The role of installation businesses in the uptake of residential microgeneration

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1. Background - residential microgeneration in the UK

- 2010 Committee on Climate Change Medium abatement scenario - air and ground source heat pumps could be installed in a quarter of UK residences by 2030
- Less than 100,000 microgeneration installations in the UK at the end of 2007
- 16,000 household and 3,200 community microgeneration systems were fitted through Low Carbon Buildings Programme (2006 to 2011) –
  - mainly solar thermal and PV, but also heat pumps, wind turbines and biomass boilers
- Additional 250,000 (mostly solar PV) systems installed through the Feed-In Tariffs from April 2010 to June 2012

1. Background – rationale for research purpose

- Lack of academic research on supply-side drivers and barriers to uptake
- Very little academic research has looked at microgeneration installer businesses and their impact on microgeneration uptake

Research aims

1. Establish the factors influencing UK microgeneration installer business formation and operation, and the diversity of business models underpinning them

2. Compare the impact of different business models on the rate of microgeneration uptake in homes

3. Compare the impact of different installer business models on standards of microgeneration installation in homes and quality of after-care

1. Background - Installer business models

- E.g. companies which are locally-focused to those which install systems nationwide, types of technologies installed, specialism and diversification, retail options offered to customers, way that profits are generated, ‘free solar PV’ companies
- Solar hot water installers have previously had a reputation for aggressive ‘cowboy’ marketing strategies
- Microgeneration Certification Scheme (MCS, 2012) now well established, but cannot be assumed to be a comprehensive failsafe against systems being installed sub-optimally
- Key problems for residential microgeneration customers is if more than one company is involved in different aspects of the installation process (e.g. surveying, electrical, plumbing etc.)

2. Research approach – survey and interview stages

1. Pilot survey – May 2011

71 responses from 235 businesses emailed after posted pre-notification letter

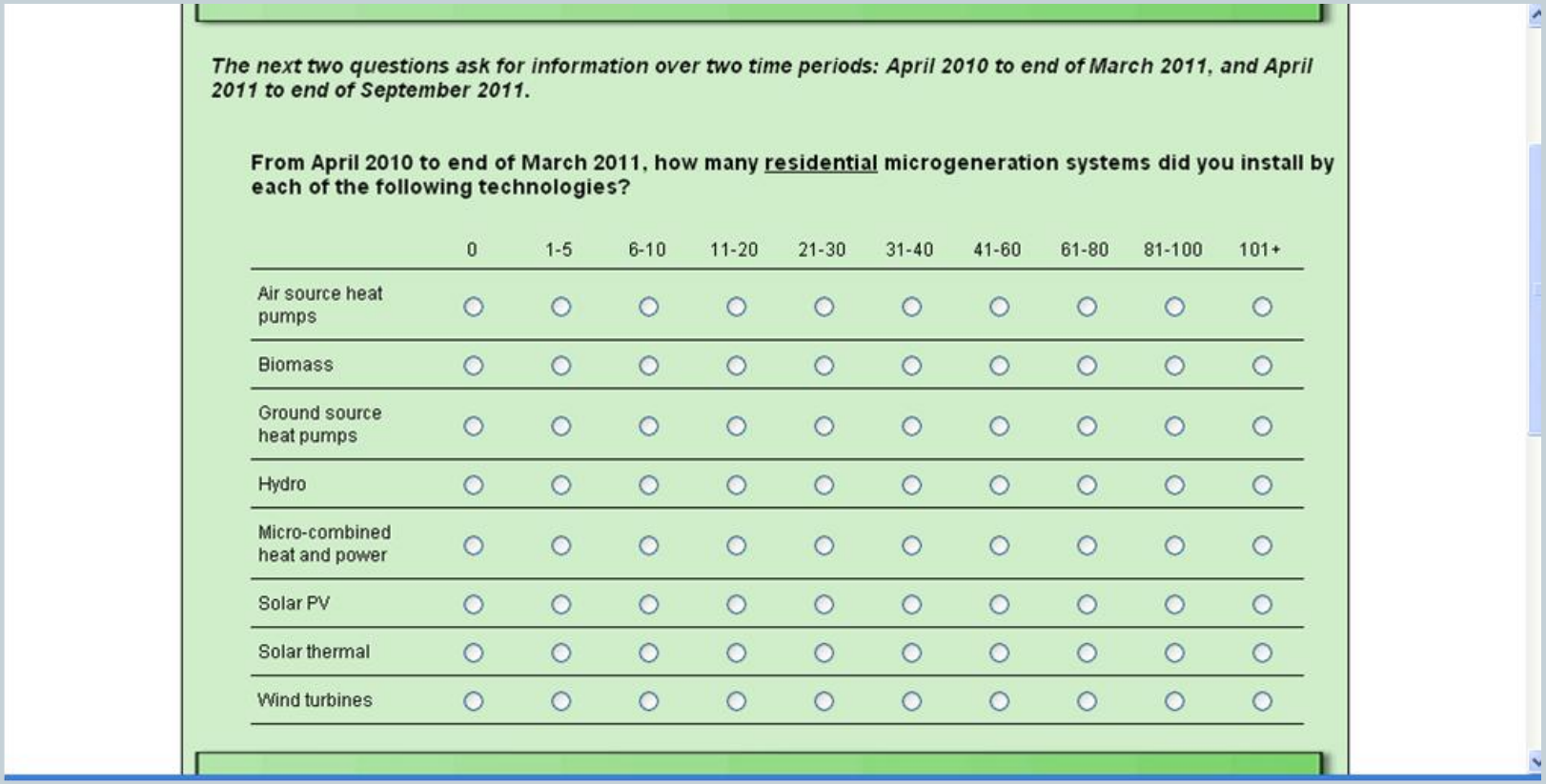
2. Main survey – October to December 2011

