

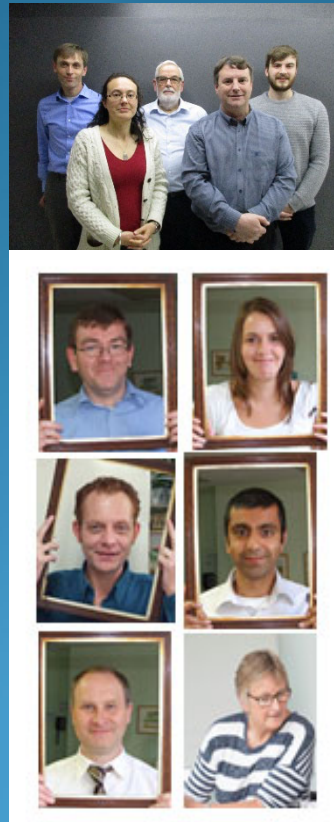
Wednesday 3rd February 2021

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



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

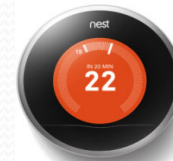
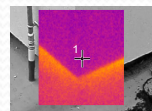
products monitored

Technical innovation Fund - Summary

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



SunampCube



Qualitative, Quantitative & Evaluation

NOTE TO INSTALLATION: on the point of installing the boiler and please complete section 1 and 2.

The following is intended to complete the necessary data for the boiler. It should be completed by the installer and the homeowner. It is not intended to be a technical specification. It is intended to be a record of the installation and the homeowner's requirements. It is not intended to be a technical specification. It is intended to be a record of the installation and the homeowner's requirements.

Section 1: General Information

1.1. Name of the property: _____

1.2. Address: _____

1.3. Postcode: _____

1.4. Date of installation: _____

1.5. Name of the installer: _____

1.6. Name of the homeowner: _____

1.7. Contact number: _____

1.8. Email address: _____

1.9. Website: _____

1.10. Social media: _____

1.11. Other information: _____

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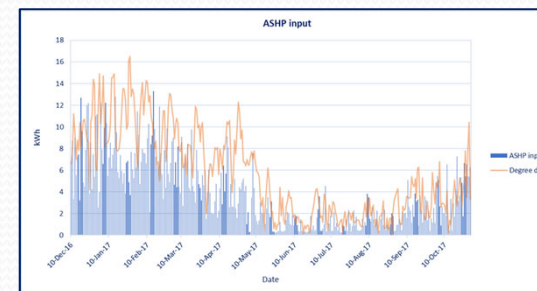
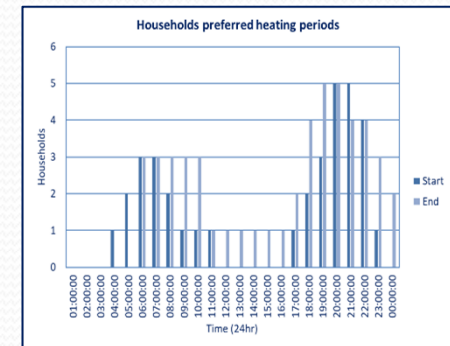
1.98. Other information: _____

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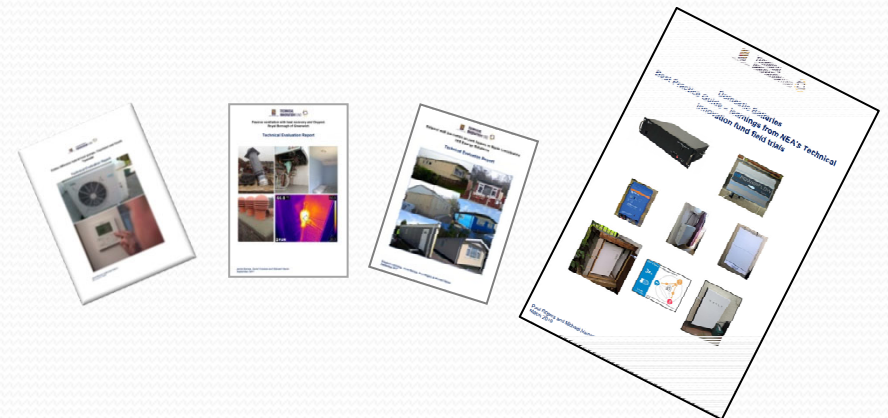


