

# LEAP4SME

## ENERGY AUDIT POLICIES TO DRIVE ENERGY EFFICIENCY

### 2<sup>nd</sup> Peer learning workshop

Lefteris Giakoumelos, CRES

THE PROJECT LEAP4SME, PRELIMINARY RESULTS

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This project has received funding from the EU  
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# LEAP4SME

## *Energy Audit policies to drive Energy Efficiency*

### Consortium

The National Energy Agencies of Austria, Croatia, Greece, Italy, Malta, Poland, Portugal, Slovakia, United Kingdom and the Communication partner Revolve



### Main goals

- **Mapping and understanding** the complex context of national and local support to SMEs
- **Contributing**, through LEAP4SME research, analysis, and stakeholders involvement, to help the Institutions finding solutions to fill the gap of data
- **Knowledge sharing** (successes, barriers and failures) on national policies



- **Proposing effective and realistic solutions** to policy makers and policy implementers in terms of policy schemes, cross-cutting policy solutions embracing both **energy and non-energy benefits**, policy recommendations



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## Energy Audit

The Energy Efficiency Directive (EED) defines an energy audit as, “**a systematic procedure with the purpose of obtaining adequate knowledge of the existing energy consumption profile of a building or group of buildings, an industrial or commercial operation or installation or a private or public service, identifying and quantifying cost-effective energy savings opportunities, and reporting the findings;**”

Audits should:

- a) be based on up to date, measured, traceable operational data on energy consumption and (for electricity) load profiles;
- b) comprise a detailed review of the energy consumption profile of buildings or groups of buildings, industrial operations or installations, including transportation;
- c) build, whenever possible, on life-cycle cost analysis (LCCA) instead of Simple Payback Periods (SPP) in order to take account of long-term savings, residual values of long-term investments and discount rates;
- d) be proportionate, and sufficiently representative to permit the drawing of a reliable picture of overall energy performance and the reliable identification of the most significant opportunities for improvement. Energy audits shall allow detailed and validated calculations for the proposed measures so as to provide clear information on potential savings.

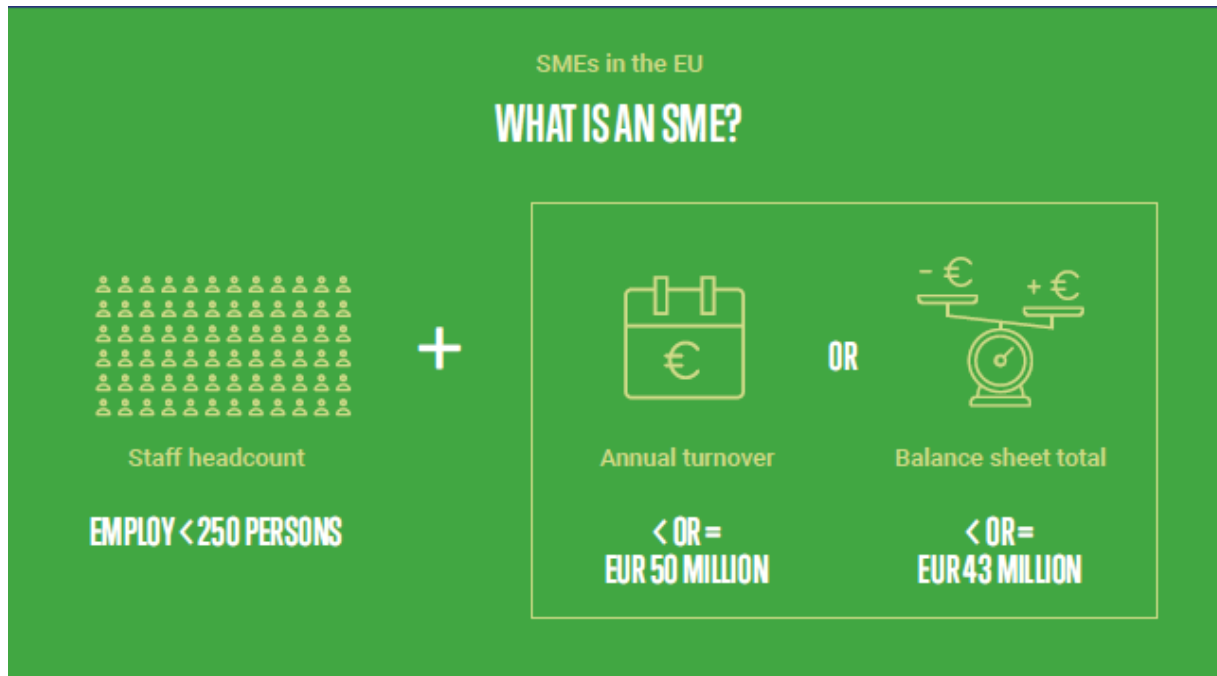
The data used in energy audits shall be storable for historical analysis and tracking performance.

Source: D2.3



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# State of the art – SMEs Mapping



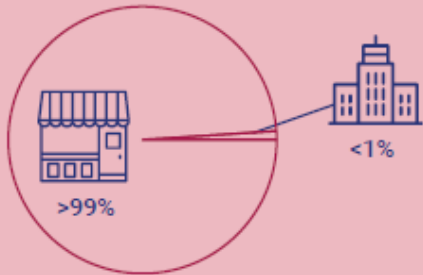
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## State of the art – SMEs Mapping

