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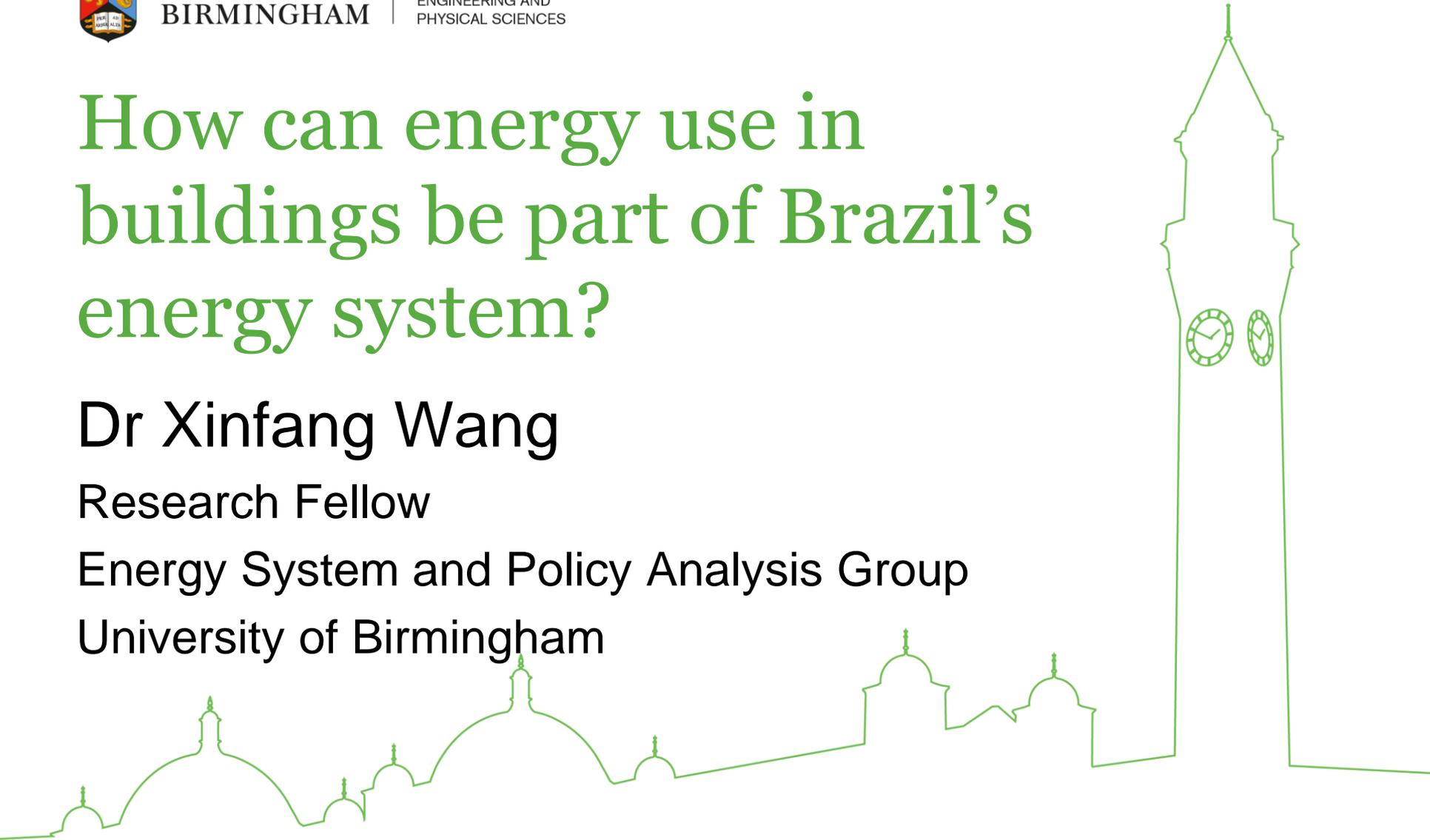
# How can energy use in buildings be part of Brazil's energy system?

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# The role of energy storage

Increasing access to energy of buildings, especially in remote areas is going to be a significant challenge



Decentralised energy generation and storage could play a significant role – e.g. building that incorporates PV generation and large scale grid-connected battery storage



