



Overview Study: Promotional Schemes for Demand Side Energy Efficiency

New Delhi, 28 Feb 2014

Markus Wypior, Director Support Office, Indo-German Energy Forum

-
- Applied categories for mapping of German schemes
 - Identification of relevant German schemes
 - Clustering schemes into groups
 - Overview of financial promotional mechanisms
 - Choice of representative schemes of the clusters
 - Parameters to assess German promotional schemes
 - Assessment and data collection
 - Overview most successful promotional schemes
 - Case Studies
 - Next steps

Applied categories for mapping of German schemes



The following categories were applied to map the German schemes:

C 1

- Name of programme

C 2

- Targeted sector of programme: *e.g. industry, buildings*

C 3

- Promotional mechanism: *e.g. grants, loans, information, capacity building*

C 4

- Action implemented / Measure promoted

C 5

- Brief description of specific activity to be promoted

C 6

- Level of implementation: *state level, national level*

C 7

- Eligible group: *e.g. companies, home owners, communities*

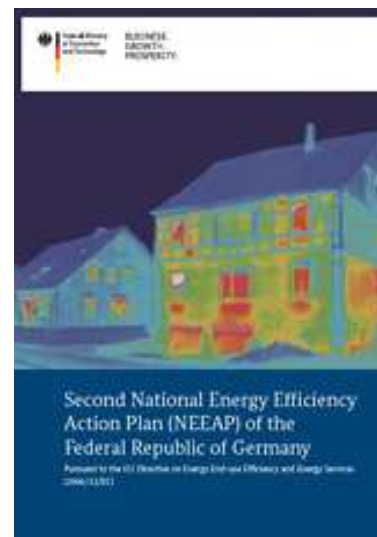
C 8

- Implementing institution

❖ Identification of relevant German schemes



- Funding database on national and state level promotional schemes (www.foerderdatenbank.de)
- Second National Energy Efficiency Action Plan (NEEAP) of the Federal Republic of Germany
- Websites of the funding bodies (e.g. BAFA and KfW)
- Fraunhofer ISI: Study on Energy Efficiency Policies and Measures in Germany



••• Clustering schemes into groups



- Large number of similar German promotional schemes for energy efficiency using the same promotional mechanism (e.g. several loan programmes for energy efficient refurbishment from different funding bodies)
- Similar programmes grouped into clusters
- Clusters according to type of mechanism for promotion (financial promotion and information schemes) and action being promoted (e.g. EE construction, employment of energy manager)
- 21 clusters for Financial Promotional Schemes formed
- Additionally, 9 clusters for publicly funded information means (portals and telephone helpline)

❖ Overview of financial promotional mechanisms



21 clusters with similar promotional programmes identified

Cluster name	no. of schemes in cluster
1. Financial promotion of refurbishment of EE buildings	38
2. Financial promotion of implementation of EE technologies / measures in industries	29
3. Financial promotion of conduction of energy audits (buildings)	12
4. Financial promotion of construction of EE buildings	11
5. Financial promotion for installation of Cogeneration of Heat and Power	11
6. Financial promotion of implementation of energy management systems at industries	8
7. Financial promotion of planning /supervision of EE modernisation / rehabilitation	8
8. Financial promotion of conduction of energy audits (industries)	6
9. Financial promotion of conduction of EE trainings	6

❖ Overview of financial promotional mechanisms



- | | | |
|-----|---|---|
| 10. | Financial promotion of implementation of heating / cooling network solutions | 5 |
| 11. | Financial promotion for installation of energy storage systems | 5 |
| 12. | Financial promotion of establishing controlling / metering systems | 5 |
| 13. | Financial promotion of development of climate / energy concepts (at municipalities) | 5 |
| 14. | Financial promotion of employment of energy manager in public institutions | 4 |
| 15. | Financial promotion of foundation of regional Energy Agencies | 3 |
| 16. | Financial promotion of (long-term) energy coaching / consulting | 3 |
| 17. | Financial promotion of networking of companies exchanging EE ideas | 3 |
| 18. | Financial promotion of implementation of management system to achieve and evaluate climate and energy targets of municipalities | 1 |
| 19. | Financial promotion for installation of load management systems | 1 |
| 20. | Financial promotion of companies shutting down heavy loads in peaks | 1 |
| 21. | Financial incentives for schools: keep 50% of monetary savings from EE measures | 1 |
-