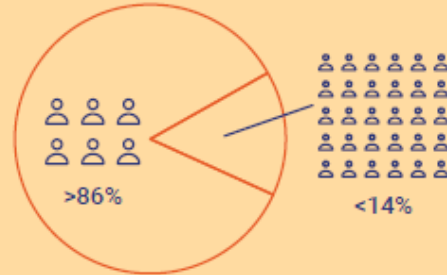
SMEs in LEAP4SME Partner Countries

**SMEs MAKE UP OVER 99%  
OF ALL ENTERPRISES.**



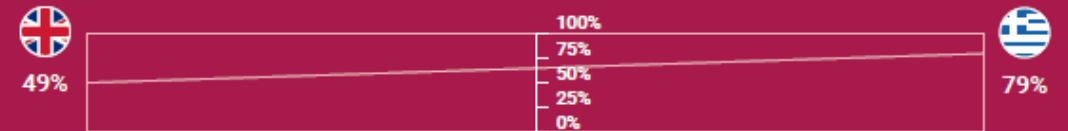
SMEs in LEAP4SME Partner Countries

**MICRO ENTERPRISES ACCOUNT FOR  
OVER 86% OF ALL BUSINESSES.**



SMEs in LEAP4SME Partner Countries

**THE ECONOMIC VALUE ADDED BY SMEs VARIES BETWEEN  
49% IN THE UK AND 79% IN GREECE.**



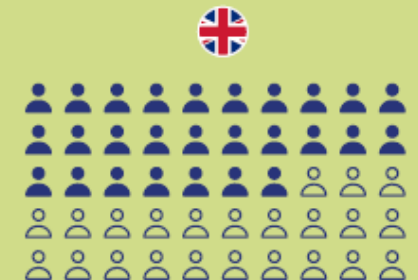
SMEs in LEAP4SME Partner Countries

**83% - GREECE HAS THE HIGHEST SHARE  
OF PERSONS EMPLOYED BY SMEs.**



SMEs in LEAP4SME Partner Countries

**54% - UK HAS THE LOWEST SHARE  
OF PERSONS EMPLOYED BY SMEs.**



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## State of the art – SMEs Mapping

SMEs in LEAP4SME Partner Countries

### SECTOR INSIGHTS



Wholesale and retail trade

**MOST ENTERPRISES, EMPLOYEES  
AND VALUE ADDED.**



Manufacturing

**SECOND IN EMPLOYEES  
AND VALUE ADDED.**

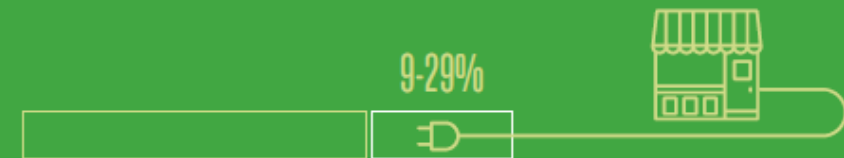


Professional, scientific and  
technical activities

**SECOND IN NUMBER OF  
ENTERPRISES.**

LEAP4SME Key Findings

### SHARE OF SME ENERGY CONSUMPTION ON GROSS INLAND CONSUMPTION



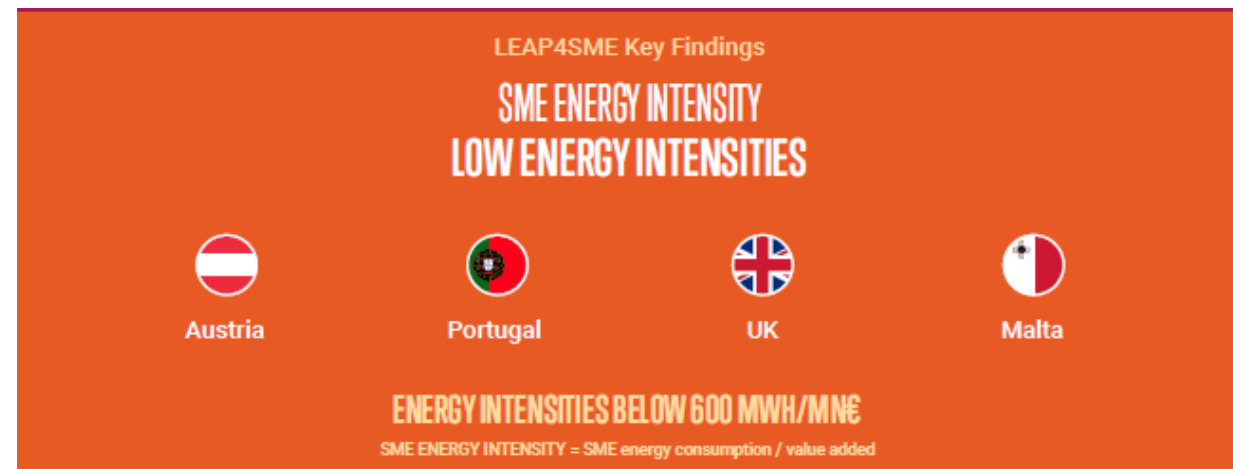
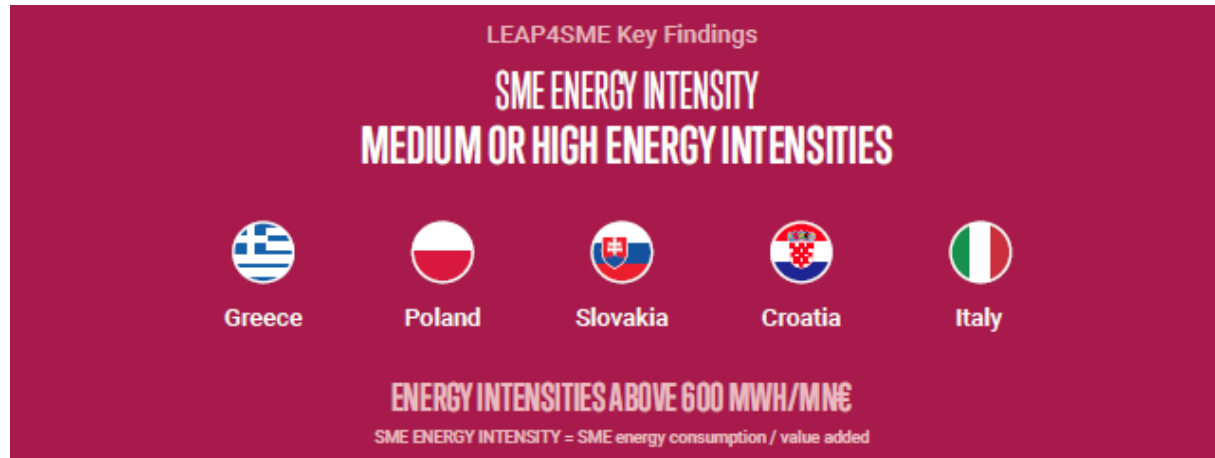
The estimated share of SME energy consumption on gross inland consumption (GIC) ranges from 9% to 29%.



