

Adaptation Measures in the EU: Policies, Costs, and Economic Assessment

Climate Proofing Report #2

Publication

<u>Report</u>

Citation

Susanne Altvater, Debora de Block, Irene Bouwma, Thomas Dworak, Ana Frelih-Larsen, Benjamin Görlach, Claudia Hermeling, Judith Klostermann, Martin König, Markus Leitner, Natasha Marinova, Sabine McCallum, Sandra Naumann, Daniel Osberghaus, Andrea Prutsch, Christiane Reif, Kaj van de Sandt, Rob Swart, Jenny Tröltzsch 2012: Adaptation Measures in the EU: Policies, Costs, and Economic Assessment.

In this second part of the published report, existing policies were shown to be partly insufficient for satisfying adaptation needs, and thus the inclusion of new measures into existing policies is required. Based on the review of existing measures suitable for climate change adaptation in key policies as well as interviews with key EC representatives, additional measures and adjustments to existing measures have been identified that are necessary to respond to the impacts of climate change. This includes consideration of possible support for "climate proofing". The report is available for download.

The outcome of the report was a matrix of measures, indicating the EU policy areas vis-Ã -vis corresponding measures. It follows an initialassessment of whether accompanying measures can be established to support the "climate proofing" of existing EU legislation (e.g. guidelines, funding instruments), or whether legislative adjustments and new instruments would need to be implemented. A final selection of measures agreed upon with the Commission was further examined in terms of costs (chapter 4) and the assessment of impacts (chapter 5).

The <u>Climate Proofing report, part 2</u>, [pdf, 2.5 MB, English] is available for download.

Language

English

Authorship

Susanne Altvater, Ass.iur. Dr. Ana Frelih-Larsen Benjamin Görlach

Sandra Naumann Jenny Tröltzsch Debora de Block Irene Bouwma Thomas Dworak Claudia Hermeling Judith Klostermann Martin König Markus Leitner Natasha Marinova Sabine McCallum Daniel Osberghaus Andrea Prutsch **Christiane Reif** Kaj van de Sandt Rob Swart

Year

2012

Dimension

309 S.

Project

Climate Proofing of Key EU Policies - Short Term Actions

Table of contents

- Â Â INTRODUCTION AND AIM OF THE REPORT
- ÂÂÂ METHODOLOGY
- ÂÂÂ Â 2.1 Policy screening and identification of adaptation measures
- Â Â 2.2 Costing of key measures
- Â Â 2.3 Assessment of economic, social and environmental impacts of key measures
- Â Â SCREEN KEY POLICY AREAS AND IDENTIFY ADAPTATION MEASURES
- ÂÂÂ 3.1 Energy
- Â Â 3.1.1 Analysis of current EU policies towards climate change adaptation efforts
- ÂÂÂ 3.1.2 Gap analysis
- Â Â 3.1.3 The components of the energy system
- ÂÂÂ 3.2 Infrastructure and Transport
- Â Â 3.2.1 Analysis of current EU policies towards climate change adaptation efforts
- ÂÂÂ 3.2.2 Gap analysis
- Â Â 3.2.3 Examination of different transport modes
- ÂÂÂ 3.3 Urban areas
- ÂÂÂ Â 3.3.1 Analysis of current EU policies towards climate change adaptation efforts
- ÂÂÂ 3.3.2 Gap analysis
- ÂÂÂ Â 3.3.3 Examination of different components of urban areas
- ÂÂÂ 3.4 Agriculture Rural Development Programs and adaptation
- Â Â 3.4.1 Next Rural Development Programmes
- Â Â 3.4.2 Community strategic guidelines
- Â Â 3.4.3 National strategy plans â 🔲 the basis for national/region programmes
- Â Â 3.4.4 The SWOT assessment as an entry point
- Â Â 3.4.5 Adaptation measures that could be included under the current RD period
- Â Â COSTING OF FUTURE KEY MEASURES
- ÂÂÂ 4.1 Energy
- ÂÂÂ 4.1.1 Introduction, key impacts and key adaptation options

