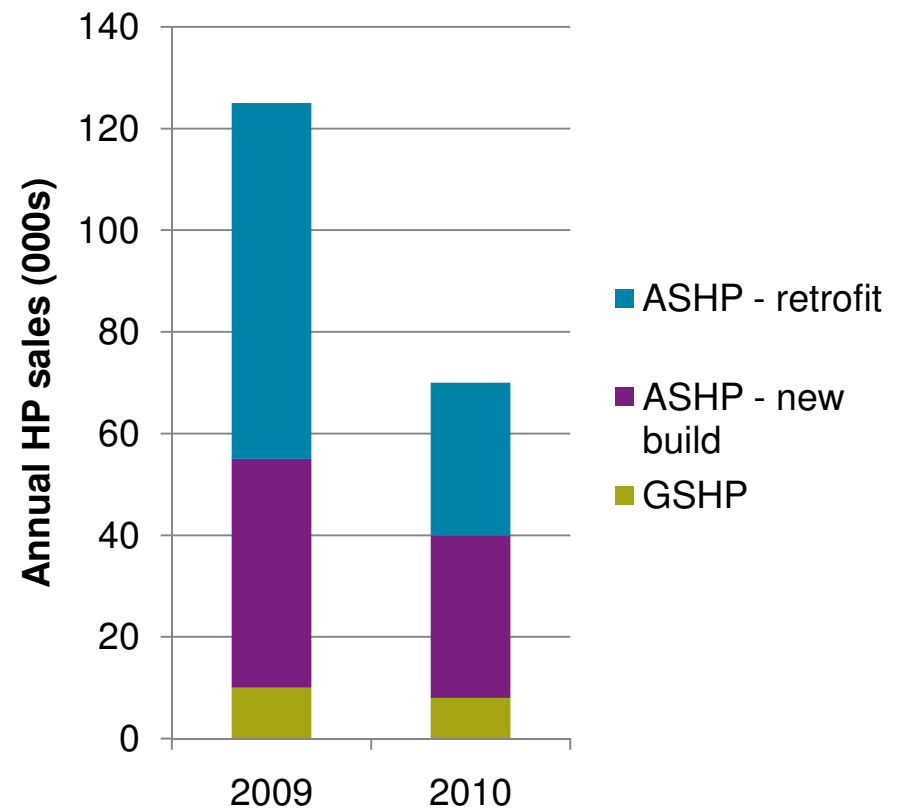


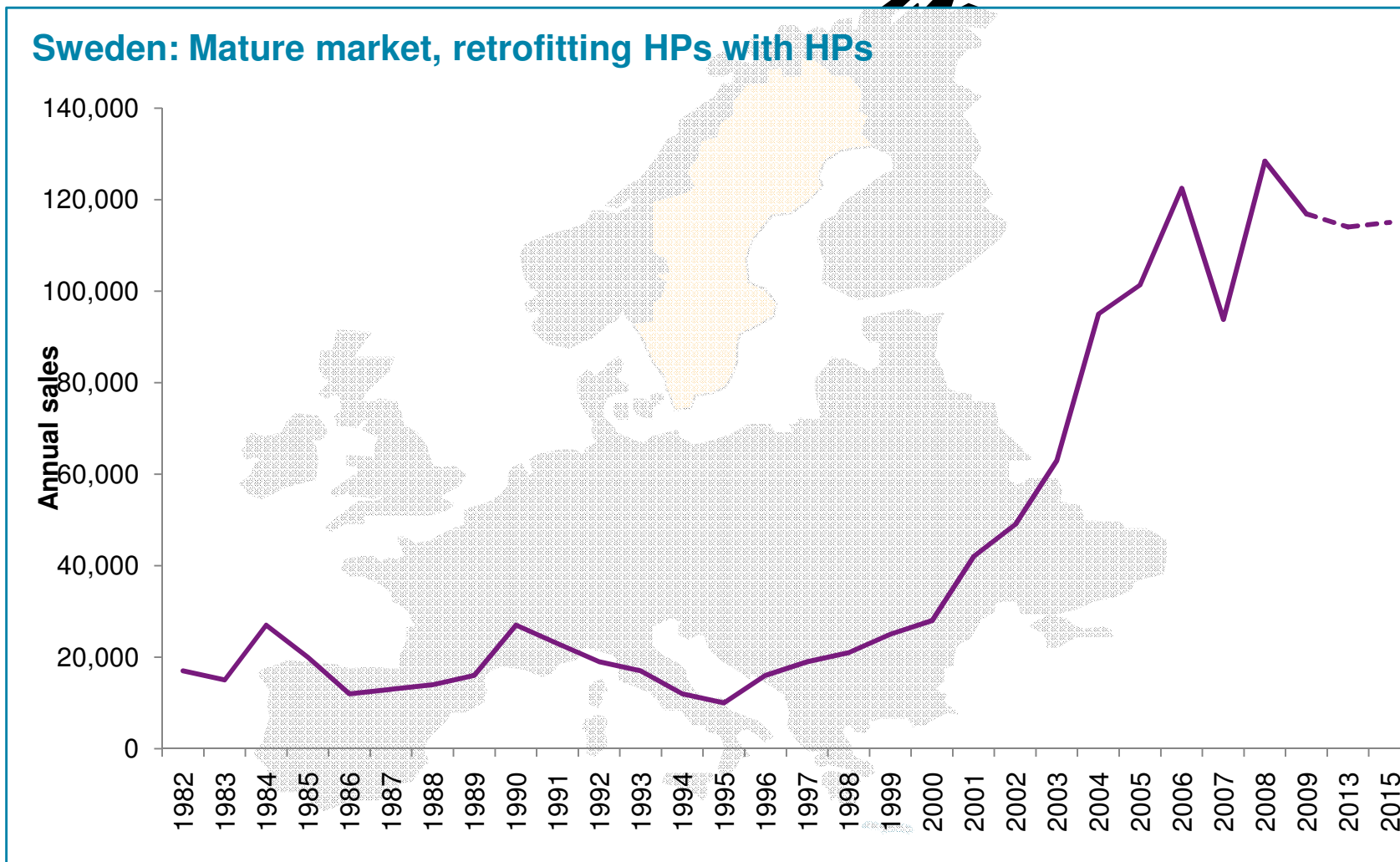
Germany: Retrofit