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## State of the art – SMEs Mapping



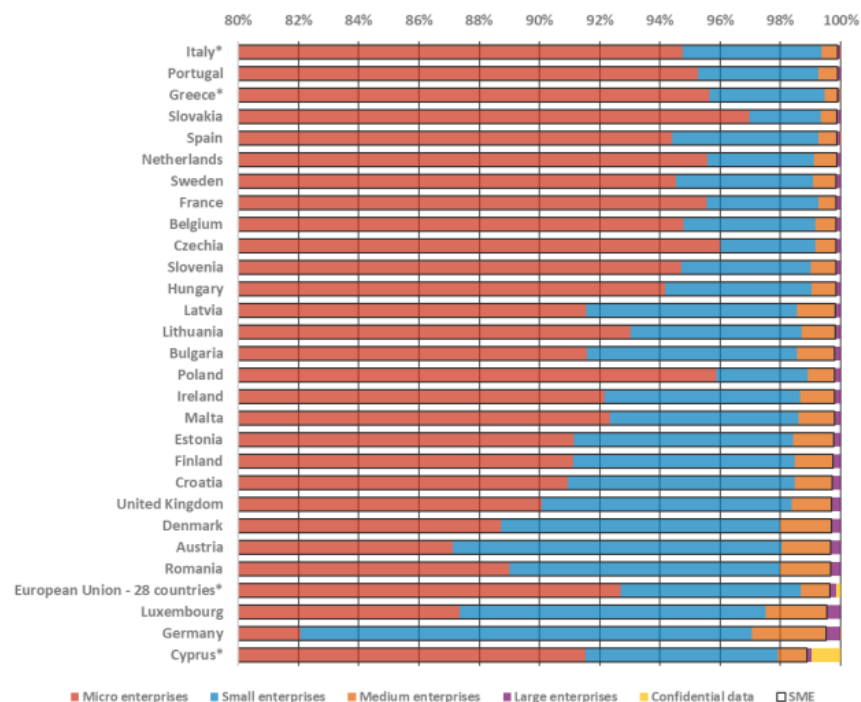
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# Data availability on the SME sector at national and European levels

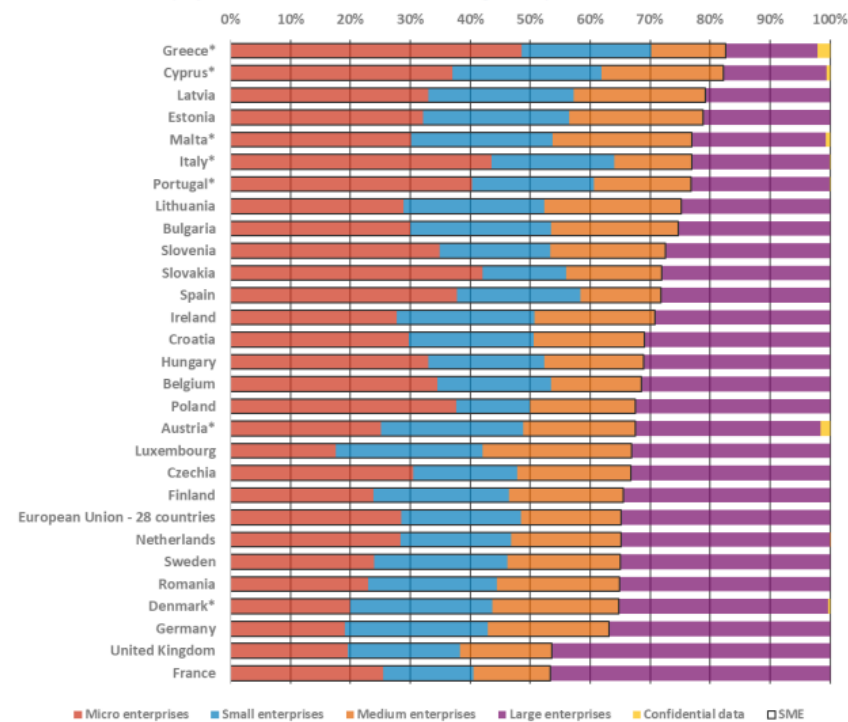


- Good availability of economic-related data, number of enterprises & employees + interesting results from EC/SAFE and EIB surveys
- Lack of **energy-related data** on SMEs: **insufficient data situation** for properly planning energy efficiency policies
- Need for KPIs to implement policies and support the policy process development

Share of micro, small, medium and large enterprises related to the total number of enterprises in EU member states



Share of employees in micro, small, medium and large enterprises in EU member states



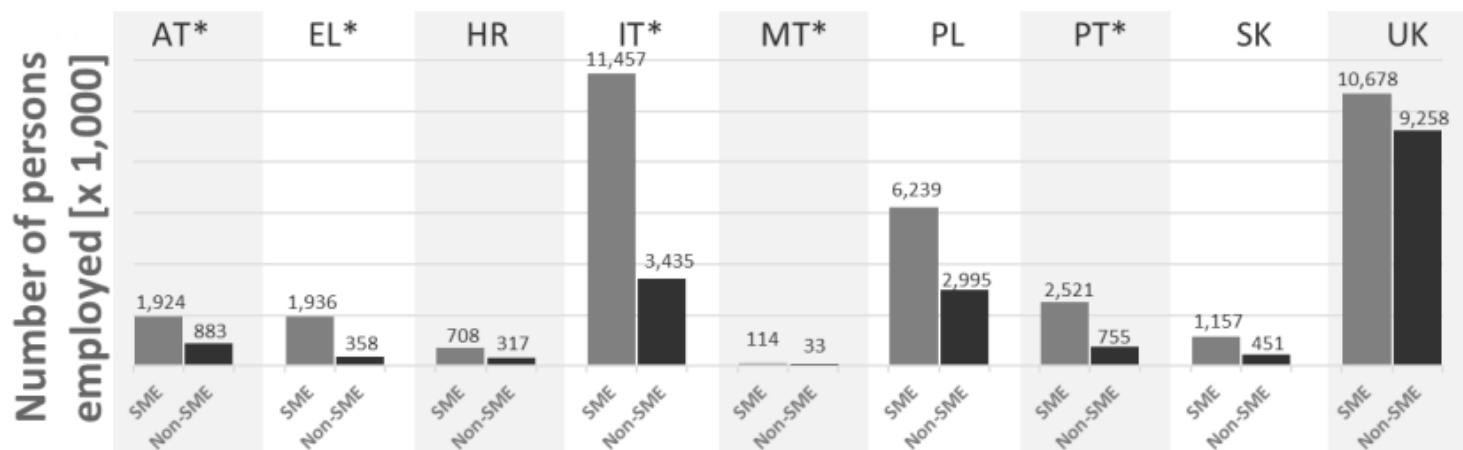
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Source: LEAP4SME elaborations on data from Eurostat, European Commission, SAFE reference year 2017

