

Energy Efficiency in the Industrial Sector of Moldova

Vasile SCORPAN

Manager, Climate Change Office, Ministry of
Environment of the Republic of Moldova

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1. Institutional Framework for IEE

Institutions promoting energy policies

1. Ministry of Economy and Commerce (MEC)
 - General department for energy security,
 - Department for power, cooperation of power systems,
 - Department for gasification and energy resources,
 - Department for thermal energy.
2. Ministry of Environment and Natural Resources
3. National Agency for Energy Regulation (ANRE).
4. National Agency for Energy Conservation (ANCE).
5. State Energy Inspection (IES).
6. Energy Institute of the Academy of Sciences of RM (IE AȘM).
7. Technical University of Moldova:
 - Energy Faculty
 - City Development and Architecture Faculty



2. Policy and Legal Frameworks for IEE

Strategies and programs:

- EU-Moldova Action Plan. <http://www.europa.md/rom/sbmen/31>
- RM Strategy for Energy till 2020 approved by Republic of Moldova Government Decision no. 958 as of 21.08.2007
- Poverty Reduction and Economic Growth Strategy (PREGS). No.398/02.12.2004
- Concept of renovation of the republican heat supply system: HG RM N 189 of 20.02.2003.
- National Energy Conservation Program for the period 2003-2010. HG RM N 1078 of 5.09.2003.
- National Gasification Program of RM. HG RM no. 1643 of 19 December 2002. R. Moldova Official Gazette (Monitorul Oficial) N 190-197 of 31.12.2002
- Long term Energy Strategy of Republic of Moldova brought in line with the energy objectives of the European Union. Draft [e-Journal “*REGIONAL ENERGY PROBLEMS (PROBLEMELE ENERGETICII REGIONALE)* № 2 (2006).].



2. Policy and Legal Framework for IEE

Specific Objectives of the Strategies and Programs in the area of enhancing energy efficiency include:

- Implementation of the National Energy Conservation Program 2003-2010 and its extension, with updating every two years, taking into consideration the EC Green Paper as of 22 June 2005 “Energy efficiency or achieving more with less” and the Green Paper of 8 March 2006 “European Strategy for sustainable, competitive and secure energy”;
- Development, approval and application of standards aimed at increasing the energy efficiency by using equipment in conformity with the EU legal standards on energy efficiency;
- Development and encouragement through material and moral incentives of the initiative in the area of energy conservation and enhancement of energy efficiency in the budget, residential sectors and in the national economy branches, including the energy sector;



2. Policy and Legal Framework for IEE

- Promotion of using most efficient technologies' and economically viable and non-polluting energy equipment in all branches of the national economy;
- Encouraging the application of new investment and incentives norms for increasing the energy efficiency, such as establishing of energy resources' consumption norms on specific terms, accepting the use of freed energy resources resulting from better efficiency for other production needs or for ensuring the enterprise or organization activity;
- Setting up a database on energy efficiency and providing free access for legal entities and natural persons to that information;
- Promotion of providing consulting and audit services by private or state organizations, which will offer information on energy efficiency programs and technologies and will deliver technical assistance to state and private sector users;
- Establishment of regional demonstration centers for energy efficiency;
- Development of price and tax policies to provide clear signals about favouring energy efficiency.



2. Policy and Legal Framework for IEE

Measures to achieve specific objectives include:

- Relaunching and expansion of National Energy Conservation Agency, which shall have responsibilities with regards to implementation of the National Energy Conservation Program;
- Cooperation in the energy efficiency and use of renewable energy sources areas with European Union structures and CIS ones, including technical assistance;
- Monitoring EU secondary legislation transposition with regards to energy saving and energy efficiency;
- Promotion of energy efficiency through technologies minimizing energy consumption in buildings, especially in public ones, including through the usage of renewable energy sources;



2. Policy and Legal Framework for IEE

- Development and supply of some financial support tools for energy efficiency projects, efficient technologies and research and development in the respective area; to this end, funds shall be accumulated both from the state budget and from grants;
- Actions to set up energy service companies (ESCOs) and using other financial instruments and organizational approaches to stimulate commercial banks to invest in energy efficiency projects;
- Establishing minimum energy efficiency standards for various equipment and technologies (e.g. for buildings, transport, household appliances, ordinary industrial equipment, etc), that shall be gradually harmonized with the EU standards;
- Consideration given to the possibility of setting up a market for selling white and green certificates;
- Reviewing methodologies of price and taxes definition for energy products in such a way as to include energy efficiency facilities.



