EU-MORE

EUropean MOtor REnovation initiative

Germany

Review f past and existing policy options for the acceleration of electric motor renovation

EU-MORE

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List of Acronyms

Acronym	Description	English
BAFA	Bundesamt für Wirtschaft und Ausfuhrkontrolle	Federal Office for Economic Affairs and Export Control
BMWK	Bundesministerium für Wirtschaft und Klima	Federal Ministry for Economic Affairs and Climate Action
BMWi	Bundesministerium für Wirtschaft und Energie	Federal Ministry for Economic Affairs and Energy of Germany
KfW	Kreditanstalt für Wiederaufbau	Credit Institute for Reconstruction

EU-MORE is an acronym for
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Introduction and description of the national policy framework and important related national programmes, measures and/or developments:

Germany's national policy framework includes implementing authorities such as the Federal Ministry for Economic Affairs and Climate Action (BMWK)[1]. It is responsible for formulating and implementing policies related to economic affairs, energy, and climate action. The ministry's main tasks include promoting economic growth and employment, ensuring the competitiveness of German industry, and developing policies to address climate change. There are several other important authorities. The Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV)[2] focuses on environmental protection and climate change. The Federal Ministry for Digital and Transport (BMDV)[3] deals with transportation and digital infrastructure. The Federal Network Agency (BNetzA)[4] regulates energy and telecommunications. The Federal Ministry of Education and Research (BMBF)[5] is responsible for education, research, innovation, and technology. These authorities play key roles in implementing policies within their respective areas.

Germany's National Energy and Climate Plan (NECP) outlines the country's general direction and course of action for achieving its energy and climate objectives. The NECP focuses on the transition to a sustainable and low-carbon economy, with a strong emphasis on renewable energy sources, energy efficiency, and greenhouse gas (GHG) emissions reduction. Germany recognizes the importance of energy efficiency in reducing energy consumption and improving overall sustainability. The NECP includes measures to enhance energy efficiency in buildings, industry, transportation, and other sectors. This involves implementing energy-efficient technologies, promoting energy-saving practices, and establishing energy performance standards. The NECP emphasizes the need for sectoral integration and cross-sectoral cooperation to achieve synergies and optimize energy systems. This involves coordinating efforts between energy, transportation, industry, and other sectors to facilitate a holistic approach towards sustainable energy transformation.[6]

Several national programs support energy efficiency initiatives in Germany's industry:

- The "KfW Energy Efficiency Programme for Production Plants/Processes" is a German national program that provides low-interest loans to commercial enterprises for implementing energy efficiency measures in their production facilities and processes. The program is ongoing and is available for companies of any size and is open to companies and individual entrepreneurs in the commercial sector who are majority privately owned, as well as freelancers. The program requires all investment measures to achieve energy savings of at least 10%[7].
- The "Federal Funding for Energy and Resource Efficiency in the Economy" is another German national program that aims to increase energy efficiency in the industry. The program receives over 10,000 applications per year and consists of different modules. The purpose of module 1 is to support the replacement or acquisition of high-efficiency units for industrial and commercial applications on the company premises in cross-sectional technologies. The

[1] https://www.bmwk.de/Navigation/DE/Home/home.html
[2] https://www.bmuv.de/
[3] https://bmdv.bund.de/DE/Home/home.html
[4] https://www.bundesnetzagentur.de/cln_111/DE/Home/home_node.html
[5] https://www.bmbf.de/bmbf/de/home/home_node.html
[6] https://www.bmwk.de/Redaktion/EN/Downloads/E/draft-of-the-integrated-national-energy-and-climate-plan.pdf?__blob=publicationFile&v=1
[7] https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/F%C3%B6rderprodukte/EE-Produktion-292/

program is ongoing and has been successful in supporting smaller projects with a very high attractiveness for applicants[8].

- The "Energy-efficient and climate-friendly production processes" programme, which is designed to improve energy efficiency in production processes. It supports companies in investing in the most energy-efficient and environmentally friendly solutions in the design of their production processes[9].
- The "STEP up! - Utilizing electricity efficiency potentials" programme aims to increase the efficiency of electricity use by promoting the use of energy-efficient technologies and practices. It provides funding for projects that reduce energy consumption and greenhouse gas emissions by improving the energy efficiency[10]. The programme was running from 2016-2019.
- The "PIUS Advice and Invest" programme subsidises investment projects by SMEs which increase resource efficiency and reduce CO2 emissions through process and/or organisational changes. SMEs in production, commerce and the service sector are supported with consulting in their efforts to cut their resource consumption and reduce emissions of harmful substances through [11].

According to "Regulation on Securing Energy Supply through Medium-Term Effective Measures (EnSimiMaV)" (Verordnung zur Sicherung der Energieversorgung über mittelfristig wirksame Maßnahmen) companies are required to promptly implement identified and economically feasible energy efficiency measures within 18 months. The feasibility is determined based on an economic viability assessment as outlined in DIN EN 17463 [12].

Germany has set a goal to save 500 TWh of energy by 2030 thanks to measures set out in the new energy efficiency law[13]. The new EU ecodesign measures for electric motors and variable speed drives enter into force on 1 July 2021, aimed at improving the energy efficiency of these products across the EU. Applicable to AC induction motors (such as those that can be found in washing machines, air conditioners, or heat pumps and are also commonly used in many types of industrial applications), the new rules update the previous regulation from 2009. The new regulation has a significantly broader scope, covering motors with a power range from 0.12 kW up to 1000 kW (relative to the previous 0.75 – 375 kW). The energy efficiency requirements have also been reinforced, reflecting technological progress and market evolution in the past decade[14]. Both policy and regulatory reforms can help Germany achieve a cost-efficient, equitable and sustainable pathway to meeting its highly ambitious energy transition goals.

Brief evaluation of the overall size and scope of national actions in relation to the replacement of electric motors and the EU-MORE project as a whole

Germany has been actively promoting the replacement of old electric motors in various industrial sectors. This includes motors used for pumps, ventilators, and other related components. The country has implemented measures to increase energy efficiency in the industry. By encouraging the adoption of more efficient electric motors, Germany aims to enhance energy performance in the industrial

[8] https://www.bmwk.de/Redaktion/EN/Pressemitteilungen/2022/12/20221205-measures-under-the-eew-funding-programme-can-now-commence-ahead-of-schedule.html and https://www.bafa.de/DE/Energie/Energieeffizienz/Energieeffizienz_und_Prozesswaerme/energieeffizienz_und_prozesswaerme_node.html (Module 1)

[9] https://www.iea.org/policies/872-support-of-energy-efficient-and-climate-friendly-production-processes

[10] https://www.bmwk.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/pilotprogramm-stromeinsparungen-im-rahmen-wettbewerblicher-ausschreibungen-stromeffizienzpotentiale-nutzen-step-up.pdf?__blob=publicationFile&v=8

[11] https://www.energieeffizienz-hessen.de/investitionsfoerderung/pius-invest.html

[12] https://www.gesetze-im-internet.de/ensimimav/BJNR153000022.html

[13] https://www.euractiv.com/section/energy/news/germany-moves-ahead-with-energy-efficiency-law-amid-ongoing-eu-talks/

[14] https://commission.europa.eu/news/new-eu-rules-boost-energy-efficiency-electric-motors-2021-06-30_en

sector. These measures align with the country's commitment to sustainable practices and reducing energy consumption.