Choice of representative schemes of clusters



- In order to assess the effectiveness of the mechanism, one scheme was selected as representative scheme for each cluster.
- Criteria for a scheme to be representative for a cluster:

National scheme	over	State level scheme
Specific scheme	over	Sub-scheme in other scheme
Scheme anchored by law	over	Scheme anchored by guidelines

Cluster: Construction of Energy Efficient Buildings	
Short Description	Level of Implementation
Loans for energy efficient buildings: Brandenburg	State Level
KfW Energy-efficient Construction: Germany	National Level
Financing Energy Efficiency – Construction: Baden-Württemberg	State Level
Sub-scheme within the programme for market launch progres.nrw : NRW	State Level
Business loan for energy efficiency: Niedersachsen	State Level



A number of qualitative and quantitative parameters to assess the effectiveness of the promotional schemes were identified, based on a literature review. Parameters were chosen according to the following criteria:

- Simple
- Precise and clear defined
- Measurable
- Required data needs to be publicly available
- Applicable across different programmes and sectors

For each parameter the programmes could score from + to +++ as per defined criteria (overview of parameters and indicators on next slide)

Assessment of parameters



	Environmental impacts/ Effectiveness		Economic		Technological	Sustainability		Additional criteria	
Parameter	Direct vs. indirect savings	Energy saving effectiveness	Stimulation on investment	Job creation	Absence of techn. Risks	Sustainability of energy savings	Capacity Building	Frequency of application/ implementation	Particular reputation
Operationalisation	savings from EE measures generated directly or indirectly	Energy savings (direct & indirect)/funds	stimulated investment (in technologies or services) per € of programme	which (new) jobs are created through programme	Is the programme dependent on particular technologies, if yes, which?	Over how many years are savings generated (after closing of programme)?	How many stakeholder receive CB (name the groups)?	% of eligibly stakeholder participating in programme per year	special remark on reputation by renown experts?
Data required	qualitative assessment	Energy savings generated; funds for programme	values on stimulated investment	qualitative assessment	qualitative assessment	approximate value (technology); e.g. buildings 30 years	number of stakeholder groups with improved capacities	number of participating stakeholders	examples; qualitative assessment
Criteria for +++	direct & indirect savings	more than 10 kWh /€	> 10€ (invest)/€ (fund)	particularly labour intensive	Not dependent on any technology	long-term savings (> 10 years)	CB for several stakeholder groups	more than 10 % of eligible stakeholders	ranked as one of the best programmes
Criteria for ++	direct energy savings	1-10 kWh / €	> 2 € (invest)/€ (fund)	low labour and technology intensity or high technology intense	required technologies are well substitutable	medium-term savings (2-10 years)	CB for two stakeholder groups	more than 5 % of eligible stakeholders	ranked as particularly good
Criteria for +	indirect energy savings	0-1 kWh / invested €	≤ 2 € (invest)/€ (fund)	low labour or low technology intensity	dependency on availability of technology	once-only or very short-term savings < 2 years)	CB for one stakeholder group	less than 5% of eligible stakeholders	implementer assess the project as successful



- Data collection via publicly available evaluation reports and phone interviews with scheme implementers
- For some of the schemes quantitative information is not available. Information for qualitative assessment is broadly available.
- Assessment overview prepared for each financial promotion scheme

Example: Financial promotion of employment of energy manager

Direct vs. indirect savings	Energy saving effectiveness	Stimulation on investment	Job creation	Absence of techn. Risks	Sustainability of energy savings	Capacity Building	Frequency of application/ implementation	Particular reputation
+	++	+	+++	+++	+++	+	+	+

- Overview of the seven most effective schemes are presented on the following slides.

