Retrofitting for the Future

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Sustainable
Property Solutions
Kinetics Group

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The Challenge
For
Asset Managers

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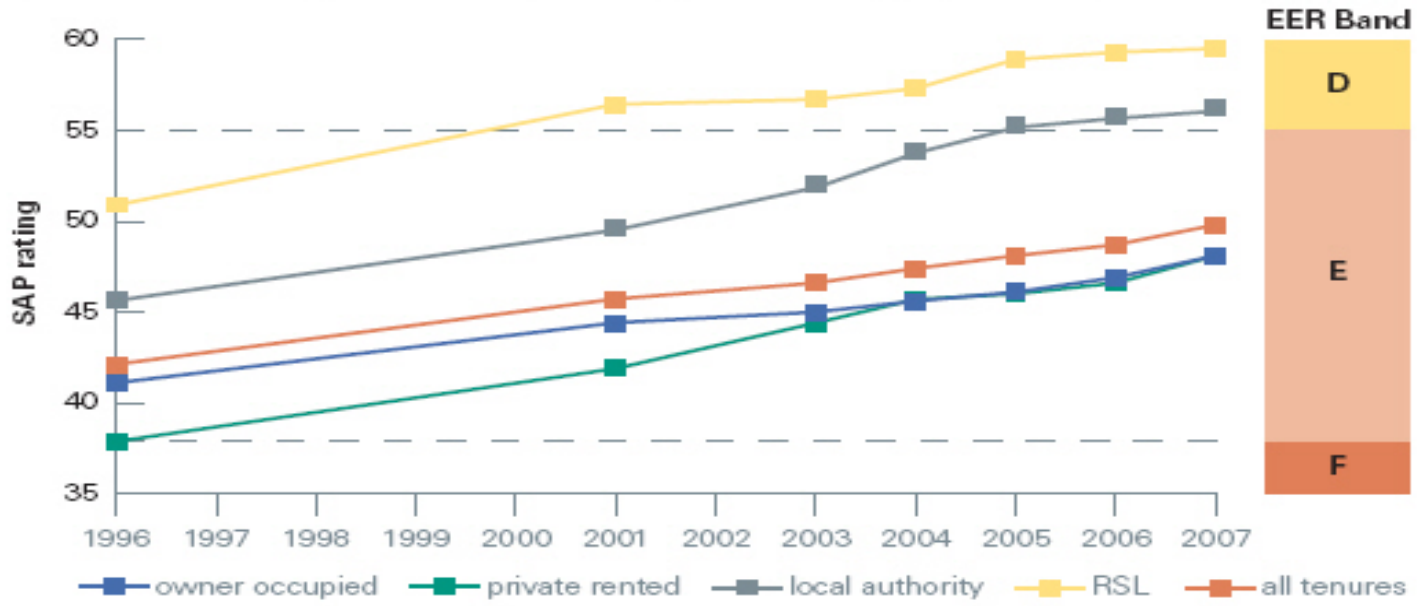
The Challenge for Asset Managers

- Average Social Housing SAP circa 60
  - increased just 1 point per annum since 1996 despite EEC1 and 2

Figure 1.12: Energy efficiency, average SAP rating by tenure, 1996-2007



Base: all dwellings
Note: Energy Efficiency Rating (EER) Bands are based on SAP ratings, as given in Table 1.8 below, with Band A being the most efficient and Band G the least efficient.

English House Condition Survey 2007

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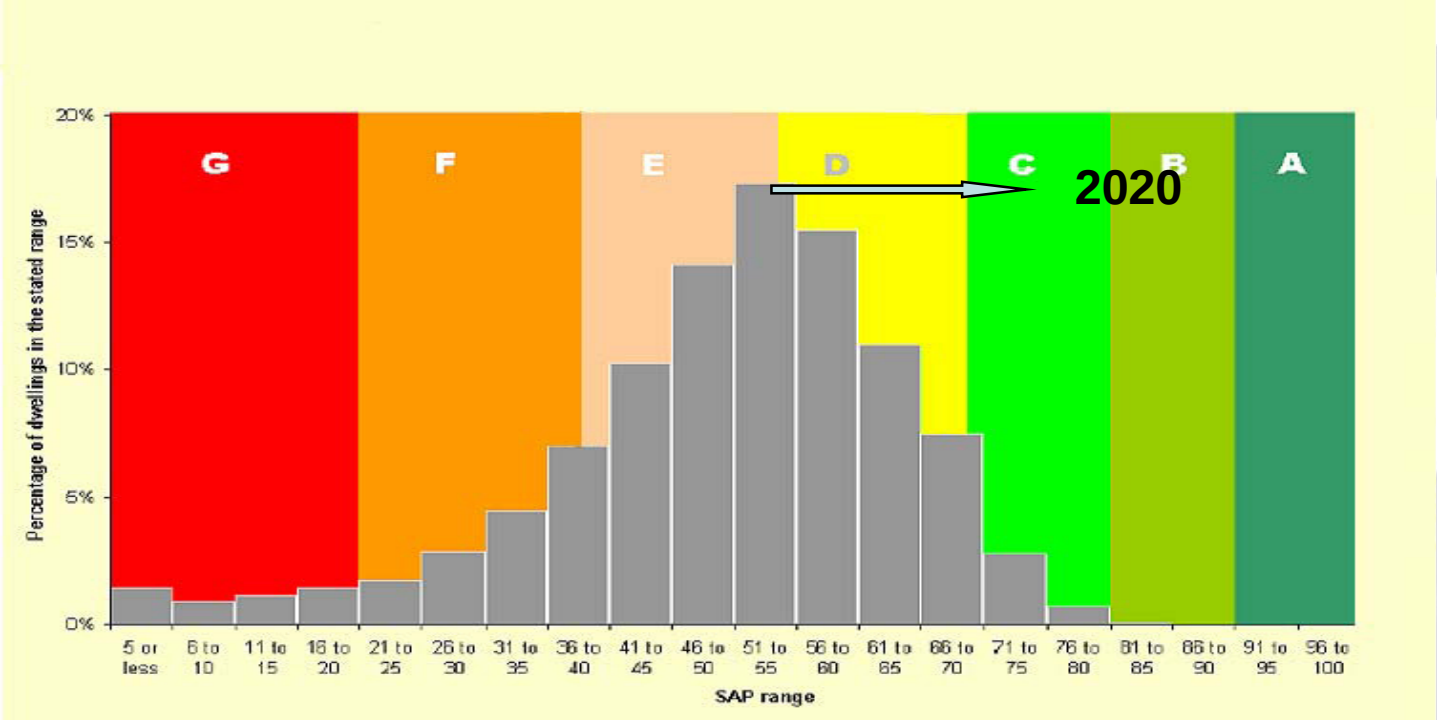
The Challenge for Asset Managers

