Saving energy in the smart home:
Opportunities and challenges

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The (energy) smart home

- Automation
- Feedback/ real-time data
- Solar PV/ micro-generation
- Smart meters
- Electric vehicle integration
- Variable price signals for electricity (linked to smart tech)
- Efficiency
- Information and communication technologies
The broader smart home vision

- Convenience
- Comfort
- Security
- Entertainment
- Aesthetics/ mood enhancers
- **Energy management systems**
- Monitoring and care (of energy, people, pets)
- Voice control
An increasingly mixed bag…

- Convenience
- Efficiency
- Control
- Automation
- Comfort
Two projects on the smart home
Smart home control project

Funded by Energy Consumers Australia (2016-17)

Focused on the benefits and detriments of smart home control for ‘energy vulnerable’ and ‘regular’ households.

- **Stage 1** – Content analysis of smart home control marketing materials
- **Stage 2** – Self-Install Trial of off-the-shelf smart home control devices (smart light bulbs and plugs) with 40 households in Victoria and South Australia (56 participants)
- **Stage 3** – Observed Installations of 3 smart plug products in 6 Victorian households

With Dr Larissa Nicholls, Tanzy Owen and Dr Sergio Tirado

Smart plug: $70-80  
LED Lighting Starter Set: $100-170
Automating the smart home

Australian Research Council project (2015-18)

• Qualitative content analysis of international magazine/online articles written about the smart home – 272
• Industry interviews (Australian)
• Household ethnography: tours, photography and interviews with Australians who live in smart homes (broadly defined!) – 31

With Dr Larissa Nicholls, Dr Jenny Kennedy, Rikke Jensen, Paula Arcari

https://automatedsmarthome.wordpress.com/
Depth not breadth

• How are people integrating smart home technologies into their everyday lives?
Resource Man
(the desired energy consumer)

- Rational, functional, efficient and tech-savvy consumer/ smart tech user (from energy industry/ policy)
- Engineering/ economic solutions
- Individual operator
- Competent and empowered
- More likely to be a man


Image credit: Interactions ma
Key challenges
Plug and play?

- ECA Study

### Self-Install Trial households

- 26% did not try
- 26% tried to install but unsuccessful
- 24% installed but abandoned use
- 24% actively using

Lifestyle benefits (ECA study)

- Predominant marketing themes from ECA study:
  - enhanced comfort
  - more convenience
  - better security
  - personalisation

- Energy saving and load shifting minor component of smart home visions and promotion

See: Strengers, Y, Nicholls, L, Owen, T & Tirado, S 2016, *Smart home control devices: Summary and assessment of energy and lifestyle marketing claims*, Centre for Urban Research, RMIT University, Melbourne, Australia.
Lifestyle benefits (ECA study)

• **Smart bulbs** used in kitchen and living room to dim light and create ambience

• **Smart plug** used to switch electric heater on before coming home
  
  ‘Melbourne is a very cold place in winter… it just meant that there wasn't that initial discomfort of being freezing in the house on entry.’

• Increased electricity use
  
  ‘The devices probably [have] not [saved energy] because I'm looking at them more as a potential safety and comfort feature.’

See: Nicholls, L, Strengers, Y & Tirado, S 2017, *Smart home control: exploring the potential for enabling technologies in households*, Centre for Urban Research, Melbourne, Australia.

https://gallery.mailchimp.com/b38874b25e686137780eb836e/files/5d00ecfb-2098-4148-89dc-49b72b98d0aa/ECA_SHC_Final_Report_CURRENT.pdf
Pleasance (ARC study)

- **Lutron home automation**
  - ‘Your home is a place where you experience comfort, romance, and peace of mind—a place where you experience pleasance.’
  - ‘pleasance … is a fundamental feeling that is hard to define but that people desire to experience’.

What other researchers say

• ““Savings” … so often turn out to be steps taken down an upward-moving escalator’ (Darby, 2008: 502).

• ‘SHTs (smart home technologies) may lead to more rather than less energy use, such as by creating new forms of energy demand, e.g. through pre-warming rooms, by normaliziing or even raising energy-intensive expectations’ (Hargreaves & Wilson, 2017: 10).
Other ‘smart home’ trends
Smart pet trends
Australian pet stats

Dogs and cats predominately stay at home during the day

Emerging pet comfort trends

• ‘I have been thinking about putting in a couple of ducts in here [the garage] for the air conditioning as well, just for the puppies you know, just when it’s really hot’.

• Oh he [the cat] has a heat mat that’s on all the time, 24 hours a day, seven days a week, 365 days of the year and that is not going off… Yeah they love it’

Opportunities
Smart energy saving technology?
Hygge

- Pronounced *Hoo-ga*
- Danish concept popularised in USA, UK and Australia (Wiking, 2017)
- A way of life which emphasizes intimacy, warmth and togetherness
- Translates as ‘cosiness’ or ‘pleasure’
- Low-energy aesthetic (candles, blankets, hot drinks, home-cooked food)
- Prioritises ‘natural’ or adaptive comfort – breezes, sunlight, ventilation etc.

Conclusions

• The smart home’s potential to save energy is widely promoted and aspired towards
• Usability and energy reduction challenges remain an ongoing issue
• Clear need to engage in lifestyle expectations promoted through smart home industry
Thank you

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