

# Public participation in energy saving retrofitting China

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# Background

- Majority residential buildings are low-energy efficient
- In northern China heat loss 2-5 times larger than other northern countries
- From 2007 onwards government promotion energy-efficiency retrofitting
- Mostly via top-down policy and implementation
- International research shows that participation in retrofitting improves energy performance
- No participation research in China on retrofitting.

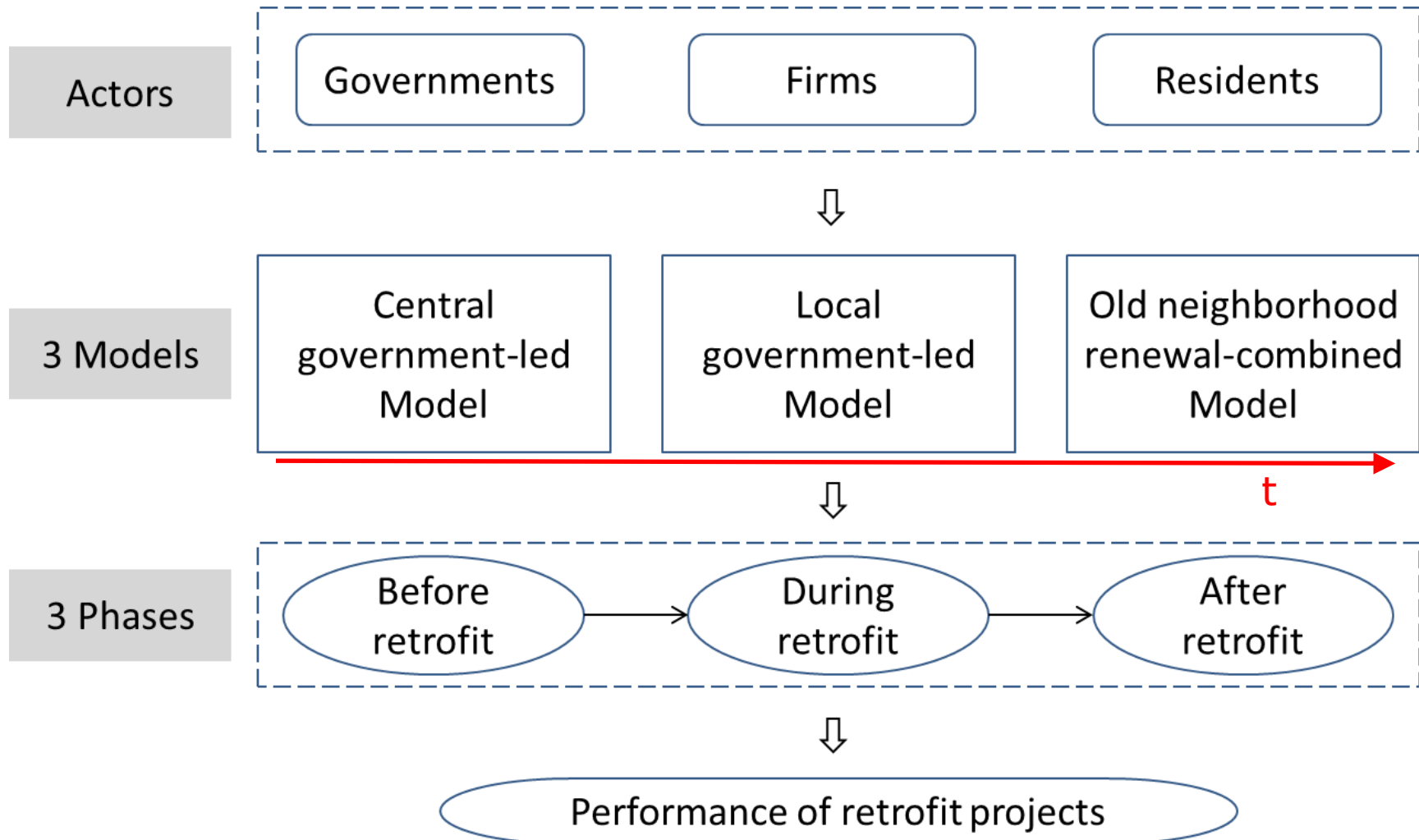


# Research question

- To what extent, how and with what effect are residents involved in energy efficiency retrofitting?