317 responses from 2000 businesses emailed after pdf pre-notification letter

3. Interviews with installers – July to October 2012

10 face-to-face and 6 telephone interviews, with a further 4-5 telephone interviews planned

2. Research approach - Main survey: example question



The next two questions ask for information over two time periods: April 2010 to end of March 2011, and April 2011 to end of September 2011.

From April 2010 to end of March 2011, how many residential microgeneration systems did you install by each of the following technologies?

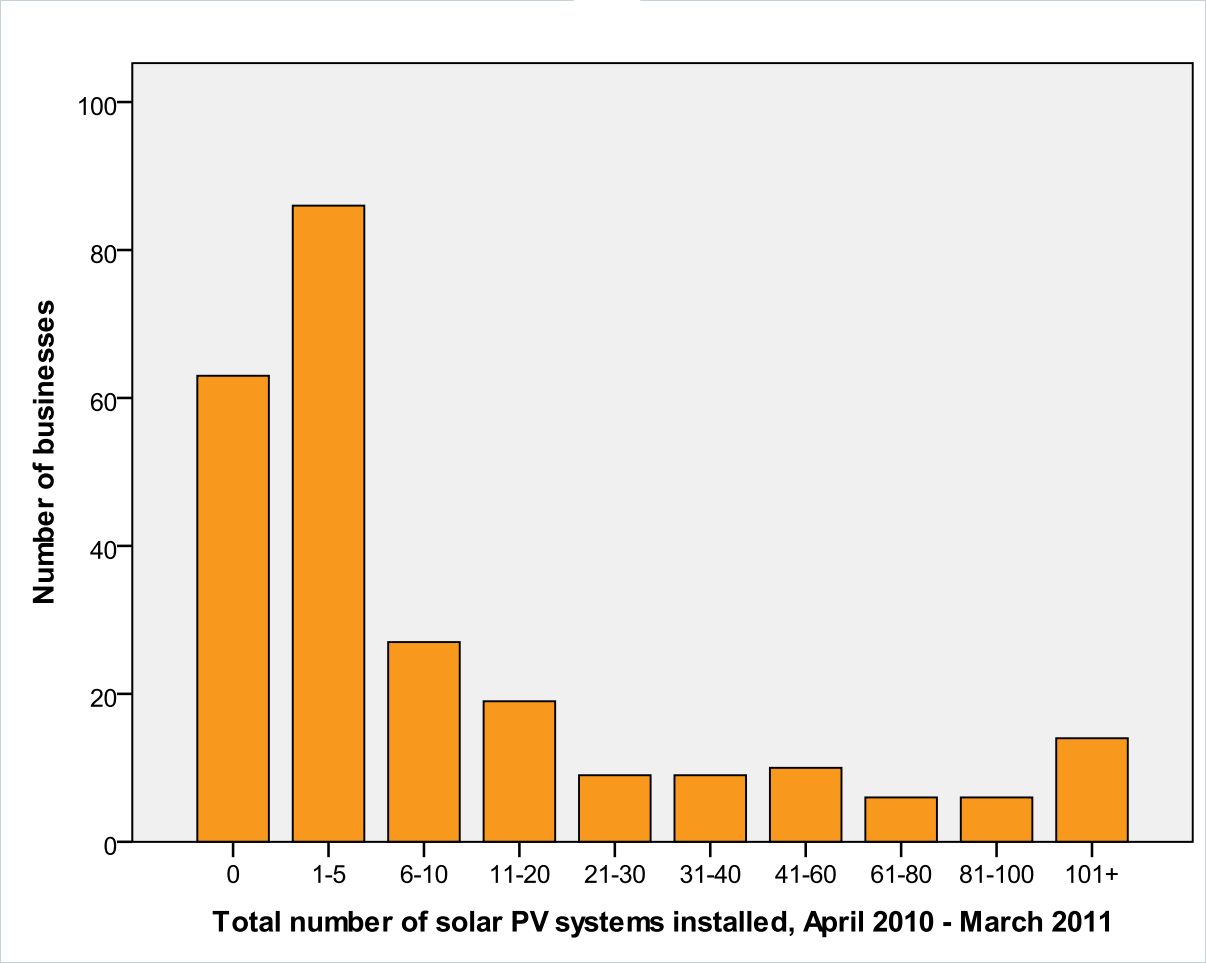
	0	1-5	6-10	11-20	21-30	31-40	41-60	61-80	81-100	101+
Air source heat pumps	○	○	○	○	○	○	○	○	○	○
Biomass	○	○	○	○	○	○	○	○	○	○
Ground source heat pumps	○	○	○	○	○	○	○	○	○	○
Hydro	○	○	○	○	○	○	○	○	○	○
Micro-combined heat and power	○	○	○	○	○	○	○	○	○	○
Solar PV	○	○	○	○	○	○	○	○	○	○
Solar thermal	○	○	○	○	○	○	○	○	○	○
Wind turbines	○	○	○	○	○	○	○	○	○	○

