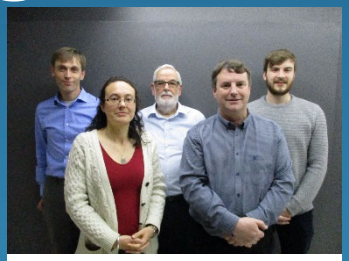
Wednesday 3rd February 2021

NEA Technology Training courses

Dr Paul Rogers

NEA Technical and Training Collaboration



Overview of presentation

- NEA Technical Innovation Fund (TIF)
  - Funded installation of large and small measures
  - Monitoring and evaluation
- Converting the lessons into training
- Energy in the home: a technical approach
  - 8 Modules
  - Practical examples from the course

Technical Innovation Fund Programme

April 2015 - March 2019

NEA Action for Warm Homes

HEALTH & INNOVATION PROGRAMME

46 projects in TIF

£5 million programme

£2.6 million gap and match funding generated
(combined)

Headline outputs

46	projects
2202	households received a measure
2719	measures installed
19	technologies monitored
67	products monitored

Technical innovation Fund - Summary

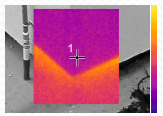
Heating Improvement	Energy Storage	Fabric	Controls	Complementary Products
19	7	8	10	15

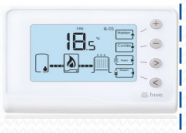
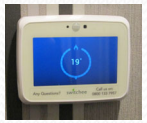



SunampCube

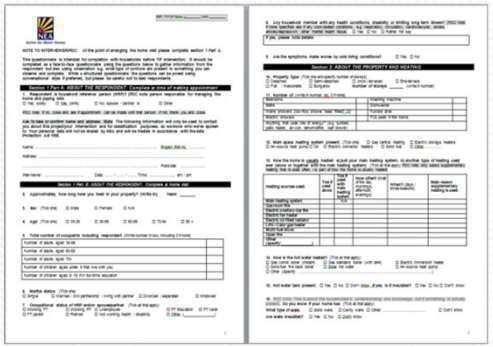




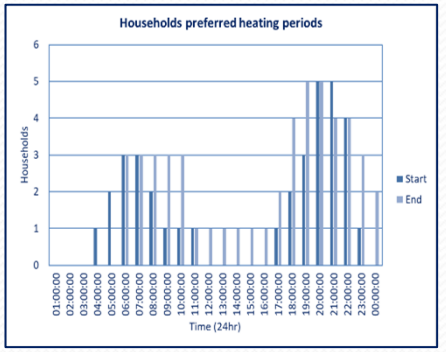



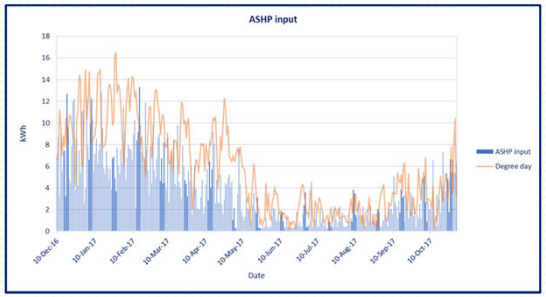



Qualitative, Quantitative & Evaluation



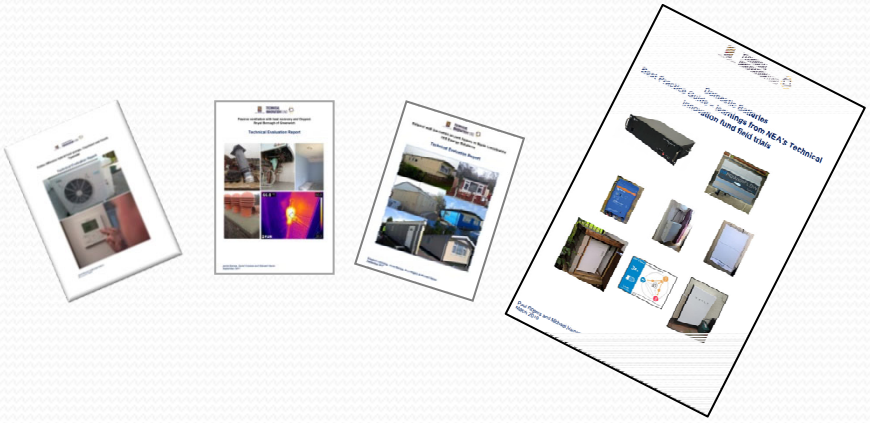
Tech Ref	Before		After		Comparison	
	Cost per 30 days	Estimated annual cost	Cost per 30 days	Estimated annual cost	Estimated Saving (%)	Estimated Saving (£)
Existing radiators						
T-02	£65	£773	£59	£621	20%	£152
T-18	£99	£1,153	£86	£1,050	9%	£104
T-01	£83	£982	£80	£847	14%	£135
T-20*	£19	£276	£27	£280	-1%	-£4
Average	**£82**	**£969**	**£75**	**£839**		**£130**
New radiators						
T-07	£91	£1,122	£91	£954	15%	£168
T-06	£101	£1,189	£86	£851	28%	£339
T-08	£46	£552	£50	£539	2%	£13
T-10**	-	-	£122	£1,255	-	-
Average	**£79**	**£954**	**£87**	**£781**		**£173**