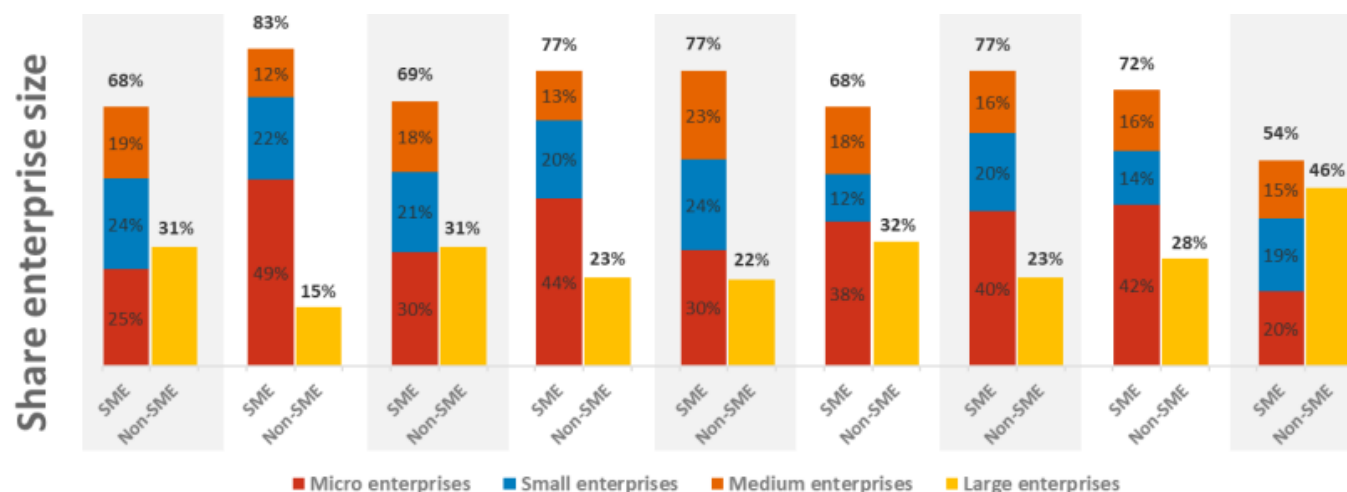
# Data availability on the SME sector at national and European levels



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Source: LEAP4SME elaborations on data from Eurostat, European Commission, SAFE reference year 2017



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# Methodologies for estimating the energy consumption of SMEs in nine European Countries



- Good availability of economic-related data, number of enterprises & employees + interesting results from EC/SAFE and EIB surveys
  - Lack of **energy-related data** on SMEs: **insufficient data situation** for properly planning energy efficiency policies
  - Need for KPIs to implement policies and support the policy process development
- 
- Sources analysed: IEA, Eurostat, EIB, OECD, EC studies (also third parties for EC) and initiatives, 63 EU funded projects on energy efficiency/SMEs/enterprises, peer reviewed publications and main conferences on EE in Europe
  - Participant Agencies consultation: **9 out of 9 Agencies stated no published energy-related data on SMEs** is publicly available on national level
  - Two different approaches established + individual approaches by some project partners



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# The SME sector energy consumption: methodologies



## Approach 1 (Bottom-up)

- Step 1: Definition of threshold consumption for non-household customers that are classified as SMEs
- Step 2: Summing up of annual consumption volumes within the threshold
- Step 3: Calculation of the share of other energy sources and extrapolation for total energy consumption
- Step 4: Consideration of additional data to improve the estimation

Table 7 Non-household natural gas consumption bands

Consumption band	Annual natural gas consumption [GJ]		Annual natural gas consumption [GWh]	
	Minimum	Maximum	Minimum	Maximum
Band I1		< 1,000		< 0.28
Band I2	≥ 1,000	< 10,000	≥ 0.28	< 2.8
Band I3	≥ 10,000	< 100,000	≥ 2.8	< 28
Band I4	≥ 100,000	< 1,000,000	≥ 28	< 280
Band I5	≥ 1,000,000	< 4,000,000	≥ 280	< 1,111
Band I6	≥ 4,000,000		≥ 1,111	

Source: Regulation (EU) 2016/1952

Table 8 Non-household electricity consumption bands

Consumption band	Annual electricity consumption [MWh]	
	Minimum	Maximum
Band IA		< 20
Band IB	≥ 20	< 500
Band IC	≥ 500	< 2,000
Band ID	≥ 20,000	< 70,000
Band IE	≥ 70,000	< 150,000
Band IF	≥ 150,000	

Source: Regulation (EU) 2016/1952



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# The SME sector energy consumption: methodologies



## Approach 2 (Top-down)

- Basis: Annual energy consumption data of large enterprises from mandatory energy audits, energy balances
- Step 1: Accumulation of the annual energy consumption of large enterprises
- Step 2: Collection of relevant data from the energy balance
- Step 3: Complement of energy balance data with data from physical energy flow accounts (PEFA) and estimation of SME consumption
- Approach SME definition-oriented

