ODYSSEE-MURE

Grant agreement n°. H2020 Energy/69607

ODYSSEE-MURE

A decision support tool for energy efficiency policy evaluation.

Deliverable 4.2: Overview of Studies and Results on the Evaluation of Multiple Benefits on the MURE website

31 July 2017

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1 Summary

The general objective of the ODYSSEE-MURE project is to provide a comprehensive monitoring of energy consumption and efficiency trends, as well as of energy efficiency policy measures by sector. The originality of the project is to cover all sectors and end-uses with a homogeneous and harmonised approach and to provide an overall picture of the trends and measures by sector.

The objective of work package (WP) 4 of the ODYSSEE-MURE project is to provide an assessment of the multiple benefits of energy efficiency as an important input to policy making and as the basis for capacity building on multiple benefits in WP 5. This includes access to concepts of multiple benefits of energy efficiency, quantification based on existing data in the ODYSSEE-MURE databases or study results, identification of measures having (and enhancing) multiple benefits as well as organisation of the knowledge in an easily accessible policy facility under the MURE database.

In this deliverable we document the current status of the multiple benefits of energy efficiency (MB:EE) facility on the project website and the overview of studies linked to these benefits.

Objectives of the Facility on Multiple Benefits of Energy Efficiency

The current ODYSSEE-MURE monitoring and evaluation tools and facilities meet various needs of different stakeholders (such as policy makers at the level of the EC, MS and regions/cities). The objective of work package (WP) 4 is to provide an assessment of the multiple benefits of energy efficiency as an important input to policy making and as the basis for capacity building on multiple benefits in WP 5. This includes access to concepts of multiple benefits of energy efficiency, quantification based on existing data in the ODYSSEE-MURE databases or study results, identification of measures having (and enhancing) multiple benefits as well as organisation of the knowledge in an easily accessible policy facility under the MURE database. Through the various capacity building channels discussed in WP5, this will contribute to enhance the knowledge of stakeholders on multiple benefits, supporting thus the policy development.

In WP4 we focus on new needs of stakeholders, in particular to understand and use the concepts of multiple benefits. Multiple benefits are an important additional justification of energy efficiency actions, beyond the economic and environmental benefits. These needs are the starting point to develop new tools to meet the demand and to enhance capacity building in this field.

Recently the IEA has launched a report on the multiple benefits of implementing energy efficiency measures. Next to energy savings themselves, and the money saved, it is shown that other benefits might be important in the formulation of savings policy: new employment, reduced import dependence, less health problems, etc. The EC has already reacted positively on taking into consideration multiple benefits in EU policy on EE (COM (2014) 520). Also national governments are already looking into multiple benefits, such as the employment effects in the recent NEO for the Netherlands. This is even more crucial at regional and city level, where economic downturn asks for new activities, such as large scale energy renovation.

The most relevant multiple benefits will be identified and definitions and calculation methods will be formulated as part of the ODYSSEE-MURE tools. Default approaches to multiple benefits can be integrated to the database, including default values. This should enable the stakeholders to apply quantified multiple benefits as part of their EE policies, and to avoid confusion due to different methods.

The new facility and tools on multiple benefits enlarge the scope of the ODYSSEE-MURE, contributing to a better monitoring & evaluation of energy efficiency policy and implementation, and thereby stimulating more effectively policy and more savings.

Once the tools become available, they will be used in ODYSSEE-MURE, but they can also be used by the different stakeholders independently. These stakeholders will be assisted in using the new tools through capacity building (see WP5).

2 The facility on Multiple Benefits of energy efficiency

As Part of WP4 the facility on multiple benefits of energy efficiency (referred to as MB:EE) focuses on the new needs of stakeholders, in particular to understand and use the concepts of multiple benefits. Multiple benefits are an important additional justification of energy efficiency actions, beyond the economic and environmental benefits. These needs were the starting point to develop a new tool to meet the demand and to enhance capacity building in this field.

For this purpose, we developed an interactive web tool to provide users of the facility with an easy to use way to explore the different aspects of MB:EE and give a quick overview as well as detailed information on methodologies and definitions of our approach and link to external sources such as related studies on the topic.

The first drafts of the design and functionality were described in Deliverable 4.1. This draft was developed further and provides all functionalities planned so far[1].