Challenges

- Small samples of monitored properties
- Complex projects with packages of measures
- Complex projects with other improvements being carried out during monitoring period
- Variability in samples (Behaviour, occupancy, energy use etc)
- Variability in resident support and instruction



Technical innovation Fund - Reports

https://www.nea.org.uk/what-we-do/resources-publications/?tag=technical

Further dissemination of learning

- Use learnings from the Technical Innovation Fund to create a suite of training courses on technologies

Further dissemination of learning

- In house pilot of face to face course for 5 modules in Dec 2019
- COVID 19 – switch in delivery for NEA Training
- Conversion to E-learning, extra content, more modules

Energy in the home: a technical approach

- Solar and Energy Storage
- Insulation
- Heating controls and technologies
- Heat Pumps
- Decarbonisation of fuel poor homes
- Electric heating
- Biomass, CHP and Heat Networks
- Electricity tariffs

Solar and Energy Storage

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Energy in the home: a technical approach

Solar and energy storage

Solar and Energy Storage

Case Study 1 – Solar PV in Cheshire (repeat click text area for more info)

- Nominally identical PV systems installed at similar times
- Annual generation ranged from 1,695 to 2,731 kWh
- Total generation from 7,877 to 15,637 kWh
- Issues
  - Shading and inverter failures
  - Slow response to issues

Solar and Energy Storage

- Battery storage installation issues – wiring, separation distance

Solar and Energy Storage

Battery storage challenges

- Batteries need a consistent internet connection
- Select households who will benefit
- Batteries and time of use tariffs
- Solar system issues

Heating controls and technologies

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Energy in the home: a technical approach

Heating controls and technologies

Heating controls and technologies

The Netatmo is really easy to use.

When in a chip shop, after coming home late, I was able to turn on the heating and avoid coming home to a cold house.

At Luton airport when going on holiday in winter, I was able to set the heating to ‘frost guard’, which gave me peace of mind.

Heating Controls and technologies

Smart thermostat challenges

- Resident does not have internet or smart phone
- Resident switches broadband provider
- Other operational challenges
- New resident moves in

Heating Controls and technologies

Smart thermostat savings

- Manufacturers often claim savings of 20 to 40%
- May be based on simulations of best performance
- Greatest savings likely in overheated homes
- Many of the fuel poor underheat their homes
    - More likely to see a rise in consumption

Insulation

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Energy in the home: a technical approach

