

7th INTERNATIONAL FORUM ON SUSTAINABLE Energy
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ENERGY EFFICIENCY IN EUROPEAN INDUSTRY



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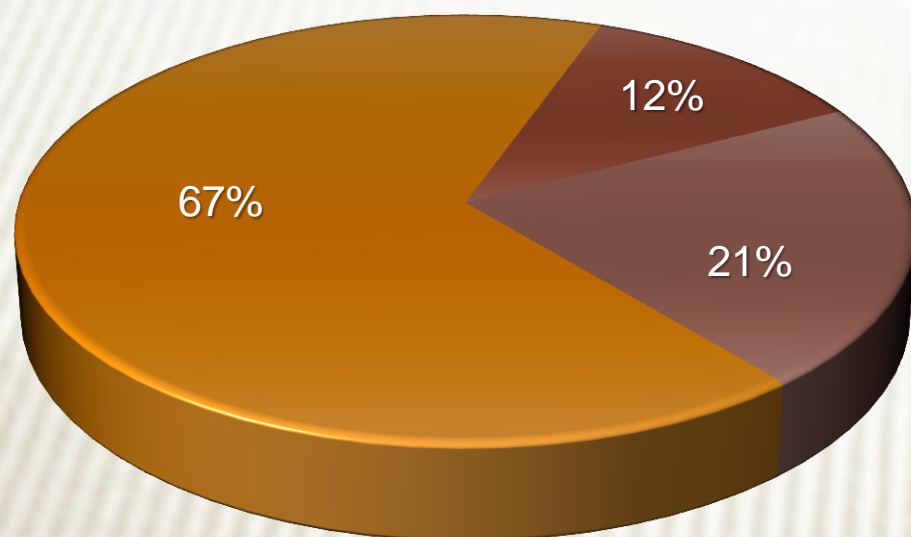
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EUROPE

NUMBER OF EUROPEAN COUNTRIES



■ EU ■ CANDIDATES ■ OTHERS

EU COUNTRIES DEVELOPED THE RULES:

- DIRECTIVES
- NATIONAL ACTION PLANS
- ECO DESIGN

CANDIDATES FOLLOW THE EU RULES TO DEVELOP OWN EE REGULATIONS

OTHER COUNTRIES FOLLOW THE SAME FRAMEWORK AND POLICY



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EU FRAMEWORK ON EE POLICIES

- **EMISSIONS TRADING DIRECTIVES** **2003/87/EC and 2009/29/EC**
- **ENERGY EFFICIENCY DIRECTIVE** **2012/27/EU (EED)**
- **PROVISIONS FOR THE INDUSTRIAL SECTOR IN EED**
 - Specific provisions for the industrial sector
 - Energy audits (Article 8)
 - Cross-cutting measures with relevance to the industrial sector
 - Energy Efficiency obligation schemes (Article 7)
- **ECO-DESIGN DIRECTIVE** **2009/125/EC**
- **RENEWABLE ENERGY DIRECTIVE** **2009/28/EC**
- **INDUSTRIAL EMISSIONS DIRECTIVES**
- **ROLE OF NEEAP MEASURES** **50% INDUSTRY**
- **MEASURES BY IMPACT**
- **DYNAMICS AND INNOVATION OF POLICY DEVELOPMENT IN THE INDUSTRIAL SECTOR**