Figure 1 shows the main screen of the MB:EE facility, which the users see when reaching the facility through the project website (http://www.odyssee-mure.eu).

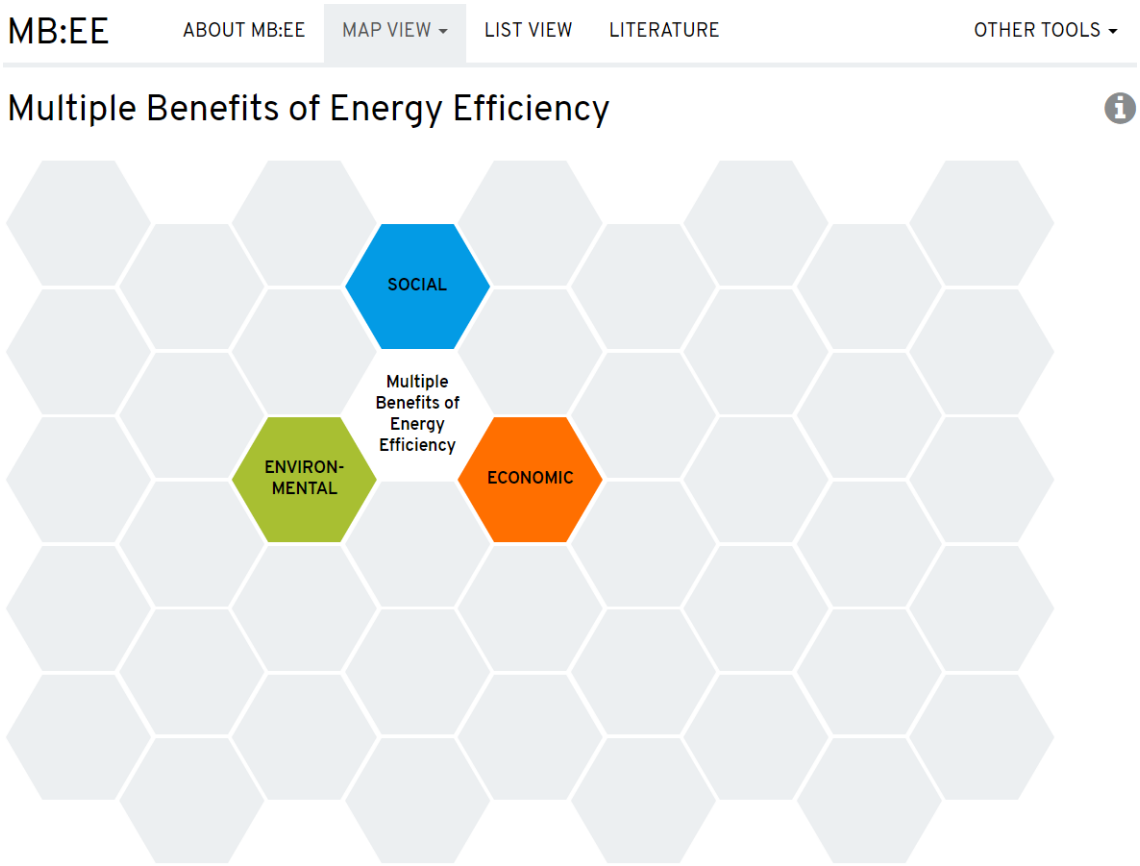

Figure 1: Starting screen of the MB:EE web facility (screenshot)

[1] While in development the facility can be found here: http://bfig1.de/mbee/ (online till November 2017)

Clicking on the tab “Literature” leads to the overview of all studies and other sources linked to MB:EE that were collected within the development and beyond. This list will be extended continuously also provide a most recent snapshot of the research on the topic of MB:EE. Figure 2 give an overview of the presentation of the list within the web facility. This complete list can be also found in the Annex of this document.