2. Policy and Legal Framework for IEE

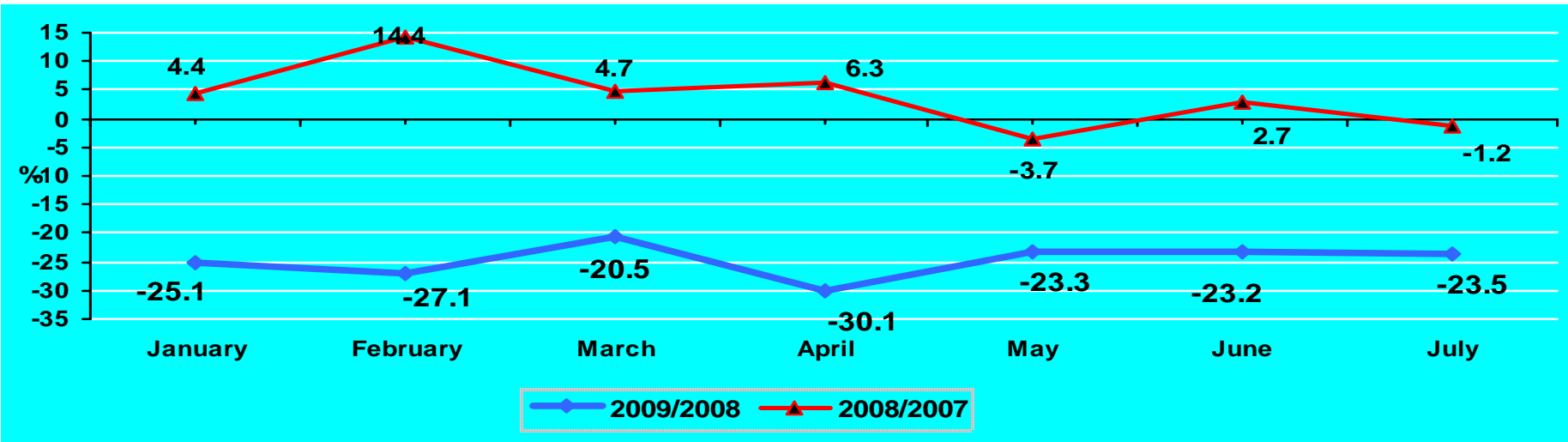
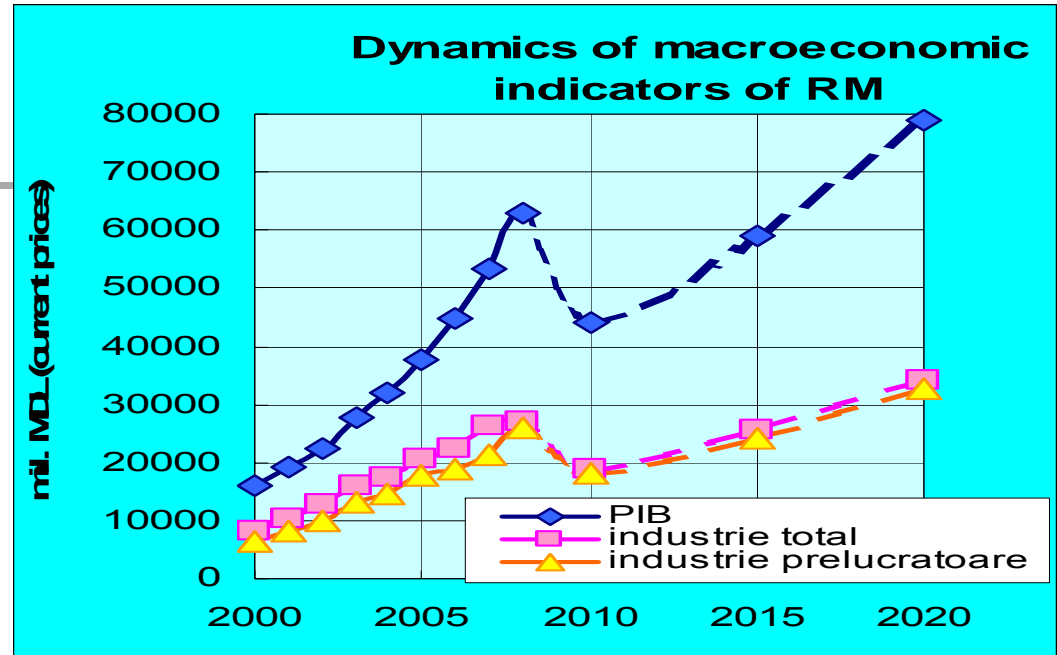
Laws:

- Republic of Moldova Law on Energy No.1525-XIII as of 19.02.98.
- Republic of Moldova Law on Standardization Nr.590-XIII as of 22.09.95
- Law on Concept regarding Privatization of power sector enterprises, no. 63-XIV of 25 June 1998;
- Republic of Moldova Law on Gas. No.136-XIV as of 17.09.98
- Republic of Moldova Law on Energy Conservation No.1136-XIV of 13.07.2000.
- Law on Promoting power production from renewable energy sources. HP RM no. 39 as of 23.02.2007.
- Law on Thermal Energy, Draft.
- Law on Energy Efficiency, Draft