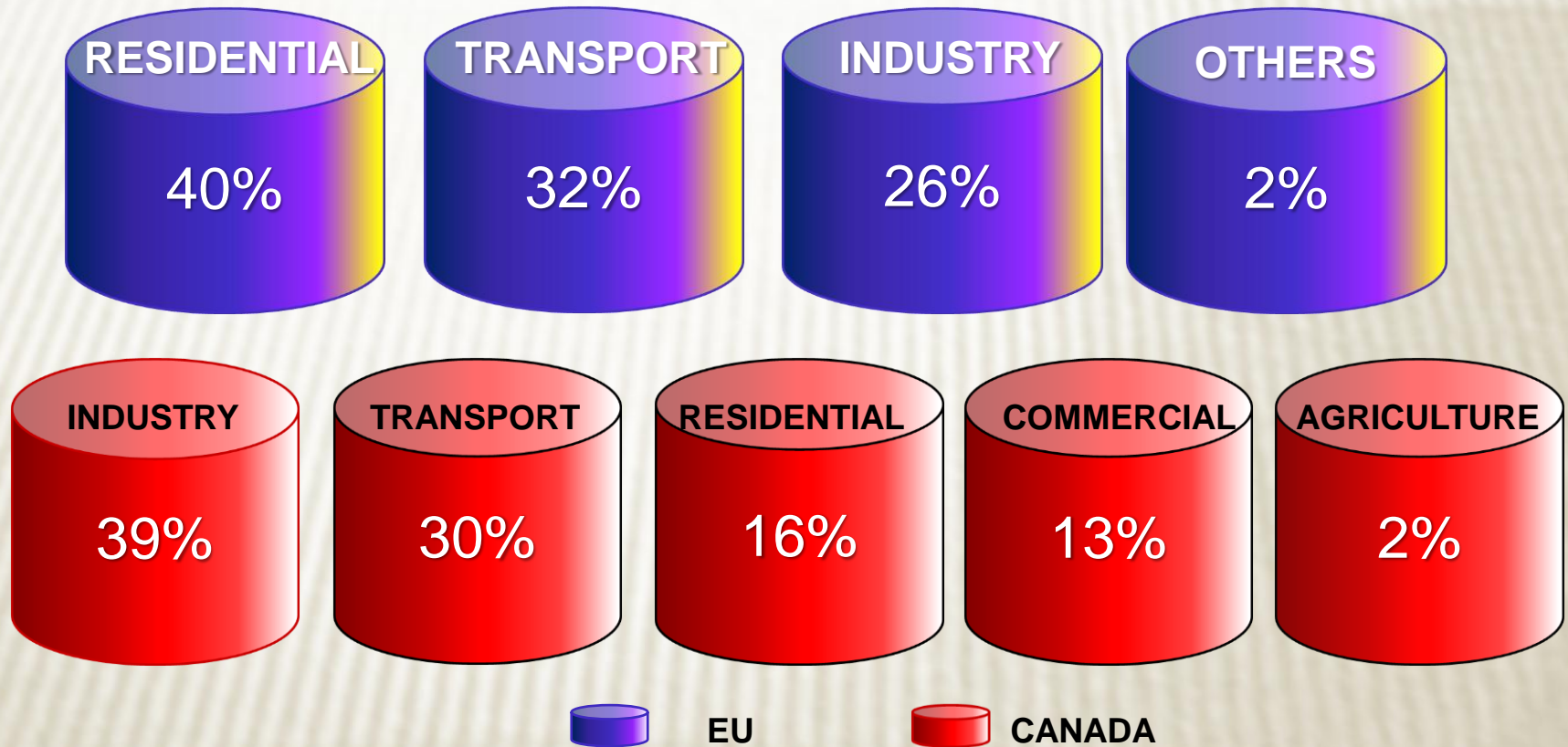


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SECTORAL IMPACT ON ENERGY CONSUMPTION



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THE MOST ENERGY - INTENSIVE INDUSTRIES TO MANUFACTURE PRODUCTS WE USE EVERY DAY

- **ALUMINUM**
- **CHEMICALS**
- **MINING**
- **IRON & STEEL**
- **PETROLEUM REFINING**
- **FOREST PRODUCT**
- **GLASS**
- **METAL CASTING**