Table 11 Approach estimation of energy consumption of SMEs

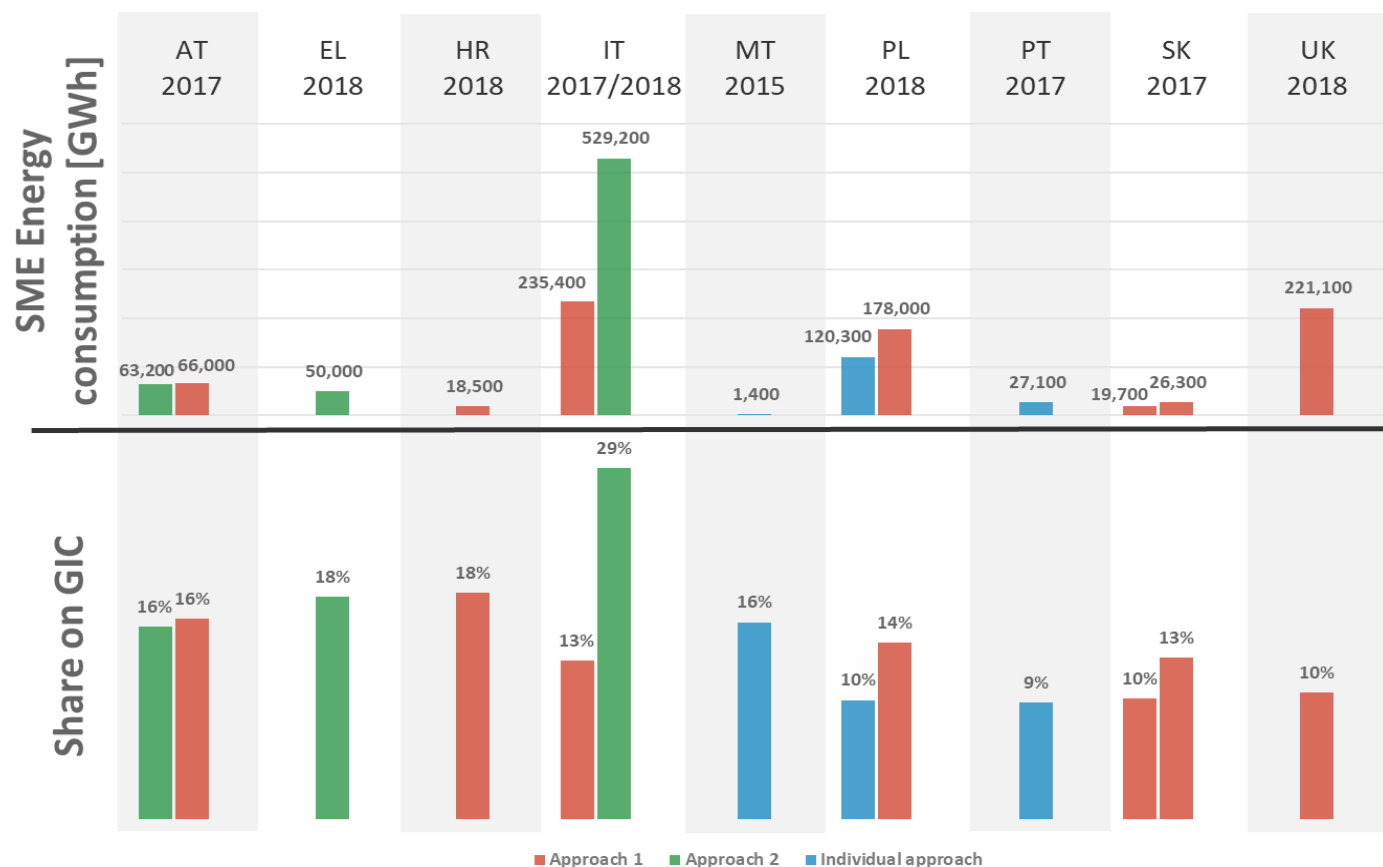
Energy indicator (GWh)	Calculation	Eurostat code	Data source
Gross inland consumption	+	GIC	Eurostat – Energy balance on country level
Annual energy consumption of audited large enterprises	-	Not applicable	National data from energy efficiency monitoring body/authority
Final non-energy consumption	-	FC_NE	Eurostat – Energy balance on country level
International aviation*	-	INTAVI	Eurostat – Energy balance on country level
Distribution losses*	-	DL	Eurostat – Energy balance on country level
Energy consumption of households and transport	-	HH Natural energy input, energy products and energy residual (N00, P00, R00)	Eurostat – Physical energy flow accounts, PEFA
Public sector*: 1. Public administration and defence; compulsory social security (O) 2. "Education (P)" "Human health and social work activities (Q)"	-	O, P & Q Natural energy input, energy products and energy residual (N00, P00, R00)	Eurostat – Physical energy flow accounts, PEFA
<b>Estimated energy consumption of all SMEs per country</b>	<b>=</b>		

\*...only if it is not already included in the annual energy consumption of audited large enterprises



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# Methodologies for estimating the energy consumption of SMEs in nine European Countries



- Share on gross inland consumption (GIC): 9 -18%
- Different scenarios calculated for Italy resulting in greater range
- Hypothesis, methodologies and assumptions explained in the report

<https://leap4sme.eu/wp-content/uploads/2021/04/LEAP4SME-D2.1-SME-MAPPING.pdf>



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Source: LEAP4SME report "Mapping SMEs in Europe: Data collection, analysis and methodologies for estimating energy consumptions at Country levels". Author: AEA



## Next steps

- The methodologies for the calculation and estimation of the energy consumption for SMEs will be further developed in terms of collecting more data and refining the existing data.
- Further investigations, especially on the role of energy-intensive SMEs, will be done by involving a broader scope of relevant stakeholders.
- Stakeholders engagement (Observatories, collection of contributions)



Source: LEAP4SME



Collection of proposals,  
contributions and ideas

LEAP4SME International  
Observatories & National  
Observatories



<https://leap4sme.eu/>



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# Data availability on the SME sector at national and European levels



- Good availability of economic-related data, number of enterprises & employees + interesting results from EC/SAFE and EIB surveys
- Lack of energy-related data on SMEs: insufficient data situation for properly planning energy efficiency policies
- Need for KPIs to implement policies and support the policy process development