# Analytical framework



# Methodology

- Three case studies in Beijing
- Focus on retrofitting walls, roofs, windows, radiators, metering, fresh air system
- Data collection through:
  - Documents on each case
  - Interviews government, neighbourhood committees
  - Survey residents(samples 77, 25, 27, resp.)
- Assessing
  - Participation
  - Effect on energy use behavior



# Operationalization models

	<b>Huixin</b>	<b>Tidong</b>	<b>Fuyuan</b>
<b>Model</b>	Central government led	Local government led	Old neighbourhood renewal
<b>Year retrofit</b>	2007	2012	2013
<b>During retrofit</b>	stayed	stayed	moved
<b>Social network</b>	Yes	No	Yes
<b>Payment</b>	Co-financed by residents	Local government	Local government
<b>Techn. options offered</b>	all	Wall+ window	all
<b>Decision power</b>	Co-decision+ free choice	Acceptance windows; walls not	Forced co-decision
<b>Participation</b>	Intensive	hardly	Semi-intensive

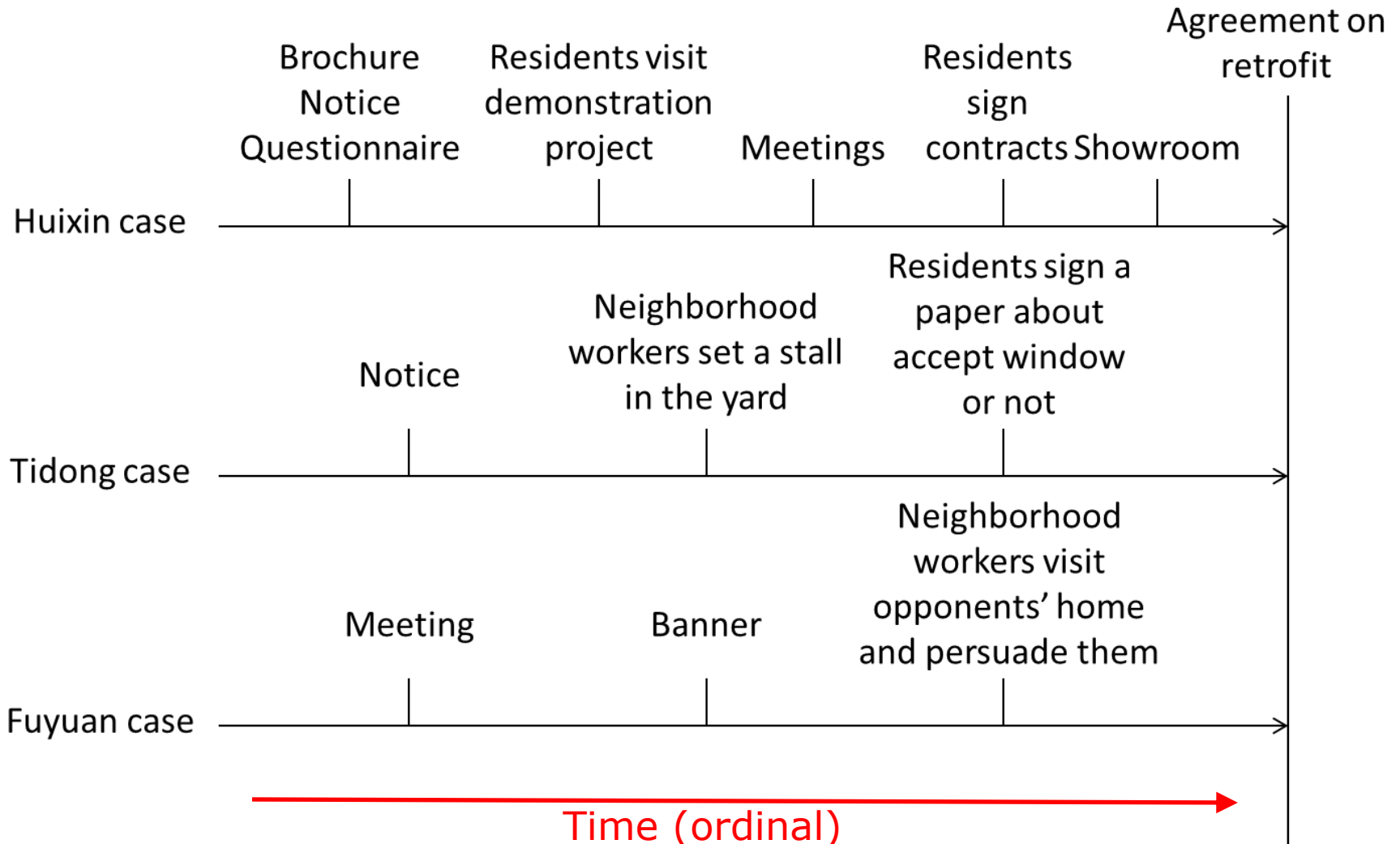


# Implementation technologies

<b>Cases</b> <b>Technologies</b>	<b>Huixin</b>		<b>Tidong</b>		<b>Fuyuan</b>	
	Offer	% Adopt	Offer	% Adopt	Offer	% Adopt
External thermal insulation	✓	100%	✓	100%	✓	100%
Energy-efficient windows	✓	97.4%	✓	76%	✓	100%
Radiators, valves, metering	✓	84.4%	x	-	✓	100%
Indoor fresh air system	✓	58.4%	x	-	x	-