Tech Ref	Before		After		Comparison	
	Cost per 30 days	Estimated annual cost	Cost per 30 days	Estimated annual cost	Estimated Saving (%)	Estimated Saving (£)
Existing radiators						
T-02	£65	£773	£59	£621	20%	£152
T-18	£99	£1,153	£86	£1,050	9%	£104
T-01	£83	£982	£80	£847	14%	£135
T-20*	£19	£276	£27	£280	-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



Action for Warm Homes

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



Action for Warm Homes

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



Action for Warm Homes

Energy in the home: a technical approach

Insulation



Insulation

Park Home Insulation



Stage 1



Stage 2



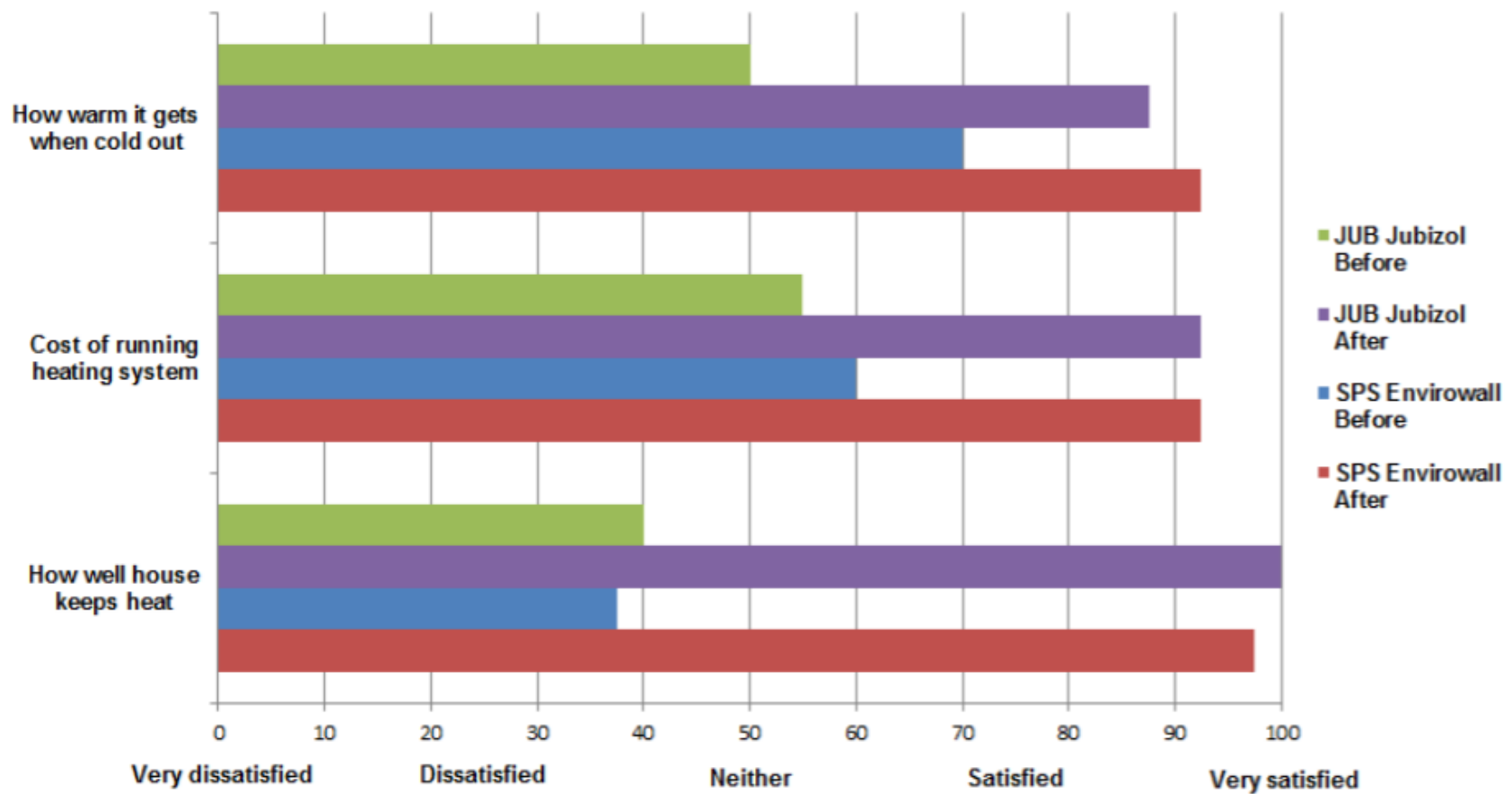
Stage 3



Stage 4

Insulation

Ashfield Park: Householder satisfaction (before and after measures installed)