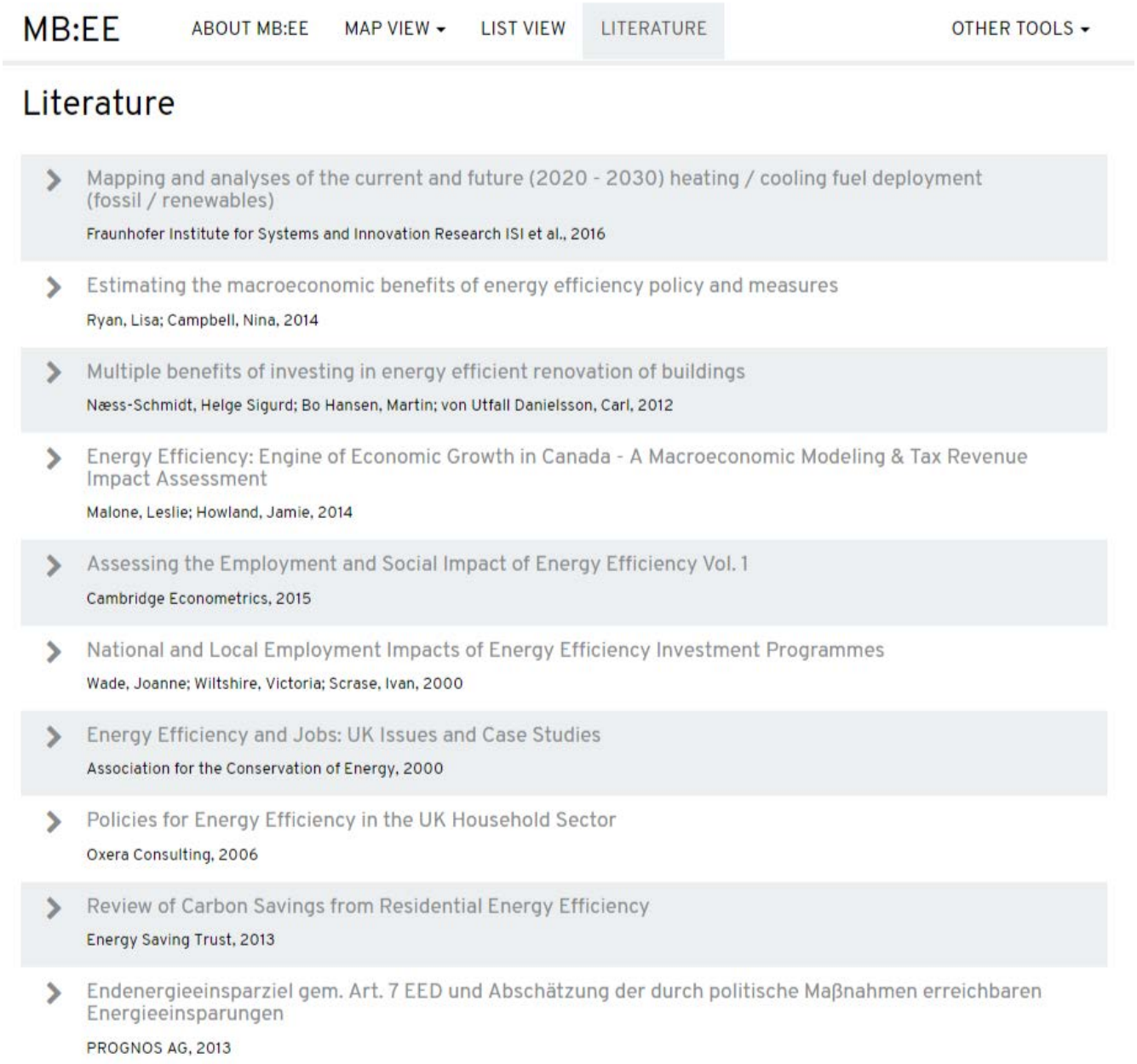

Figure 2: Overview of literature within the MB:EE facility (screenshot)

The list provides the title of the study, the authors and the year of publication. It also links to the original source of the document, so the users of the facility are provided with as much information on the topic as possible.

To link relevant sources to the indicators presented in the web facility every source was tagged with the internal number of the specific indicator(s) according to its subject matter. These sources identified as relevant for the indicator are presented within the info box of the respective indicator (see *Figure 3*). The list of sources and their mapping to the indicators can be found in *Table 1* and *Table 2* in the Annex of this document.