1.1 Measure 1: Federal Funding for Energy and Resource Efficiency in the Economy – Module 1

	Overview
Short Description	This funding program supports investment measures that lead to a reduction in energy and/or resource demand and carbon dioxide emissions. Eligible investments include the replacement or acquisition of high-efficiency units such as electric motors, pumps, ventilators, and related components such as variable-frequency drive.
Responsible Authority	Federal Office for Economic Affairs and Export Control (BAFA) or Credit Institute for Reconstruction (KfW)[15]
Status	Ongoing
Issue Date	2018 (individual modules were combined in one funding program)
Start Date	2019
Ending Date	2023 (expected; still running as of Oct. 2023)
Duration	
Reference:	https://www.bafa.de/DE/Energie/Energieeffizienz/-Energieeffizienz_und_Prozesswaerme/energieeffizienz_und_prozesswaerme_node.html

1.1.1 Main Description

A detailed description of the policy measure and how it relates specifically to EU MOREs topic of electric motors – including references to (if applicable) anchoring national law, EU directives, other schemes

"Federal Funding for Energy and Resource Efficiency in the Economy" (EEW) is the central government program of BMWK to increase energy efficiency in the industry. It receives over 10,000 applications per year. The funding program consists of different modules. The purpose of module 1 is to support the replacement or acquisition of high-efficiency units for industrial and commercial applications on the company premises in the following cross-sectional technologies:

- **High efficient electric motors and drives** consisting of an efficient electric motor and a control system (variable-speed drives) as a standard product for stationary use, which have to fulfil the following requirements:
  - Electric motors 0.12 to 0.75 kW = efficiency class IE4
  - Electric motors 0.75 to 1000 kW = at least efficiency class IE5
  - Electric motors >1000 kW = minimum efficiency of 96.8%
  - Electric motors up to 1000 kW not subject to legal requirements = at least efficiency class IE5
- **Pumps** with electrical drive - high efficient centrifugal and dry rotor pumps, wet rotor circulation pumps, frequency converter for pumps with variable flow rate.
  - Pumps must be driven by a high efficient electric motor, see above criteria
- **Fans** – high efficient fans that use an electric motor to drive a rotating impeller, frequency converters for demand-dependent control of the fan speed, heat exchangers.
  - Equipped with a motor of efficiency class IE4 or higher
- **Compressed air generators** - with speed or without speed control if the compressor operates with low switching frequency and low idle time.

[15] The program offers funding through either a direct grant from BAFA or a repayment allowance ("Tilgungszuschuss") combined with a loan from KfW.

- **Frequency converters** for demand-dependent regulation of the speed of electric motors and drives.

Eligible to apply with a place of business or branch in Germany are private companies, municipal companies, self-employed individuals and contractors. [16]

	Characteristics
Budget	No information was found about the whole budget of the program o Max. 200.000 EUR per beneficiary (for module 1 – cross-cutting technologies) o The funding rate is 30 % of eligible costs, and for small and medium-sized enterprises is 40 %.
Financing of the measure	financed by the Federal Ministry for Economic Affairs and Climate Action of Germany (BMWK)
Policy focus	Focus of physical interventions
Intervention Type	Equipment upgrade
Main Barriers Addressed	Emission reduction, efficiency optimization
Key Driver(s)	Energy efficiency directive (EED) (probably)
Replicability	High
EU Inclusion	Yes, it is a part of NECP as measure M02 [17]
Related Characteristics	Assumed lifetime for ESMs: On average 7.8 years, individual lifetime depends on the measure [electrical drives 8 years, compressed air 8 years, systemic solutions 8 years, pumps 8 years]

[16] https://www.kfw.de/PDF/Download-Center/F%C3%B6rderprogramme-(Inlandsf%C3%B6rderung)/PDF-Dokumente/6000004386_M_295_Anlage_TMA_Modul1.pdf

[17] "Notification of Member States' measures and methodologies to implement Article 7 of Directive 2012/27/EU", in the 2019 draft of the NECP

1.1.2 Impacts

A detailed description of the final (expected) results of the measure implementation and any achievements related to the measure implementation. Where possible specific to electric motors

According to the evaluation report for the years 2019, 2020 and 2021[18]:

- Average subsidy amount per motor in 2021: 9.649 €
- Electrical savings in total per year (for all systems in module 1):
  - 63 *GWh in 2019*
  - 72 *GWh in 2020*
  - 78 *GWh in 2021*
- Estimated electrical savings in motor systems per year:
  - 2.973 *MWh in 2019*
  - 4.831 *MWh in 2020*
  - 5.815 *MWh in 2021*
- Achieved GHG emission reductions (for all systems in module 1):
  - 61.122 *t CO_2 in* 2019
  - 62.959 *t CO_2 in* 2020
  - 61.655 *t CO_2 in* 2021
- Estimated reduction of energy costs (for all systems in module 1):
  - 17,3 *Mio. € in 2019*
  - 18,9 *Mio. € in 2020*
  - 20,4 *Mio. € in 2021*
- Achieved funding efficiency:
  - 50 *€/t CO_2 was the target*
  - 124 *€/t CO_2 was achieved*

	Impacts
Case level impact	High
Policy level impact	High
Size	Module 1 (cross-cutting technologies): 831 motors for 2019 525 motors for 2020 333 motors for 2021
Energy	Module 1 (cross-cutting technologies): 61.122 t CO_2 in 2019 62.959 t CO_2 in 2020 61.655 t CO_2 in 2021
Impact evaluation	The target of saving 160.000 t CO_2 in total by 2023 was already achieved in 2021 with 185.000 t CO_2 saved, The target of 20.000 funding measures in total by 2023 was already achieved in 2021 with 22.102 funding approvals.

[18] https://www.plattform-i40.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/bundesfoerderung-fuer-energieeffizienz-in-der-wirtschaft.pdf?__blob=publicationFile&v=6

(If available) Description of the method used for calculating the final energy- and/or cost-savings achieved by the measure and specific to that of electric motor replacement.

The calculation of electrical savings is done using a statistical method. To further validate the values, the number of systems, nominal power, operating hours, and any existing speed control were used to determine the power consumption after implementation of the savings measure and compared to the statistical savings value. Percentages of savings up to an average of 35% per technology cluster were accepted as plausible.

1.1.3 Lessons Learnt

Description of the lessons learnt and/or (initial) feedback gathered in response to the measure's implementation specific to electric motors. Also include (if applicable) the main barriers that would hamper and/or the conditions that are necessary for the implementation of the measure.