Insulation

Insulation

Park Home Insulation

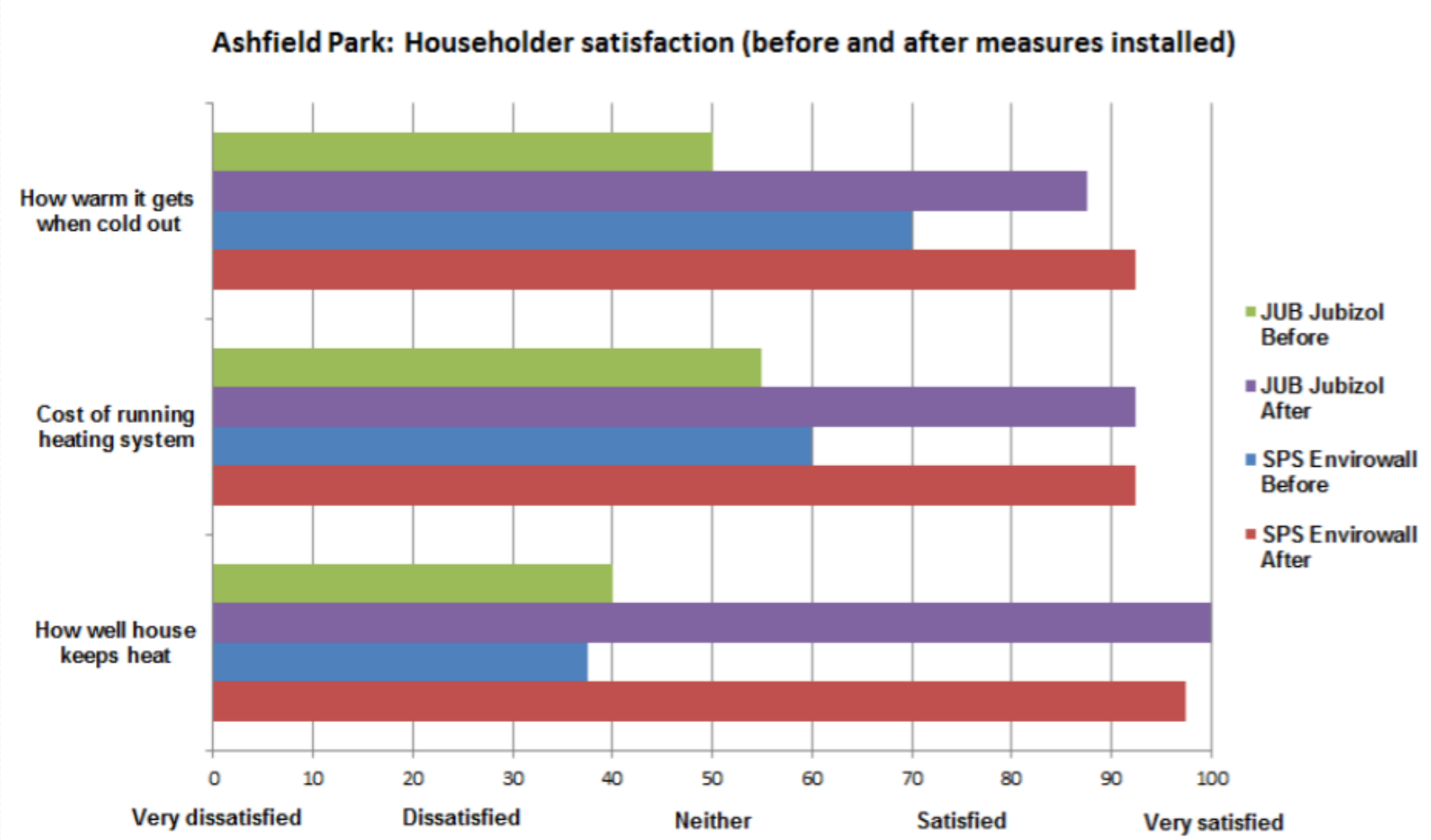
Stage 1

Stage 2

Stage 3

Stage 4

Insulation


Ashfield Park: Householder satisfaction (before and after measures installed)
How warm it gets when cold out
Cost of running heating system
How well house keeps heat
JUB Jubizol Before
JUB Jubizol After
SPS Envirowall Before
SPS Envirowall After
0
10
20
30
40
50
60
70
80
90
100
Very dissatisfied
Dissatisfied
Neither
Satisfied
Very satisfied