- ÂÂÂ 4.1.2 Literature Review
- ÂÂÂ Á 4.1.3 Adaptation costs in the electricity infrastructure
- Â Â 4.1.3.1 Definition of concrete measures and costs to be transferred
- ÂÂÂ 4.1.3.2 Cost transfer
- Â Â 4.1.3.3 Results: Costs of adapting electricity grids in the EU
- ÂÂÂ 4.1.3.4 Cost sharing
- ÂÂÂ Â 4.1.4 Adaptation costs in the thermal power generation
- $\hat{A} \hat{A} \hat{A} \hat{A}$ 4.1.4.1 Definition of concrete measures and costs to be analysed
- ÂÂÂÂ 4.1.4.2 Investment costs of alternative cooling systems
- ÂÂÂÂ 4.1.4.3 Results: Costs of alternative cooling in Europe
- Â Â 4.1.4.4 Costs of early warning systems for floods
- ÂÂÂ 4.1.4.5 Cost sharing
- ÂÂÂ 4.1.4.6 Excursion: Exposure of nuclear power plants to sea level rise
- Â Â 4.1.5 Adaptation costs for electricity demand
- Â Â 4.1.5.1 Definition of concrete measures and costs to be analysed
- ÂÂÂ 4.1.5.2 Additional investment costs for high efficiency ventilation
- ÂÂÂ 4.1.5.3 Cost sharing
- ÂÂÂ Â 4.1.6 Summary of cost estimates
- ÂÂÂ Â 4.2 Transport and Infrastructure
- ÂÂÂ Â 4.2.1 Introduction and key impacts
- ÂÂÂ 4.2.2 Literature Review
- Â Â 4.2.3 Definition of concrete measures and costs
- ÂÂÂ 4.2.4 Rail
- ÂÂÂ 4.2.4.1 Retrofitting existing infrastructure concerning increased temperatures on tracks
- ÂÂÂÂ 4.2.4.2 Retrofitting existing infrastructure on Railway Bridges
- \hat{A} \hat{A} \hat{A} 4.2.4.3 Retrofitting existing infrastructure concerning increased temperatures on Air Conditioning
- ÂÂÂ 4.2.5 Road
- ÂÂÂ Â 4.2.5.1 Retrofitting existing infrastructure concerning increased temperature
- ÂÂÂÂ 4.2.5.2 Retrofitting existing infrastructure concerning increased precipitation
- ÂÂÂ 4.2.6 Aviation
- Â Â 4.2.6.1 Retrofitting existing infrastructure of airports concerning increased temperature Â Â 4.2.6.2 Retrofitting existing infrastructure of airportsâ wet days
- ÂÂÂÂ4.2.7 Shipping
- $\hat{A} \hat{A} \hat{A}$ 4.2.7.1 Retrofitting existing infrastructure of shipping concerning extreme events $\hat{A} \hat{A} \hat{A}$ 4.2.8 Excursion: Cost estimates for the installation of additional hydrological stations concerning flood damages of all sectors
- $\hat{A} = \hat{A} + \hat{A}$ 4.2.9 Summary of cost estimates
- ÂÂÂ 4.3 Urban areas:
- Â Â 4.3.1 Introduction, key impacts and key adaptation options
- ÂÂÂ 4.3.2 Literature Review
- ÂÂÂ 4.3.3 Costs for green spaces
- ÂÂÂ Á 4.3.3.1 Definition of concrete measures and costs to be analysed
- ÂÂÂ 4.3.3.2 Cost estimation
- ÂÂÂ 4.3.3.3 Procedure of estimation
- ÂÂÂ 4.3.3.4 Results
- ÂÂÂ 4.3.3.5 Cost sharing
- ÂÂÂ 4.3.4 Costs for green roofs
- $\hat{A} \; \hat{A} \; \hat{A} \; 4.3.4.1$ Definition of concrete measures and costs to be analysed
- ÂÂÂ 4.3.4.2 Cost estimation
- ÂÂÂ Â 4.3.4.3 Cost sharing
- ÂÂÂ 4.3.5 Summary of cost estimates
- Â Â 4.4 Agriculture:
- ÂÂÂ Â 4.4.1 Introduction, key impacts and key adaptation options
- ÂÂÂ 4.4.2 Literature Review