Energy Efficiency in the Industrial Sector of Moldova

3. Moldova IEE Context

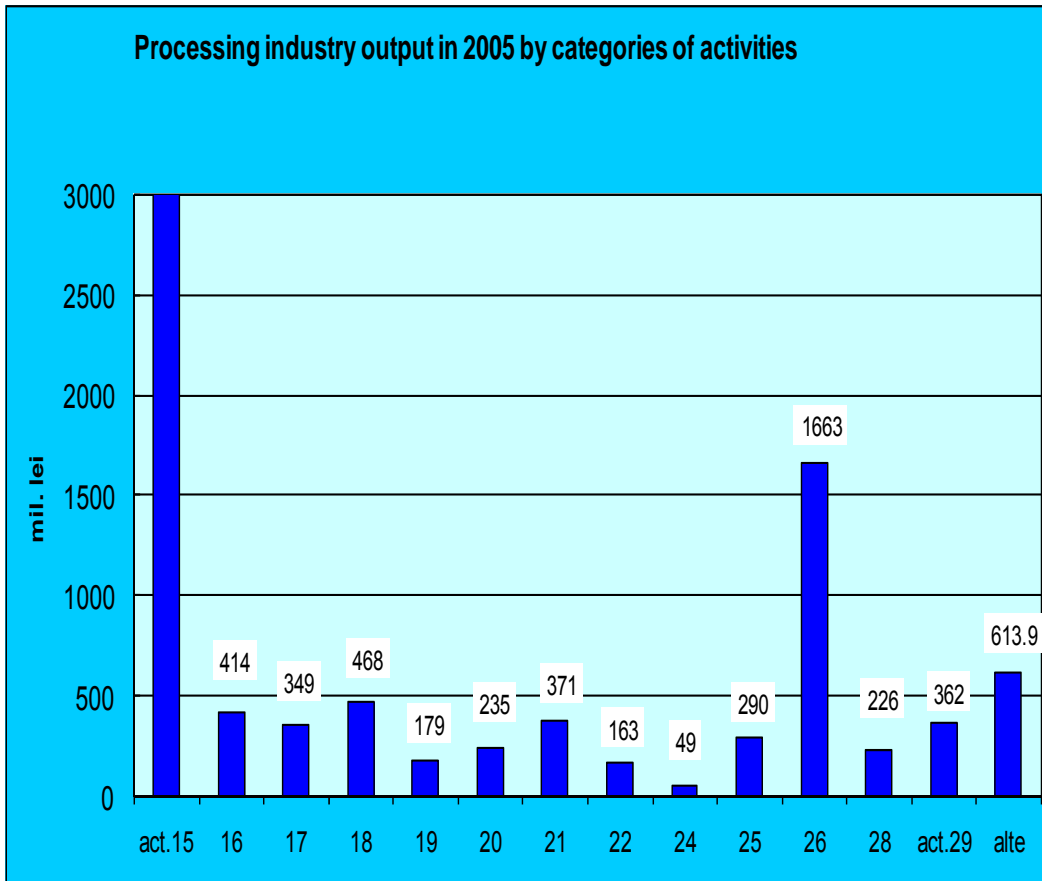
Monthly evolution of industrial production output in comparable prices (last year averages), percentage change compared to the respective month of the precedent year



Energy Efficiency in the Industrial Sector of Moldova

3. Moldova IEE Context

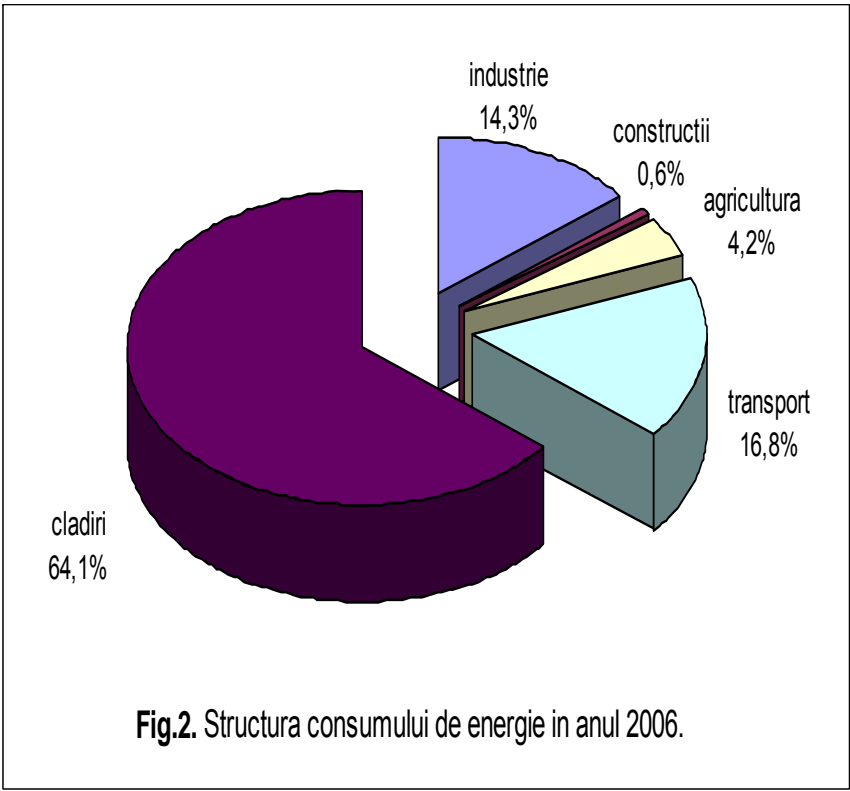
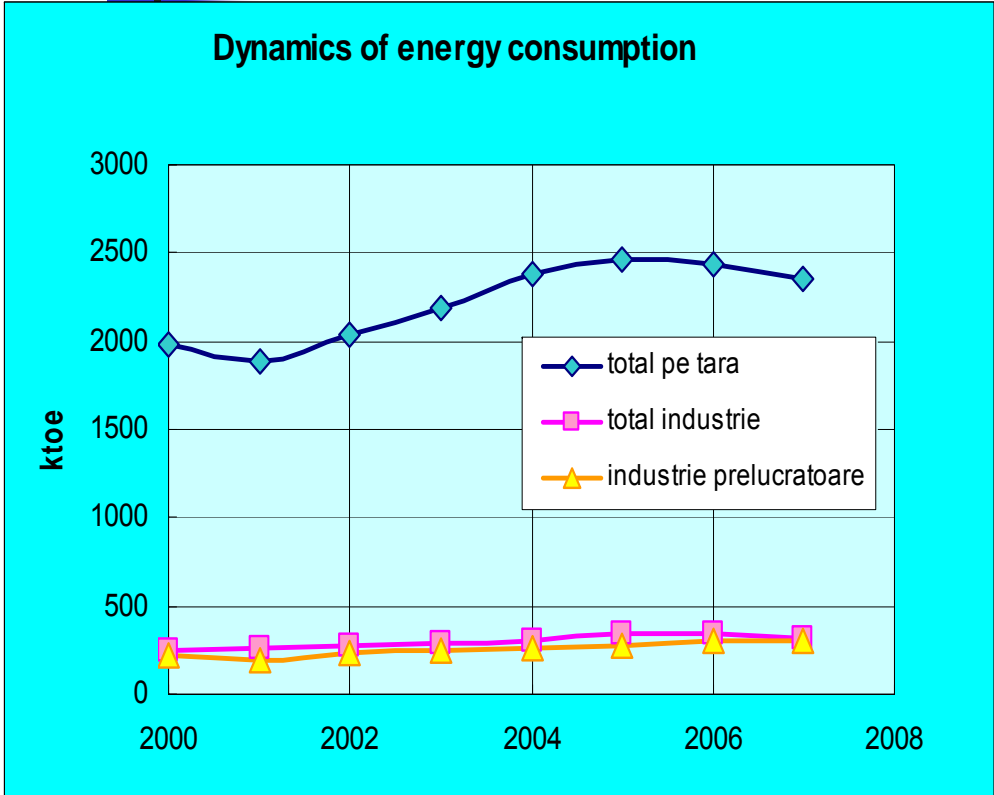
Processing industry output in 2005 by categories of activities