GENERAL SECTOR KPIS		
REFERRED TO ALL ENTERPRISES, BOTH LARGE AND SMES PER SECTOR (INDUSTRY, TRANSPORTS, TERTIARY ETC.) - 1/2 DIGITS NACE CODE		
KPI Group	Availability	Relevance
GENERAL		Highly important
ENERGY CONSUMPTION		Highly important
CO <sub>2</sub> EMISSIONS		Moderately important
ENERGY INTENSITY		Moderately important
COST OF ENERGY		Highly important
POTENTIAL SECTOR		Highly important

GENERAL SME SECTOR KPIS		
REFERRED ONLY TO SME		
KPI Group	Availability	Relevance
GENERAL		Highly important
ENERGY CONSUMPTION		Highly important
CO <sub>2</sub> EMISSIONS		Moderately important
ENERGY INTENSITY		Moderately important
COST OF ENERGY		Highly important
POTENTIAL SECTOR		Highly important

Source: LEAP4SME analysis on data from the partner National Agencies (WP3, lead: KAPE)



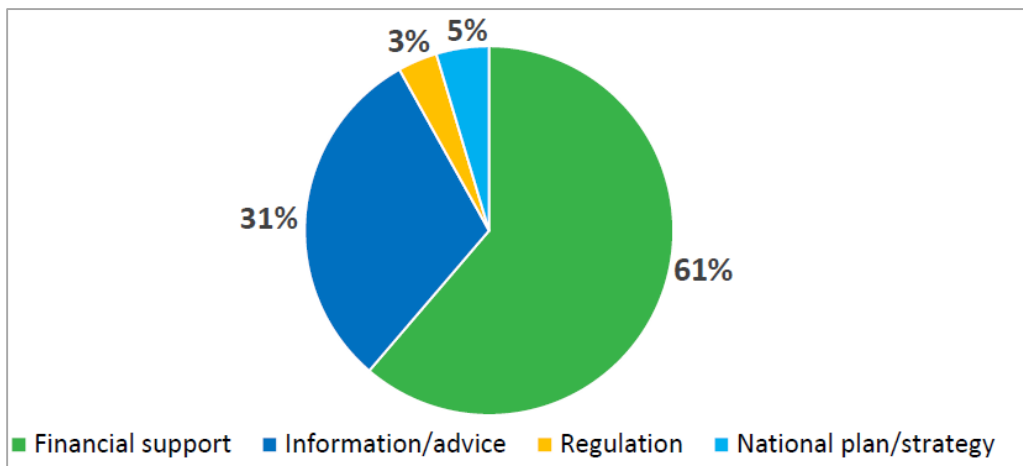
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# Energy Efficiency Policies in SMEs and barriers

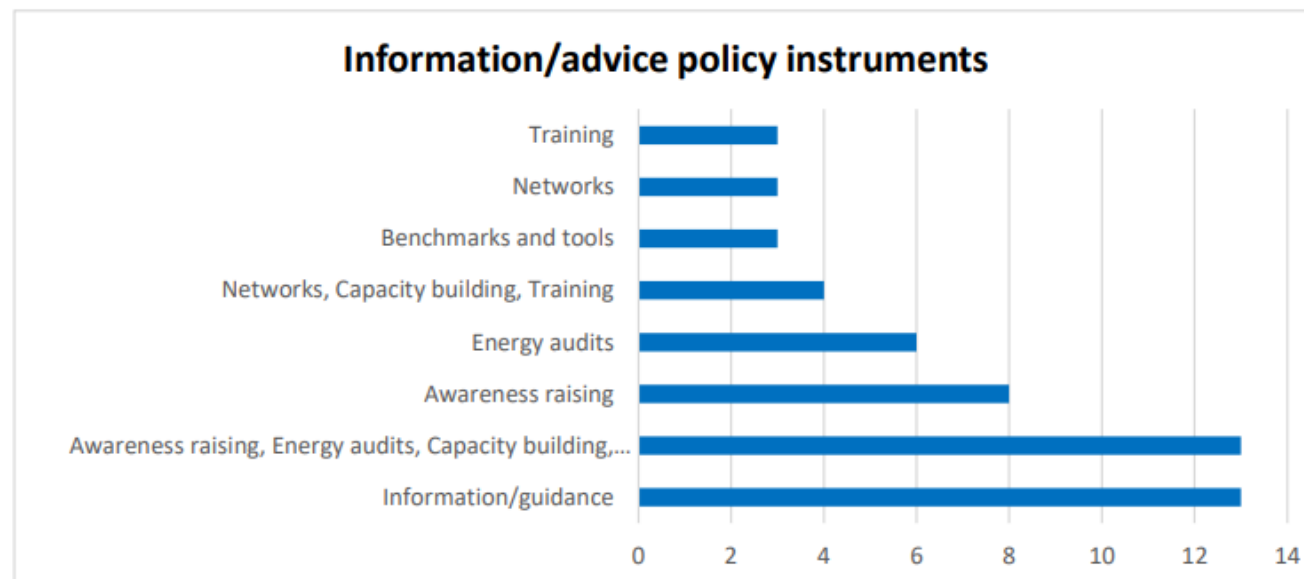


173 Policies, programmes/projects analysed covering the nine targeted Countries



Source: LEAP4SME, reports "Existing support measures for energy audits and energy efficiency in SMEs" and "Energy audits market overview and main barriers to SMEs".  
Author: Energy Saving Trust

In total 53 Information/advice policy instruments were identified. A common type seen throughout the data collected was information/guidance (13), referring to policies or support mechanisms which develop and disseminate information relevant to SMEs (and in some instances large enterprises, public sector and/or households) related to energy audits or energy efficiency.