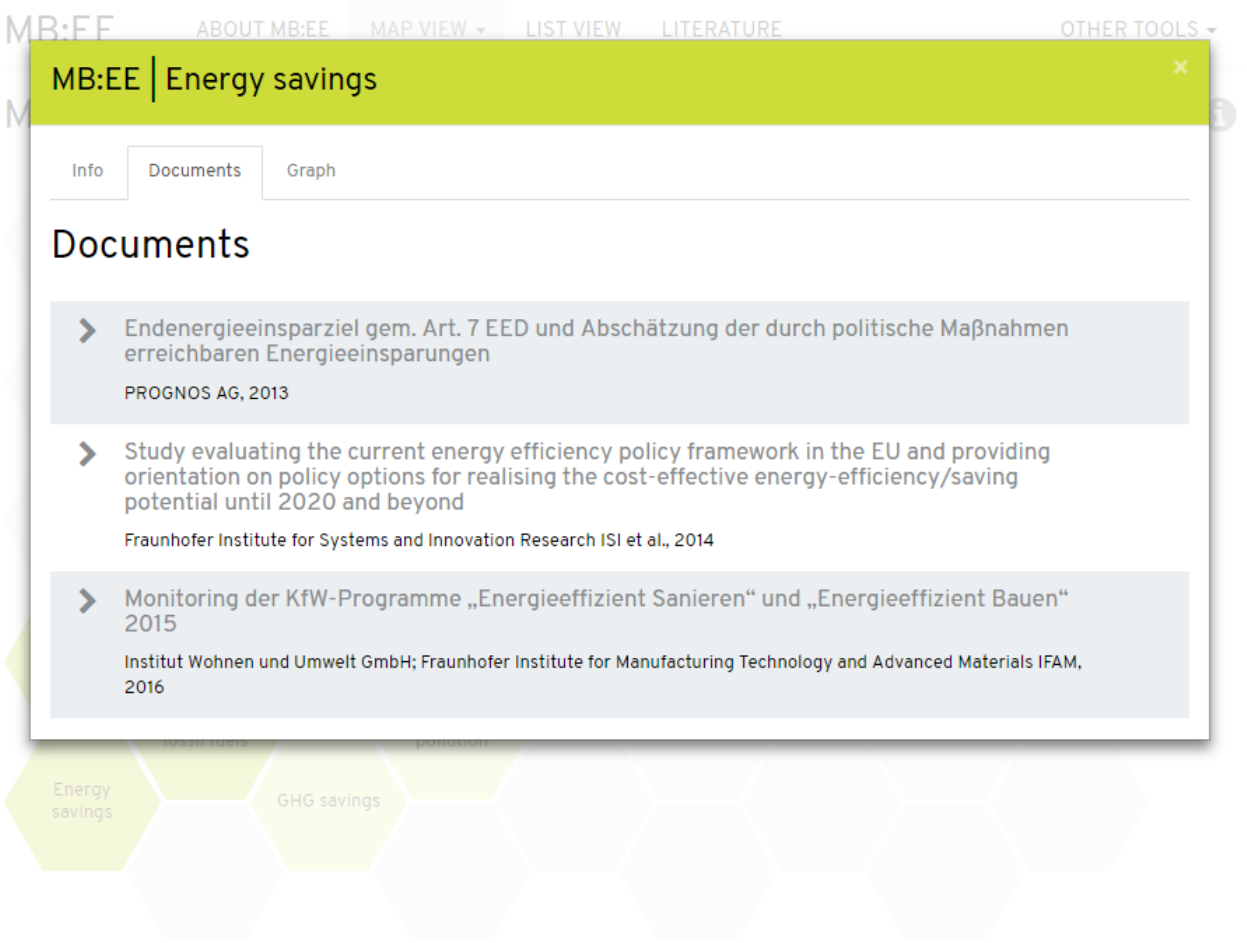

Figure 3: Presentation of relevant sources within the web facility (screenshot)

3 Annex

Complete List of Literature:

Mapping and analyses of the current and future (2020 - 2030) heating / cooling fuel deployment (fossil / renewables), Fraunhofer Institute for Systems and Innovation Research ISI et al., 2016

Estimating the macroeconomic benefits of energy efficiency policy and measures, Ryan, Lisa; Campbell, Nina, 2014

Multiple benefits of investing in energy efficient renovation of buildings, Næss-Schmidt, Helge Sigurd; Bo Hansen, Martin; von Utfall Danielsson, Carl, 2012