2. Research approach - Small installers and business models

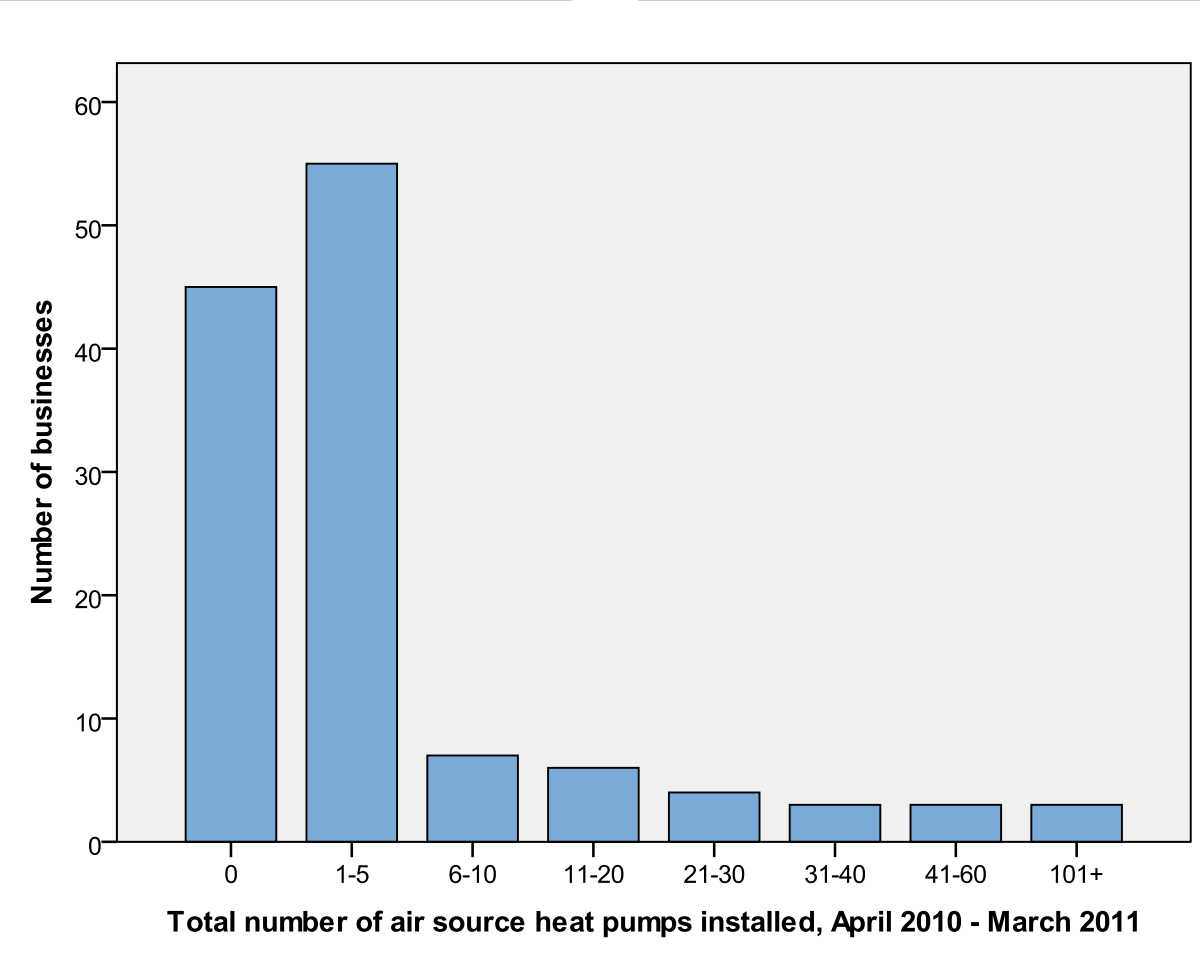
'Just to let you know, we are a very small company with me as sole employee, one other self-employed electrician who works with me 90% of the time, and sub-contractor labour when required. We have installed around 100 systems. If you think it's still worthwhile I am more than happy to help.' [J]

'I have to say that I am only a one man band, well one man and his eldest son band, we don't advertise anywhere getting all enquiries either through the MCS or Solar Trade Association web sites or recommends from customers. I shall not take offence should you consider me too small fry for any meaningful research figures.' [G]