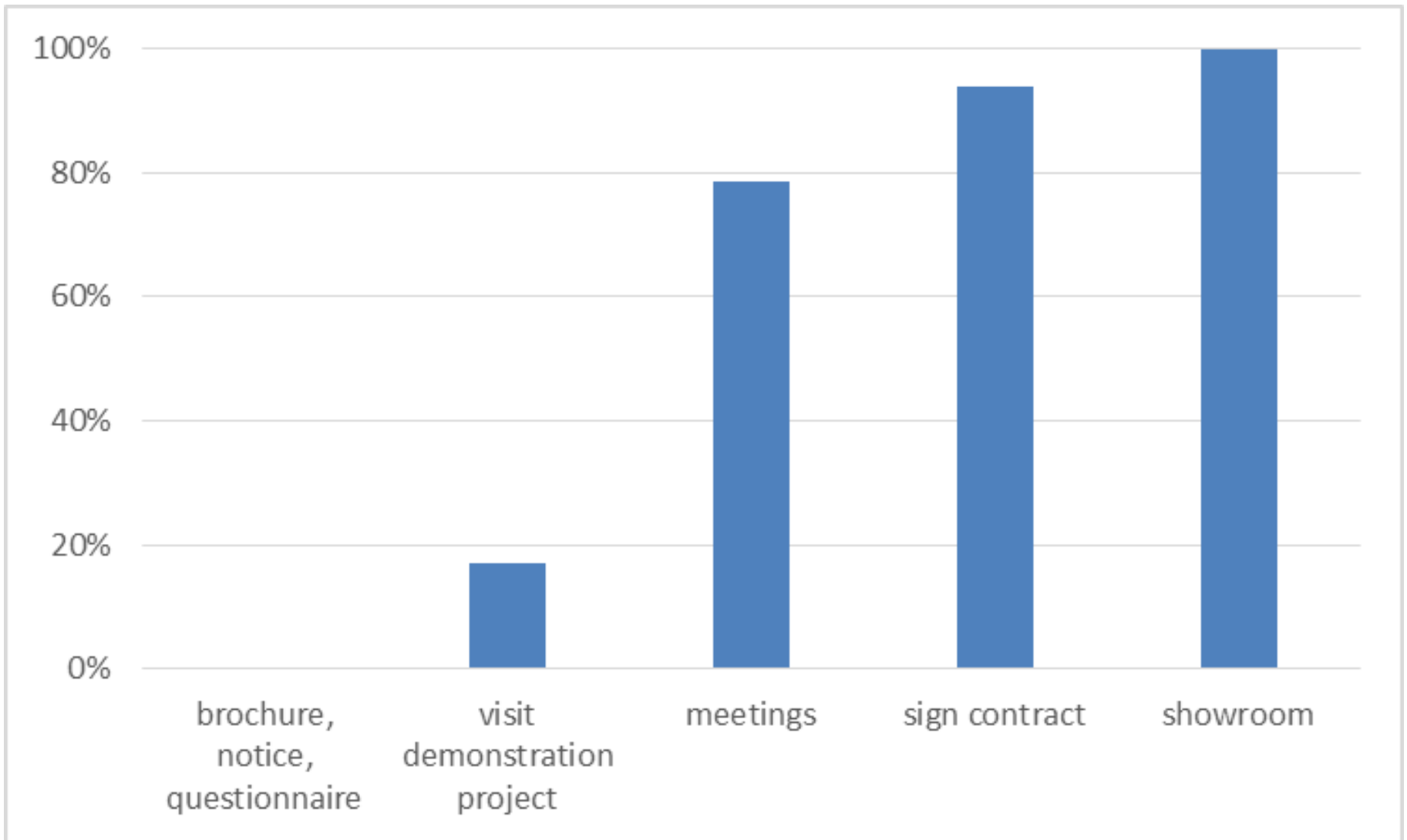


# Promulgation activities towards