

# **HOUSEHOLD ENERGY CONSUMPTION: A STUDY OF MICRO RENEWABLE ENERGY SYSTEMS IN IRELAND.**

## **IS EMPOWERING IRISH ENERGY CITIZENS WORKING?**

**Presenter: Michael Chesser**

The logo for the International Sustainable Energy Conference (ISEC) 2018 is displayed. It consists of the letters 'ISEC' in a large, bold, white font, with the year '2018' in a smaller font to the right. The background is a dark blue horizontal bar with a subtle grid pattern.

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# INTRODUCTION & STUDY OBJECTIVES

- Introduction
  - Ireland's Green Paper - increasing energy efficiency through the promotion and use of energy saving appliances and renewable energy systems in the residential sector, as a means to accomplish its environmental goals.
  - The promotion of micro-RES in Ireland could help it reach its energy policy goals while also contributing to its future energy demand.
- Study objectives
  - Profile of the average household that is currently adopting micro-RES.
  - Whether the adoption of micro-RES is successful in reducing residential energy consumption.
  - Results could guide energy policy makers to better promote micro-RES.
- Data
  - Microdata collected from the Irish Household Budget Survey covers 5,891 households.

# MICRO-RES OWNERSHIP MODEL LOGIT REGRESSION RESULTS

- Households with Higher Weekly Disposable Income
- Rural Areas
- Household is Owned by the Occupant
- The level of Education Acquired by the Chief Economic Supporter (CES)
  - Wealth
  - Awareness
- House Construction
- Higher Number of Bedrooms (a Larger House)

	<b>COEF.</b>
<b>LOG OF HOUSEHOLD DISPOSABLE INCOME</b>	0.4836 **
<b>NUMBER OF PEOPLE</b>	0.0018
<b>URBAN &amp; RURAL HOUSEHOLD LOCATION</b>	-1.0766 ***
<b>OWNERSHIP OR RENTAL HOUSEHOLD</b>	2.0533 ***
<b>HOUSEHOLD WITH CHILDREN</b>	0.4893 *
<b>EDUCATION STATUS OF CES</b>	
<b>PRIMARY SCHOOL, NO FORMAL EDUCATION, OTHER</b>	-1.0794 **
<b>SECONDARY SCHOOL</b>	-0.4701 *
<b>HIGHER INSTITUTE</b>	(R.C)
<b>HOUSE CONSTRUCTION YEAR.</b>	
<b>PRE 1918</b>	-0.5795
<b>1918-1945</b>	-1.1769 **
<b>1946-1960</b>	-1.8636 **
<b>1961-1970</b>	-1.2947 **
<b>1971-1980</b>	-1.3410 ***
<b>1981-1990</b>	-2.5067 ***
<b>1991-2000</b>	-0.9924 ***
<b>2001-2005</b>	-1.3800 ***
<b>2006-2010</b>	(R.C)
<b>NUMBER OF BEDROOMS</b>	0.315 ***
<b>CONSTANT</b>	-8.7955 ***
<b>NO OF OBSERVATIONS</b>	5,818
<b>R<sup>2</sup></b>	0.172

**NOTES : \* SIGNIFICANT AT THE 10% LEVEL, \*\* SIGNIFICANT AT THE 5% LEVEL, \*\*\* SIGNIFICANT AT THE 1% LEVEL, R.C. REFERENCE CATEGORY.**

# ENERGY CONSUMPTION MODELS

## OLS REGRESSION RESULTS

- Micro-RES was only statistically significant for electricity use and increased electricity use.
  - Rebound effect?.
- SEF were in line with the previous literature.
- DF
  - households in an urban area use less of total overall fuel, liquid fuel and solid fuel.
  - that newer built homes use less fuel than older homes
  - an extra bedroom in a house will increase
- AF
  - varied across all the models.
  - No. of TVs & Dishwasher increasing energy use across several models

Model	1	2	3	4	5
	Total Fuel	Electricity	Natural Gas	Liquid Fuel	Solid Fuel
	Coef.	Coef.	Coef.	Coef.	Coef.
<b>Micro Renewable Energy System</b>	0.019	0.211 ***	0.084	-0.029	0.028
<b>Number of People in Home</b>	0.057 ***	0.126 ***	0.090 ***	-0.010	0.026
<b>Log of Household Disposable Income</b>	0.091 ***	0.049 ***	-0.020	0.130 ***	-0.068
<b>Urban &amp; Rural Household Location</b>	-0.069 ***	0.022	0.029	-0.067 ***	-0.310 ***
<b>Ownership or Rental Household</b>	0.138 ***	-0.111 ***	-0.091 *	0.190 ***	0.057
<b>Household With or Without Children</b>	0.109 ***	0.027	0.056	0.075 *	0.024
<b>Education Status of CES</b>					
<b>Primary School, No Formal Education, Other</b>	(R.C.)	-0.071 **	-0.034	(R.C.)	(R.C.)
<b>Secondary School</b>	0.002	(R.C.)	(R.C.)	-0.030	-0.064
<b>Higher Institute</b>	-0.011	-0.022	-0.023	0.050	-0.225 **
<b>House Construction Year.</b>					
<b>Pre 1918</b>	-0.152 **	0.060	(R.C.)	0.088	-0.199
<b>1918-1945</b>	-0.018	-0.029	0.065	(R.C.)	0.021
<b>1946-1960</b>	(R.C.)	0.033	0.117	0.019	(R.C.)
<b>1961-1970</b>	-0.115 *	(R.C.)	0.078	0.002	0.041
<b>1971-1980</b>	-0.099 *	0.060	-0.015	-0.050	-0.158
<b>1981-1990</b>	-0.145 **	0.121 **	0.020	-0.043	-0.160
<b>1991-2000</b>	-0.275 ***	0.038	-0.235 **	-0.100	-0.191
<b>2001-2005</b>	-0.279 ***	0.054	-0.204 **	-0.109	-0.163
<b>2006-2010</b>	-0.232 ***	0.030	-0.089	-0.226 ***	-0.315 *
<b>Number of Bedrooms</b>	0.135 ***	0.044 ***	0.093 ***	0.090 ***	0.034
<b>Appliances</b>					
<b>Dishwasher</b>	0.124 ***	0.138 ***	-0.033	0.047	-0.094
<b>Tumble dryer</b>	0.013	0.039 *	-0.050	0.058	-0.161 *
<b>Fridge-freezer</b>	0.054 *	-0.003	0.142 **	0.052	-0.049
<b>Microwave</b>	0.070	0.048	0.056	0.015	0.181
<b>Console</b>	0.032	0.087 ***	0.052	-0.050	-0.102
<b>Number of TVs</b>	0.045 ***	0.025 ***	0.031 *	0.037 ***	0.027
<b>Constant</b>	4.431 ***	3.469 ***	5.127 ***	3.924 ***	5.745 ***
<b>R<sup>2</sup></b>	0.184	0.220	0.071	0.146	0.0618
<b>F-stat</b>	56.31 ***	67.12 ***	8.72 ***	17.13 ***	4.01 ***
<b>No of Observations</b>	5759	5489	2633	2324	1424

Notes : \* significant at the 10% level, \*\* Significant at the 5% level, \*\*\* Significant at the 1% level, R.C. Reference Category.

**Thank You For  
Your Attention**