- 2020 target Av SAP 75 + (SAP 2005)
  - Cost potential increases into higher SAP performance



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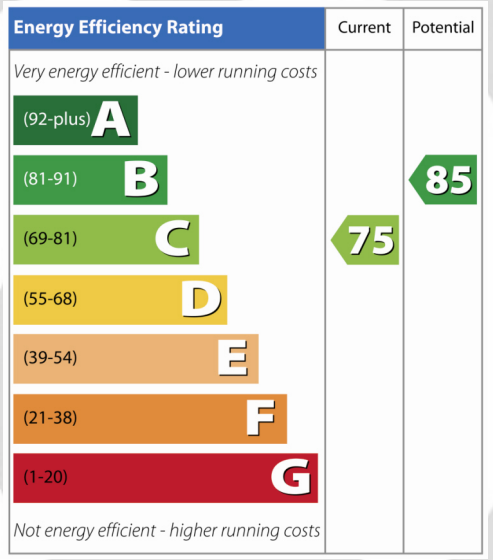
The Challenge for Asset Managers

- Current Estimates - £25,000 av. Cost per property
- However:
  - A cost of diminishing returns in carbon
  - First £5000 makes the biggest difference
- Research by Elmhurst Energy on 1.2m EPC's
  - Consumers in denial
  - SAP of Av. properties 58
  - Potential for SAP 77
  - 43% Carbon saving or 2.8 tonnes
- Basic measures provide biggest gains
  - 270mm of loft insulation and cylinder jacket
  - Wall insulation – Cavity, External or internal
  - 'A' rated boilers
  - Low energy lighting



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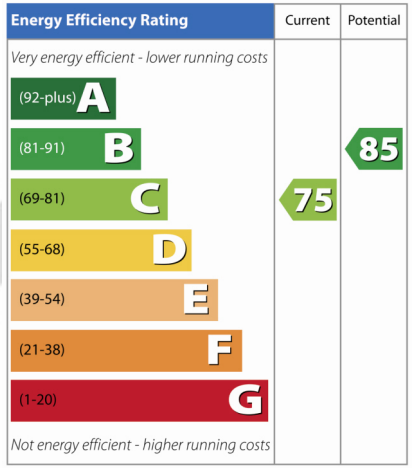
The Challenge for Asset Managers

- Kinetics Survey found - Insulation
  - Average of 80% SHP's lofts and cavity walls insulated
  - Many SHP's were unsure what depth of insulation
  - Average priority for insulation was 7/10
  - Av 10% of budgets set aside for retrofit measures
- CLG Database Nov 2009
  - Av SAP for RSL's 60/LA Rented 56
  - Around half had loft insulation >150mm
  - 90% properties had central heating but figure covers all boiler ratings
- Are you confident of your data?
- Good stock condition information
  - Essential to effective long term retrofit planning
  - Getting value from investment



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The Hierarchy of Retrofit Measures

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The Hierarchy of Retrofit Measures

- Definition Retrofit - 'improvement in the energy efficiency of energy-using equipment or the thermal characteristics of an existing building'
- Retrofit Hierarchy (Minimise, Reuse/Recover, Renewables)
  - Priority 1 - Energy Efficiency
    - Insulation – Loft and CW essential
    - Air tightness – Simple but very effective (testing or thermography)
    - Optimised energy using equipment – boilers and appliances
    - Heat and Water Recovery – Extensive ducting can limit application
  - Priority 2 - Renewable Energy
    - Solar Thermal – Conflicts with Combi's but trends under review
    - Solar PV – Significant potential since Feed in Tariff
    - Heat Pumps – Ideal for off grid heating
    - CHP – Good high rise/Community solution especially with FiT. Works well on larger scale but being developed on smaller scale
    - Biomass – An off grid solution linked with and ESCO
    - Wind Turbines – Good solution for coastal applications or where space is not a problem – Can be unpopular