residents

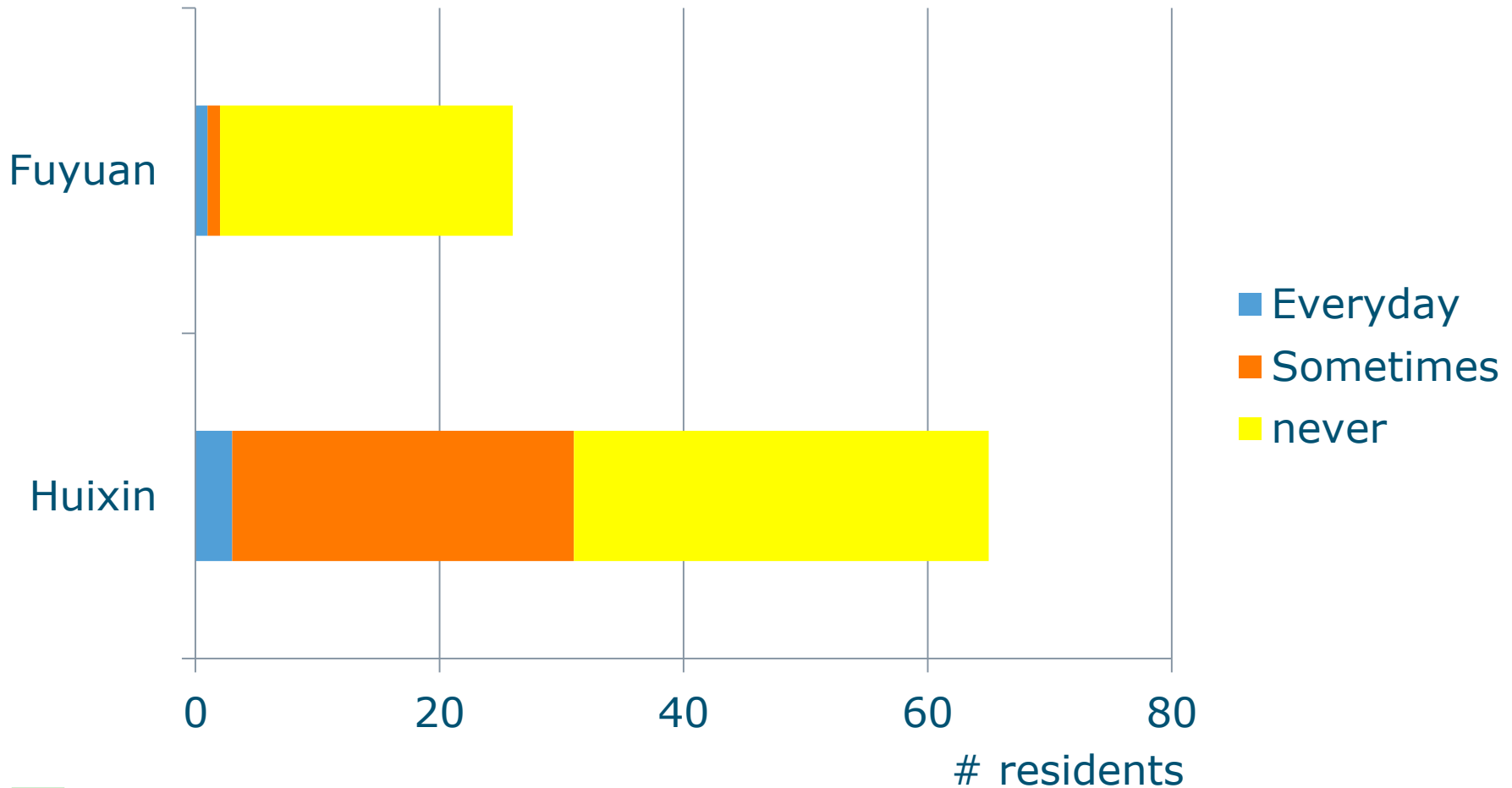