Module 1 is the most widely supported module in the "Federal Funding for Energy and Resource Efficiency in the Economy". The module is designed for applicants with smaller projects and has a very high attractiveness for applicants. In 2021, a total of 8.870 projects were supported with around 76 million euros in funding, leading to about 249 million euros in investment. The majority of the applications were submitted online, with only a small percentage submitted through KfW as a repayment bonus / allowance alongside a credit application. The reason for the low credit application may be due to the fact that the program is intended for smaller projects. The program's online application process and ease of access contribute to its success. The credit application process, on the other hand, requires collateral and is therefore more complicated. The need for a credit option should be assessed on a case-by-case basis, depending on the practical needs of the applicant[19].

	Lessons Learnt
Key takeaways	○ Electric motor systems were direct affected by this measure ○ The target regarding the number of support measures has already been reached prematurely. ○ The target for CO2 savings has already been achieved in 2021. ○ The current funding efficiency of support is worse than the target.
Recommendations	
Linked measures	
Reference(s)	2021, BMWK, Querschnittstechnologien – Merkblatt, Link: https://www.bafa.de/SharedDocs/Downloads/DE/Energie/eew_merkblatt_2022.pdf?__blob=publicationFile&v=2 2023, Fraunhofer, Evaluation der Bundesförderung für Energieeffizienz in der Wirtschaft, Link: https://www.plattform-i40.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/bundesfoerderung-fuer-energieeffizienz-in-der-wirtschaft.pdf?__blob=publicationFile&v=6 "Credit Institute for Reconstruction" (KfW), Link: https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/F%C3%B6rderprodukte/Energieeffizienz-und-Prozessw%C3%A4rme-aus-Erneuerbaren-Energien-(295)/
Other	
Thoughts, comments, considerations ...	

[19] https://www.plattform-i40.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/bundesfoerderung-fuer-energieeffizienz-in-der-wirtschaft.pdf?__blob=publicationFile&v=6

1.2 Measure 2: Federal Funding for Energy and Resource Efficiency in the Economy – Module 4

	Overview
Short Description	Module 4, part of the funding program "Federal Funding for Energy and Resource Efficiency in the Economy" supports investment measures for energy-efficient optimization of systems and processes in industrial and commercial companies. The aim is to increase energy efficiency, reduce the consumption of fossil fuels, and enhance the competitiveness of the funded enterprises.
Responsible Authority	Federal Office for Economic Affairs and Export Control (BAFA) or Credit Institute for Reconstruction (KfW)[20]
Status	Ongoing
Issue Date	2018 (individual modules were combined in one funding program)
Start Date	2019
Ending Date	2023 (expected)
Duration	48 months (expected)
Reference:	https://www.bafa.de/DE/Energie/Energieeffizienz/Energieeffizienz_und_Prozesswaerme/Modul4_Energiebezogene_Optimierung/modul4_energiebezogene_optimierung_node.html

1.2.1 Main Description

A detailed description of the policy measure and how it relates specifically to EU MOREs topic of electric motors – including references to (if applicable) anchoring national law, EU directives, other schemes

Module 4 of the funding program is specifically designed to be technology-neutral, allowing all efficiency measures that contribute to the energy-related optimization of systems and processes in companies to be eligible for funding. However, it is required to submit an energy-saving concept during the application process.

Targeted enterprises for funding include both small and medium-sized enterprises (SMEs) and large companies, including private and municipal entities, freelance professionals utilizing a predominantly business location, and contractors implementing eligible measures for qualifying companies.

The funding program offers two options: a grant variant and a repayment subsidy alongside a loan. The BMWK considers these funding options to cater to the diverse financing needs of businesses. The technical minimum requirements are the same for both variants. The maximum funding amount is 10

[20] The program offers funding through either a direct grant from BAFA or a repayment allowance ("Tilgungszuschuss") combined with a loan from KfW.

million euros, with a funding rate of up to 30% of eligible investment costs (40% for SMEs). Under the loan variant, projects can be financed up to 25 million euros of eligible investment costs.[21]

Eligible measures for funding include[22]:

- Process optimizations or changes for energy and resource savings.
- Utilization of process waste heat, such as capturing and using it in heating networks or generating electricity.
- Increasing energy and/or resource efficiency in heating, cooling, and ventilation systems used in manufacturing.
- Efficient provision of process heat or cooling, including optimized storage.
- Avoiding energy and/or resource losses in production processes.
- Shifting from fossil fuels to renewable energy sources.
- Electrification of processes.

	Characteristics
Budget	No information was found about the whole budget of the program o A maximum amount of €500 per tonne of CO2 saved annually (for medium-sized enterprises (ME): max. €900, small enterprises (SE): max. €1,200) as outlined in the energy-saving concept. o The funding rate is 30 % of eligible costs, and for small and medium-sized enterprises is 40 %[23].
Financing of the measure	financed by the Federal Ministry for Economic Affairs and Climate Action of Germany (BMWK)
Policy focus	Focus of physical interventions
Intervention Type	**E**quipment upgrade
Main Barriers Addressed	emission reduction, efficiency optimization
Key Driver(s)	Energy efficiency directive (EED) (probably)
Replicability	High
EU Inclusion	Yes, it is a part of NECP
Related Characteristics	

[21] https://www.plattform-i40.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/bundesfoerderung-fuer-energieeffizienz-in-der-wirtschaft.pdf?__blob=publicationFile&v=6

[22] https://www.bafa.de/SharedDocs/Downloads/DE/Energie/eew_modul_4_oap_merkblatt_2023.pdf?__blob=publicationFile&v=3

[23] https://www.bafa.de/SharedDocs/Downloads/DE/Energie/eew_modul_4_oap_merkblatt_2023.pdf?__blob=publicationFile&v=3

1.2.2 Impacts

A detailed description of the final (expected) results of the measure implementation and any achievements related to the measure implementation. Where possible specific to electric motors

- Achieved final energy savings (for all systems in module 4):
  - 2.007 *GWh/a in* 2019
  - 1.786 *GWh/a in* 2020
  - 3.801 *GWh/a in* 2021
- Achieved GHG emission reductions (for all systems in module 4):
  - 677.113 *t* CO_2 *in* 2019
  - 519.271 *t* CO_2 *in* 2020
  - 1.016.128*t* CO_2 *in* 2021
- Estimated reduction of energy costs (for all systems in module 4):
  - 299,1 *Mio. € in 2019*
  - 142,5 *Mio. € in 2020*
  - 238,7 *Mio. € in 2021*
- Achieved funding efficiency:
  - 23 *€/t* CO_2 *was the target*
  - 32,78 *€/t* CO_2 *was achieved (2019-2021)*

	Impacts
Case level impact	high
Policy level impact	high
Size	Electric drive systems (motors, pumps, fans, HVAC systems) represents around 36% from all the funded projects
Energy	• 7.594 GWh (2019-2021) • 2.212.512 t CO_2 (2019-2021)
Impact evaluation	

(If available) Description of the method used for calculating the final energy- and/or cost-savings achieved by the measure and specific to that of electric motor replacement.

not found

1.2.3 Lessons Learnt

Description of the lessons learnt and/or (initial) feedback gathered in response to the measure's implementation specific to electric motors. The main barriers that would hamper and/or the conditions that are necessary for the implementation of the measure.