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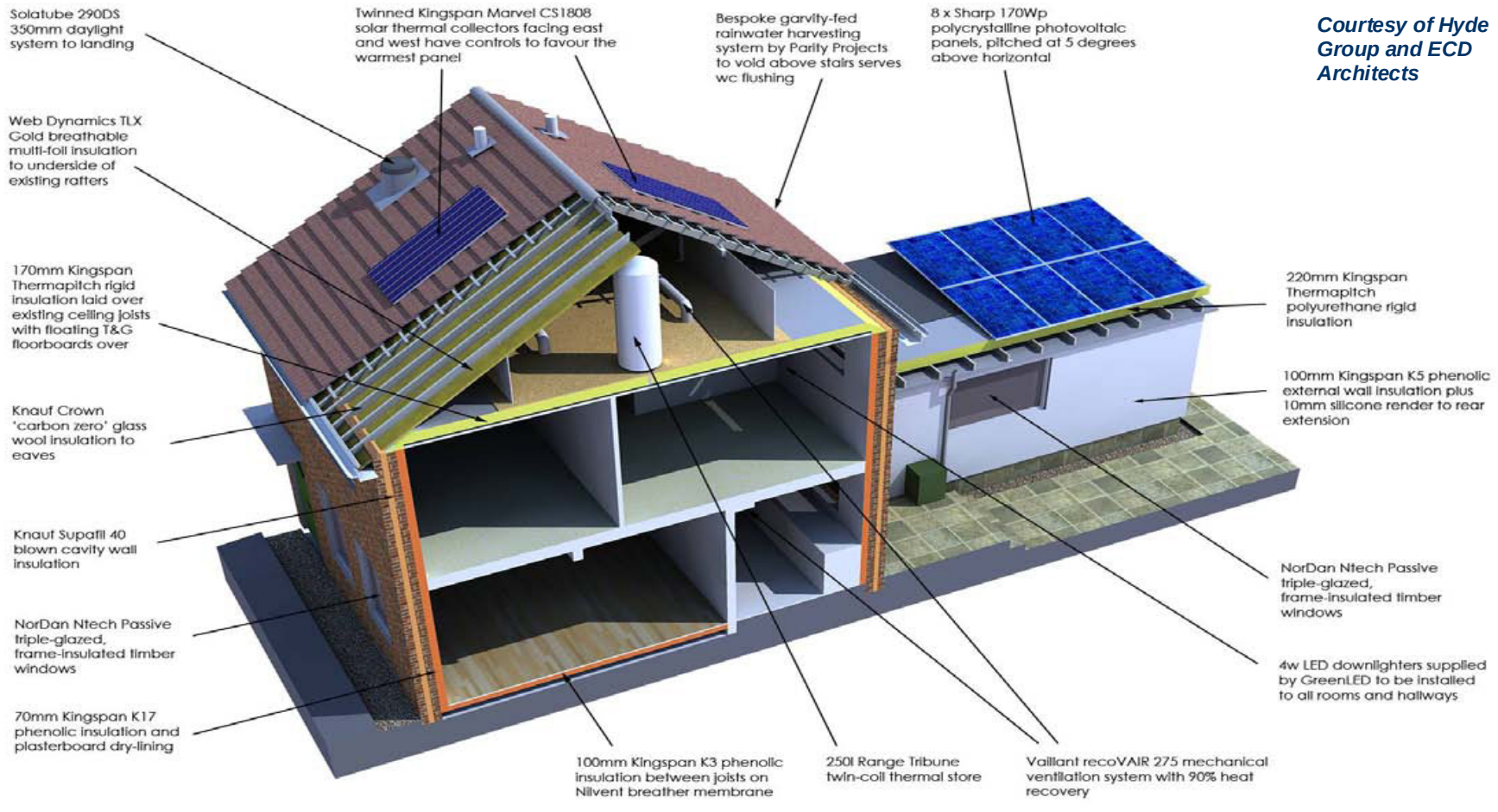
The Hierarchy of Retrofit Measures



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The Hierarchy of Retrofit Measures

- Indicative Cost/carbon ratios (typical 3 bed semi using EST carbon savings)
  - Fabric insulation
    - 270mm Loft (Virgin) @ £250 - £0.32/KgCo2/Annum
    - 270mm Loft (Top up) @ £250- £1.09/KgCo2/Annum
    - Cavity Wall @ £250 - £0.41/KgCo2/Annum
    - Cylinder jacket @ £30 - £0.15/kgCo2/Annum
    - Internal Wall @£7k - £3.50/KgCo2/Annum (HTT Homes)
    - External Wall @ £9k - £4.28/KgCO2/Annum (HTT Homes)
  - Windows
    - A rated double glazing @ £3k - £4.16/KgCo2/Annum
  - Boiler and Heating Control Upgrade
    - G to A Rated @ £1500 - £1.15/KgCo2/Annum
  - Draught Proofing
    - General Measures @ £200 - £1.54/KgCo2/Annum
    - Underfloor Insulation - £variable depending on method

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The Hierarchy of Retrofit Measures

- Other Retrofit Indicative Costs
  - Solar
    - Solar Thermal Collectors and Storage £5k - £7.49/KgCo2/Annum
    - Photovoltaics- £5K (with 50% LCBP grant) - £9.39/KgCo2/Annum
  - Heat Recovery
    - MVHR/airtight measures/testing - £3K or £2.83/KgCo2/Annum
  - Low Energy Lighting
    - LED - £2.5K - £8.32/KgCo2/Annum
    - CFL's - £30 - £0.20/KgCo2/Annum
  - Windows and Doors
    - Triple Glazing - £9.5K - £21.34/KgCo2/Annum
  - Lessons
    - Continue building good your stock intelligence
    - Step by Step approach using cost/carbon savings
    - Insulation, CFL's, draught proofing, 'A' boilers offer best returns