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# Energy Efficiency Policies in SMEs and barriers



## Outcomes and preliminary recommendations:

- Further evaluate a combined approach with a mix of different instruments
  - Assess the effectiveness of focused obligations for SMEs to conduct energy audits
  - Simplification of application processes, as well as support for SMEs during the application phase
  - Sector specific policy instruments & assessment of tailor made approaches at the intersection of firms size and specific aspects of energy/climate investment
- 
- Awareness raising and communication of existing policy instruments for SMEs
  - Create linkages between audits and wider support programmes
  - Strong standards for auditors and their outputs



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Source: LEAP4SME, reports “Existing support measures for energy audits and energy efficiency in SMEs” and “Energy audits market overview and main barriers to SMEs”. Author: Energy Saving Trust



# Energy Efficiency Policies in SMEs and barriers



Barriers	Size of SME		
	Micro	Small	Medium
Access to finance	Challenging – providing guarantee for accessing credit e.g., microloans	Moderately challenging	Not challenging – more likely to have financial reserves. Internal departments that manage business finances
Energy consumption data	Moderately challenging – usually simple energy consumption data / locally accessed	Moderately challenging – may not receive metered consumption	Challenging – more complex organisational consumption
Lack of resource (finance, time, expertise)	Challenging	Challenging	Moderately challenging
Energy efficiency opportunities	Challenging	Challenging	Moderately challenging

Hypothesis, figures and text in sections 4.4/5 of D2.3

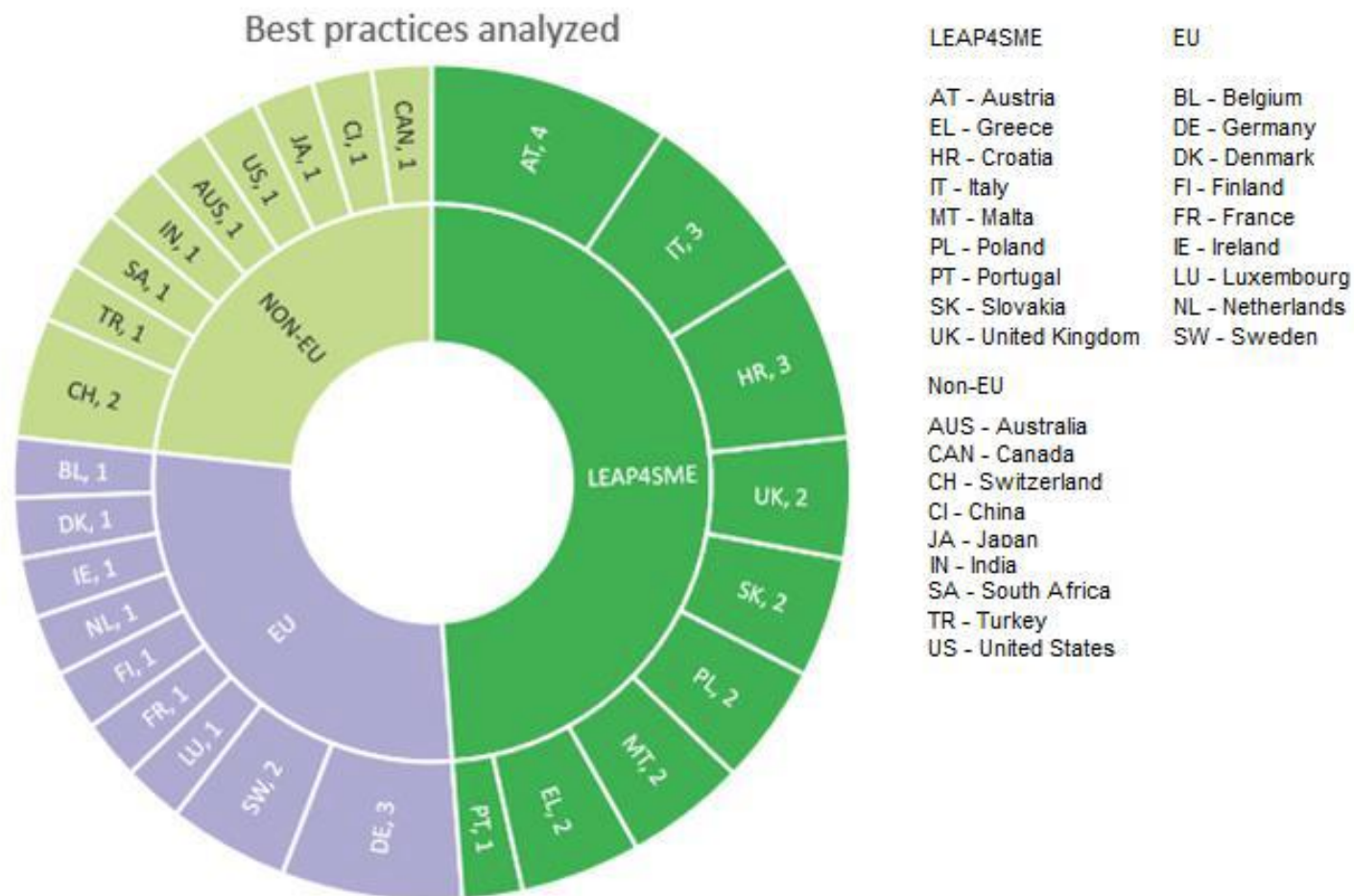
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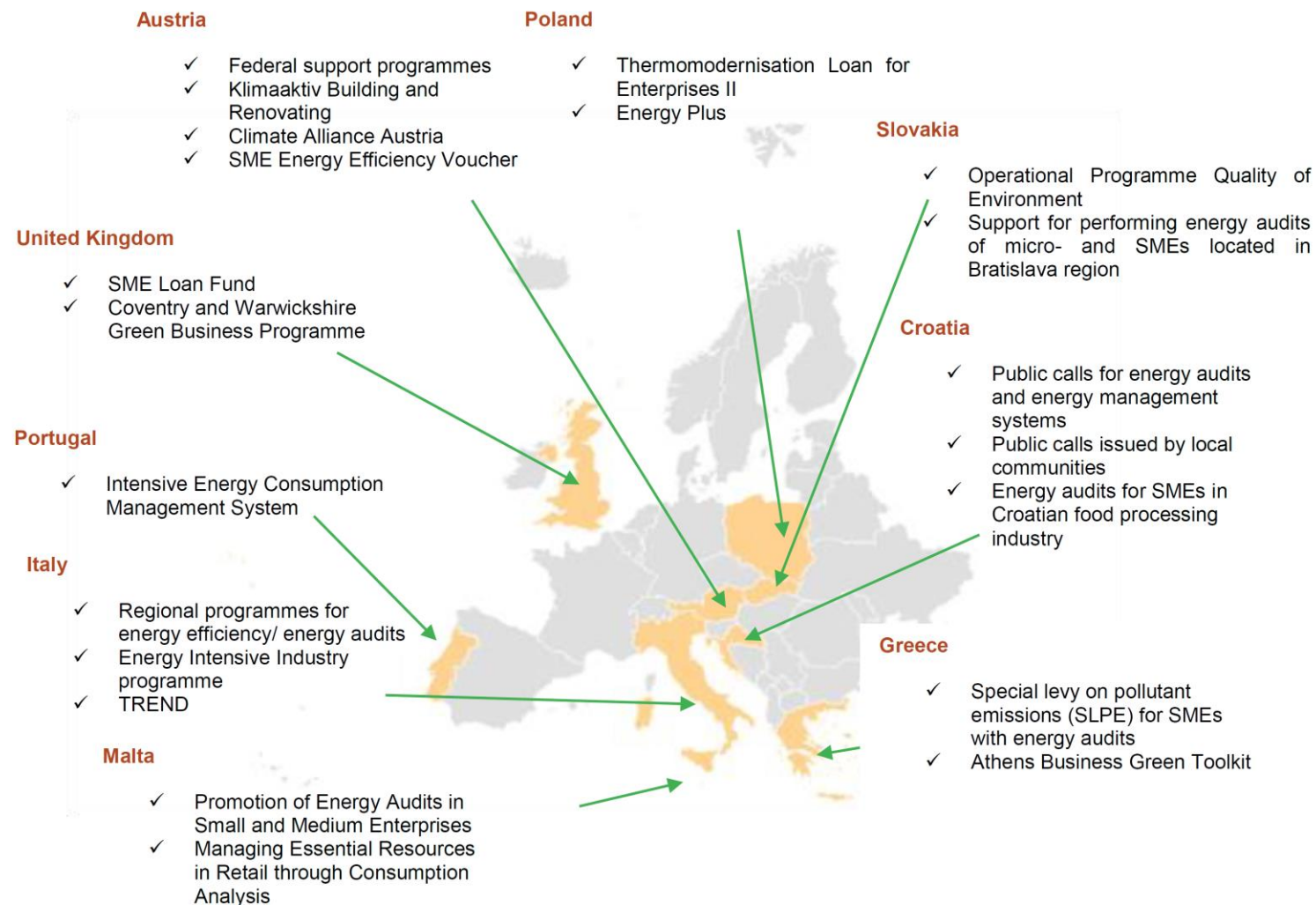