Energy Efficiency: Engine of Economic Growth in Canada - A Macroeconomic Modeling & Tax Revenue Impact Assessment, Malone, Leslie; Howland, Jamie, 2014

Assessing the Employment and Social Impact of Energy Efficiency Vol. 1, Cambridge Econometrics, 2015

National and Local Employment Impacts of Energy Efficiency Investment Programmes, Wade, Joanne; Wiltshire, Victoria; Scrase, Ivan, 2000

Energy Efficiency and Jobs: UK Issues and Case Studies, Association for the Conservation of Energy, 2000

Policies for Energy Efficiency in the UK Household Sector, Oxera Consulting, 2006

Review of Carbon Savings from Residential Energy Efficiency, Energy Saving Trust, 2013

Endenergieeinsparziel gem. Art. 7 EED und Abschätzung der durch politische Maßnahmen erreichbaren Energieeinsparungen, PROGNOS AG, 2013

Study evaluating the current energy efficiency policy framework in the EU and providing orientation on policy options for realising the cost-effective energy-efficiency/saving potential until 2020 and beyond, Fraunhofer Institute for Systems and Innovation Research ISI et al., 2014

Monitoring der KfW-Programme „Energieeffizient Sanieren“ und „Energieeffizient Bauen“ 2015, Institut Wohnen und Umwelt GmbH; Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, 2016

The macroeconomic effects of ambitious energy efficiency policy in Germany – Combining bottom-up energy modelling with a non-equilibrium macroeconomic model, Hartwig, Johannes; Kockat, Judith; Schade, Wolfgang; Braungardt, Sibylle , 2017

The Macroeconomic Benefits of Energy Efficiency - The case for public action, Holmes, Ingrid; Mohanty, Rohan, 2012

Review of Costs and Benefits of Energy Savings - Task 1 Report "Energy Savings 2030", Sauter, Robert; Volkery, Axel, 2013

The Economic Impacts and Macroeconomic Benefits of Energy Efficiency Programs in Oregon, Whelan, Robert; Krebs, Tessa; Morgan, Tina, 2015

Potenziale und volkswirtschaftliche Effekte einer ambitionierten Energieeffizienzstrategie für Deutschland, Pehnt, Martin; Lutz, Christian; Seefeldt, Friedrich; Schlomann, Barbara; Wünsch, Marco; Lehr, Ulrike; Lambrecht, Udo; Fleiter, Tobias, 2009

Energieeffizienz: Potenziale, volkswirtschaftliche Effekte und innovative Handlungs- und Förderfelder für die Nationale Klimaschutzinitiative. Endbericht, Pehnt, Martin et al., 2011

20% by 2020? Economy-wide impacts of energy efficiency improvement in Germany, Lehr, Ulrike et al., 2011

Executive Summary of the Impact Assessment accompanying Directive 2012/27/EU on Energy Efficiency, European Commission, 2016

The rationale for energy efficiency policy: Assessing the recognition of the multiple benefits of energy efficiency retrofit policy, Kerr, Niall; Gouldson, Andy; Barrett, John, 2017

Costs and benefits of Energy Efficiency Obligations: A review of European programmes, Rosenow, Jan; Bayer, Edith, 2017

Fuel poverty-induced 'prebound effect' in achieving the anticipated carbon savings from social housing retrofit, Teli; Dimitriou; James; Bahaj; Ellison; Waggot, 2016

Climate change mitigation policies and poverty, Barbier, Edward, 2014

Fuel poverty and energy efficiency obligations – A critical assessment of the supplier obligation in the UK, Rosenow, Jan;Platt, Reg; Flanagan, Brooke, 2013

Building synergies between climate change mitigation and energy poverty alleviation, Ürge-Vorsatz, Diana; Herrero, Sergio Tirado, 2011

Energy, energy efficiency, and the built environment, Wilkinson, Paul; Smith, Kirk; Beevers, Sean; Tonne, Cathryn; Oreszczyn, Tadj, 2007

Energy substitution, efficiency, and the effects of carbon taxation: Evidence from China's building construction industry, Liu, Hongxun; Lin, Boqiang, 2017