Overview most effective promotional schemes



Cluster	Direct vs. indirect savings	Energy saving effectiveness	Stimulation on investment	Job creation	Absence of Technology Risks	Sustainability of energy savings	Capacity Building	Frequency of application/ implementation	Particular reputation
Construction EE buildings	++	++	+++	++	++	+++	+++	+++	+++
Refurbishing EE buildings	++	++	+++	+++	++	+++	+++	+++	+++
Energy Audits in Industry	+	+++	+++	+++	+++	++	+	+	++
Energy Audits in Buildings	+	+++	+++	+++	+++	+++	+	+	++
Energy Efficiency Networks	+	+++	+++	++	+++	++	+	+	++
Monitoring of implementation of EE measures	+	No data	+	+++	+++	+++	+++	++	No data
Financial incentives for schools	+	+++	No data	+	+++	++	+++	+++	++



Promotional mechanisms in this cluster <i>Financial promotion of construction of EE buildings</i>	
Number of programmes in Germany <i>11 similar programmes available in Germany</i>	Targeted sector <i>residential, commercial, and public buildings</i>
Representative scheme <i>KfW energy-efficient Construction</i>	
Level of implementation <i>National</i>	Funding body <i>KfW Investment Bank</i>
Description of scheme <i>The programme provides low interest, long-term loans and grants for the constructing of residential buildings. Pre-condition is that the building qualifies as a certified KfW Energy Efficient Building and is used for residential purpose. KfW EE Building standards are based on and significantly go beyond the National Building Codes.</i>	

❖ Case Studies – No. 1: Construction EE buildings



Direct/indirect savings

- direct: technologies and measures directly financed and implemented (++)

Energy saving effectiveness

- combined numbers for construction and refurbishment - In 2009: € 1,420 million public funds resulted in 2,623 GWh primary energy saved => 1.85 kWh/€ (++)

Stimulation on investment

- € 26,960 million investments triggered (for EE construction and refurbishment)
=> €19 investment / € fund (+++)

Job creation

- few new jobs created (construction workers/architects required anyways for building) and usage of new technologies (++)

Absence of Techn. Risks

- well substitutable technologies (many technical options to achieve standard) (++)

Sustainability of savings

- high: long-lasting savings for building refurbishments (+++)

Capacity building

- capacities of several stakeholder groups increased: architects, engineers/developers, end users (+++)

Frequency of application

- high: 55% of newly build residential buildings used KfW promotional scheme in 2012 (+++)

Particular reputation

- regarded as most effective EE scheme among experts (+++)

❖ Case Studies - No. 2: Refurbishing EE buildings



Promotional mechanisms in this cluster <i>Financial promotion of refurbishment of EE buildings</i>	
Number of programmes in Germany <i>38 similar programmes available in Germany</i>	Targeted sector <i>residential, commercial, and public buildings</i>
Representative scheme <i>KfW energy-efficient refurbishment</i>	
Level of implementation <i>National</i>	Funding body <i>KfW Investment Bank, state banks</i>
Description of scheme <i>The programme provides low interest, long-term loans and grants for investment in energy saving measures of existing residential buildings. Loans available for single measures and for comprehensive refurbishment to reach certified KfW Energy Efficient Building standard.</i>	

❖ Case Studies - No. 2: Refurbishing EE buildings



Direct/indirect savings

- direct: technologies and measures directly financed and implemented (++)

Energy saving effectiveness

- combined numbers for construction and refurbishment - In 2009: € 1,420 million public funds resulted in 2,623 GWh primary energy saved => 1.85 kWh/€ (++)

Stimulation on investment

- € 26,960 million investments triggered (for EE construction and refurbishment)
=> €19 investment / € fund (++++)

Job creation

- high labour intensity: labour required for refurbishment, architects/engineers, building developers, craftsmen (++++)

Absence of Techn. Risks

- well substitutable technologies (many technical options to achieve standard) (++)

Sustainability of savings

- High: long-lasting savings for building refurbishments (++++)

Capacity building

- capacities of several stakeholder groups increased: architects, engineers/developers, end users (++++)

Frequency of application

- High: nearly half of the refurbished apartments in Germany use loan (++++)

Particular reputation

- regarded as most effective EE scheme among experts (++++)