Courtesy of Hyde Group and ECD Architects

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Developing
Stock Information

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Developing Stock Information

- Continuing to focus on what Asset Managers are good at!
  - Asset Management Plan
    - Include Low Carbon objectives endorsed by Board
  - Maintain good detailed records of stock condition
    - Recent SHP 400 prop sample - 80 sold and 20 demolished!
    - EEC1 and EEC2 often spawned inaccurate info – recheck!
  - Revise Maintenance and Improvement Contracts
    - Reflecting Low Carbon output requirements
    - Modified contracts to accommodate maintenance of renewables
  - Use EPC's and EPR surveys to benchmark accuracy of data
    - Is a 10 year EPC any use given targets?
    - Can EPR's be incorporated into other regimes like voids?
- Use your staff
  - Training
    - Advise to tenants on energy saving and fuel switching
    - Can they undertake Mini energy audits?

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Developing Stock Information

- Get the best from your contractors
  - Are they familiar with your low carbon objectives?
    - Do you meet regularly to see what they can offer?
    - Contractors provide additional resources and extended skills
    - Examine and develop maintenance programmes using low carbon
- Capitalise on opportunities
  - Annual Gas Servicing
    - Contractors already visiting most homes in lofts (Checking flue terminals etc) and every room (Checking TRV's)
    - Extend regime to include additional CP12 data (EPR's)
    - Voids potential for mini energy upgrades
- Need for alternative thinking
  - kitchens and bathroom programmes
    - Could offer opportunities for insulation prior to fitting?
- Prepare low carbon solutions each property type
  - No one size fits all!

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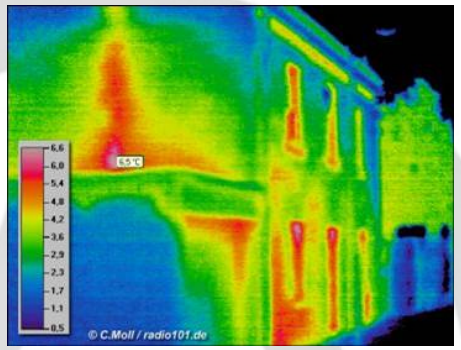
Developing Stock Information

- Think it through!
  - Opportunities to incorporate low carbon measures before commissioning
    - Improvement Programmes
    - Maintenance and repair
  - Output based to achieve SAP targets
- Use audit techniques to maintain quality
  - Thermal Image surveys before signing off work?
    - Identify weak areas and note for future improvement
- Select contractors with good track record
  - End to end capability needed to ensure continuity of project
    - Encourage partnerships between contractors
- Get the priorities in place
  - Energy efficiency then renewables



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Delivering Finance
For The
Future

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Delivering Finance for the Future

- Support available for planning
  - EST or Carbon Trust
- Funding Opportunities
  - Third Party Finance
    - ESCO's
    - Leasing from private sector for capital investment
    - Bank underwritten Project Finance for sale of community heat and power
    - Long term loans e.g PAYS on photovoltaic outlays to support ESCO
- Increased Rent for Renewable Energy technologies
  - Being trialled by a few SHP's
- Grant funding trends
  - Access to Funding will increasingly rely on good information and evidence of material benefit
  - Shift to whole house upgrades and possible different fit with the way in which decent homes programmes have been delivered

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Delivering Finance for the Future

- Sources for Grant Funding
  - CERT and CESP
  - ERDF Funding
  - Low Carbon Buildings Programme (LCBP)
    - Ending for energy generation grants 2010 the rest 2011
  - Scottish Power Energy People and Green Energy Funds
  - Eon Sustainable Energy Fund
  - Eaga Partnership Charitable Trust
  - EDF Green Energy Fund
  - Big Lottery fund
  - HCA
  - Health Care Trusts and PCT's
  - Regional Housing Boards and Single Regional Pots
  - DEFRA Biomass Funding (Schemes and Esco's)
  - Big lottery fund and many other specific tailored funds
- LSP's and LAA's for working collectively!

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Delivering Finance for the Future

- Latest Energy Supplier Feedback
  - Recent CERT and CESP Consultation out
    - 2015 target for all homes to have loft and cavity insulation
  - Likely 65% of funding focussed on insulation
  - Energy suppliers looking for 50% match funding
  - PG's and NPG's are attractive based on economies, if funded
  - Low Super Output Areas up to 2012 then possibly regional focus
  - Whole house solution on a street by street basis likely post 2012
  - CESP now targeting HTT homes
    - Solid Wall Insulation
    - Fuel Switching
    - Air Source Heat Pumps and other renewables
  - High density schemes attractive
    - More than 25% of Props in LSOA will give +50% lift on all measures
    - High rise properties capture big wins for funder
  - Good stock information essential
  - Partnerships working encourages confidence

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Delivering Finance for the Future

- European Regional Development Fund
  - Low Carbon and Economic Benefit focus
  - Regionally budgeted and based
  - 3 Priorities
    - Innovation and Knowledge Transfer
    - Enterprise and Business support
    - Sustainable Development, Production and Consumer Benefit
  - Output and results driven
  - Will promotes energy efficiency and renewables
    - But not conventional loft and cavity wall
  - Bias towards innovation and green job market stimulation
  - Whole House solutions preferred
    - Lowering CO2
    - Actual employment benefits
    - Measurement of the effects (Particularly of new technological trials)

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Delivering Finance for the Future