still tough





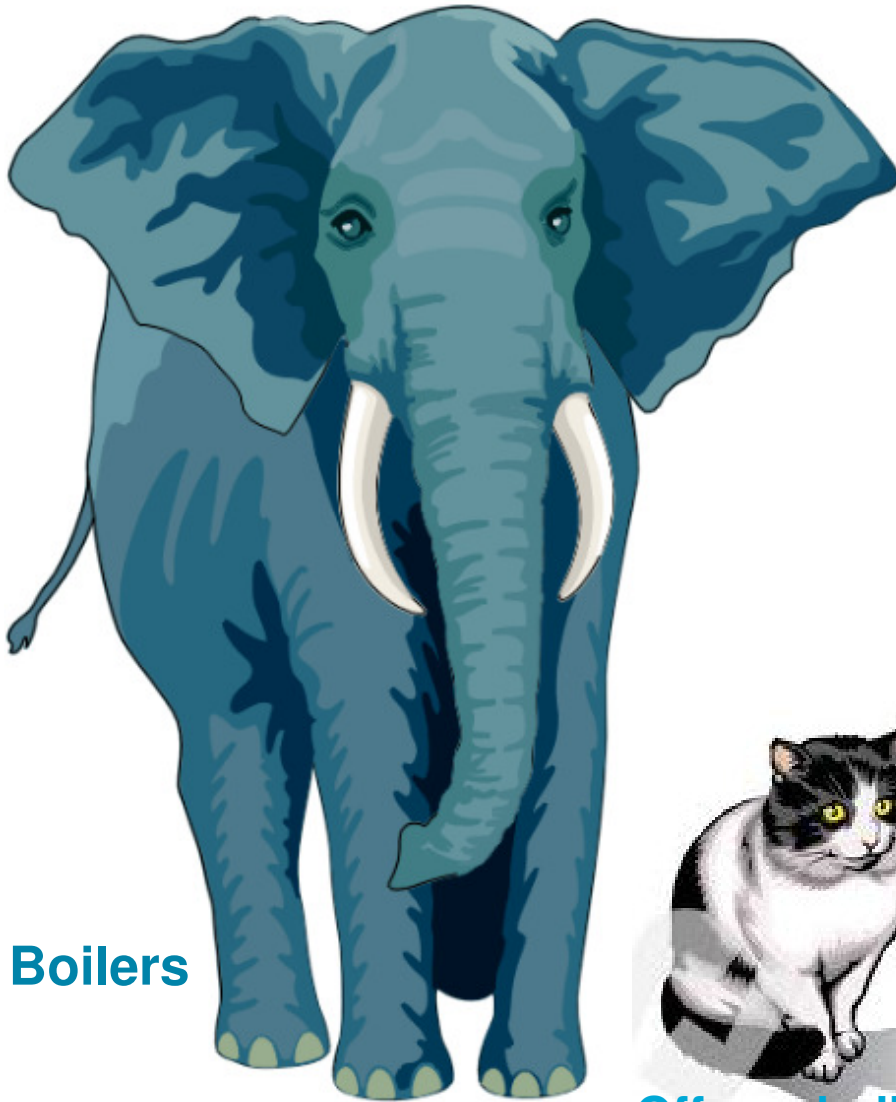
France: opening up the retrofit market?