3. Rates of microgeneration uptake – Number of solar PV systems installed from survey data, April 2010 – March 2011



3. Rates of microgeneration uptake – Number of air source heat pumps installed from survey data, April 2010 – March 2011



3. Rates of microgeneration uptake – Chi-squared correlations from survey data: age of business and number of installations

Dependent variable	Age of business (0-1 years; 2-4 years; 5-10 years; 11 years+)
Apr 2010 – Mar 2011: solar PV installations (1-5 / 6-20 / 21 or more)	**0.02 (6 df, 0%<5)**
Apr – Sep 2011: solar PV installations (1-10 / 11-20 / 21-60 / 61+)	**0.05 (9 df, 0%<5)**
Apr 2010 – Mar 2011: solar thermal installations (1-5 / 6 or more)	**0.03 (3 df, 12.5%<5, min = 4.5)**
Apr – Sep 2011: solar thermal installations (1-5 / 6 or more)	**0.09 (3 df, 12.5%<5, min = 4.7)**

3. **Rates of microgeneration uptake** – Chi-squared correlations from survey data: business size and number of installations

Dependent variable	Number of employees (0-2; 3-4; 5-10; 11+)
Apr 2010 – Mar 2011: solar PV installations (1-5 / 6-20 / 21 or more)	**0.01 (6 df, 0%<5)**
Apr – Sep 2011: solar PV installations (1-10 / 11-20 / 21-60 / 61+)	**0.000 (9 df, 0%<5)**

Dependent variable	Whether or not company has more than one business location in the UK
Apr 2010 – Mar 2011: solar PV installations (1-5 / 6-20 / 21 or more)	**0.008 (3df, 12.5%<5)**
Apr – Sep 2011: solar PV installations (1-10 / 11-20 / 21-60 / 61+)	**0.002 (3df, 12.5%<5)**

3. Rates of microgeneration uptake – Survey findings: Business models and marketing strategies

- Most microgeneration installer businesses are small and regionally-focused. Around half of all installers had five employees or less, while 75% had 10 employees or less
- Independence - 75% of respondents were founders of their installer business, while only 22 businesses were owned by another company
- Half of businesses were no more than four years old, while 75% of respondents had only been installing microgeneration for two years
- Regional focus + small-scale means low marketing power and ambition. Common across most businesses surveyed were two basic marketing strategies: word of mouth and their company website
- Over two thirds said they never advertised their services on television or radio, and over a third of the businesses hadn't used newspaper advertising

3. Rates of microgeneration uptake – Interview findings: Business models and marketing strategies

- Most of the businesses interviewed who installed residential microgeneration heat technologies fitted them in homes within their locality or region, partly due to regular servicing requirements
- Installers A and D fitted PV nationally, partly due to a lesser need to service PV systems
- Installer J, based in the South West, had decided to install PV locally only after the inverters twice developed faults in a system he had installed in Norfolk. Installer I felt that there was sufficient demand to satisfy his business in his local city, and going further afield to fit PV systems would simply lose time
- Installers I and J used a local magazine and local free paper respectively to compliment their basic word of mouth strategy. Even for installer A, with 20 employees, TV and radio marketing was seen as unaffordable

3. Rates of microgeneration uptake – Survey findings: Payment options offered by installers

- Lack of flexibility over payment methods continues to be a barrier to market growth

- Customers usually pay a deposit up front for installations with the remainder paid on completion (80% of companies surveyed). Half of installers took full payments on completion for installations

- 12 businesses - mortgage additions
- 16 businesses - low interest loans
- 10 businesses – installed solar PV for free, financed from their business receiving the Feed-In Tariffs from generation over 25 years
- 18 businesses installed PV for free financed by a third party receiving the tariff payments
- One business installed micro-wind for free, funded by a third party being paid the Feed-In Tariffs

3. Rates of microgeneration uptake – Interview findings: Alternative payment options

'We actually had our agreement terminated by the finance company, because we didn't provide them with enough business basically … we are targeting now different crowd …by speaking to people that actually have got the money to invest in the installations, rather than having to go for low, or take a finance option …' [D50]

'..Mr. A, who's got a good roof but hasn't got the money…they register…on our portal…we then go do a survey and then ascertain what can be installed…we then have those details to hand…and similarly Mr. B can come along and say…I'm prepared to invest in solar, we then send them particulars of properties which fit his investment criteria, and if they're interested then we put the two parties together, they both sign a number of contracts, one is leasing the roof, then the contract between investor and investee…we then handle the installation, and the warranty, the service, maintenance, and monitoring of the system.' [P35]

