Perspectives of Welsh Social Landlords on Smart meter data research for assessing benefits of energy efficient housing improvements

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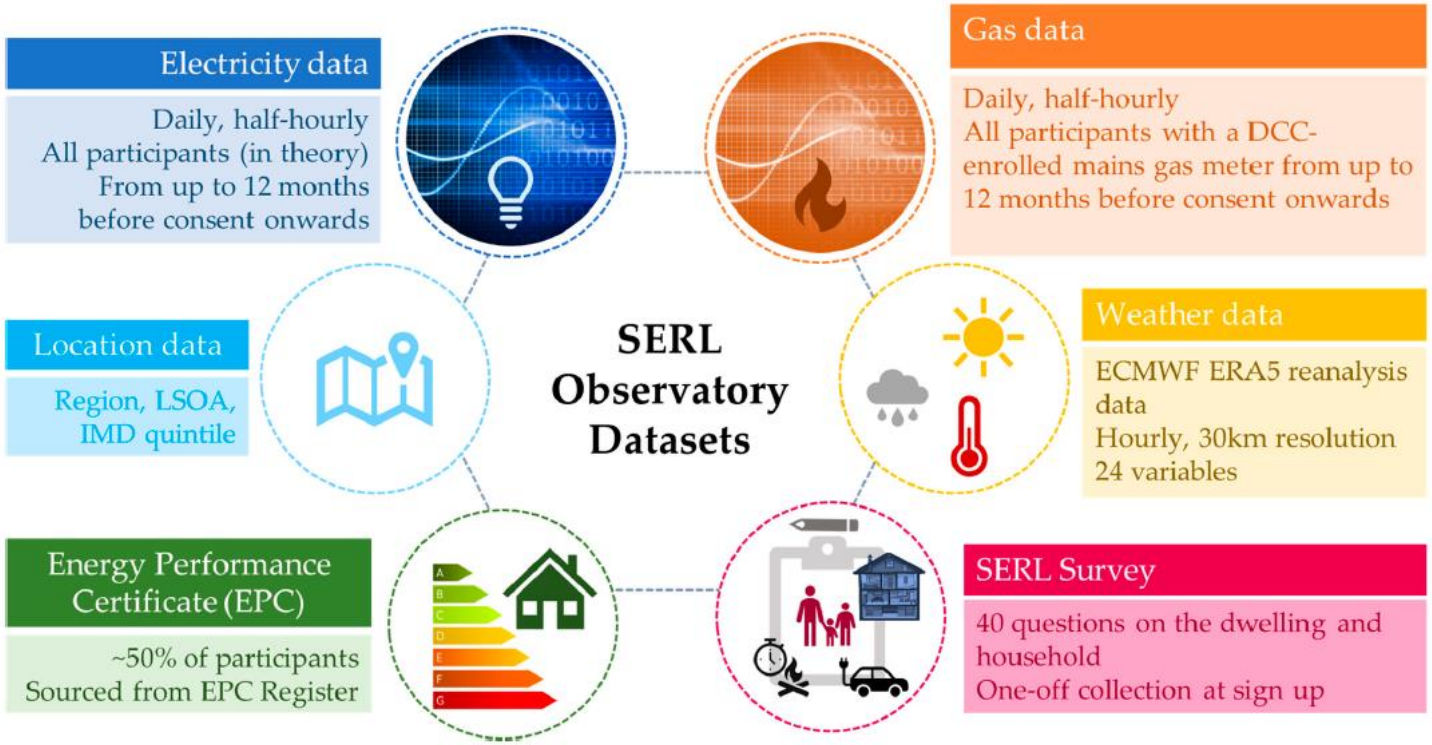
Overview of presentation

- SERL and SHREWD project
- Research context, workshop aim and objectives
- Workshop structure
- Discussions
- Themes
- Conclusion

SERL and SHREWD project



SHREWD

This project plans to create an **energy data resource for social housing in Wales** through which housing and energy efficiency policies such as the **Welsh Housing Quality Standard (WHQS)** can be monitored. The SERL observatory will be used as a control to compare results with the wider UK housing stock.