The Relationship between Input Prices and Energy Intensity in Canadian Manufacturing Industries, Gamtessa, Samuel, 2009

Review of the security of supply in Turkish energy markets: Lessons from the winter shortages, Seyit Ali Dastan; Orhun Selcuk, 2016

Capitalization of energy efficiency on corporate real estate portfolio value, Ingrid Nappi-Coulet; Aurélien Décamps, 2013

Energy and environment efficiency of industry and its productivity effect, Dongsuk Kang; Duk Hee Lee, 2016

Fossil fuel and CO2 emissions savings on a high renewable electricity system – A single year case study for Ireland, J.M. Clancy; F. Gaffney; J.P. Deane; J. Curtis; B.P. Ógallachóir, 2015

A new method for cost of renewable energy production in Algeria: Integrate all benefits drawn from fossil fuel savings, Akbi Amine; Noureddine Yassaa; Rachid Boudjema; Boualem Aliouat, 2015

Benefits and costs of renewable electricity in Europe, Margarita Ortega-Izquierdo; Pablo del Río, 2016

Table 1: List of studies linked to indicators of the web facility

Author(s)	***Year***	***Title***	***Indicator #***
Fraunhofer Institute ISI et al.	2016	Mapping and analyses of the current and future (2020 - 2030) heating / cooling fuel deployment (fossil / renewables)	11; 5
Ryan, Lisa; Campbell, Nina	2014	Estimating the macroeconomic benefits of energy efficiency policy and measures	11; 5; 12
Næss-Schmidt, Helge Sigurd; Bo Hansen, Martin; von Utfall Danielsson, Carl	2012	Multiple benefits of investing in energy efficient renovation of buildings	11; 13
Malone, Leslie; Howland, Jamie	2014	Energy Efficiency: Engine of Economic Growth in Canada - A Macroeconomic Modeling & Tax Revenue Impact Assessment	11; 5; 13
Cambridge Econometrics	2015	Assessing the Employment and Social Impact of Energy Efficiency Vol. 1	11; 5; 16
Wade, Joanne; Wiltshire, Victoria; Scrase, Ivan	2000	National and Local Employment Impacts of Energy Efficiency Investment Programmes	5; 13
Association for the Conservation of Energy	2000	Energy Efficiency and Jobs: UK Issues and Case Studies	11; 5
Oxera Consulting	2006	Policies for Energy Efficiency in the UK Household Sector	3
Energy Saving Trust	2013	Review of Carbon Savings from Residential Energy Efficiency	3
PROGNOS AG	2013	Endenergieeinsparziel gem. Art. 7 EED und Abschätzung der durch politische Maßnahmen erreichbaren Energieeinsparungen	1
Fraunhofer Institute for Systems and Innovation Research ISI et al.	2014	Study evaluating the current energy efficiency policy framework in the EU and providing orientation on policy options for realising the cost-effective energy-efficiency/saving potential until 2020 and beyond	1
Institut Wohnen und Umwelt GmbH; Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM	2016	Monitoring der KfW-Programme „Energieeffizient Sanieren“ und „Energieeffizient Bauen“ 2015	5
Institut Wohnen und Umwelt GmbH; Fraunhofer Institute for Manufacturing Technology and	2016	Monitoring der KfW-Programme „Energieeffizient Sanieren“ und „Energieeffizient Bauen“ 2015	1