3. Rates of microgeneration uptake - Impact of Feed-In Tariffs and delays to residential Renewable Heat Incentive

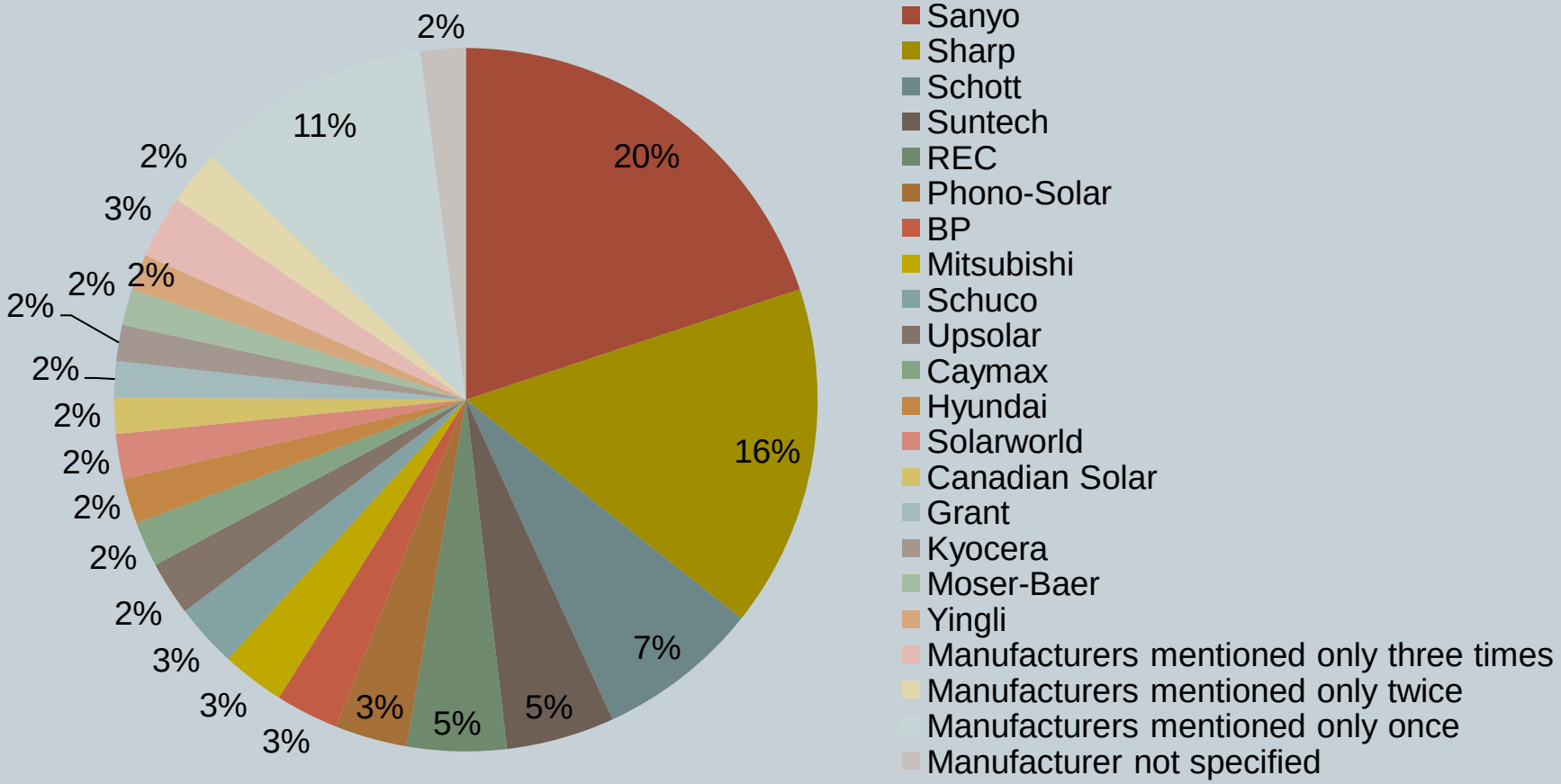
- PV installers most directly impacted; e.g. installer C had handed in MCS licence; installer A and installer M had cut the number of sub-contracting teams installing PV
- Renewable heat installers do not yet benefit from subsidies other than RHPP (Insufficient to offset upfront costs except in Northern Ireland)
- Since March 2012 installer K had fitted just two biomass systems in homes, and was having to diversify into commercial / district heating from biomass; installer E was all set up for biomass installation but could not go ahead without domestic RHI certainty
- However, installer F took view that ASHPs were already cheaper than oil heating alternatives, and so RHI for domestic ASHPs was unnecessary and would attract installers more interested in making profits over ensuring adequate installation standards