In addition to SERL data variables:

Interventions data (from Landlords)

Webborn, E.; Few, J.; McKenna, E.; Elam, S.; Pullinger, M.; Anderson, B.; Shipworth, D.; Oreszczyn, T. The SERL Observatory Dataset: Longitudinal Smart Meter Electricity and Gas Data, Survey, EPC and Climate Data for over 13,000 Households in Great Britain. Energies 2021, 14, 6934. https://doi.org/10.3390/en14216934

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RSL Workshop

- There is limited literature **on impact of WHQS on energy use in Welsh Social Housing**.
- We wanted to **learn from the landlords** what they already know and what information will be useful.

The workshop aimed to bring together Registered Social Landlords (RSLs) in Wales to explore the knowledge gaps and challenges in smart meter data use for assessing the impacts of housing policies.

Three questions were given to the RSLs to discuss during the 20 mins breakout sessions:

- What do you **already know about energy use** before and after intervention in your properties?
- What do you **want to know about energy use** in your properties?
- What do you see as the **pros and cons of installing and using smart meters** in social housing?

Analysis

Method

Analytical approach for identifying themes in the discussions (themes coding).

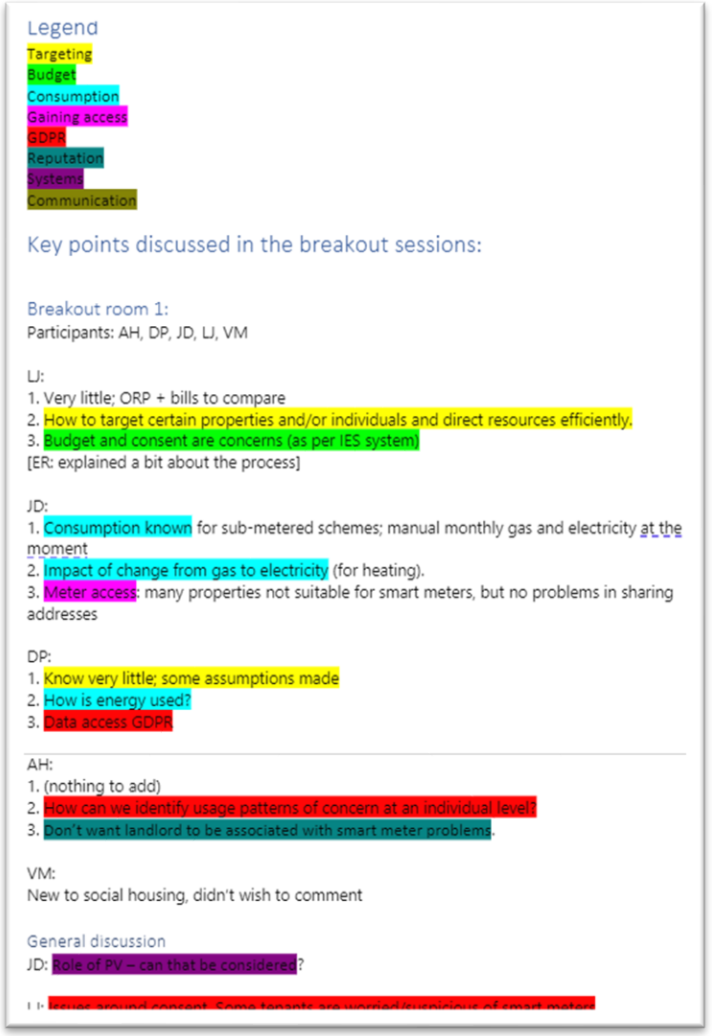
- 3 Broder themes

Benefits

Targeting issues

Socio-economic challenges

- Sub-themes



Legend

Targeting
Budget
Consumption
Gaining access
GDPR
Reputation
Systems
Communication

Key points discussed in the breakout sessions:

Breakout room 1:
Participants: AH, DP, JD, LJ, VM

LJ:
1. Very little; ORP + bills to compare
2. How to target certain properties and/or individuals and direct resources efficiently.
3. Budget and consent are concerns (as per IES system)
[ER: explained a bit about the process]

JD:
1. Consumption known for sub-metered schemes; manual monthly gas and electricity at the moment
2. Impact of change from gas to electricity (for heating).
3. Meter access: many properties not suitable for smart meters, but no problems in sharing addresses

DP:
1. Know very little; some assumptions made
2. How is energy used?
3. Data access GDPR

AH:
1. (nothing to add)
2. How can we identify usage patterns of concern at an individual level?
3. Don't want landlord to be associated with smart meter problems.