## D 3.3 Overview of good practices



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## D 3.3 Overview of good practices



Map of LEAP4SME countries  
best practices



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# LEAP4SME

## *Energy Audit policies to drive Energy Efficiency*

- From *D5.1 Capacity Building implementation plan*

	Barrier/need	Possible Capacity building action
1	Lack of knowledge about energy efficiency and its benefits	<ul style="list-style-type: none"> <li>• Informing on the options for raising efficiency, and the cost and benefit of those</li> <li>• Guidance on how to access the external parties that have EE skills and expertise</li> <li>• Information on EU – MS measures that enhance EE implementation</li> <li>• Ensuring that EE measures do not disrupt the production process or lead to revenue losses or product quality</li> </ul>
2	Difficulty accessing the capital to finance energy efficiency improvements /Restricted financial capacity	Information on the funding opportunities or other schemes
3	Relevance of energy demand/ technical and organizational difficulties	Information on other benefits occurring from implementing EE

- *Energy efficiency projects typically include improvements to production lines, energy generation processes, and regulation of energy use in the workplace*

Energy efficiency in production process		Efficient generation of energy inputs		Efficient use of energy in the workplace	
i)	Replacing obsolete and energy inefficient production lines	i)	Combined heat and power production (CHP), also known as cogeneration	i)	Improved regulation of indoor temperature
ii)	Waste heat recovery	ii)	High efficiency boilers and decentralization of heat production	ii)	Improved thermal insulation of buildings
iii)	Improved regulation and control of the production process	iii)	Improved insulation of heat/steam pipes	iii)	High efficiency lighting systems
		iv)	Fuel switching and/or renewable energy utilization		



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## Survey

### Survey for Organisations

Assessment of Energy Audits and Efficiency policy barriers and needs in SMEs (ORG)



[https://ec.europa.eu/eusurvey/runner/LEAP4SME\\_Survey\\_Organizations](https://ec.europa.eu/eusurvey/runner/LEAP4SME_Survey_Organizations)

### Survey for Enterprises (SMEs)

Assessment of Energy Audits and Efficiency policy barriers and needs in SMEs (SMEs)



[https://ec.europa.eu/eusurvey/runner/LEAP4SME\\_Survey\\_SMEs](https://ec.europa.eu/eusurvey/runner/LEAP4SME_Survey_SMEs)

### Collection of proposals, contributions and ideas

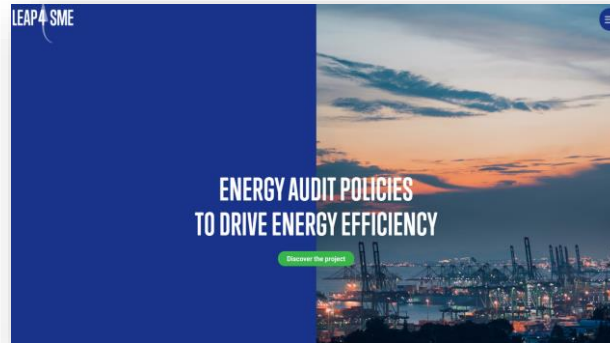
LEAP4SME International Observatory + National Observatories and trainings (2022)



<https://leap4sme.eu/>



# Thanks for your attention



[www.leap4sme.eu](http://www.leap4sme.eu)



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