15.	Manufacture of food products and beverages
16.	Manufacture of tobacco products
17.	Manufacture of textiles
18.	Manufacture of wearing apparel; dressing and dyeing of furs
19.	Manufacture of leather, leather products and manufacture of footwear
20.	Manufacture of furniture
21.	Manufacture of paper and paperboard
26.	Manufacture of other non-metallic mineral products
28.	Manufacture of fabricated metal products, except machinery and equipment
29.	Manufacture of machinery and equipment

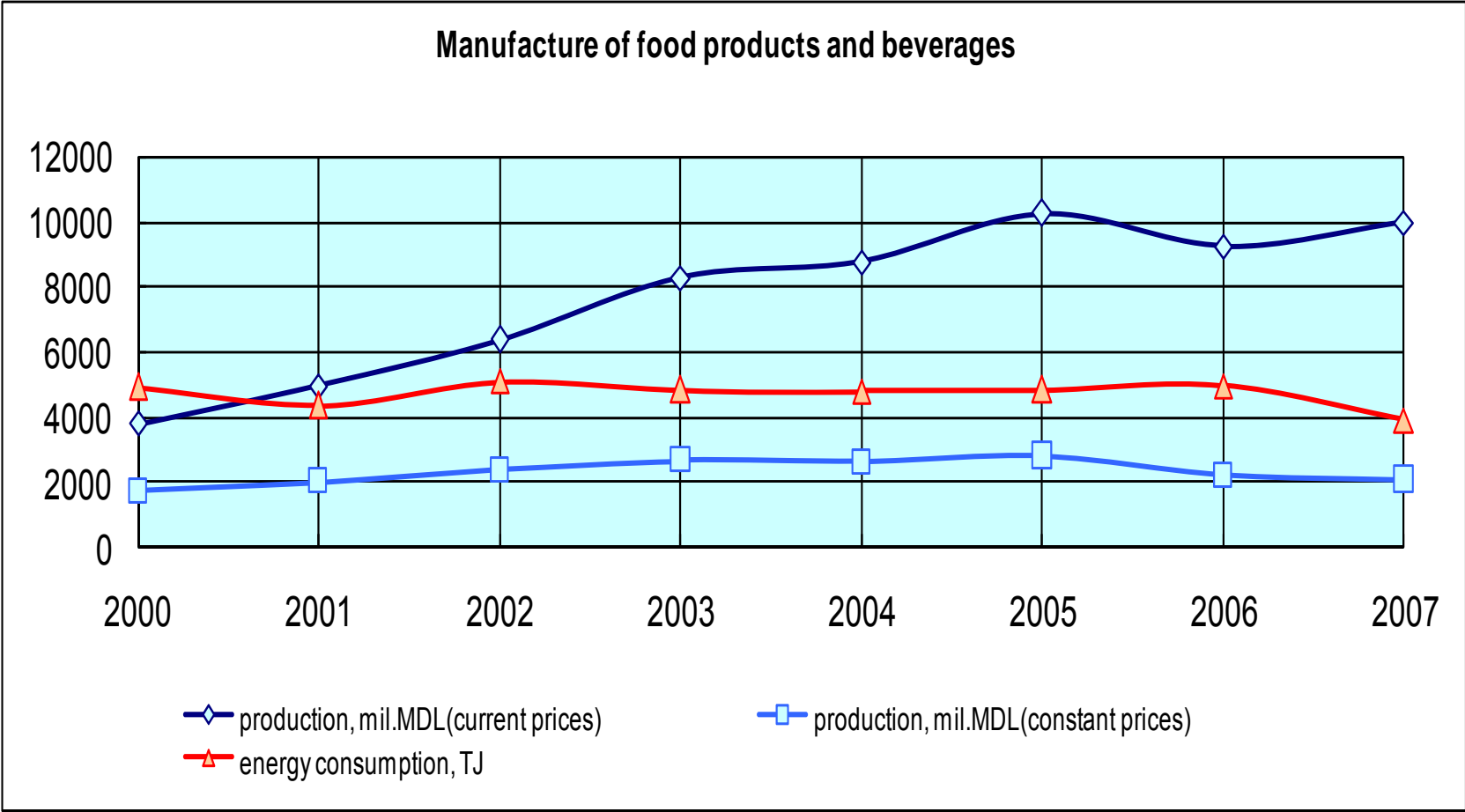
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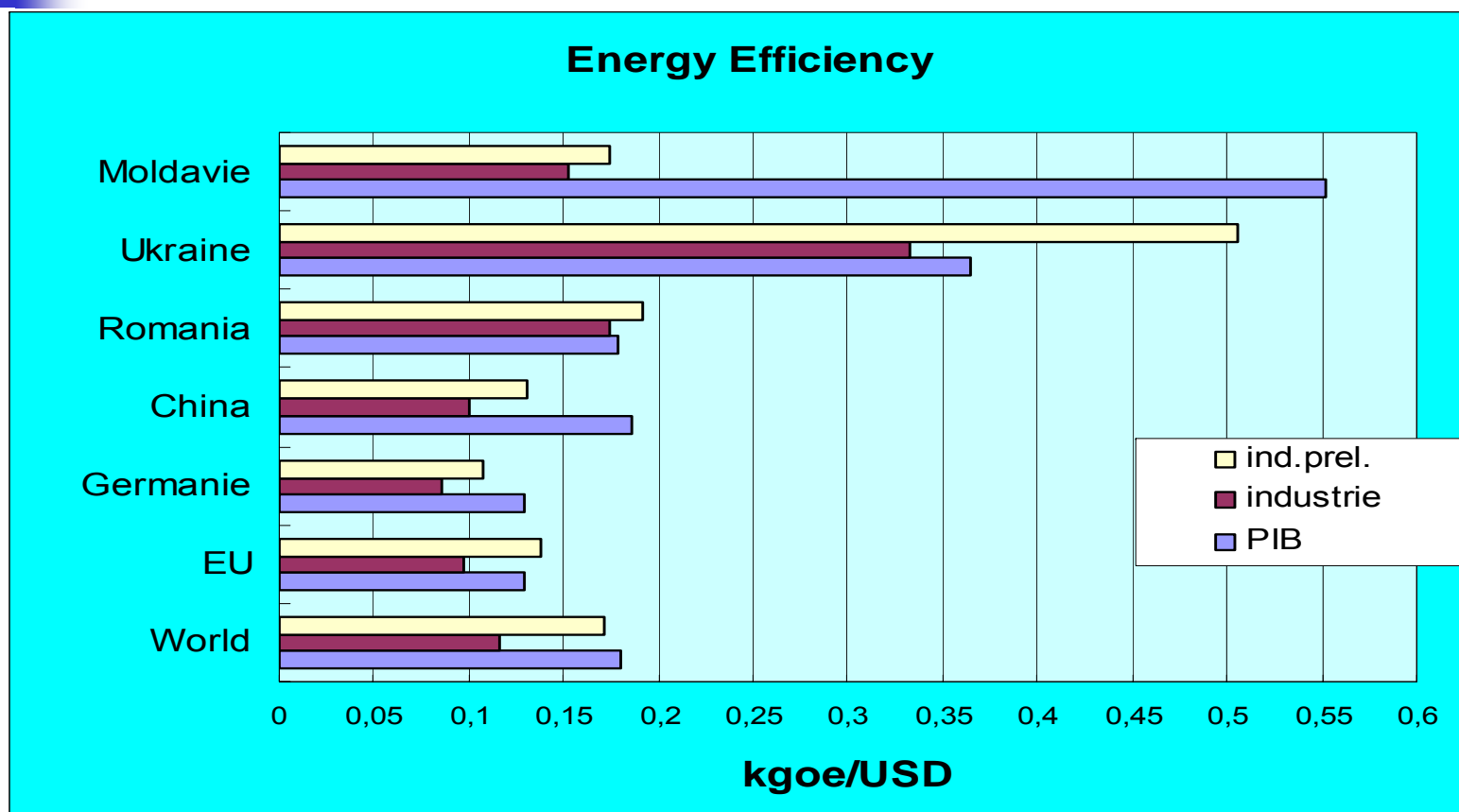
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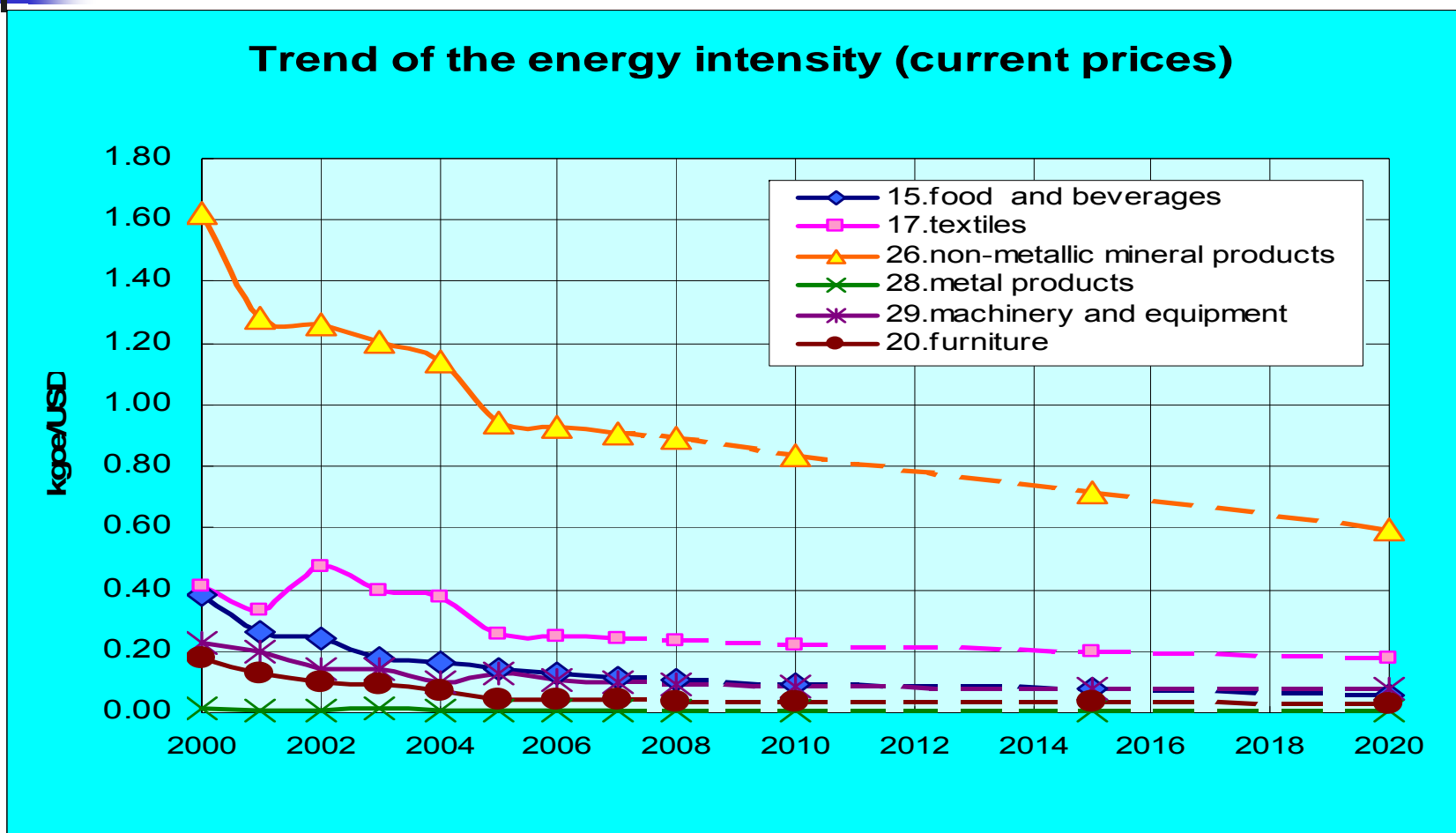
4. Energy Performance of Moldovan Industry