In the 2021 funding cycle of Module 4, a total of 2.116 projects were supported, with approximately 337 Mio. € in funding allocated, triggering over 2.064 Mio. € in investments. The number of funding cases increased by 70% compared to the 2020, with a corresponding 85% increase in funding volume. SMEs represented 75% of the funded cases, while private companies dominated the funding landscape. The focus was on process and plant optimization, with a notable rise in funding for waste heat utilization. The program achieved significant energy savings, resulting in an annual reduction of 1 Mio. t CO2 and cost savings of around 240 Mio. €.

	Lessons Learnt
Key takeaways	• Increased funding and participation. • SMEs play a major role. • Focus on process optimization and waste heat utilization. • Significant energy and cost savings achieved. • Program effectiveness and positive evaluation.
Recommendations	
Linked measures	
Reference(s)	2021, BMWK, Querschnittstechn. - Merkblatt Modul 4 Link: https://www.bafa.de/SharedDocs/Downloads/-DE/Energie/eew_modul_4_oap_merkblatt_2023.pdf?__blob=publicationFile&v=3 2023, Fraunhofer, Evaluation der Bundesförderung für Energieeffizienz in der Wirtschaft, Link: https://www.plattform-i40.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/bundesfoerderung-fuer-energieeffizienz-in-der-wirtschaft.pdf?__blob=publicationFile&v=6
Other	
Thoughts, comments, considerations ...	

1.3 Measure 3: Federal Funding for Energy and Resource Efficiency in the Economy – Funding competition

	Overview
Short Description	The funding competition is explicitly technology-, actor-, and sector-neutral. This means that regardless of the technology, actor, or sector, all efficiency measures that contribute to the energy-related optimization of facilities and processes can be supported
Responsible Authority	Federal Office for Economic Affairs and Export Control (BAFA) or Credit Institute for Reconstruction (KfW)[24]
Status	Ongoing
Issue Date	2018 (individual modules were combined in one funding program)
Start Date	2019
Ending Date	2023 (expected)
Duration	48 months (expected)
Reference:	https://www.wettbewerb-energieeffizienz.de/WENEFF/Navigation/DE/Foerderwettbewerb/Rahmenbedingungen/rahmenbedingungen.html https://www.wettbewerb-energieeffizienz.de/WENEFF/Redaktion/DE/PDF-Anlagen/richtlinie-bmwk-weneff-08-05-2023.pdf?__blob=publicationFile&v=9

1.3.1 Main Description

A detailed description of the policy measure and how it relates specifically to EU MOREs topic of electric motors – including references to (if applicable) anchoring national law, EU directives, other schemes

The funding competition is explicitly open to all technologies, actors, and sectors. This means that any efficiency measures contributing to the energy-related optimization of facilities and processes can be supported, regardless of their specific characteristics. The funding competition is designed similarly to Module 4 in terms of its target groups and objectives. The main differences lie in the funding procedure, which can be either competitive or through application, and in the maximum funding limit or possible funding rate.

The funding is carried out through a competitive process, where companies submit their applications on specific deadlines for each competition round. Any applications submitted after the deadline will be considered in the following round. The applications are ranked based on their funding efficiency (CO2 emissions reduction per year achieved per funding euro) and then approved, taking into account the available funds.

With the promotion competition and its systemic approach, savings of approximately 0,7 million tonnes of CO2 or three terawatt-hours of final energy are intended to be achieved by 2023.

	Characteristics

[24] The program offers funding through either a direct grant from BAFA or a repayment allowance ("Tilgungszuschuss") combined with a loan from KfW.

Budget	Projects with a maximum budget of 5 million euros can be funded with a support rate of up to 50% of eligible costs. The funding is provided as a non-repayable grant.
Financing of the measure	Financed by the Federal Ministry for Economic Affairs and Climate Action of Germany (BMWK)
Policy focus	Focus of physical interventions
Intervention Type	Equipment upgrade
Main Barriers Addressed	emission reduction, efficiency optimization
Key Driver(s)	Energy efficiency directive (EED)(probably)
Replicability	high
EU Inclusion	Yes, it is a part of NECP
Related Characteristics	

1.3.2 Impacts

A detailed description of the final (expected) results of the measure implementation and any achievements related to the measure implementation. Where possible specific to electric motors

According to the evaluation report for the years 2019, 2020 and 2021[25]:

- Funding overview:
  - 26 funding approvals; 14,1 Mio. € funding support *in 2019*
  - 39 funding approvals; 43,5 Mio. € funding support *in 2020*
  - 23 funding approvals; 23,7 Mio. € funding support *in 2021*
- Achieved final energy savings (for all systems):
  - 230.515 MWh/*a in* 2019
  - 411.064 MWh/*a in* 2020
  - 638.327 MWh/*a in* 2021
- Achieved GHG emission reductions (for all systems):
  - 59.896 *t* CO_2 *in* 2019
  - 187.202 *t* CO_2 *in* 2020
  - 103.485 t CO_2 *in* 2021
- Estimated reduction of energy costs (for all systems):
  - 11,1 *Mio. € in 2019*
  - 22,1 *Mio. € in 2020*
  - -3,3 *Mio. € in 2021*
- Achieved funding efficiency:
  - 29,86 *€/t* CO_2 *was achieved (2019-2021)*

[25] https://www.plattform-i40.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/bundesfoerderung-fuer-energieeffizienz-in-der-wirtschaft.pdf?__blob=publicationFile&v=6

	Impacts
Case level impact	Medium
Policy level impact	Medium
Size	
Energy	• 1.280 GWh (2019-2021) • 350.583 t CO_2 (2019-2021)
Impact evaluation	

(If available) Description of the method used for calculating the final energy- and/or cost-savings achieved by the measure and specific to that of electric motor replacement. For

not found

1.3.3 Lessons Learnt

Description of the lessons learnt and/or (initial) feedback gathered in response to the measure's implementation specific to electric motors. The main barriers that would hamper and/or the conditions that are necessary for the implementation of the measure.

The majority of funded companies are large companies. Most of the cases come from the glass and, ceramics, stone and earth processing sector, and the wholesale trade. The projects are expected to achieve energy savings of about 638 GWh per year and a reduction of approximately 103 thousand tonnes of CO2-equivalent per year. There was an increase in electricity consumption due to the measures, which reduced primary energy savings and greenhouse gas emissions. 45% of the projects did not apply for the maximum funding rate (50% of eligible costs) likely for competitive reasons.