3. Rates of microgeneration uptake - Impact of media representation of Feed-In Tariffs cut

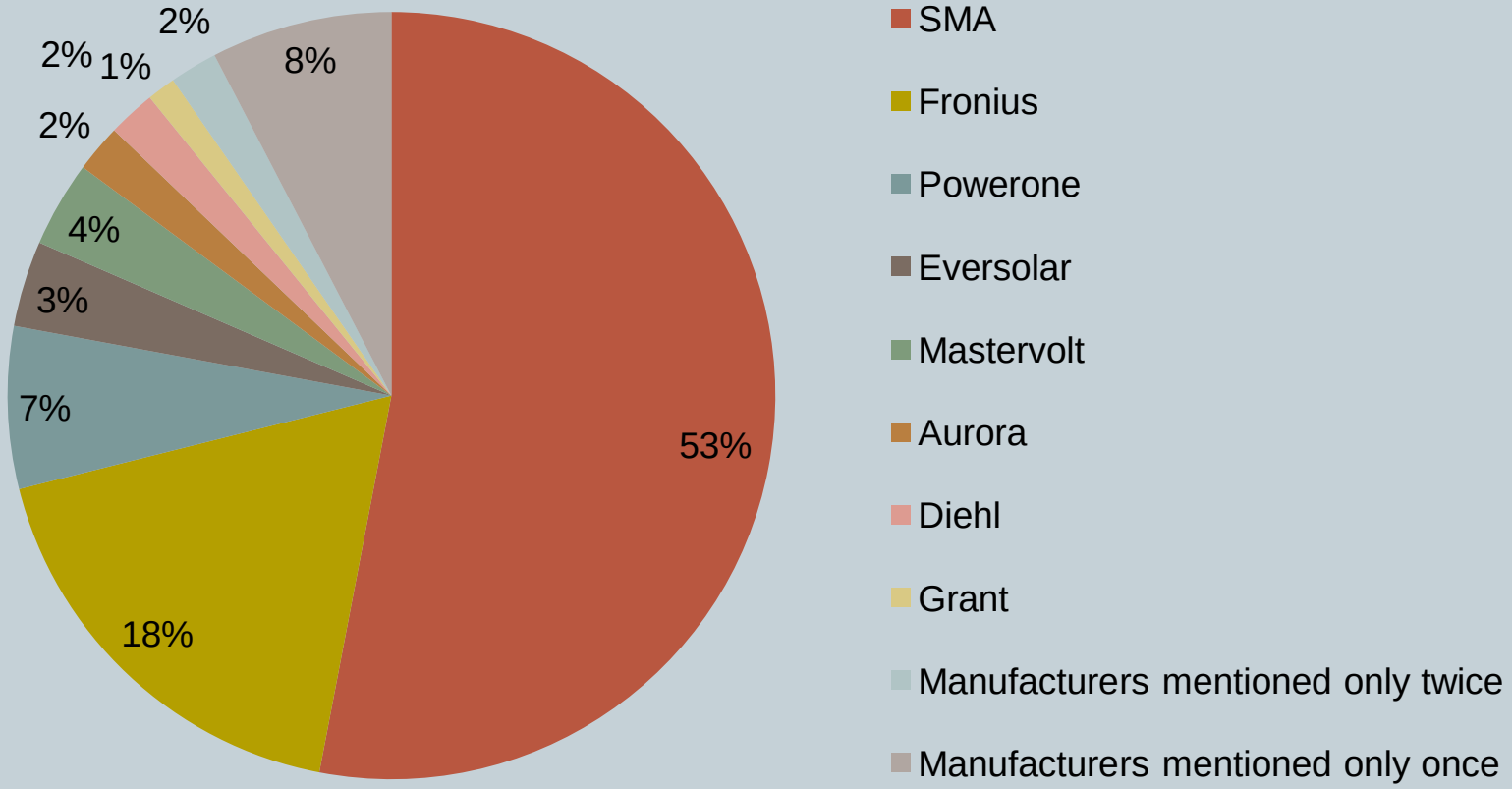
'People never read in between the lines ..the first announcement that they heard was tariffs are getting down, therefore its not longer wise to invest in panels, and they stopped there….majority of people are just believing what they see, what they are hearing, basically in the news, or the papers.' [D52]

'The Daily Mail, goes to a lot of the market that we would be working with … and when the FITs fiasco happened, they milked it for months, how ridiculously inefficient, how terrible renewables were, and how they were going to bankrupt the country.. .there were rumours floating around that putting in renewables was going to add £200 a year to everybody's gas and electric bill .. they've actually published the figures since, I think they came out at £5 a year, of course when DECC published those figures they are not sensational good news … so they get hidden away on page 10.' [K25]