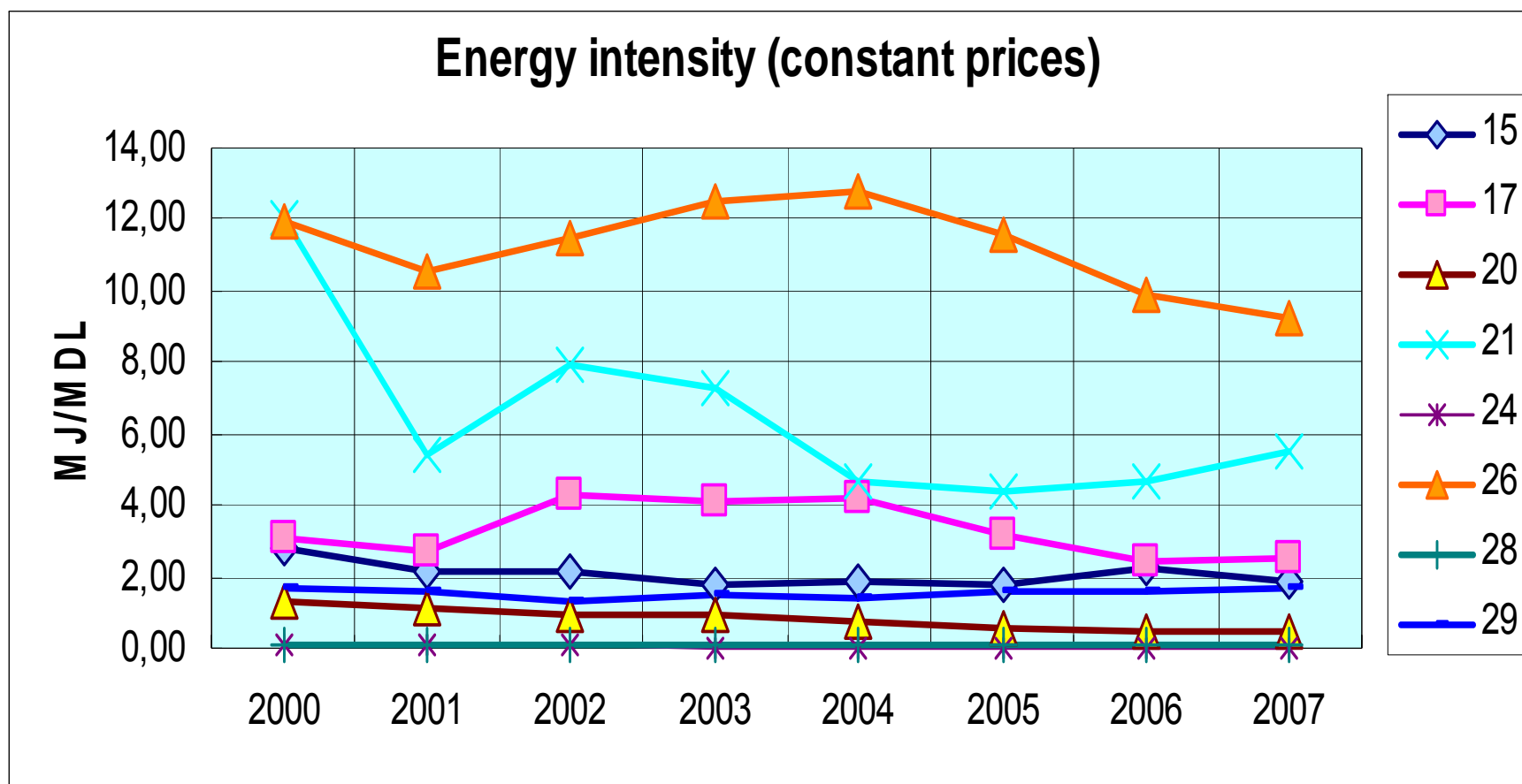
Source: http://www.worldenergy.org/publications/energy_efficiency_policies_around_the_world_review_and_evaluation/1230.asp