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CONSUMPTION IN INDUSTRY

SECTOR'S FINAL ENERGY CONSUMPTION IN EU28 2013y

	KTOE	SHARE	PROCES HEATING
CHEMICAL AND PHARMACEUTICAL	51,485	18.9%	58%
IRON AND STEEL²	50,815	18.6%	75%
PETROLEUM REFINERIES	44,657	16.4%	84%
NON-METALLIC MINERAL	34,249	12.6%	74%
PULP, PAPER AND PRINT	34,265	12.6%	59%
FOOD AND BEVERAGE	28,353	10.4%	62%
MACHINERY ¹	9,282	7.1%	40%
NON-FERROUS METAL	9,381	3.4%	32%
TOTAL	272,487		66%

SOURCE: ICF - STUDY ON ENERGY EFFICIENCY AND ENERGY SAVING POTENTIAL IN INDUSTRY AND ON POSSIBLE POLICY MECHANISMS

² Note that the EUROSTAT data presented for iron and steel sector group only covers the downstream steel making process; upstream iron making process is not reported under this figure.



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THROUGHOUT THE MANUFACTURING PROCESS, ENERGY IS LOST DUE TO:

- **EQUIPMENT INEFFICIENCY,**
- **MECHANICAL LIMITATIONS,**
- **THERMAL LIMITATIONS**

OPTIMIZING THE EFFICIENCY OF THESE SYSTEMS CAN RESULT:

- **SIGNIFICANT ENERGY AND COST SAVINGS**
- **REDUCED CARBON DIOXIDE & OTHER EMISSIONS**

UNDERSTANDING HOW ENERGY IS USED AND WASTED, OR ENERGY USE AND LOSS FOOTPRINTS—CAN HELP PLANTS PINPOINT AREAS OF ENERGY INTENSITY AND WAYS TO IMPROVE EFFICIENCY.



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ISO 50001 – ENERGY MANAGEMENT

ENERGY MANAGEMENT SYSTEM IS A **VOLUNTARY** FRAMEWORK OF INTERRELATED ELEMENTS FOR THE MANAGEMENT OF ENERGY IN ANY BUSINESS LARGE OR SMALL.

IMPLEMENTATION OF THIS STANDARD WILL ASSIST ORGANIZATIONS IN **REDUCING ENERGY USE** THROUGH THE UTILIZATION OF BEST PRACTICES, MEASUREMENT AND REPORTING DISCIPLINES AND PROMOTING ENERGY EFFICIENCY THROUGHOUT THE SUPPLY CHAIN.

REDUCTION IN ENERGY LEADS TO **REDUCED GHGs** AND **OPERATIONAL COSTS**



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ISO 50001 - KEY ELEMENTS

- CONDUCT AN **ENERGY REVIEW**
- ESTABLISH AN **ENERGY BASELINE**
- ESTABLISH ENERGY **OBJECTIVES AND TARGETS**
- ESTABLISH AN **ACTION PLAN**
- **IMPLEMENT** THE ACTION PLAN
- **CHECK PERFORMANCE**
- **MONITOR**, DOCUMENT AND REPORT ALL THE ABOVE

IMPLEMENT ENERGY MANAGEMENT INTO EVERYDAY PRACTICES



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ENERGY SYSTEM OPTIMIZATION

- **Motor system optimization**
- **Pump system optimization**
- **Fan system optimization**
- **Compressed air system optimization**
- **Steam system optimization**
- **Water supply system**
- **Heat system optimization**
- **Refrigeration & air conditioning optimization**
- **Renewable**
- **Carbon capture and storage**
- **Carbon capture and usage**
- **Storage of electrical energy**
- **Fuel cells**
- **Reduction of emissions of CO₂ and nanoparticles**

CONSUMPTION & COSTS

NEW TECHNOLOGIES



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BARRIERS TO ENERGY EFFICIENCY IN INDUSTRY

- TECHNICAL
- TECHNOLOGY
- PRODUCTION PROCESSES
- RESEARCH & DEVELOPMENT
- FINANCIAL
- STRUCTURAL CONNECTIONS AMONG INDUSTRIES
- EDUCATIONAL & PROFESSIONAL
- COMMUNICATION
- HABITS & TRADITIONS