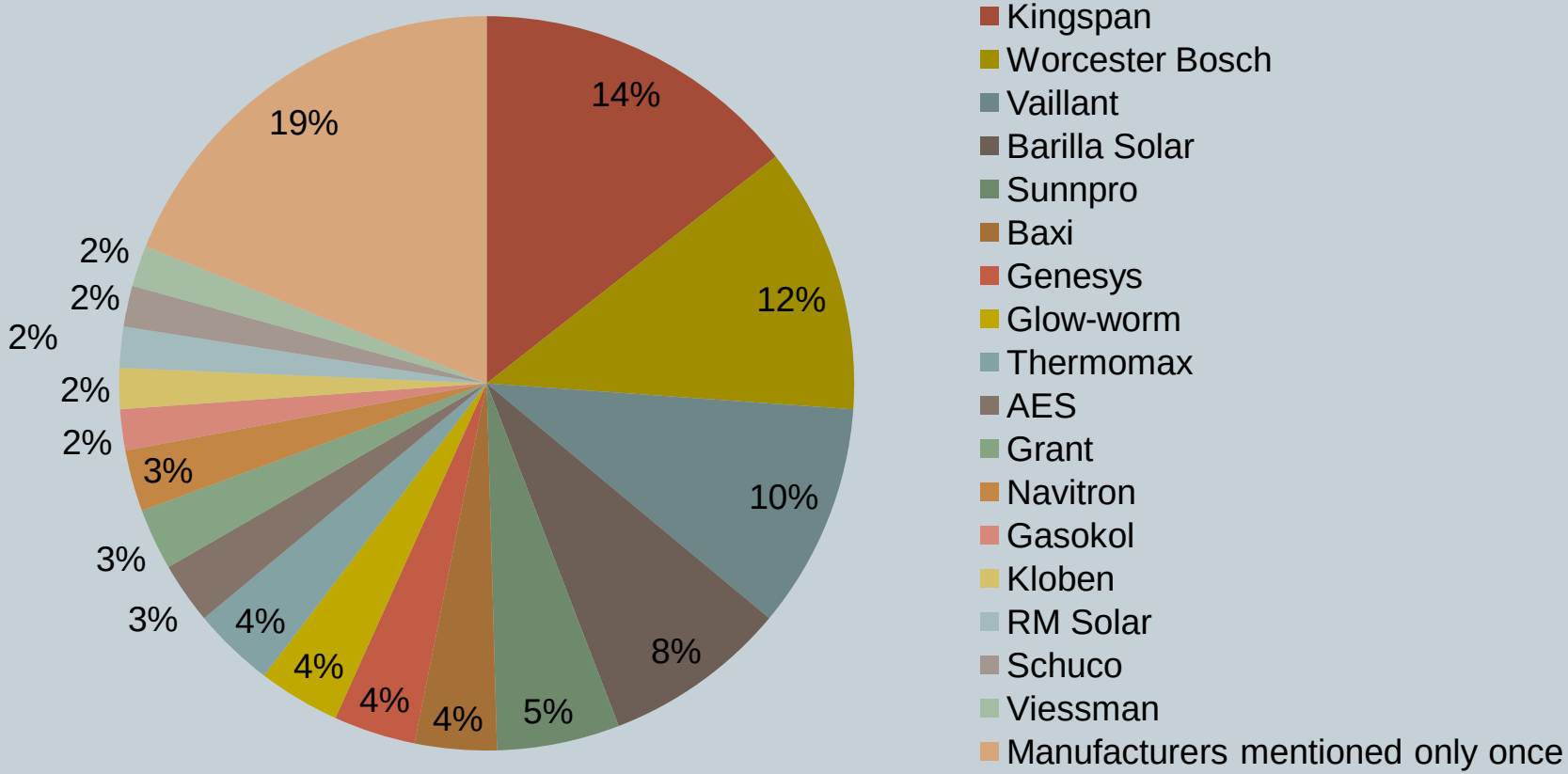
4. Microgeneration installation standards - Relative % of installed manufacturer products: solar PV modules



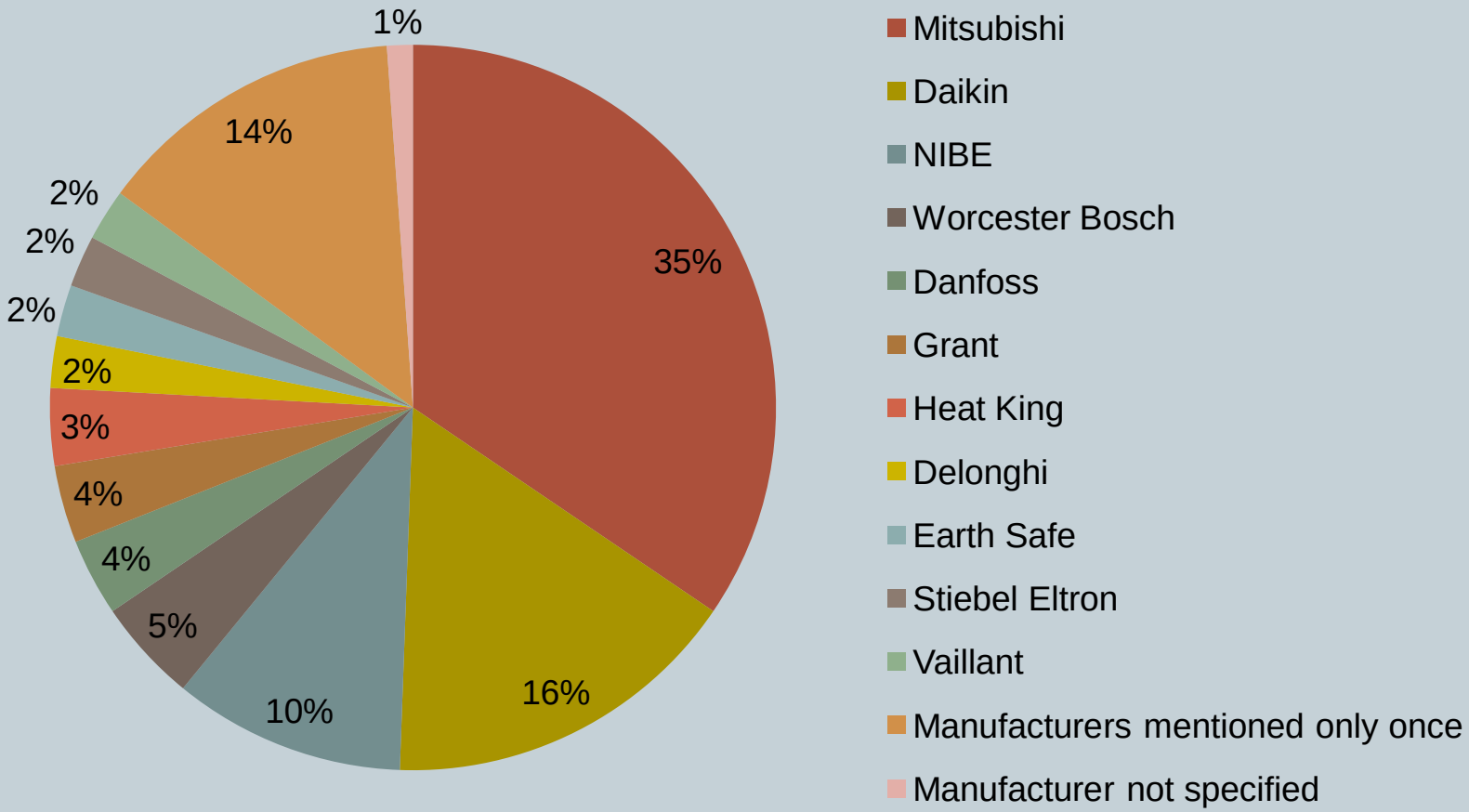
4. Microgeneration installation standards - Relative % of installed manufacturer products: solar PV inverters