Energy Efficiency in the Industrial Sector of Moldova

4. Energy Performance of Moldovan Industry



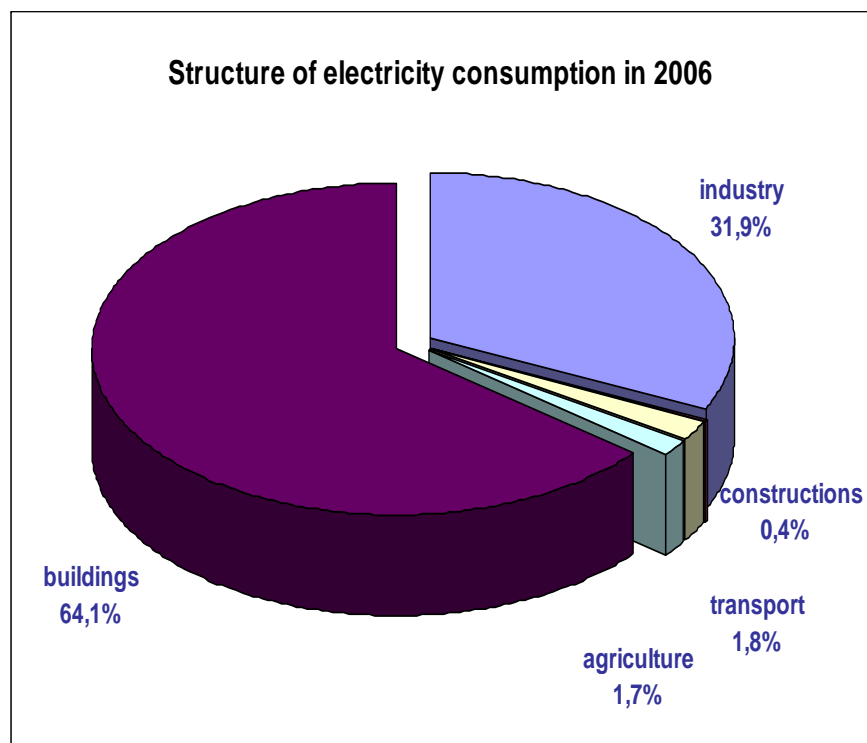
4. Energy Performance of Moldovan Industry



Energy Efficiency in the Industrial Sector of Moldova

4. Energy Performance of Moldovan Industry

Trend of electricity consumption, in GWh



	2000	2001	2002	2003	2004	2005
15.food and beverages	224	220	250	259	265	276
17.textiles	29	33	33	35	38	40
26.non-metallic mineral products	120	106	132	140	190	207
28.metal products	1,0	1,0	1,0	3,0	2,0	2,0
29.machinery and equipment	33	36	37	44	40	39
20.furniture	5,7	4,2	3,1	2,9	2,2	1,4

