

Contents

Foreword	v
Abstract	vi
Acknowledgements	vii
Executive Summary	1
1 What is Unique about ECA	5
The cold winters	5
The crumbling legacy of central planning	5
Falling household incomes	6
2 Household Energy Use	9
Energy prices	10
Conclusion	12
3 Household Demand for Heat	13
Household heating patterns and fuel choices	13
How much heat do households consume?	14
How much do households spend on heating?	14
Demand for heat in selected countries	15
How will households respond to price and income signals?	15
Conclusion	16
4 Rethinking Heat Supply	17
The prevailing practice: Least-cost heating options for full heat service	17
The new reality: Lower heat demand	19
The importance of building-based efficiency measures	21
Conclusion	21
5 Providing Clean Heat in Fiscally-Sustainable Ways	23
What we know so far	23
Policy instruments to encourage clean choices	24
Investments in heating technology	25
Institutional challenges	27
Conclusion	28

Annexes 29

1	Purchasing Power Parity and Exchange Rate Conversions	30
2	Data Assumptions	32
3	Household Energy Consumption Summary Statistics	35
4	Social Costs of Heating Options	42
5	How to Estimate the Demand for Heat	44
6	Validity of Heat Demand Model	48
7	Fixed Effects of Different Heating Techniques	49
8	Key Technical Characteristics of District Heating Systems and Housing Stock in Eastern Europe and Central Asia	50

References 57

Figures

1-1	Observed mean temperature January 1961 to January 1990, degrees Celsius	6
1-2	Relative changes in energy prices and incomes in Eastern Europe and Central Asia, 1991–2000	6
2-1	Per capita energy consumption in Eastern Europe and Central Asia	11
2-2	Share of energy spending in household budgets in Eastern Europe and Central Asia	11
2-3	Expenditure elasticity of energy demand	11
3-1	Urban household heating fuel choices by welfare (income) quintile	13
3-2	Predicted per capita heat and nonheat energy consumption in selected countries	14
3-3	Predicted heat expenditure as a percentage of household expenditures	15
3-4	Demand for heat in selected countries	15
4-1	Costs of different heat supply options in Moldova	18
4-2	Annual costs of different heating options for full heat service in Yerevan, Armenia	18
4-3	Cost of district heating per capita at various effective indoor temperatures compared with national GDP and official wages per capita in Moldova	19
4-4	Fuel costs as share of total heat costs for different heat supply options and demand levels, Yerevan, Armenia	20
4-5	Yerevan: Average cost of heating for high and low demand	20

Tables

2-1	Urban network energy use in Eastern Europe and Central Asia	9
2-2	Urban non-network energy use in Eastern Europe and Central Asia	10
2-3	Energy prices in Eastern Europe and Central Asia	10
3-1	Self-reported temperatures and heating expenditures in Armenia, 2000	15
4-1	Payback times for energy efficiency investments in buildings	21
4-2	Typical cost of heat metering and individual controls in apartments	21