- Energy Services Companies (ESCO's)
  - Based on Partnerships with energy suppliers
    - Designed to save money and generate revenue
    - Designed to lever private finance
  - Package measures
    - Supply at competitive rates
    - Funded energy efficiency
    - Grants, Advice an interest free loans
  - One company, one bill principle
  - Three types of ESCO
    - Energy Generation Schemes where energy sold is used to raise finances
    - Preferred Supplier schemes where SHP gets commission for signing up tenants to energy supplier
    - Housing Energy Clubs extending preferred supplier arrangement into an ESCO providing more flexibility e.g. to raise income and support low income households

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Questions and Discussion

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Supplementary Information

The Energy Challenge

- Fossil fuels
  - Half of gas/oil used up
  - Unstable security of supply
  - Gas prices doubled in 2 years
- Fuel Poverty from 1.2m to 4m since 2004
- Finding Sustainable Energy Sources
  - Solar
    - Radiation - Direct heat and electricity
    - Absorption - Heating ground, water and air sources
    - Rivers and tides
    - Wind
  - Home Grown
    - Wood, straw and organic
  - Other Low Carbon
    - Fuel cells, Chemical Reaction, Nuclear?

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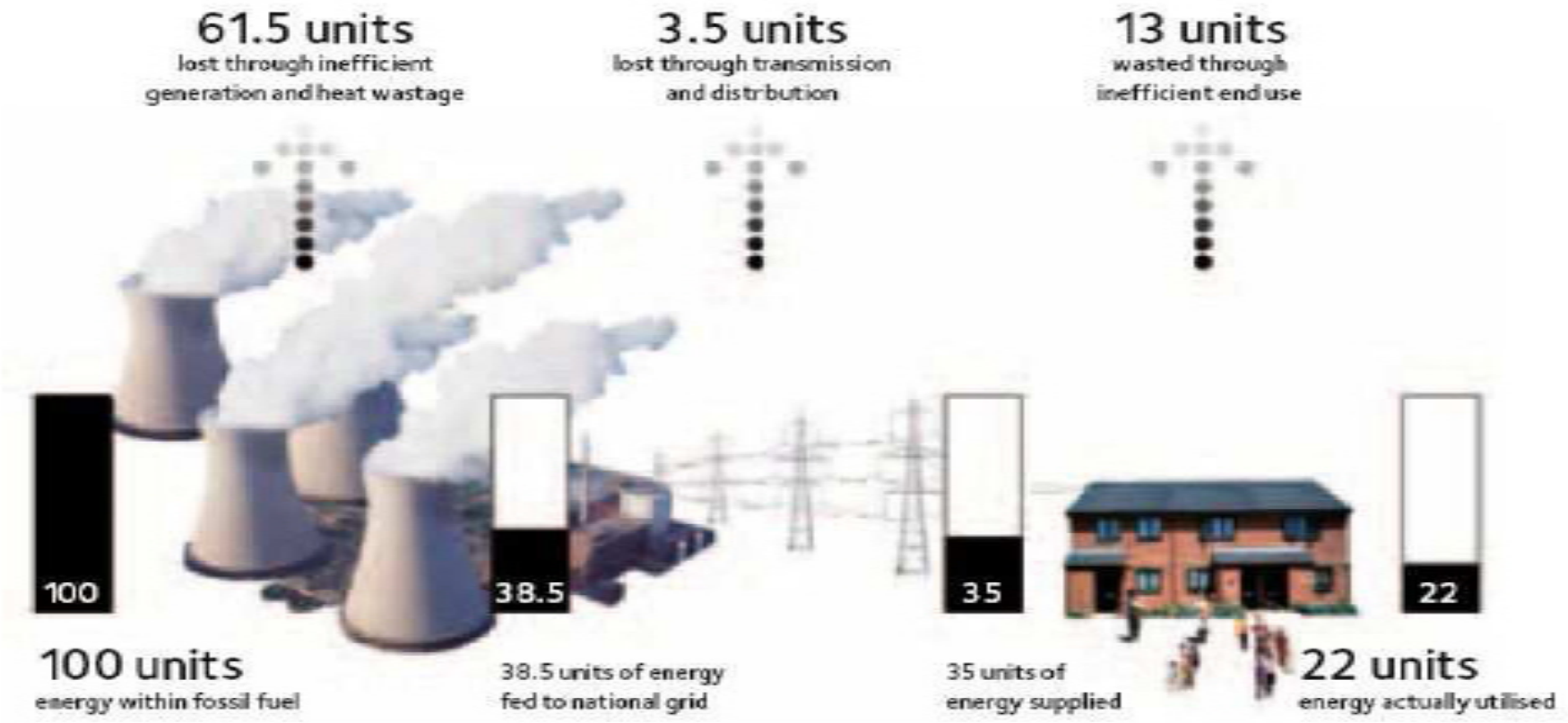
Energy Waste Chain



Centralised energy – yesterday's technologies: Centralised energy infrastructures waste more than two thirds of the energy available from fossil fuels. Inefficient end use makes this situation worse. ©Greenpeace/breeze

National Drivers

- UK/EU Climate Change Programme
  - 80% reduction of UK CO_2 emissions by 2050
  - 15% of electricity supply from renewables by 2020
- National Fuel Poverty Strategy
- Increasing legal framework ‘carrot and stick’
- 80% of buildings forecast to still be in use by 2050
  - Increased demand for housing
- Microgenerated (locally supplied)
  - heat and light through renewable energy
  - more efficient than current grid distribution
  - Stimulate market for ESCO’s