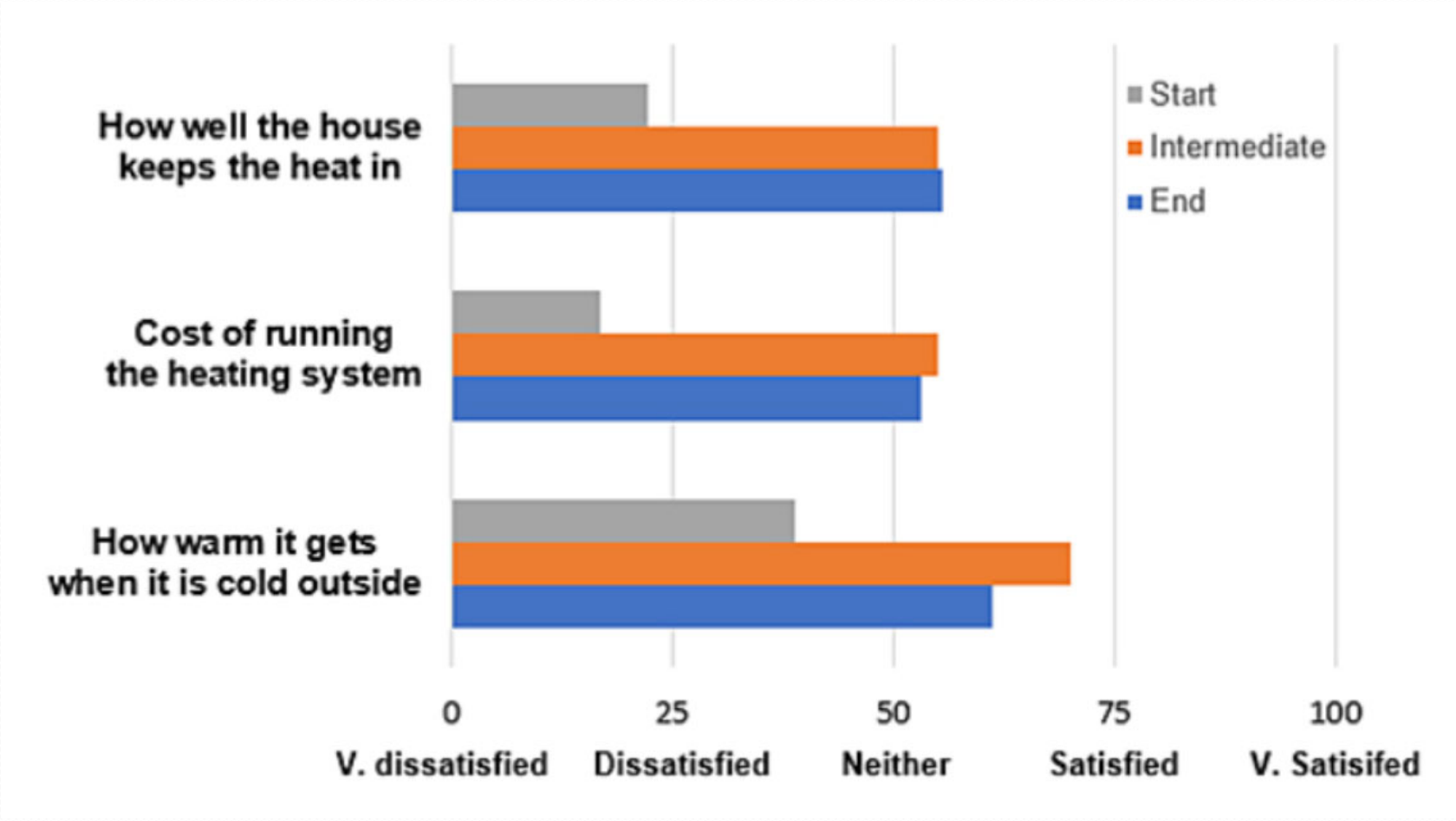
Insulation

Park home insulation

- High levels of resident satisfaction
- Average savings of about 20%
- Payback time based on bill reduction of over 40 years
- Additional benefits
  - Improved appearance
  - Improved sound-proofing
  - Reduced condensation and mould
  - Health benefits

Insulation

Underfloor insulation



Insulation

Underfloor insulation

- Installations in solid wall flats or houses over 100 years old
- Average savings of about 13%
- Payback time based on bill reduction of over 30 years
- Lower improvement in resident satisfaction
  - Issues with drafts and heat loss elsewhere
  - Single glazed windows
  - Solid walls

Heat Pumps

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Energy in the home: a technical approach

Heat pumps

Heat Pumps

Hybrid heat pump with existing oil boiler

- 5kW ASHP added to oil boiler to become hybrid
- System automatically works with ASHP, oil or both
- Mode depends on temperature and price of fuels

Heat Pumps

Hybrid heat pump with existing oil boiler

- Only one system correctly used in hybrid mode
- One used oil while tank full and then switched to ASHP
- Another switched between systems manually
- Hybrid mode, SCoP = 2.65
- ASHP on own, SCoP = 1.82
- Issue over training

Thank you for listening

Any Questions?