VM:
New to social housing, didn't wish to comment

General discussion
JD: Role of PV – can that be considered?

What do you already know about energy use before and after intervention in your properties?

- **Lack of data-**

"***we can't assess if our interventions are working, smart meter data can fill that gap***."

- **Anecdotal information**

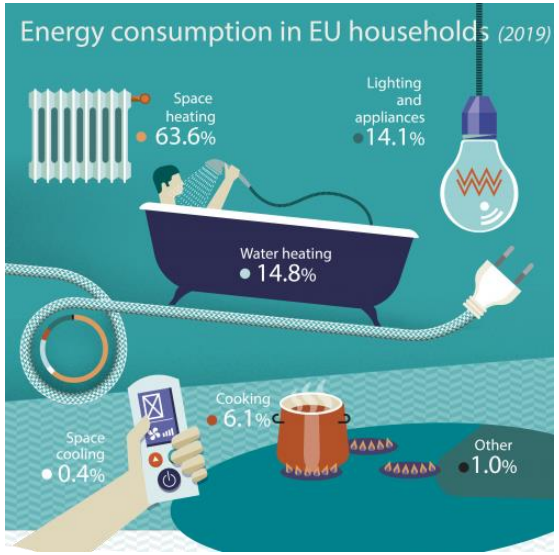
*"We don't have a consistent sort of robust information and we have some **anecdotal cases**."*

- **Profiling of properties based on occupancy**

"*We've got some anecdotal information that **we've got three profiles.**"*

- **Evaluation through contextual information**

"*The problem is that **tenant's don't keep record of their energy use and we assume that has not changed much**."*



What do you want to know about energy use in your properties?

- **Is it working?**

*"A**re these interventions/upgrades working**, is it cheaper to install these technologies in long term?"*

- **Which technology works where?**

*"We are interested to understand the energy use patterns in our houses so we can derive **which interventions are working in which dwelling** and **make dwelling based solutions**."*

- **Where is the problem?**

*"If we can know the **change in energy consumption in the early stage of implementation** of the technology, we can decide if there is a problem are prepare a plan."*

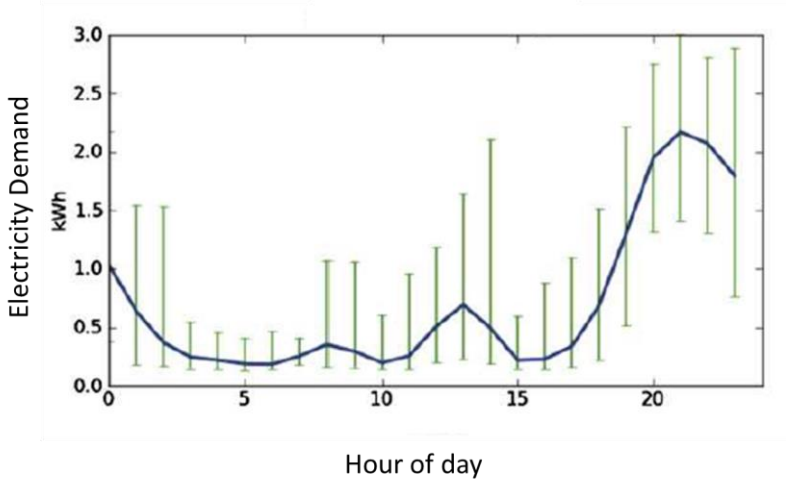
What do you see as the pros and cons of installing and using smart meters in social housing?

- Pros

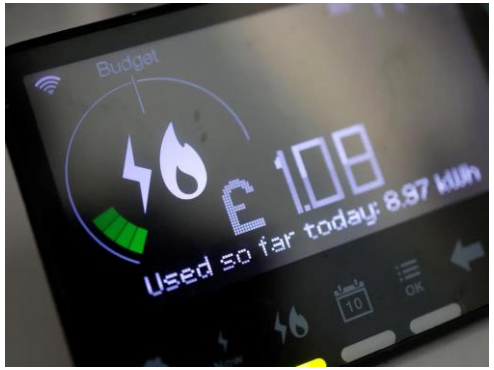
1. High resolution, reliable and continuous data
2. Can be used to identify energy use peaks
3. Test performance of heat pumps and quantify PV input and output

