

Table of Contents

List of Tables.....	v
List of Figures	vii
1 Introduction.....	1
1.1 The influence of residential heating on global warming	1
1.2 The energy economists' and social scientists' view on the determinants of energy technology adoption	4
1.2.1 Theoretical approaches towards technology adoption.....	4
1.2.2 Methodological approaches	7
2 Focus and contribution of this thesis	9
2.1 Research questions, objectives and scope of the thesis.....	9
2.1.1 Research questions	9
2.1.2 Objectives	10
2.1.3 Scope	11
2.2 Context of the thesis	11
2.2.1 An overview of the residential heating technologies considered	11
2.2.2 Residential heating in Germany	13
2.3 Methodological approach	14
2.3.1 Questionnaire development and implementation	14
2.3.2 Analytical procedure	16
2.4 Structure and contribution of this thesis	17
2.4.1 Chapter 3: Homeowners' Preferences for Adopting Innovative Residential Heating Systems: A Discrete Choice Analysis for Germany.....	19
2.4.2 Chapter 4: Motivational Factors Influencing the Homeowners' Decisions Between Residential Heating Systems: An Empirical Analysis for Germany	20
2.4.3 Chapter 5: Switching from Fossil Fuel to Renewables in Residential Heating Systems: An Empirical Study of Homeowners' Decisions in Germany	21
2.4.4 Overarching contributions of this thesis.....	23
2.5 Discussion of limitations of this research	24
2.6 Scope for further research.....	26
3 Homeowners' Preferences for Adopting Innovative Residential Heating Systems: A Discrete Choice Analysis for Germany	27
3.1 Abstract	27
3.2 Introduction	28
3.3 Residential heating systems in Germany.....	30
3.3.1 Policy framework	30
3.3.2 Market data.....	32
3.4 Literature review	33
3.5 Survey procedure and data description	36
3.5.1 Survey development and implementation	36
3.5.2 Data description.....	38
3.6 Model specification.....	43

3.7 Results and discussion.....	44
3.7.1 Results for the full sample.....	44
3.7.2 Results for existing homes.....	47
3.7.3 Results for newly built homes	49
3.7.4 Comparison of the findings for existing and newly built homes.....	50
3.8 Conclusions	52
3.9 Appendix	55
4 Motivational factors influencing the homeowners' decisions between residential heating systems: An empirical analysis for Germany	56
4.1 Abstract.....	56
4.2 Introduction	57
4.3 Individual decision-making and the motivation to adopt a technology.....	59
4.3.1 Theoretical approaches towards technology adoption and diffusion	59
4.3.2 Empirical studies on RHS adoption by private homeowners	61
4.4 Methodology.....	64
4.4.1 Questionnaire development and implementation	64
4.4.2 Analytical procedure	65
4.5 Results.....	67
4.5.1 Characterizing the RHS adoption motivation.....	67
4.5.2 Characterizing the RHS adopter.....	72
4.6 Discussion and conclusions	76
4.7 Appendix	80
5 Switching from Fossil Fuel to Renewables in Residential Heating Systems: An Empirical Study of Homeowners' Decisions in Germany	83
5.1 Abstract	83
5.2 Introduction	84
5.3 Literature review	88
5.3.1 Technology replacement and switching behavior	88
5.3.2 Barriers to technology adoption	89
5.4 Methodology and data.....	91
5.4.1 Survey development and implementation	91
5.4.2 Model specification	95
5.5 Results and discussion.....	97
5.5.1 RHS replacement decision	97
5.5.2 Reasons for non-adoption.....	100
5.6 Conclusions	104
Literature	107
Appendix	116