	Lessons Learnt
Key takeaways	○ The measure reaches SMEs, although large corporations remain the major of funded entities ○ Diversification among technology fields is crucial
Recommendations	Positive feedback from recipients, who express satisfaction with the administrative process and plan to recommend the competition in the future.
Linked measures	
Reference(s)	
Other	
Thoughts, comments, considerations …	

1.4 Measure 4: KfW Energy Efficiency Programme - Production Plants/Processes

	Overview
Short Description	The KfW Energy Efficiency Programme provides low-interest loans to support energy efficiency measures in the area of production facilities/processes of commercial enterprises
Responsible Authority	Credit Institute for Reconstruction (KfW)
Status	ongoing
Issue Date	not found
Start Date	01.07.2015
Ending Date	not found
Duration	not found
Reference:	https://www.kfw.de/inlandsfoerderung/Companies/Energy-and-the-environment/

1.4.1 Main Description

A detailed description of the policy measure and how it relates specifically to EU MOREs topic of electric motors – including references to (if applicable) anchoring national law, EU directives, other schemes

The KfW Energy Efficiency Program for Production Plants and Processes (KfW 292/293) supports commercial enterprises in implementing energy efficiency measures with low-interest loans. Investments in production plants, process technology, cross-sectional technologies, heat recovery and utilization of waste heat, as well as combined heat and power plants, are eligible for funding. All investments must meet certain minimum energy efficiency requirements.[26]

The funding program is available for companies of any size. The program is available for companies and individual entrepreneurs in the commercial sector who are majority privately owned, as well as freelancers. These eligible parties must either be located in Germany or have foreign branches, subsidiaries, establishments, or offices in Germany. In addition, companies that provide services for a third party within the framework of a contracting agreement are also eligible.

All investment measures that achieve energy savings of at least 10% are eligible for funding, including:

- Machinery/equipment/process technology
- Compressed air/vacuum/extraction technology
- Electrical drives/pumps
- Measurement, control, and automation technology
- Information and communication technology
- Etc.

[26] https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-alle-Evaluationen/Evaluation-KfW-Effizienzprogramm-f%C3%BCr-die-F%C3%B6rderjahre-2017-und-2018.pdf

	Characteristics
Budget	○ The maximum funding per project is 25 million EUR ○ Up to 100% of eligible costs can be financed. ○ The credit limit can be exceeded if the project has special eligibility for funding.
Financing of the measure	national fund
Policy focus	physical intervention
Intervention Type	equipment upgrade
Main Barriers Addressed	high initial cost, energy efficiency
Key Driver(s)	EU Energy Efficiency Directive 2012/27/EU (EED)
Replicability	medium
EU Inclusion	No
Related Characteristics	

1.4.2 Impacts

A detailed description of the final (expected) results of the measure implementation and any achievements related to the measure implementation.

The investments funded in 2017 and 2018 have resulted in total greenhouse gas reductions of 543.000 tCO_{2e}, including 151.000 tCO_{2e} from projects supported abroad[27]. The investments funded in 2015 and 2016 have resulted in total greenhouse gas reductions of 475.000 tCO_{2e}, including 62.000 tonnes CO_{2e} from projects supported abroad[28].

	Impacts
Case level impact	high
Policy level impact	medium
Size	no information was found
Energy	For the years 2015, 2016, 2017, 2018 a total of 1.018.000 tCO_{2e} according to evaluation reports
Impact evaluation	

[27] https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-alle-Evaluationen/Evaluation-KfW-Effizienzprogramm-f%C3%BCr-die-F%C3%B6rderjahre-2017-und-2018.pdf

[28] https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-alle-Evaluationen/Evaluation-KfW-Energieeffizienzprogramm-Produktionsanlagen-und-prozesse-F%C3%B6rderjahrg%C3%A4nge-2015-und-2016.pdf

(If available) Description of the method used for calculating the final energy- and/or cost-savings achieved by the measure and specific to that of electric motor replacement. For

not found

1.4.3 Lessons Learnt

Description of the lessons learnt and/or (initial) feedback gathered in response to the measure's implementation specific to electric motors. The main barriers that would hamper and/or the conditions that are necessary for the implementation of the measure.

Key results from the evaluation of the programs for the years of 2015, 2016, 2017 and 2018[29,30] are as following:

- The programme supported 2.103 energy efficiency projects with a lending volume of €6.2 billion in the years 2015, 2016, 2017 and 2018.
- Supported projects resulted in final energy savings of 2.4 TWh in the years 2015, 2016, 2017 and 2018.
- The investments led to energy cost savings of around €219 million in the years 2015, 2016, 2017 and 2018.
- The investments also resulted in an annual reduction of greenhouse gas emissions of 1.018.000 tCO2e.

	Lessons Learnt
Key takeaways	
Recommendations	
Linked measures	
Reference(s)	2019, KfW, Evaluation KfW Energy Efficiency Programme – Production Facilities and Processes for the years 2017 und 2018 Source: https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-alle-Evaluationen/Evaluation-KfW-Effizienzprogramm-f%C3%BCr-die-F%C3%B6rderjahre-2017-und-2018.pdf 2017, KfW, Evaluation KfW Energy Efficiency Programme – Production Facilities and Processes for the years 2015 und 2016 Source:https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-alle-Evaluationen/Evaluation-KfW-Energieeffizienzprogramm-Produktionsanlagen-und-prozesse-F%C3%B6rderjahrg%C3%A4nge-2015-und-2016.pdf
Other	

[29] https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-alle-Evaluationen/Evaluation-KfW-Effizienzprogramm-f%C3%BCr-die-F%C3%B6rderjahre-2017-und-2018.pdf
[30] https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-alle-Evaluationen/Evaluation-KfW-Energieeffizienzprogramm-Produktionsanlagen-und-prozesse-F%C3%B6rderjahrg%C3%A4nge-2015-und-2016.pdf

Thoughts, comments, considerations ...	

1.5 Measure 5: Energy-efficient and climate-friendly production processes

	Overview
Short Description	This program promoted measures to improve energy efficiency and reduce greenhouse gas emissions in industry, which may include the use of efficient electric motors.
Responsible Authority	Federal Ministry of Economics and Energy (BMWi); implementation: Project Management Agency Karlsruhe
Status	Completed.
Issue Date	7 April 2014 (amendment from 12 December 2013)
Start Date	12, 2013
Ending Date	12, 2017
Duration	48 months. Applications could be submitted continuously; evaluation happened four times a year
Reference:	https://www.bmwk.de/Redaktion/DE/Artikel/Industrie/klimaschonende-produktionsprozesse.html; https://www.bmwk.de/Redaktion/DE/Downloads/P-R/richtlinie-foerderung-klimaschonende-produktion.pdf?__blob=publicationFile&v=1

1.5.1 Main Description

A detailed description of the policy measure and how it relates specifically to EU MOREs topic of electric motors – including references to (if applicable) anchoring national law, EU directives, other schemes

The program had the **aim** to support the industry in implementing energy-efficient and climate-friendly production processes. The government wanted to provide incentives to support investments to increase energy efficiency in industrial production processes. "Production processes" within the meaning of these guidelines are industry-specific processes for the direct production of a (material) company product.