Advanced Materials IFAM			
Hartwig, Johannes; Kockat, Judith; Schade, Wolfgang; Braungardt, Sibylle	2017	The macroeconomic effects of ambitious energy efficiency policy in Germany – Combining bottom-up energy modelling with a non-equilibrium macroeconomic model	11; 5
Holmes, Ingrid; Mohanty, Rohan	2012	The Macroeconomic Benefits of Energy Efficiency - The case for public action	11; 5; 13
Sauter, Robert; Volkery, Axel	2013	Review of Costs and Benefits of Energy Savings - Task 1 Report "Energy Savings 2030"	11; 5; 13
Whelan, Robert; Krebs, Tessa; Morgan, Tina	2015	The Economic Impacts and Macroeconomic Benefits of Energy Efficiency Programs in Oregon	11; 5
Pehnt, Martin; Lutz, Christian; Seefeldt, Friedrich; Schlomann, Barbara; Wünsch, Marco; Lehr, Ulrike; Lambrecht, Udo; Fleiter, Tobias	2009	Potenziale und volkswirtschaftliche Effekte einer ambitionierten Energieeffizienzstrategie für Deutschland	11; 5
Pehnt, Martin et al.	2011	Energieeffizienz: Potenziale, volkswirtschaftliche Effekte und innovative Handlungs- und Förderfelder für die Nationale Klimaschutzinitiative. Endebericht	11; 5; 17a
Lehr, Ulrike et al.	2011	20% by 2020? Economy-wide impacts of energy efficiency improvement in Germany	11; 5; 3
European Commission	2016	Executive Summary of the Impact Assessment accompanying Directive 2012/27/EU on Energy Efficiency	11; 5
Kerr, Niall; Gouldson, Andy; Barrett, John	2017	The rationale for energy efficiency policy: Assessing the recognition of the multiple benefits of energy efficiency retrofit policy	11; 13
Rosenow, Jan; Bayer, Edith	2017	Costs and benefits of Energy Efficiency Obligations: A review of European programmes	11; 13
Teli; Dimitriou; James; Bahaj; Ellison; Waggot	2016	Fuel poverty-induced 'prebound effect' in achieving the anticipated carbon savings from social housing retrofit	7
Barbier, Edward	2014	Climate change mitigation policies and poverty	7; 6
Rosenow, Jan;Platt, Reg; Flanagan, Brooke	2013	Fuel poverty and energy efficiency obligations – A critical assessment of the supplier obligation in the UK	7
Ürge-Vorsatz, Diana; Herrero,	2011	Building synergies between climate change mitigation and energy poverty alleviation	7

Sergio Tirado			
Wilkinson, Paul; Smith, Kirk; Beevers, Sean; Tonne, Cathryn; Oreszczyn, Tadj	2007	Energy, energy efficiency, and the built environment	6
Liu, Hongxun; Lin, Boqiang	2017	Energy substitution, efficiency, and the effects of carbon taxation: Evidence from China's building construction industry	11; 5; 12; 13
Gamtessa, Samuel	2009	The Relationship between Input Prices and Energy Intensity in Canadian Manufacturing Industries	11; 5; 12;
Seyit Ali Dastan; Orhun Selcuk	2016	Review of the security of supply in Turkish energy markets: Lessons from the winter shortages	17a
Ingrid Nappi-Coulet; Aurélien Décamps	2013	Capitalization of energy efficiency on corporate real estate portfolio value	15
Dongsuk Kang; Duk Hee Lee	2016	Energy and environment efficiency of industry and its productivity effect	14
J.M. Clancy; F. Gaffney; J.P. Deane; J. Curtis; B.P. Ógallachóir	2015	Fossil fuel and CO2 emissions savings on a high renewable electricity system – A single year case study for Ireland	2; 3
Akbi Amine; Noureddine Yassaa; Rachid Boudjema; Boualem Aliouat	2015	A new method for cost of renewable energy production in Algeria: Integrate all benefits drawn from fossil fuel savings	2
Margarita Ortega-Izquierdo; Pablo del Río	2016	Benefits and costs of renewable electricity in Europe	2; 19

Table 2: Indicators of the web facility and their respective internal numbering

Indicator	***No.***
Annual energy savings (by energy carrier)	1
Saving on fossil fuels; extension of range of fossil fuels	2
Lowering of RES target; replacement of RES capacity; reduced need for interconnectors	19
Annual CO2 savings linked to energy savings	3
Emission factors for avoided local pollutants (incl. electr.)	4
Impact of savings on energy cost shares in household income (fuel poor households)	7
Externalities linked to health impacts	6
Shares of energy costs in household income	16

Patent indicators	8
Indicators on foreign trade with EE products	9
Production statistics	10
Impact of energy savings on GDP growth	11
Input-Output (I/O) analysis	5
Price elasticities	12
State income from employment based on energy savings	13
Semi-quantitative classification of impacts? Evtl. improvement in factor costs from EE measures	14
Valuation of buildings and companies for different end-uses according to energy efficiency benefits	15
Import dependency (conversion to primary energy necessary)	17a
Impact on supplier diversity (Herfindahl-Hirschman-Index)	17b
Demand-response potentials by country	18