- Cons

1. Complains of smart meter failure
2. Smart meter anxiety
3. Data privacy concerns



Adapted from: Abreu, J. M., Câmara Pereira, F., & Ferrão, P. (2012). Using pattern recognition to identify habitual behavior in residential electricity consumption. *Energy and Buildings*, 49, 479–487. https://doi.org/10.1016/j.enbuild.2012.02.044



Themes

- Benefits
  1. Economic strategy
  2. Data privacy and quality
  3. Monitoring impacts-aligning with decarbonising targets
- Targeted issues
  1. Tenancy turnover time
  2. Unusual energy patterns
  3. Tenants reluctant to participate
  4. Testing current quantitative data and methods
  5. Fuel vulnerability and equity
  6. Performance gap
- Socio-economic challenges
  1. People
  2. Budget
  3. Access
  4. Reputation

Benefits of smart meter data research for RSLs

1. Economic Strategy

*"**Are we doing the right retrofit?** The way that we feel about that information is **we're going to be spending a lot of money** to meet these standards that are being required. **That information is going to be vital to know that we're doing a job, that what we're doing is working.**"*

2. Solves data privacy and quality issues

*"**There's issues with data protection**. People don't want to store that data; We won't need to store that information. It'll be kept in a separate area where we won't have to worry."*

3. Aligning with decarbonisation targets

*"This links into obviously the new act that is coming into force next year, the **In Homes Act** and that hugely could have an impact on energy because it does **correlate between the two in terms of energy use**." -Participating RSL*

Targeting issues

1. Tenancy turnover time

*"The question of how much **risk they end in their tenancy because of energy demands.***"

2. Unusual energy patterns

"*In some cases, we have seen that **energy use has gone up because the bills went down** so tenants feel they can consume more energy*."

3. Tenants reluctant to participate

- **Tenants unsure about benefits-** *"Getting access to homes unless we can sort of articulate **that there's a real benefit**."*
- **Data privacy-***"There's a sense of **suspicion about what information can be captured**, sense of ownership about control."*
- **Physical changes-** *"A **physical difficulty in terms of getting equipment into homes** and that requires changes within the home."*
- **Engagement and knowledge-** *"If there are issues on **lack of education**, we can address those with more engagement if we have more data."*

Targeting issues

4. Validating current data (EPC) and methods (models)

*"using smart meter data and **fill in the gaps in the data** because at least if you've got EPC in, it sets the level."*

5. Fuel vulnerability and equity

*"We aim to improve their lives and need to know if it's not. **Selling decarbonisation to those who can't afford it will not work**."*

6.Performance gap

- Needed support on heat pump energy demand
- How do complex systems work together, PV, Battery, Heat Pump and smart tariff
- Issues where external wall insulation / cavity wall insulation was [wrongly] installed and now taking out.

Socio-economic challenges faced by RSLs in implementation of retrofits and monitoring benefits

1. People

- Selling decarb solutions to tenants
- Post-retrofit anxiety
- Smart meter anxiety
- Adapting to change

2. Budget

Monitoring systems costly (**Expensive to install £3,500 for the kit**) and intrusive to install

3. Access

- Perception from tenants that social housing tenants are singled out and patronised.
- Resistance to additional cabling and bulky kit.
- Many properties not suitable for smart meters
- Tenants do not like monitoring, which leads to resistance in installation of monitoring systems.

*"Resistance to previous IES[1] project (**only 12 out of 69 properties** wanted IES)."*

4. Reputation

*"Funded support to manage **energy poverty**, but **there is a stigma, so people don't want to admit**."*

[1]**IES** -Integrated Environmental Solutions, building performance analysis applications

Conclusions

1. They want to know the actual reduction in electricity and gas consumption post retrofit/intervention.
2. They are struggling to get their tenants to participate in retrofit programs, there is lack of engagement.
3. They want to know if they are losing tenants because of poor building performance.
4. They struggle to get access to households to install smart meters and access to smart meter data.
5. Smart meter data research can bridge the gap between the known and unknown and help build engagement between landlords and tenants.

Thank you!

Q/A

Project website:

https://www.cardiff.ac.uk/research/explore/find-a-project/view/social-housing-research-on-energy-from-welsh-data

Email: Guptab3@cardiff.ac.uk