The funding program **targeted**:

- Companies in the manufacturing sector with their registered office or branch in Germany (with the exception of energy supply) and
- Contractors who carry out an eligible measure under a contracting agreement at an eligible company.

Funding was **available for investment measures to increase energy efficiency** in commercial and industrial production processes, in particular:

- Production process and production method conversions to energy-efficient technologies,
- Measures for the efficient use of energy from production processes or plants in the company, and
- Other energy optimization of production processes.

The program underlines that measures should correspond to the *"state of the art in environmentally friendly technology"* (available on the market) or *"go beyond this for the specific application, by applying known and already tested and technologies in a new context"*. The program does not state specific measures, such as the replacement of motors.

The **funding volume** is up to 20% of the investment costs directly related to environmental protection. The maximum amount is 1.5 million euros.

The following **funding requirements** must be fulfilled:

- Additional investment costs of at least 50.000 euros;
- Specific final energy savings for the same production output measured against the average consumption of the last three years of the plant/process under consideration of at least 5 percent; and
- At least 100 kg CO_2 savings per year in relation to 100 euros additional investment costs.

In addition, the companies need to have evidence of energy and CO2 savings and the improvement of energy efficiency by an independent energy advisor or by an by energy officer, if company is certified according to DIN EN ISO 50001 or EMAS is certified.

The projects to be funded are selected in a competition held four times a year. Projects may be funded by means of grants in accordance with the present guideline[31], the Law on the Establishment of a Special Fund "Energy and Climate Fund" (EKFG) and the Administrative Regulations on Sections 23, 44 of the Federal Budget Code (BHO) as amended from time to time. Applications can be submitted through a portal[32].

[31] https://www.bmwk.de/Redaktion/DE/Downloads/P-R/richtlinie-foerderung-klimaschonende-produktion.pdf?__blob=publicationFile&v=1

[32] https://foerderportal.bund.de/easyonline/nutzungsbedingungen.jsf;jsessionid=8104B26D27E3A9AD57AB1C6D652005E5?redirectFrom=/easyonline/easyOnline.jsf

	Characteristics
Budget	Overall budget not defined; maximum 1.5 million euros per beneficiary
Financing of the measure	Special fund: "Energy and Climate Fund"
Policy focus	Increase of energy efficiency in production processes
Intervention Type	Project funding
Main Barriers Addressed	Market failure because positive externalities of energy-efficient production processes with regard to climate protection are not taken into account by the individual actors in their investment decisions
Key Driver(s)	Energy reduction as key pillar of the energy concept of the government; enable international competitiveness and innovativeness; measures to reduce energy use and costs
Replicability	High (replicability to other companies and branches was a selection criteria)
EU Inclusion	No; reference is only made to the national energy strategy
Related Characteristics	Selection criteria for the funding were specific final energy savings per year, CO2 reduction through the measurements, the improvement of energy efficiency and the innovation and replication potential, existence of an energy management system.

1.5.2 Impacts

A detailed description of the final (expected) results of the measure implementation and any achievements related to the measure implementation. Where possible specific to electric motors

The duration of the project was four years in which period about 87 projects have been funded. Online and also the Project Management Agency Karlsruhe could not provide any information on the overall impact of the funding programme. Given that funded project had to achieve at least 100 kg CO_2 savings per year, it can be assumed that the investments led to reduction of 8.700 kg of CO_2 per year.

	Impacts
Case level impact	Medium
Policy level impact	n/a
Size	n/a

Energy	Given that funded project had to achieve at least 100 kg CO_2 savings per year, it can be assumed that the investments led to reduction of 8.700 kg of CO_2 per year.
Impact evaluation	87 projects have been implemented that improved the energy efficiency of production processes

(If available) Description of the method used for calculating the final energy- and/or cost-savings achieved by the measure and specific to that of electric motor replacement. For

not found

1.5.3 Lessons Learnt

Description of the lessons learnt and/or (initial) feedback gathered in response to the measure's implementation specific to electric motors. The main barriers that would hamper and/or the conditions that are necessary for the implementation of the measure.

The missing evaluation of the program makes it hard to assess the final impact. The extension of the funding period suggests that there was an interest from the side of the industry to apply for the program.

	Lessons Learnt
Key takeaways	Funding programme could initiative the realisation of project that increased the energy efficiency in production processes.
Recommendations	Impact evaluation of such programmes is crucial to assess the effectiveness of such programs. The responsible implementation authority should be responsible for the data collection and assessment.
Linked measures	n/a
Reference(s)	n/a
Other	
Thoughts, comments, considerations ...	n/a

1.6 Measure 6: STEP up! - Utilizing electricity efficiency potentials

	Overview
Short Description	This program supported projects to increase electricity efficiency in all sectors, which may include the use of efficient electric motors.
Responsible Authority	Federal Ministry of Economics and Energy (BMWi)
Status	Completed.
Issue Date	25 May 2016
Start Date	May, 2016
Ending Date	2019 (pilot phase 2016-2019)
Duration	24 months. There were two funding periods per year.
Reference:	https://www.bundesanzeiger.de/pub/publication/jklwwm2Mkb13bVQye13/content/jklwwm2Mkb13bVQye13/BAnz%20AT%2031.05.2016%20B2.pdf?inline https://www.bmwk.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/pilotprogramm-stromeinsparungen-im-rahmen-wettbewerblicher-ausschreibungen-stromeffizienzpotentiale-nutzen-step-up.pdf?__blob=publicationFile&v=8

1.6.1 Main Description

A detailed description of the policy measure and how it relates specifically to EU MOREs topic of electric motors – including references to (if applicable) anchoring national law, EU directives, other schemes

The pilot program "Electricity savings in the context of competitive tenders: Exploiting Electricity Efficiency Potentials" (STEP up!) was running two years. The aim was to introduce a competitive model as a new way of promoting energy efficiency in a way that is open to all sectors, technologies and actors in the field of energy efficiency.

The evaluation report refers to the energy end-use efficiency and energy services, as well the energy efficiency directives as drivers that brought the topic on the agenda in Europe and Germany. The further development of these "competitive tenders" took shape in the course of the development of the National Action Plan for Energy Efficiency (NAPE) in 2014.

Eligible applicants were:

- Commercial enterprises, including economically active municipal enterprises, with a permanent establishment or branch in Germany,
- Contractors who carry out eligible measures under a contracting agreement at eligible companies.