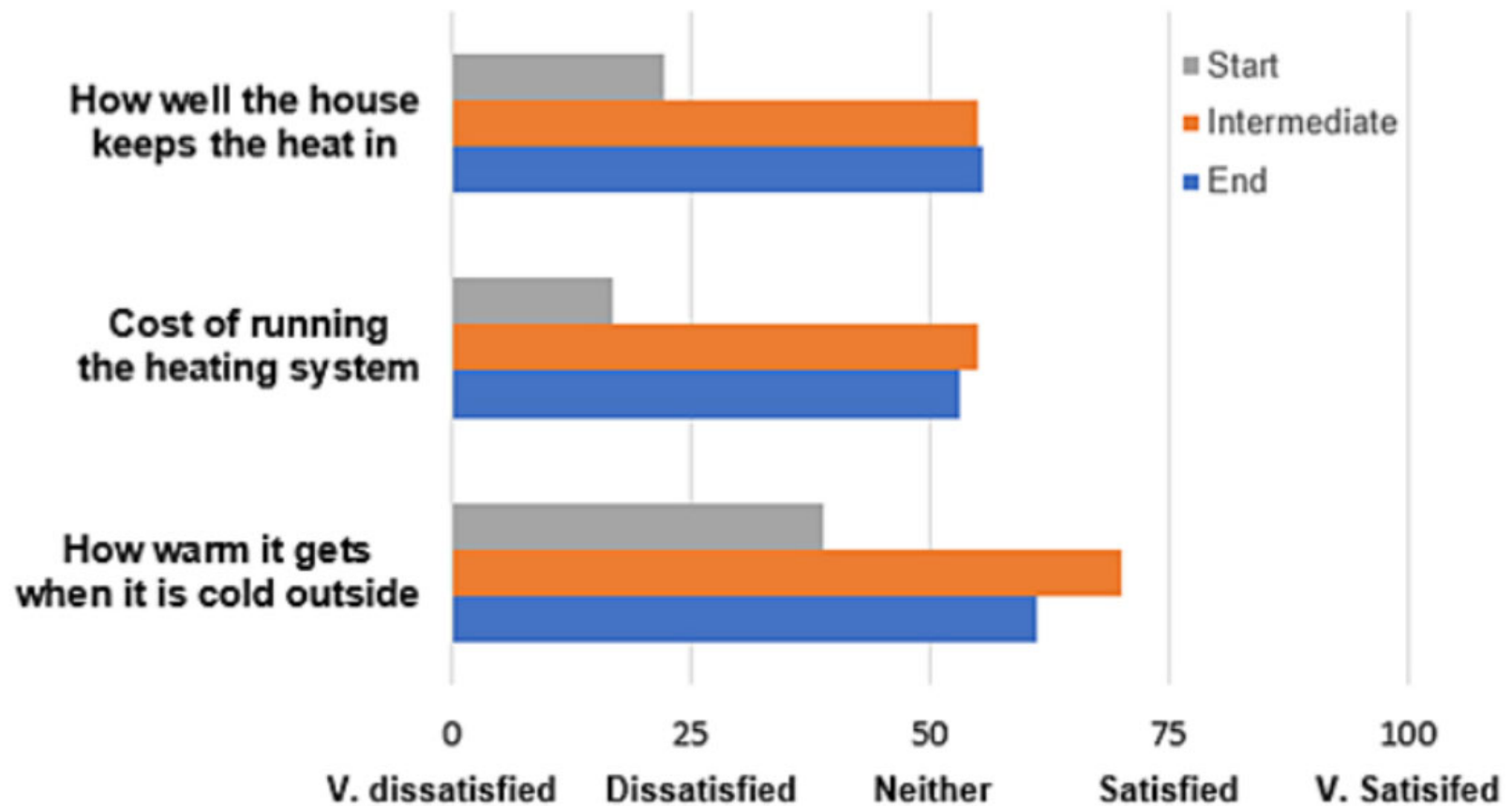
Insulation

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



Action for Warm Homes

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?