Promotional mechanisms in this cluster <i>Financial promotion of conduction of energy audits (industries)</i>	
Number of programmes in Germany <i>5 similar programmes available in Germany</i>	Targeted sector <i>Available for industries of all types and sizes</i>
Representative scheme <i>KfW energy audits in SMEs (Energieberatungen im Mittelstand)</i>	
Level of implementation <i>National</i>	Funding body <i>KfW Investment Bank</i>
Description of scheme <i>The programme provides financial support for energy audits in SMEs (including freelancers) whose costs for energy amount to at least 5,000 Euro per year. Audits comprise an initial audit, in which the status quo is described, deficiencies are identified and measures for energy efficiency are proposed. In the following detailed audit, this analysis is expanded and specified. The grants can amount to 80%/60% of the costs and a maximum of 1,280 Euros/4,800 Euros for the initial/detailed audits.</i>	

Case Studies – No. 3: Energy Audits in Industry



Direct/indirect savings

- indirect savings: because no measure implemented through audit only (+)

Energy saving effectiveness

- In 2009: € 8.2 million public funds resulted in 870 GWh primary energy saved => 106,09 kWh energy savings per 1€ fund (++++)

Stimulation on investment

- ratio of € 37,5 overall investment per 1€ fund (++++)

Job creation

- labour intensive: new jobs for auditors created (++++)

Absence of Techn. Risks

- low: no dependency on technology (++++)

Sustainability of savings

- energy savings over entire life cycle of industrial equipment (medium term) (++)

Capacity building

- capacities of one stakeholder group increased: industrial staff (+)

Frequency of application

- less than 0.1% of SMEs apply yearly at programme (4720 applications in 2009) (+)

Particular reputation

- Very good reputation according to Fraunhofer ISI (++)

❖ Case Studies – No. 4: Energy Audits in buildings



Promotional mechanisms in this cluster <i>Financial promotion of conduction of energy audits (buildings)</i>	
Number of programmes in Germany <i>11 similar programmes available in Germany</i>	Targeted sector <i>Available for all buildings – residential, public, commercial</i>
Representative scheme <i>BAFA On-site energy audits (BAFA Vor-Ort Beratung)</i>	
Level of implementation <i>National</i>	Funding body <i>BAFA – Federal Office of Economics and Export Control</i>
Description of scheme <i>The programme provides financial support for energy audits in residential buildings. Auditors conduct the audits on-site and conclude them with a detailed report. They receive a grant of 400 Euros for detached and semi-detached houses and of 500 Euros for apartment houses, the contribution of the house owners/residents has to be at least as high.</i>	

❖ Case Studies – No. 4: Energy Audits in buildings



Direct/indirect savings

- indirect savings: because no measure implemented through audit only (+)

Energy saving effectiveness

- 77,700 MWh saved, € 3.5 million public funds invested
- 22,2 kWh energy savings per 1€ fund (++++)

Stimulation on investment

- ratio of € 16 overall investment per 1€ fund (++++)

Job creation

- labour intensive: new jobs for auditors and consultants created (++++)

Absence of Techn. Risks

- low: no dependency on technology (++++)

Sustainability of savings

- energy savings over entire life cycle of buildings (long term) (++++)

Capacity building

- capacities of one stakeholder group increased: residents (+)

Frequency of application

- less than 5% of eligible applicants use programme per year (12,000 audits in 2013) (+)

Particular reputation

- good programme „...established and respected standard for high quality energy audits in the housing stock...“ (Architects Chamber Hamburg) (++)

❖ Case Studies – No. 5: Energy Efficiency Networks



Promotional mechanisms in this cluster <i>Financial promotion of networking of companies exchanging EE ideas</i>	
Number of programmes in Germany <i>3 similar programmes available in Germany</i>	Targeted sector <i>industries</i>
Representative scheme <i>Learning Energy Efficiency Networks</i>	
Level of implementation <i>National</i>	Funding body <i>Deutsche Bundesstiftung Umwelt</i>
Description of scheme <i>Creation of 30 energy efficiency networks of high energy intensive companies (ca. 10 companies per network). Networks are guided by experienced energy experts and jointly develop solutions to overcome obstacles, reduce transaction costs, and identify innovation effects in order to increase their energy efficiency.</i>	

❖ Case Studies – No. 5: Energy Efficiency Networks



Direct/indirect savings

- indirect savings: only information exchange and capacity building funded (+)

Energy saving effectiveness

- ~29000 MWh saved per one network, €330,000 support through public funds
- 880 kWh energy savings per 1€ funds (+++)