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PRINCIPLES OF NEW INDUSTRY

1. **EFFICIENCY** – Energy, Materials, Fuel, Time,
2. **ECOLOGICAL PRINCIPLES** – Overproduction, Technology
3. **ENERGY MANAGEMENT**
4. **R&D** – constant R&D
5. **MEASUREMENT & DATA MANAGEMENT**
6. **LEGISLATION** – Transnational regulations,
7. **STANDARDIZATION** – respect of international standards
8. **EXCHANGE OF EXPERIENCE AND GOOD PRACTICES**
9. **COMMON SOLVING OF OBSTACLES**
10. **ETHNICITY** – Population, Environmental, Flora & Fauna,



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RESEARCH AND DEVELOPMENT PROJECTS

- **NEXT GENERATION OF ELECTRIC MACHINES**
- **INNOVATIVE PROCESS AND MATERIALS TECHNOLOGIES**
- **NEXT GENERATION OF MANUFACTURING PROCESSES**
- **NEXT GENERATION OF MATERIALS**
- **COMBINED HEAT & POWER**
- **SMALL BUSINESS INNOVATION RESEARCH**



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NEW POLICY APPROACHES FOR ENERGY EFFICIENCY IN INDUSTRY

- **MANDATORY INDUSTRIAL ENERGY AUDITS**
- **ENERGY EFFICIENCY MANAGEMENT IN THE INDUSTRIAL ENTERPRISES AND ANNUAL REPORTING OF ITS IMPLEMENTATION**
- **DEVELOPMENT OF PUBLIC-PRIVATE PARTNERSHIP FOR IMPLEMENTATION OF ENERGY EFFICIENCY MEASURES**
- **INDUSTRIAL ENERGY EFFICIENCY NETWORK**
- **PROMOTION OF ENERGY MANAGEMENT SYSTEMS**
- **INTELLIGENT METERING IN THE INDUSTRIAL ENTERPRISES**
- **CREATION OF BUSINESS PARKS**



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COMPETITIVE LOW-CARBON ECONOMY

- 1. FOCUS ON ADVANCED VALUE-ADDED MANUFACTURING, ESTABLISHING A PUBLIC-PRIVATE PARTNERSHIP ON PROJECTS**
- 2. TECHNOLOGY OF INTELLIGENT MATERIALS, HIGH PERFORMANCE PRODUCTION.**
- 3. FACILITATING ACCESS TO NEW TECHNOLOGICAL INFRASTRUCTURE**
- 4. ENSURE THE ACCESS TO SUSTAINABLE RAW MATERIALS AT WORLD MARKET PRICE FOR THE PRODUCTION OF BIO-BASED PRODUCTS**
- 5. INTERCONNECTIONS AND SMART GRIDS CAPABLE OF HANDLING MULTIPLE VARIABLE INPUTS, BALANCING POWER AND CONSISTENT SUPPLY**
- 6. CLEAN AND ENERGY EFFICIENT TRANSPORT AND COMMON STANDARDS FOR ELECTRIC CARS**
- 7. BUILDING RENOVATION**



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RECENT POLICY MEASURES STARTED SINCE 2013

Implementation of the following actions in the EU Member States and Norway:

1. Grants for energy efficiency measures in agriculture and animals, as in Bulgaria
2. Energy audits in enterprises, as in Croatia, Denmark, Czech Republic, France, Germany, Latvia and Slovenia;
3. Development of Cogeneration and efficient Heat Networks as in France;
4. Implementation of Energy Management Systems, as in Germany and Latvia;
5. Energy efficiency investments in the SMEs, as in Poland;
6. Schemes for efficient utilization of electricity and heat, as in Germany and Slovenia;
7. Emissions reducing under EU-ETS, as in Romania and UK;
8. Financial and technical aids to SMEs and large companies in the industrial sector as in Spain.



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THANK YOU

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