- ÂÂÂ 4.4.3 Irrigation
- Â Â 4.4.3.1 Definition of concrete measures and costs to be analysed
- ÂÂÂ 4.4.3.2 Cost estimation
- ÂÂÂ 4.4.3.3 Results
- ÂÂÂ 4.4.3.4 Cost sharing
- ÂÂÂ 4.4.4 Cooling of stables
- ÂÂÂ 4.4.5 Farm advice
- ÂÂÂ 4.4.5.1 Definition of concrete measures and costs to be analysed
- ÂÂÂ 4.4.5.2 Cost estimation
- ÂÂÂ 4.4.5.3 Results
- ÂÂÂ 4.4.5.4 Cost sharing
- Â Â 4.4.6 Summary of cost estimates
- Â Â ASSESSMENT OF ECONOMIC, SOCIAL AND ENVIRONMENTAL IMPACTS OF KEY MEASURES
- ÂÂÂ 5.1 Energy
- Â Â 5.1.1 'Climate Proofing' measures for the Energy Sector â 🛛 Adaptation of the European electricity infrastructure
- ÂÂÂ 5.1.2 Basic information
- ÂÂÂ 5.1.3 Effectiveness of adaptation
- ÂÂÂ Ŝ.1.4 Efficiency/ costs and benefits
- ÂÂÂ 5.1.4.1 Electricity infrastructure
- ÂÂÂ 5.1.4.2 Electricity Demand
- ÂÂÂ 5.1.5 Side effects
- ÂÂÂ 5.1.5.1 Economic side effects
- ÂÂÂ Ŝ.1.5.2 Environmental side effects
- ÂÂÂ 5.1.5.3 Social side effects
- ÂÂÂ 5.2 Transport
- Â Â 5.2.1 'Climate Proofing' measures for the Transport Sector â Transport infrastructure
- ÂÂÂ Ś.2.2 Basic information
- ÂÂÂ 5.2.3 Effectiveness of adaptation
- Â Â 5.2.4 Efficiency/ costs and benefits
- Â Â 5.2.4.1 Rail Transport â [] Retrofitting existing infrastructure concerning increased temperatures (Track buckling)
- Â Â 5.2.4.2 Road Transport â Retrofitting existing infrastructure concerning increased temperatures (heat resistant asphalt)
- Â Â 5.2.4.3 Comparison costs and benefits
- Â Â 5.2.4.4 Road Transport â Retrofitting existing infrastructure concerning increased precipitation (drainage systems)
- Â Â 5.2.4.5 Comparison costs and benefits
- ÂÂÂ 5.2.5 Side effects
- ÂÂÂ 5.2.5.1 Economic side effects
- Â Â 5.2.5.2 Environmental side effects
- Â Â 5.2.5.3 Social side effects
- ÂÂÂ 5.3 Urban Areas
- Â Â 5.3.1 Climate Proofing' measures for Urban Areas â 🔲 Adaptation in Urban Areas
- ÂÂÂ 5.3.2 Basic information
- ÂÂÂ Ŝ.3.3 Effectiveness of adaptation
- Â Â 5.3.4 Efficiency/ costs and benefits
- ÂÂÂ Ŝ.3.4.1 Green Space
- Â Â 5.3.4.2 Green roofs
- $\hat{A} \hat{A} \hat{A} \hat{A}$ 5.3.5 Side effects
- Â Â 5.3.5.1 Economic side effects
- ÂÂÂ 5.3.5.2 Environmental side effects
- ÂÂÂ 5.3.5.3 Social side effects
- ÂÂÂ 5.4 Agriculture
- Â Â 5.4.1 â Climate Proofing' measures for Agriculture â Cl with a focus on irrigation as an

adaptation measure

- ÂÂÂ 5.4.1.1 Irrigation as adaptation measure
- Â Â 5.4.1.2 Agriculture is not the highest value water user
- ÂÂÂ Â 5.4.1.3 Droughts can hit harder productivity levels in other sectors
- ÂÂÂ 5.16.4 Increased irrigation can affect directly other economic activities
- ÂÂÂ 5.16.5 Example of competing uses for water resources
- ÂÂÂ REFERENCES
- ÂÂÂ 6.1 Chapter 3
- ÂÂÂ 6.1.1 Energy
- ÂÂÂ 6.1.2 Transport
- ÂÂÂ 6.1.3 Urban areas
- ÂÂÂ 6.2 Chapter 4
- ÂÂÂ 6.2.1 Energy
- ÂÂÂ 6.2.2 Transport and Infrastructure
- ÂÂÂ 6.2.3 Urban Areas
- ÂÂÂ 6.2.4 Agriculture
- ÂÂÂ 6.3 Chapter 5
- ÂÂÂ 6.3.1 Energy
- ÂÂÂ 6.3.2 Transport and Infrastructure
- ÂÂÂ 6.3.3 Urban areas
- ÂÂÂ 6.3.4 Agriculture

List of Tables

List of Figures

Keywords

<u>Cities</u> <u>Economics</u> <u>Energy</u> adaptation measures, cost-benefit-analysis, economic assessment, energy, agriculture, infrastructure and transport, urban areas Europe

Source URL: https://www.ecologic.eu/4778