The program **funded investment measures to save electricity** at the site of Germany:

- Renewal investments and early replacement investments

- Replacement and substitution of existing technology with high-efficiency technology
- Replacement of inefficient electricity-consuming components, systemic optimizations, implementation of new developments

- Additional investments:
  - Supplementation of existing systems by new acquisition
  - additional high-efficiency technologies

Eligible were additional investment costs, costs that led to an improvement of efficiency, and investments side costs, such as for planning or installation.

The tender rounds included each open and closed tenders – open rounds were for sector- and technology open projects and closed ones for specific sectors, target groups, technologies or themes. Single projects but also collections of projects could be funded in so called open tenders.

Funding volume was between 20,000-250,000 euros for small projects and between 250,000-1,500,000 euros for large projects. The funding intensity was up to 30% of the eligible costs.

Funding criteria were that:

- The payback period of each (partial) measure must be more than three years in relation to the electricity costs saved without subsidies.
- The funding amount applied for in the competition must not exceed the funding quota of a maximum of 30% for the additional investment costs of the measures is not exceeded.
- The cost-benefit threshold must not exceed €0.10/kWh.

Project with the greatest savings effect per requested funding euro were funded.

	Characteristics
Budget	300 million euro; maximum funding of 1.5 million euro / project
Financing of the measure	n/a
Policy focus	Energy saving, energy efficiency
Intervention Type	Pilot funding program
Main Barriers Addressed	n/a
Key Driver(s)	The evaluation report stated the reduction of energy costs and the regular proof of the implementation of energy efficiency measure were main drivers for the project implementation.
Replicability	Medium. Can be replicated. Focus of the closed tenders could be targeted to electric motors.
EU Inclusion	EU framework mentioned in the evaluation report, but no direct link.

Related Characteristics	n/a

1.6.2 Impacts

A detailed description of the final (expected) results of the measure implementation and any achievements related to the measure implementation. Where possible specific to electric motors

Overall, 89 project have been funded.

The cost-benefit ratio of the subsidized projects ranges from 0.5 to 10.0 ct/kWh and, at an average of 4.8 ct/kWh, is well below the maximum permissible value of 10 ct/kWh.

The **electricity consumption could be declined by 1.142.097 MWh.** In total, around 113 GWh of electricity per year and around 1.1 TWh of electricity over the service life will be saved.

The electricity savings and the CO_2 intensity of the saved electricity result in total savings of **58 kt per year, or over 586 kt CO_2 eq** over the useful lives of the projects.

In total, the subsidized electricity efficiency measures lead to a reduction in electricity costs of just under 13 million euros per year.

The evaluation report[33] of the program states that the quantitative savings and climate protection targets of STEP up! were missed. As main reasons were given the low demand and therefore the low number of funding cases. The economic policy objectives, such as reducing energy costs or dismantling obstacles to efficiency measures among grant recipients, were achieved.

	Impacts
Case level impact	Low
Policy level impact	Low
Size	Low; as it could be identified: 2 out of 89 projects, but indirect measures might have been missed.
Energy	1.142.097 MWh, 58.144 tCO_2
Impact evaluation	Savings are far behind the expectation; e.g. estimated were 400.000 t CO2 eq to over 800.000 t CO2 eq in comparison to 58.144 t CO2.

[33] Ifeu and Prognos, 2019. Ex post-Analyse des Pilotprogramms STEP up! https://www.bmwk.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/pilotprogramm-stromeinsparungen-im-rahmen-wettbewerblicher-ausschreibungen-stromeffizienzpotentiale-nutzen-step-up.pdf?__blob=publicationFile&v=8

(If available) Description of the method used for calculating the final energy- and/or cost-savings achieved by the measure and specific to that of electric motor replacement. For

The saving were calculated based on data from the funding data bank and calculation by Ifeu and Prognos, who did the funding evaluation.

1.6.3 Lessons Learnt

Description of the lessons learnt and/or (initial) feedback gathered in response to the measure's implementation specific to electric motors. Also include (if applicable) the main barriers that would hamper and/or the conditions that are necessary for the implementation of the measure.

In contrast to previous funding measures, this program has a competitive element to stimulate a high level of dynamism. Most projects had been submitted as individual projects in open tender rounds. The applications sharply increased in 2018-2019, in comparison to lower number of applicants in 2016-2017[34]. Thus, it seems that the program had to be first known and that there was a wider interest of applicants from different sectors. Almost half of the funded companies were SMEs. Overall, 89 project have been funded with a funding volume of 28.8 million euros, among which were also two drives, or motor projects. Closed tenders specifically for electric motors could potentially increase the number of applications; though this funding program saw a higher attendance in the open tender rounds. From the interviews and case studies in the evaluation phase[18], it became clear that especially the effort of the application in connection with the competitive procedure (and thus an uncertainty of results for the applicant) in relation to the achievable funding amount (funding rate) is a particular challenge for the interested applicants. Adaptation to the pilot program could not be implemented in that regard, but changes were already made to the guidelines during the pilot phase: The main changes were the reduction of the minimum project size and the extension of the guidelines to include electricity and heat projects. Further challenges were: the timeline of the program implementation, required support services for the applicants and activities to raise awareness of the program; the fix funding rounds; three month tender period and the complex funding structure with open and closed tenders. Furthermore, small companies saw the competitive character as barrier.

[34] Ifeu and Prognos, 2019. Ex post-Analyse des Pilotprogramms STEP up! https://www.bmwk.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/pilotprogramm-stromeinsparungen-im-rahmen-wettbewerblicher-ausschreibungen-stromeffizienzpotentiale-nutzen-step-up.pdf?__blob=publicationFile&v=8

	Lessons Learnt
Key takeaways	Open tenders were more prominent. Applicant number was still low. Barriers must be overcome to make programs more attractive and application easier. The expected impacts in terms of emission reductions and energy savings could not be met.
Recommendations	Design funding programs flexible to address barriers of applicants from one funding round to the next.
Linked measures	Evaluation report: https://www.bmwk.de/Redaktion/DE/Evaluationen/Foerdermassnahmen/pilotprogramm-stromeinsparungen-im-rahmen-wettbewerblicher-ausschreibungen-stromeffizienzpotentiale-nutzen-step-up.pdf?__blob=publicationFile&v=8
Reference(s)	It is important to understand the motivations for the attendance to a funding program. Energy efficiency is not a main investment criterion for most companies. Barriers for energy efficiency must be known and tackled in the program.
Other	
Thoughts, comments, considerations ...	

1.7 Measure 7: PIUS Advice and Invest

	Overview
Short Description	PIUS-Invest is a funding program for SMEs in the German federal state of Hesse that funds efficient production processes and digitization.
Responsible Authority	LEA Hessen, federal energy agency
Status	Ongoing
Issue Date	2017
Start Date	2017
Ending Date	Not defined.
Duration	n/a
Reference:	https://www.energieeffizienz-hessen.de/investitionsfoerderung/pius-invest.html https://www.energieeffizienz-hessen.de/fileadmin/user_upload/news-import/PIUS-Invest_Dokumentation-Ansicht.pdf

1.7.1 Main Description

A detailed description of the policy measure and how it relates specifically to EU MOREs topic of electric motors – including references to (if applicable) anchoring national law, EU directives, other schemes

PIUS is a funding program for SMEs in the federal state of Hesse, Germany. The four letters stand for Production Integrated Environmental Protection. This means that entrepreneur can optimize their production processes with state support in such a way that the environment also benefits.

