

# Home heating fuels: spatial, socio-demographic and building determinants

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ESRI-UCC-MaREI energy research: climate action conference  
17<sup>th</sup> May 2019, Dublin

# Acknowledgements



This research is part of the ESRI - EPRC reserach program



# Background



Climate targets: -80% emissions by 2050

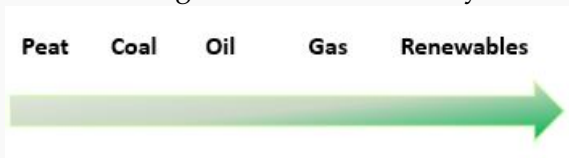
**Peat**   **Coal**   **Oil**   **Gas**   **Renewables**



# Background



Climate targets: -80% emissions by 2050



- Investigate factor affecting gas connection
- Investigate factor affecting consumption
- Provide a profile of connected vs non-connected buildings

# Data



- Source: CSO + GNI
- domestic premises (exc. apartments)
- Subset of all existing buildings:
  - Distance from network  $\leq 30\text{m}$
  - Only Buildings available in both 2011 and 2016
- Property-specific variables
- Socio-demographics
- Approx. 556,000 Obs

Table: Main fuel type

	Mean	st. dev	Min	Max
Gas	0.766	0.424	0	1
Oil	0.170	0.376	0	1
Solid fuels	0.038	0.190	0	1
Electricity	0.027	0.161	0	1

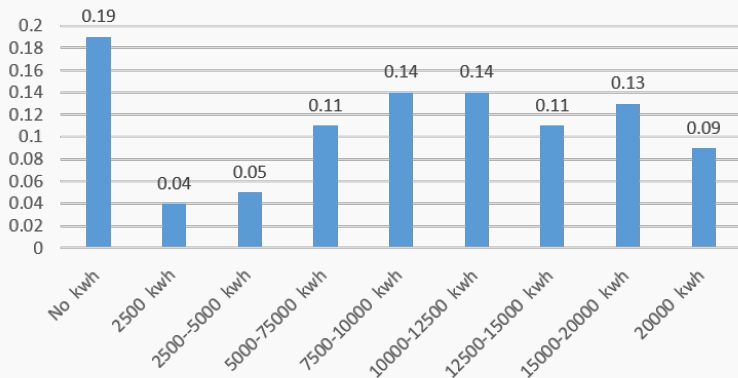
Table: Distance from Network

	Mean	st. dev	Min	Max
$\leq 15m$	0.548	0.498	0	1
15 – 20m	0.311	0.463	0	1
20 – 30m	0.141	0.348	0	1

# Results - Gas Consumption



## Energy Consumption (%)





# Estimation methods

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## Gas connection:

- Multinomial logit model
- Connection as a function of:
  - distance
  - house characteristics
  - personal variables

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## Consumption:

- Ordered probit model
- Heckman Correction:
  - first stage: Binary probit for connection
  - Second stage: ordered probit model

# Results - Gas connection



**Table:** Probability of **Gas** connection related to network distance

Distance	Prob. Of gas connection
$\leq 15m$	(ref. level)
15 – 20m	-6%
20 – 30m	-12.70%

The cost of connection increases with distance

**Table:** Probability of **Oil** connection

Distance	Prob. Of oil connection
$\leq 15m$	(ref. level)
15 – 20m	5.60%
20 – 30m	10.40%

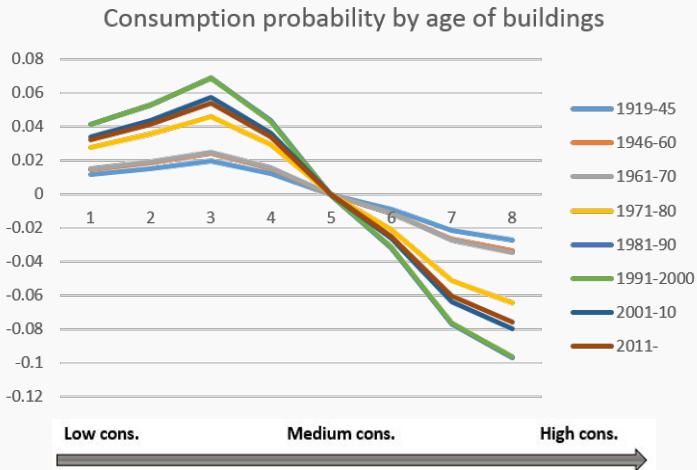
# Results - Gas connection



**Table:** House Ownership and house type

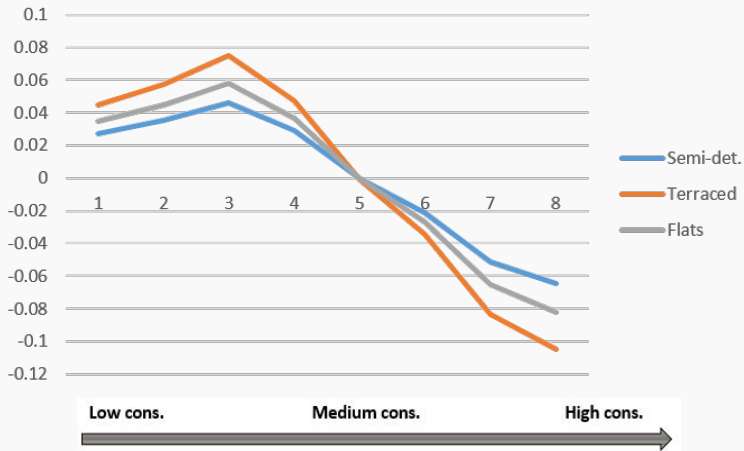
Owneship	Prob. Of gas connection
owner with mortgage	(ref.level)
outright owner	7.50%
Rent (from private)	-3.70%
Rent (from public)	7%
House type:	
Detached houses	(ref. level)
Semi-detached	4%
Terraced houses	5.70%

# Results - Gas Consumption



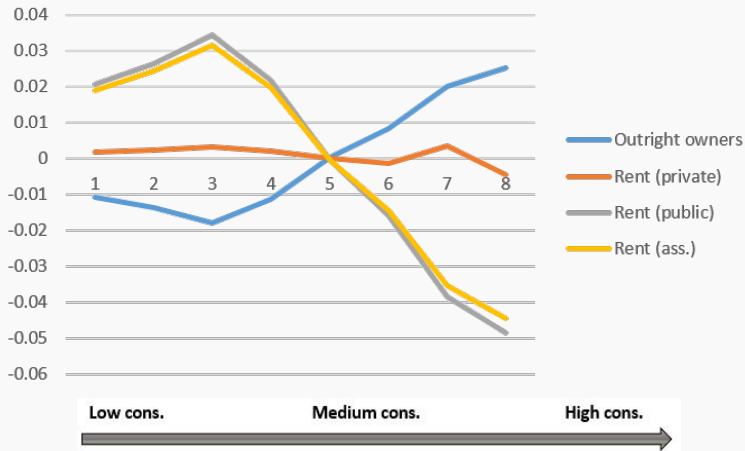
# Results - Gas Consumption

## Consumption probability by property type



# Results - Gas Consumption

## Consumption probability by ownership



# Concluding Remarks



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## Gas connection affected by:

- Distance (at increasing rates)
- Peak for 2001–2010 buildings
- after 2010: electricity
- Owners: with mortgage and social housing
- House type: Semi-detached houses and terraced houses



# Concluding Remarks



## Gas connection affected by:

- Distance (at increasing rates)
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## Consumption affected by:

- Age of buildings ( $\approx$  Energy efficiency)
- The house type
- Private owners consume more

# Thank you for your attention

Questions?

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