Public Sector Drivers

- Public Sector/Audit Commission
  - Fuel Poverty and Affordable Warmth
  - National Performance Indicators
    - NI 185,186,187,188,194 (Climate Change and Fuel Poverty)
  - Carbon Reduction Commitment (CRC)
    - Mandatory trading of CO_2 on market
      - 6000Mw (£500,000) of electrical energy
      - £13 per tonne
      - League Tables affecting 5000 organisations inc Local Authorities
    - Lower performers effectively fined for not reducing energy
  - Building Regulations and Code for Sustainable Homes
    - All new Zero Carbon Buildings by 2016

Stock Condition

- Hard to Treat Homes (Pre 1945 Stock)
  - 10 million in UK; 4 million Social Housing
  - Poor SAP rating of <50
  - Solid wall or partial cavity, draughty, normally off gas grid
  - Often occupied by ‘Priority Groups’ (i.e Fuel Poor)
- Remedy:
  - Improve U values and air tightness
    - Loft, Internal or external insulation
    - Higher efficiency glazing and doors
  - Fuel switching
  - Renewable energy solutions for off grid inc:
    - Air or Ground Source Heat Pumps
    - Biomass or wood burning Heating
    - Solar PV or Micro Wind
    - Community schemes which offer better economies

Social Housing Challenges

- Social Housing
  - Target Hard to Treat homes
  - Offer ‘whole house’ packaged solutions
    - Building – Internal, External, Floor Insulation, Draught Proofing
    - Heating – ASHP, GSHP, Solar Thermal
    - Air Conditioning – Heat Recovery, Mechanical Ventilation
    - Rainwater Goods and Treatment – Harvesting and Recycling
    - Kitchens, Bathrooms and Voids – Eco goods, insulation of external walls
    - Roofing – Solar Thermal and PV, Under Roof Insulation
  - Other potential services
    - Thermal imaging surveys
    - Air tightness testing
    - Community Schemes inc CHP