4. Microgeneration installation standards - Relative % of installed manufacturer products: solar thermal



4. Microgeneration installation standards - Relative % of installed manufacturer products: air source heat pumps



4. Microgeneration installation standards - Training, on the job learning and previous experience

Training provider	Number of companies who used training provider	% of all respondents to this question (216 / 317)	Coding category
NICEIC / PPL training	52	24	Industry training provider
Ecoskies	29	13	Industry training provider
Worcester Bosch	17	8	Manufacturer
Mitsubishi	15	7	Manufacturer
CAT	13	6	Industry training provider
Schuco	10	5	Manufacturer
Daikin	10	5	Manufacturer
NAPIT	9	4	Industry training provider
Logic	8	4	Industry training provider
Grant	8	4	Manufacturer

4. Microgeneration installation standards – Effectiveness of MCS annual inspections

- 16 accreditation bodies – varying technical expertise and approaches – some inspectors lack technical know how and are more concerned with aesthetics or minor details – e.g. Installer L pulled up on using SAP 2009 not SAP 2005!
- Annual inspections last fairly full day, mostly office-based processes but only a couple of hours for visiting an installation
- Inspected installations are almost always self-selected by installer company, and by arrangement with customers. Inspectors usually ask to see installation near company location
- Really, random system of inspection required. Installer L suggested that it is not in the interests of competing certification bodies to introduce more effective inspection systems and risk losing regular income from registered installers

4. Microgeneration installation standards - MCS annual inspections – self-selecting installation visits

'Obviously if you had a disastrous one you wouldn't put that in the list, I would imagine ...' [H]

'I'd much rather they come and turned up when you're halfway through a job, unannounced sort of thing – said, just come and have a look at what you're actually doing...'cause, one of the things I'll say about any annual inspection, it's very easy to fudge ... and a lot of contractors do that, they'll do two jobs they'll be perfect, you know the ones that get the qualities for the inspection, and all the other ones they cut corners on.' [I]

'It's improving the industry…you can't be a rogue in MCS, it's just too difficult...I put forward an installation…I got the go ahead only two weeks ago…come Tuesday, by then I would have had the heat pump fitted and underfloor heating down, I won't have the system up and running, but I would have enough for him to…get a good idea...and anything else he needs to do I can submit photos.' [F]

4. Microgeneration installation standards - Installer N view on changes required to raise heat pump installation standards

- Heat Emitter Guide for Domestic Heat Pumps
- Range of allowable flow temperatures is too generous (50 – 60ºC are acceptable), meaning that if householders want to have a heat pump they can, even if it is not going to cut carbon or save money on their energy bills
- It should be unacceptable to install domestic heat pumps that have no realistic prospect of saving carbon (this depends too on how users interact with systems)
- Unscrupulous developers and housing authorities should be prevented using technologies unless they are MCS accreditated

5. Interim conclusions

- The research presented is in the first instance an exploratory analysis of the installation market across a range of microgeneration technologies, following the introduction of the Feed-in Tariffs in April 2010
- Installer businesses are predominantly regionally-focused and small-scale, with low financial and marketing capacity. This forms part of a bigger picture of ineffective communication of microgeneration and patchy public awareness
- Overall the results show the fundamental dependence of installer business models on government subsidies and the Microgeneration Certification Scheme in particular
- The variations in business models across different technology types reflect the different economics, different level of subsidies and levels of market certainty that apply