Fundable are projects that **target at least one of the aims**:

- Improving energy and resource efficiency in production and the building envelope
- Networking and digitization of processes to optimize resource use and avoid waste
- Production, distribution, use and storage of renewable energies
- Adaptation to climate change
- Saving raw materials and recyclables and establishing recyclable material cycles through the use of innovative manufacturing technologies

The PIUS program is **aimed at SMEs** in manufacturing, services and trade. The definition of SME is:

- Maximum 250 employees. Here, the full-time equivalent applies for part-time employees. If you employ 300 employees, but 150 of them are part-time employees with 50 percent positions, the total counts as 225 full-time positions.
- Maximum 50 million euros annual turnover

- Maximum 43 million euros annual balance sheet.

Fundable are:

- a maximum of 40 percent of the eligible costs, or a
- a maximum of 500,000 euros per project.

A 100% financing is possible with the innovation credit by the WIBank.

The principle applies that companies receive one euro of project funding per kilogram of CO_2 saved. Several project applications are possible per company.

The program follows three steps:

Step 1: Free "impulse consulting" on energy efficiency in the company.

Step 2: Subsidized Hesse "PIUS consulting". Small and medium-sized companies from the production, trade and service sectors benefit from subsidized, resource-efficient consulting that helps them reduce their consumption of energy, water, air, raw materials, consumables and supplies, and cut emissions of pollutants.

Step 3: The "PIUS-Invest" grant.

	Characteristics
Budget	Up to 500,00 euros per project; 13.000.000€ funding volume from 2017-2020.
Financing of the measure	Funds of the State of Hesse, the European Fund for Regional Development (EFRE) and the European Investment Fund (EIF)
Policy focus	Efficient production processes and digitalization
Intervention Type	PIUS Advice and PIUS Invest
Main Barriers Addressed	Application process could be easier; better visibility for the funding system; schematic process for the application process[35]
Key Driver(s)	Strengthens competitiveness, Consultants provide valuable support; Reduces costs, saves resources, energy and CO_2; Responds to customers' sustainability requirements[36]
Replicability	Medium
EU Inclusion	Partial funding by EU
Related Characteristics	n/a

[35] Expressed wishes for improvement. Source: https://www.energieeffizienz-hessen.de/fileadmin/user_upload/news-import/PIUS-Invest_Dokumentation-Ansicht.pdf

[36] Expressed success criteria. Source: https://www.energieeffizienz-hessen.de/fileadmin/user_upload/news-import/PIUS-Invest_Dokumentation-Ansicht.pdf

1.7.2 Impacts

A detailed description of the final (expected) results of the measure implementation and any achievements related to the measure implementation. Where possible specific to electric motors

CO2 saving are calculated foreach company by an advisor in the PIUS Advice step.

	Impacts
Case level impact	Medium
Policy level impact	n/a
Size	n/a
Energy	14,000 t CO_2 saving annually in supported SMEs (status 2020)[37]
Impact evaluation	n/a

(If available) Description of the method used for calculating the final energy- and/or cost-savings achieved by the measure and specific to that of electric motor replacement. For

n/a

[37] https://www.energieeffizienz-hessen.de/fileadmin/user_upload/news-import/PIUS-Invest_Dokumentation-Ansicht.pdf

1.7.3 Lessons Learnt

Description of the lessons learnt and/or (initial) feedback gathered in response to the measure's implementation specific to electric motors. The main barriers that would hamper and/or the conditions that are necessary for the implementation of the measure.

Unique integration of advice (PIUS Advice), investment (PIUS Invest) and innovation credit that enable a financing of up to 100%. In 2020, 34 SMEs have profited from PIUS

	Lessons Learnt
Key takeaways	Combination of advice and investment provides a valuable support to SMEs
Recommendations	Advice can overcome challenges in the application process.
Linked measures	n/a
Reference(s)	https://www.energieeffizienz-hessen.de/fileadmin/user_upload/news-import/PIUS-Invest_Dokumentation-Ansicht.pdf
Other	n/a
Thoughts, comments, considerations ...	Successful cases: https://www.energieeffizienz-hessen.de/fileadmin/user_upload/news-import/PIUS-Invest_Dokumentation-Ansicht.pdf (none addresses electric motors)

Table 1: National Policy Measure Overview - Germany

#	Measure Title	Short Description	Type of Measure	Start Year	End Year	Duration	Target Groups	Source link / Reference	Case Level Impact of the measure
1	Federal Funding for Energy and Resource Efficiency in the Economy – Module 1	Supports investment measures that lead to a reduction in energy and/or resource demand and carbon dioxide emissions	Equipment upgrade	2019	2023	4 years	private companies, municipal companies, self-employed individuals and contractors.	Link	High
2	Federal Funding for Energy and Resource Efficiency in the Economy – Module 4	Supports investment measures for energy-efficient optimization of systems and processes in industrial and commercial companies	Equipment upgrade	2019	2023	4 years	small and medium-sized enterprises (SMEs) and large companies, including private and municipal entities, freelance professionals, and contractors	Link	High
3	Federal Funding for Energy and Resource Efficiency in the Economy – Funding competition	The funding competition is explicitly technology-, actor-, and sector-neutral. This means that regardless of the technology, actor, or sector, all efficiency measures that contribute to the energy-related optimization of facilities and processes can be supported	Equipment upgrade	2019	2023	4 years	small and medium-sized enterprises (SMEs) and large companies, including private and municipal entities, freelance professionals, and contractors	Link	Medium
4	KfW Energy Efficiency Programme -	Provides low-interest loans to support energy efficiency	Equipment upgrade	2015	-	-	Available for companies of any size.	Link	High

	Production Plants/Processes	measures in the area of production facilities/processes of commercial enterprises							
5	Energy-efficient and climate-friendly production processes	This program promoted measures to improve energy efficiency and reduce greenhouse gas emissions in industry, which may include the use of efficient electric motors.	Project funding	2013	2017	4 years	Companies in the manufacturing sector, Contractors	Link	Medium
6	STEP up! - Utilizing electricity efficiency potentials	This program supported projects to increase electricity efficiency in all sectors, which may include the use of efficient electric motors.		2016	2019	2 years overall	Commercial enterprises, Contractors	Link	Low
7	PIUS Advice and Invest	PIUS-Invest is a funding program for SMEs in the German federal state of Hesse that funds efficient production processes and digitization.	PIUS Advice and PIUS Invest	2017	n/a		SMEs	Link	Medium