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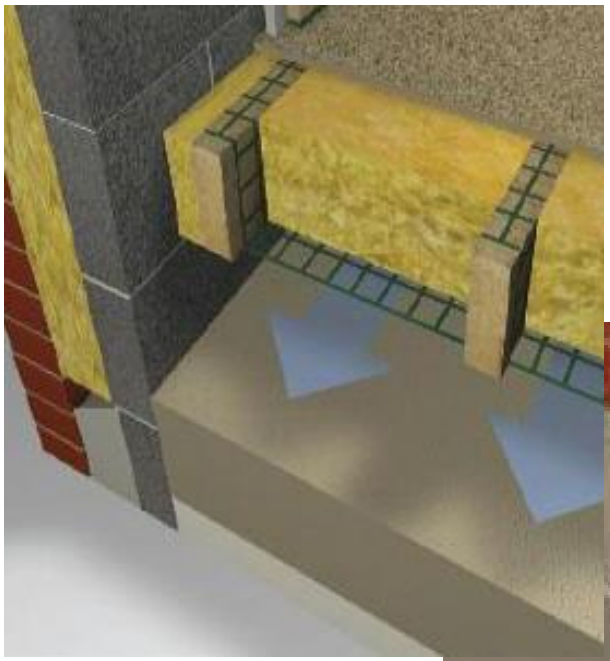
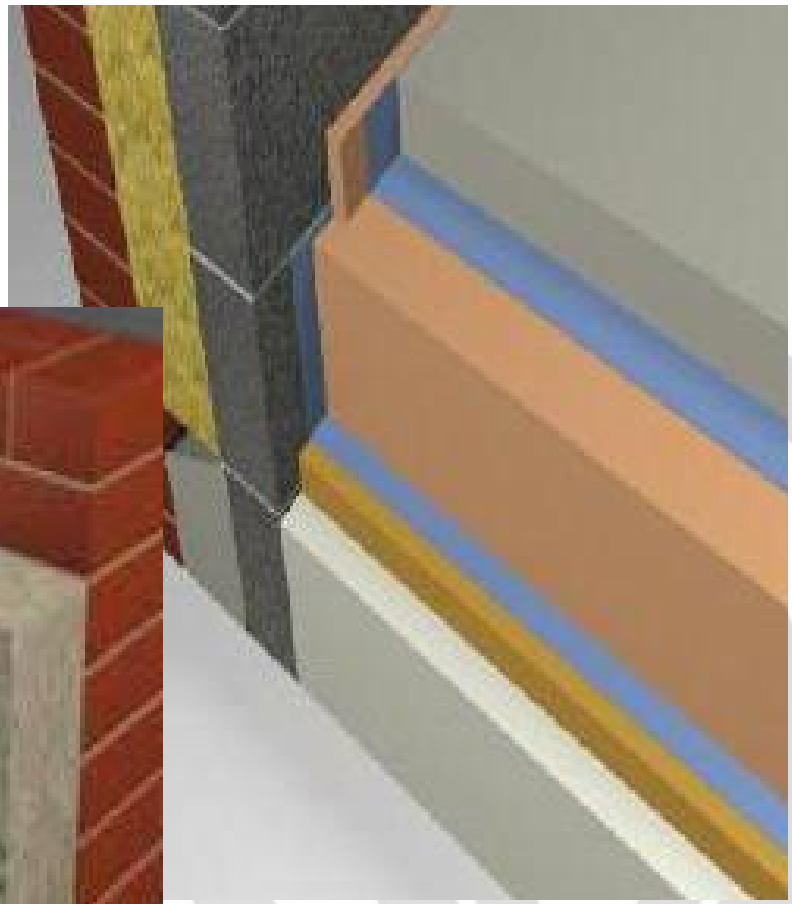
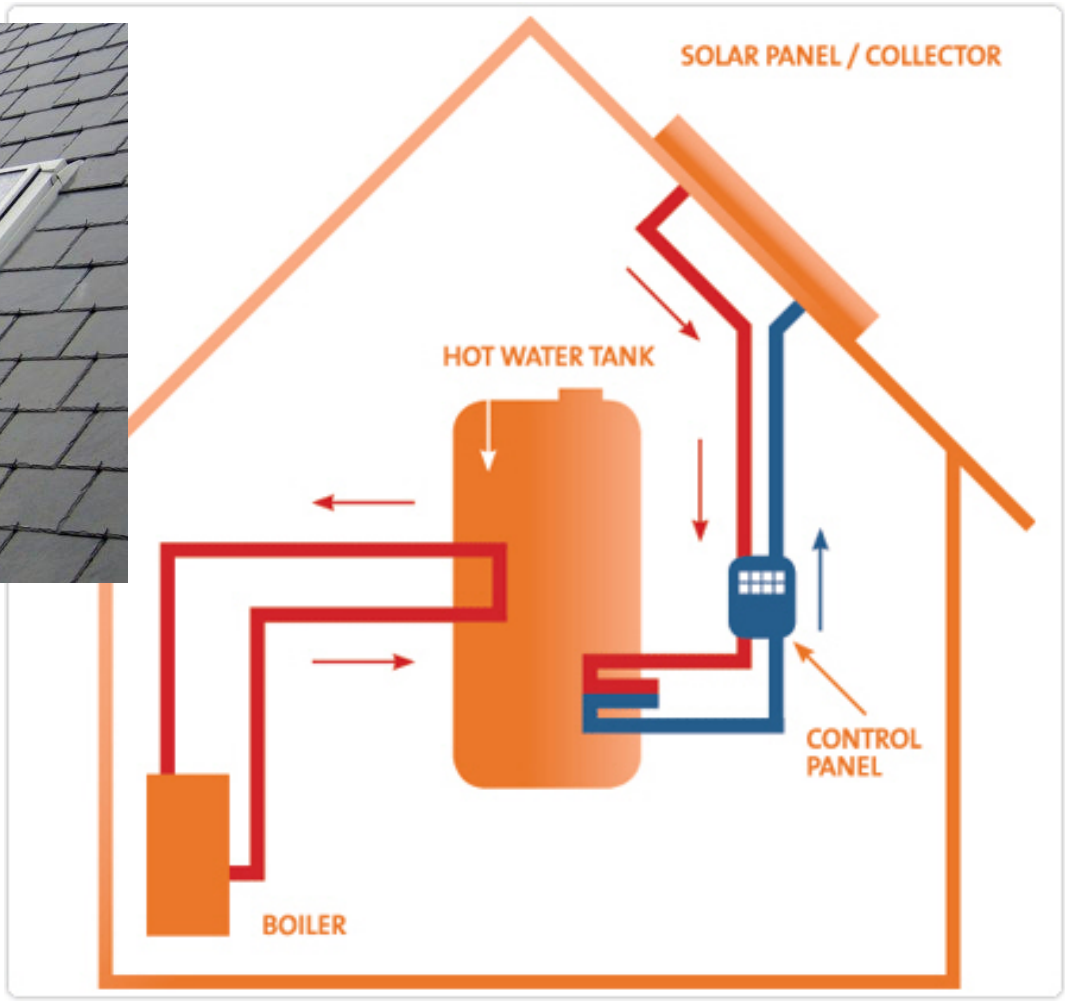
Energy Efficiency and Renewables