- ▶ The retrofit opportunity
- ▶ The cornerstones of a strong retrofit market
- ▶ Success in other markets?
- ▶ **Conclusions**

The retrofit opportunity: Current UK market



Boilers



Off-gas boilers

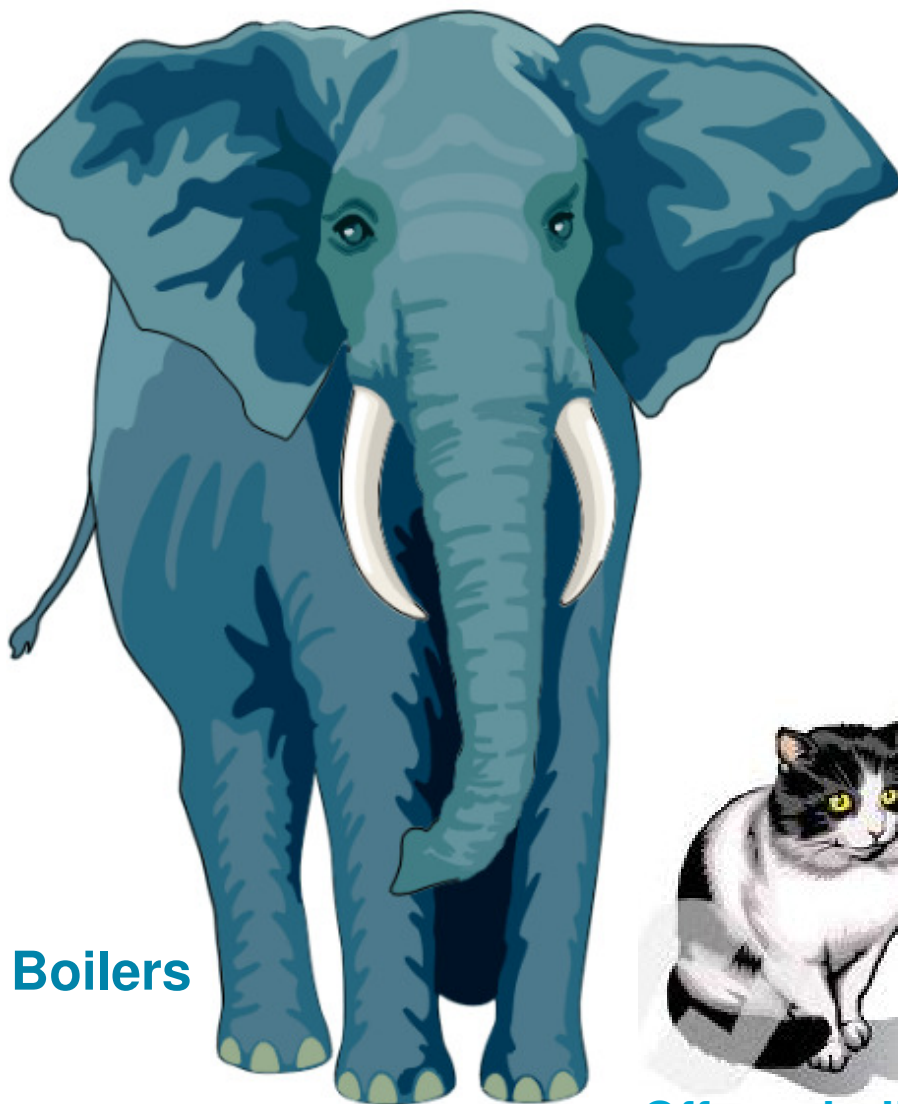