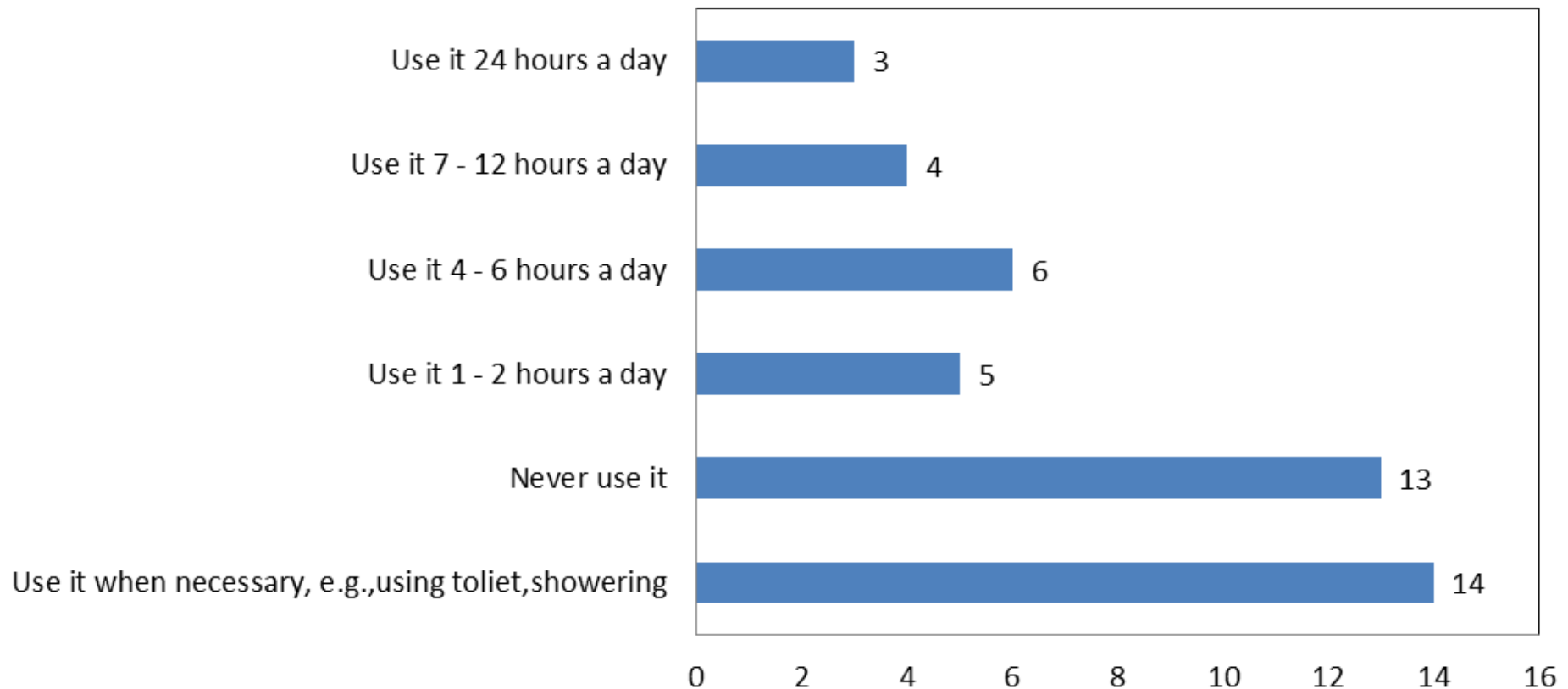
# Agreement wall insulation (Huixin, n=65)