Insulation Techniques

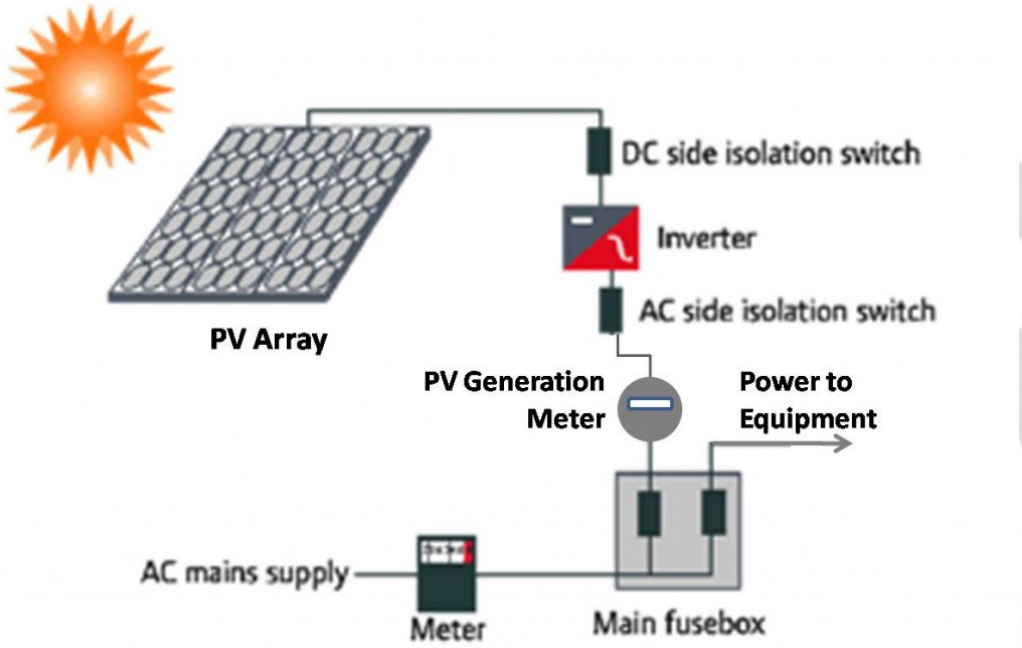




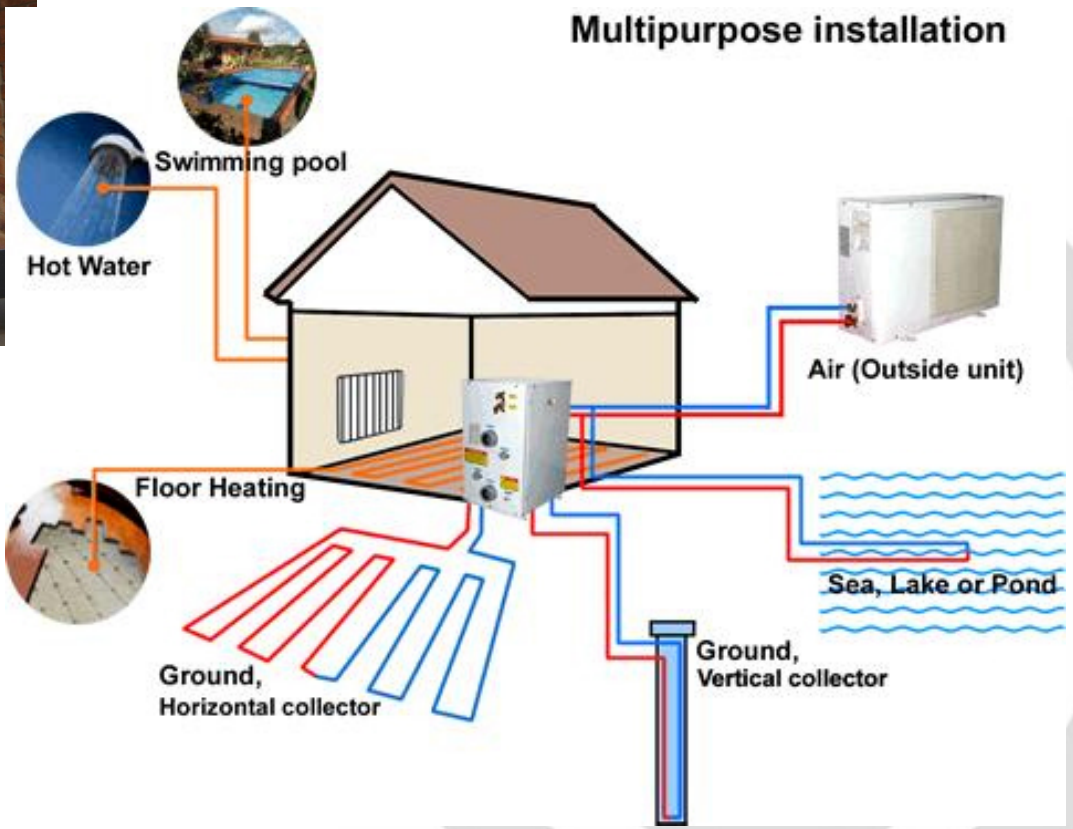
Renewable Energy – Solar Thermal



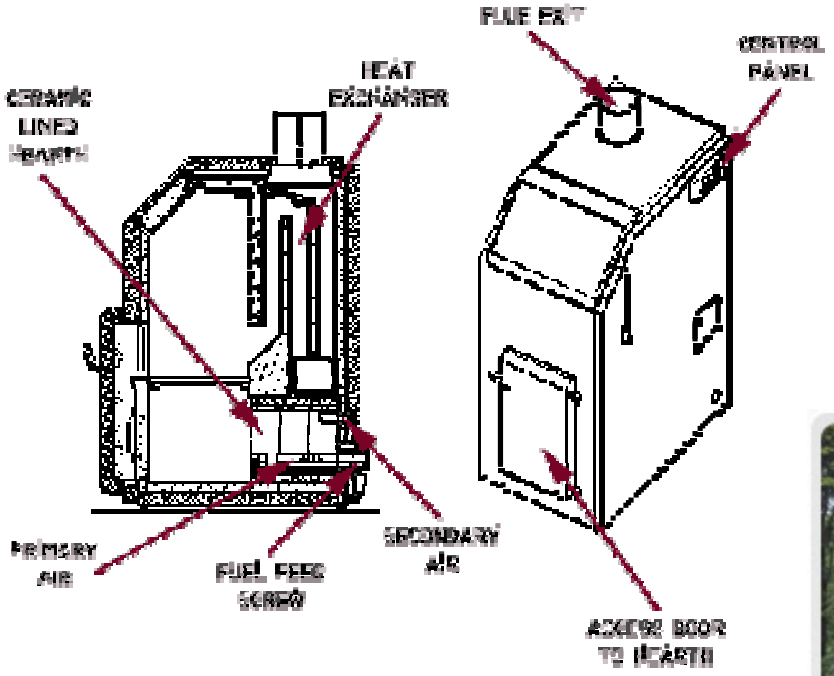
Renewable Energy – Solar PV



Renewable Energy –Heat Pumps



Renewable Energy – Biomass



Renewable Energy – Micro CHP