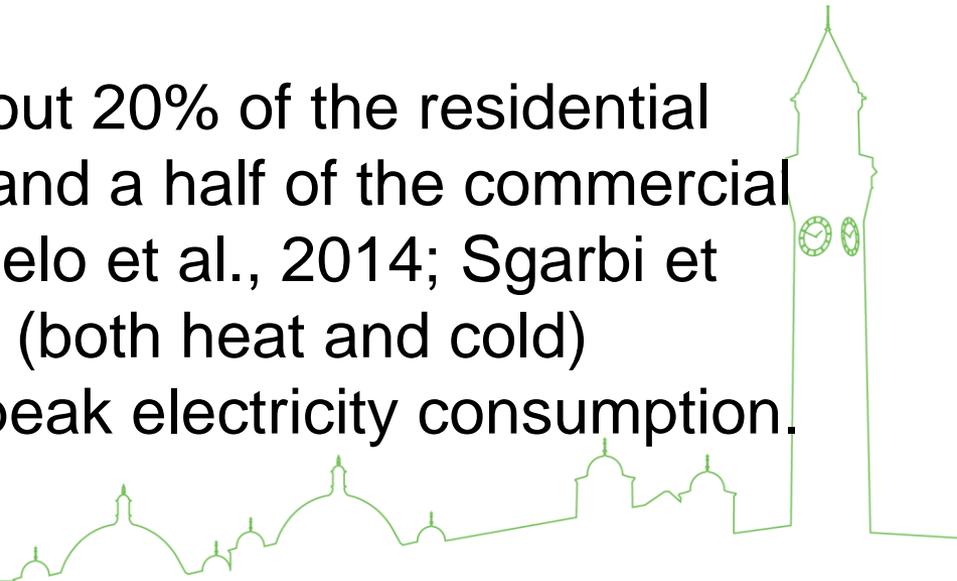
Flexible (meet peak demand), lower carbon emissions (enable the increased deployment of RES), providing back-up power



Challenges for the technology deployment and energy system transition in building sector - data limitation, institutional landscape, user behaviours, rebound effects

# Opportunities for a more decentralised energy system with energy storage

- The investment in generation, transmission and distribution infrastructure can be delayed or reduced
- Small-scale energy storage systems providing backup, reliability, and time-shifting
- Energy storage can support the power quality and reliability of the electricity grid
- Air conditioning consumes about 20% of the residential electricity demand (27 TWh), and a half of the commercial demand (66 TWh) in Brazil (Melo et al., 2014; Sgarbi et al., 2014). ➔ Increased thermal (both heat and cold) storage could help to reduce peak electricity consumption.

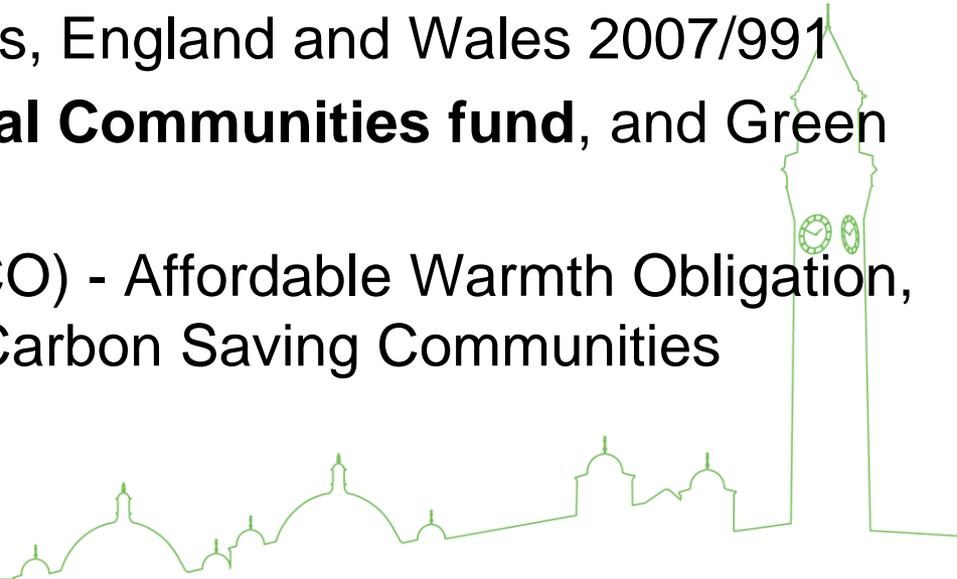


# Policy challenges for energy storage and learning from other UK energy policies

- ❑ The markets through which value can be captured are not designed to reward energy storage
- ❑ Regulatory and policy barriers exist

## ***UK policy on renewable, energy efficiency and smart meters:***

- ❑ Renewable Obligation, **Feed-in Tariffs**, Renewable Heat Incentive
- ❑ Regulation Building and Buildings, England and Wales 2007/991
- ❑ Previous Green Deal, **Green Deal Communities fund**, and Green Deal Home Improvement Fund
- ❑ Energy Company Obligation (ECO) - Affordable Warmth Obligation, Carbon Saving Obligation, and Carbon Saving Communities Obligation
- ❑ Smart meter rollout scheme





# Data on energy use in buildings for informing policy-making

- Qualitative data

- Energy meter
- Peak and off-peak consumption and energy supply capacity
- Energy efficiency of building

- Qualitative data

- Semi-structured interviews, focus groups and workshops
- Understand energy-related practices (materials, procedures and meanings) - ***the Japanese 'Cool Biz' campaign***
- Consider rebound effects