Heat Pumps



Retrofit HPs

The retrofit opportunity: FutureUK market?



Boilers

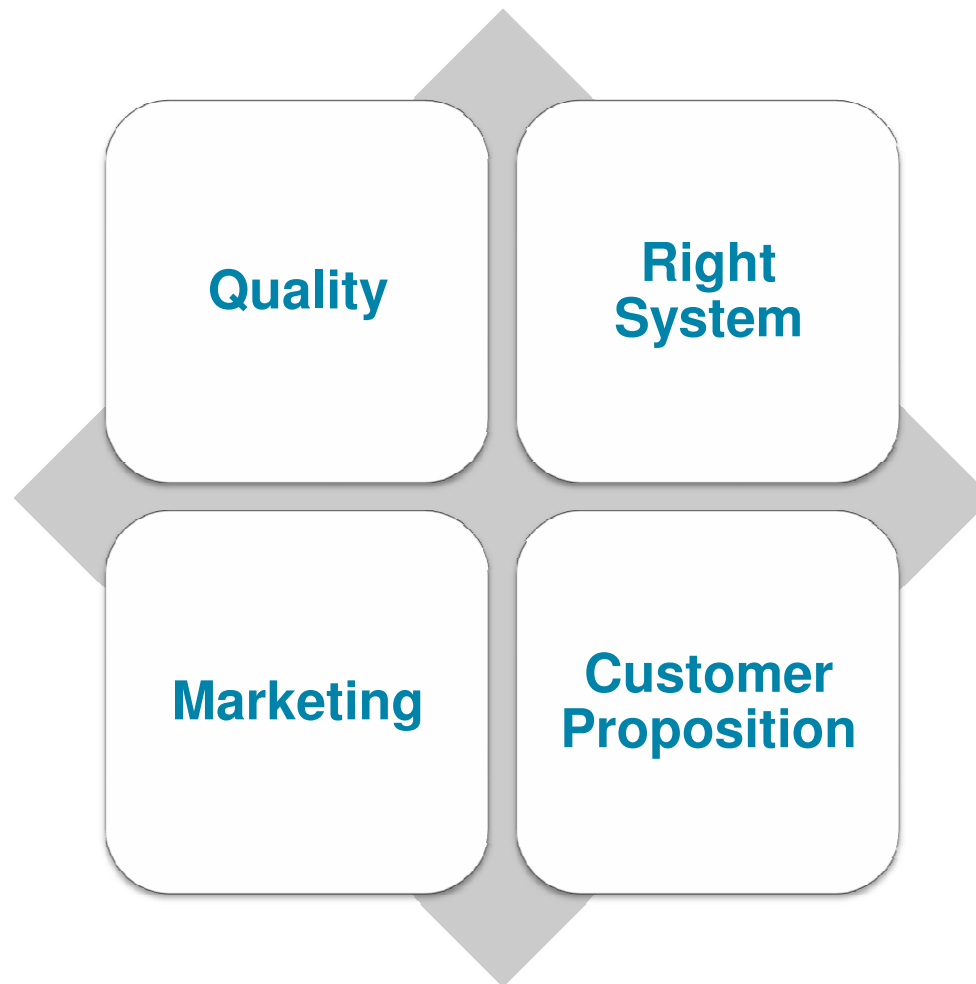


Off-gas boilers



Heat Pumps?

Cornerstones of a strong retrofit market



Thank You

Pentland Hills, Edinburgh, January 2011