Stimulation on investment

- €330,000 public funds triggered €11.4 million energy saving investments in one network => ratio of € 34,15 overall investment per 1€ fund (+++)

Job creation

- some new jobs created: networks are guided by experts + technology implementation (++)

Absence of Techn. Risks

- no dependency on technology (+++)

Sustainability of savings

- Medium term sustainability for technologies implemented in industry (++)

Capacity building

- CB for one stakeholder group: high energy intense industries (+)

Frequency of application

- Only a few big companies participate: less than 5 % of all German companies (+)

Particular reputation

- assessed as very good programme by Fraunhofer Institute (++)



Case Studies – No. 6: Monitoring of implementation of EE measures



Promotional mechanisms in this cluster <i>Financial promotion of planning /supervision of EE modernisation / rehabilitation</i>	
Number of programmes in Germany <i>9 similar programmes available in Germany</i>	Targeted sector <i>Residential buildings</i>
Representative scheme <i>KfW energy efficient refurbishment - Construction Monitoring</i>	
Level of implementation <i>National</i>	Funding body <i>KfW Investment Bank</i>
Description of scheme <i>KfW provides grants to promote the energetic planning and supervision of construction by an external and independent expert during the renovation phase of existing residential buildings. The expert may neither be in an owner, corporate or employment relationship with the construction companies or suppliers, nor may he provide goods or services. Only in combination with KfW EE construction/ refurbishment programme.</i>	



Case Studies – No. 6: Monitoring of implementation of EE measures



Direct/indirect savings	<ul style="list-style-type: none">• indirect savings: no technology financed or implemented (+)
Energy saving effectiveness	<ul style="list-style-type: none">• no data available for additional savings through external monitoring; public funds of € 13 million used in 2013
Stimulation on investment	<ul style="list-style-type: none">• no additional investments besides €27 million payments for external experts in 2013 (+)
Job creation	<ul style="list-style-type: none">• labour intensive: new jobs created for external experts (+++)
Absence of Techn. Risks	<ul style="list-style-type: none">• no dependency on technology (+++)
Sustainability of savings	<ul style="list-style-type: none">• high, energy savings over life cycle of buildings increased (+++)
Capacity building	<ul style="list-style-type: none">• Capacities of several stakeholder groups increased: architects, engineers and end users (+++)
Frequency of application	<ul style="list-style-type: none">• more than 5% of eligible stakeholders use programme (++)
Particular reputation	<ul style="list-style-type: none">• none



Promotional mechanisms in this cluster

Financial incentive for schools: keep 50% of monetary savings from energy savings

Number of programmes in Germany

1 programme available, implemented in several German cities with slight variations

Targeted sector

Available for schools

Representative scheme

Fifty/Fifty

Level of implementation

State-level (implemented in all states)

Funding body

Municipalities, education and school authorities

Description of scheme

The programme provides educational and technical support for schools to raise awareness on energy efficiency among staff and students. Its main aim is behavioural change as well as the implementation of simple technical EE measures. Schools are incentivised to save energy and costs, because half of the savings are retained at the school.

Case Studies – No. 7: Financial incentives for schools



Direct/indirect savings

- indirect savings: mainly capacity development and behavioural change (+)

Energy saving effectiveness

- 7,000 MWh saved, € 14 million invested => 50 kWh energy savings per 1€ fund (+++)

Stimulation on investment

- no data available

Job creation

- low labour intensity: only few jobs for external educators and auditors (+)

Absence of Techn. Risks

- not dependent on technology (+++)

Sustainability of savings

- energy savings through change of energy consumption behaviour, since kids are regarded as very perceptive, at least medium term savings are expected (++)

Capacity building

- CB for several stakeholder groups: students, school staff and technical staff (+++)

Frequency of application

- Participation of more than 10% of all schools (+++)

Particular reputation

- regarded as good programme by experts and replicated all over Germany (++)

Presentation of the schemes in the study report

- All 21 clusters of financial promotion mechanisms and their assessment will be presented in the study report
- Additionally, the 9 information schemes will be briefly presented



Finalisation of the study

- Finalisation of first draft of the study by end of March, including mapping of German schemes, in-depth case studies and detailed methodology section of the study.