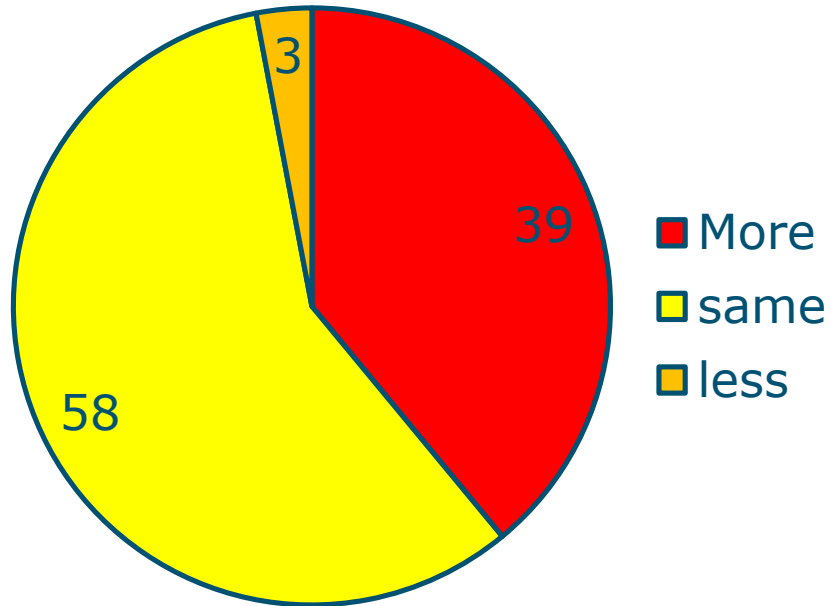
# Reported regulation valves behavior Huixin (n=65) and Fuyuan (n=27)



# Use fresh air system in Huixin (n=45)



# Opening window behavior all cases



- Hardly for temperature regulation
- Especially for fresh air
- Not much use fresh air system

# Reasons not using energy efficiency devices

**Refusal install:** financial reason, peer pressure, unknown

## Valves

- Poor understanding of possibilities of heat regulation
- No instructions given
- Afraid for damage/leakage
- Unawareness of the existence of valves

## Fresh air system

- Removal after installation
- Not satisfied
- Noisy
- Windows better



# Conclusions

- Public participation relevant, but different
- Means of participation:
  - Finances
  - Decision-making retrofit design
  - Demonstration, consultation, communications, learning
- More participation needed because
  - Maximizing implementation energy efficient technologies
  - Use-efficiency retrofitted technologies low without participation
  - Preventing destruction of technologies
  - Preventing dissatisfied residents
  - Information feed-back: metering not understood by 80%



Thanks



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