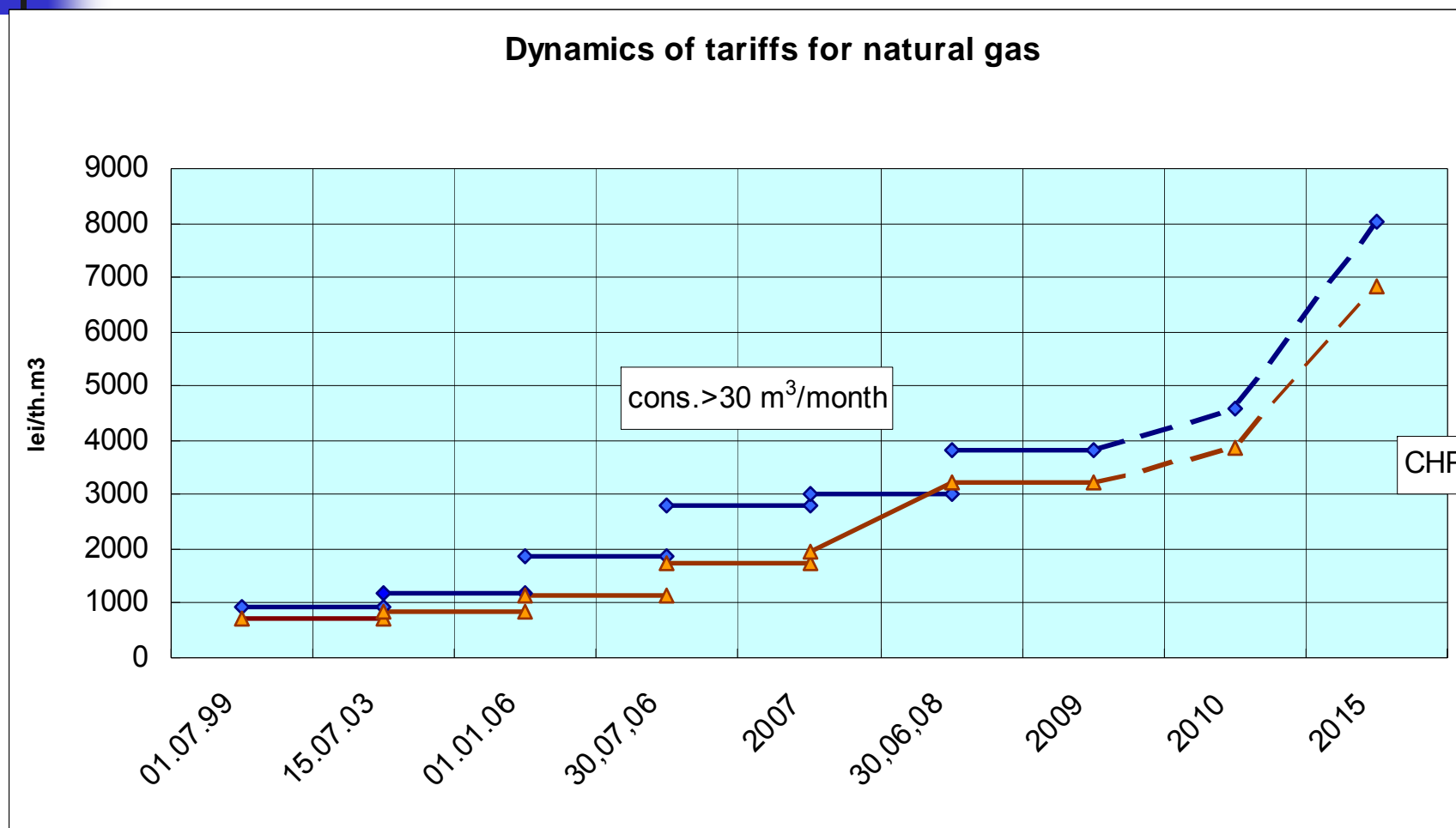


4. Energy Performance of Moldovan Industry

Trend of heat consumption, in GWh

	2000	2001	2002	2003	2004	2005
15.food and beverages	939,3	983,5	991,6	870,6	896,2	926,4
17.textiles	33,8	39,6	41,9	44,2	46,6	47,7
26.non-metallic mineral products	17,5	22,1	16,3	15,1	15,1	15,1
29.machinery and equipment	1,2	4,7	2,3	3,5	3,5	3,5
20.furniture	3,5	3,5	2,3	4,7	3,5	2,3

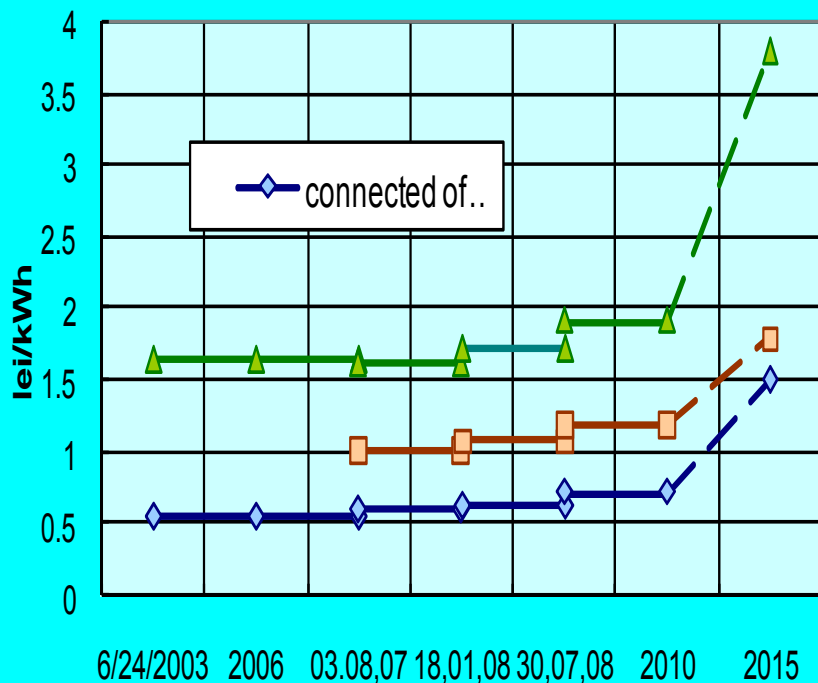
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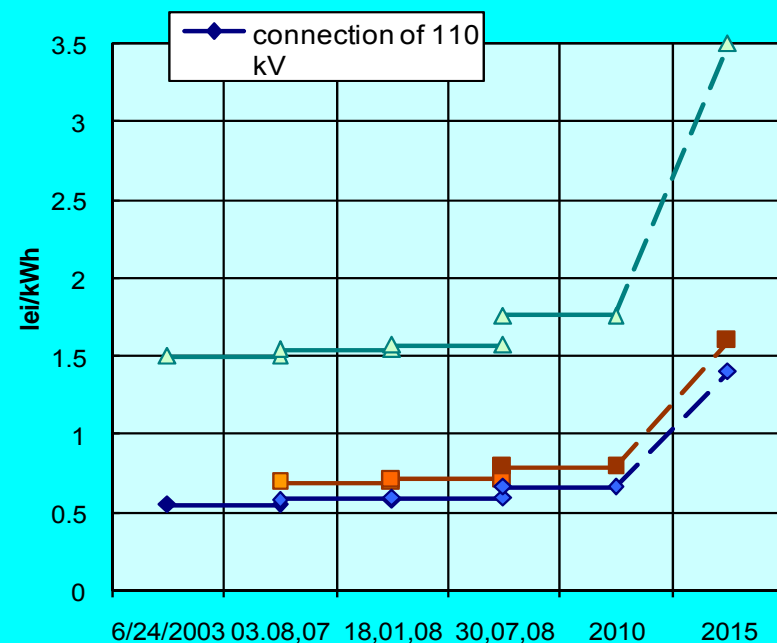
Energy Efficiency in the Industrial Sector of Moldova

4. Energy Performance of Moldovan Industry

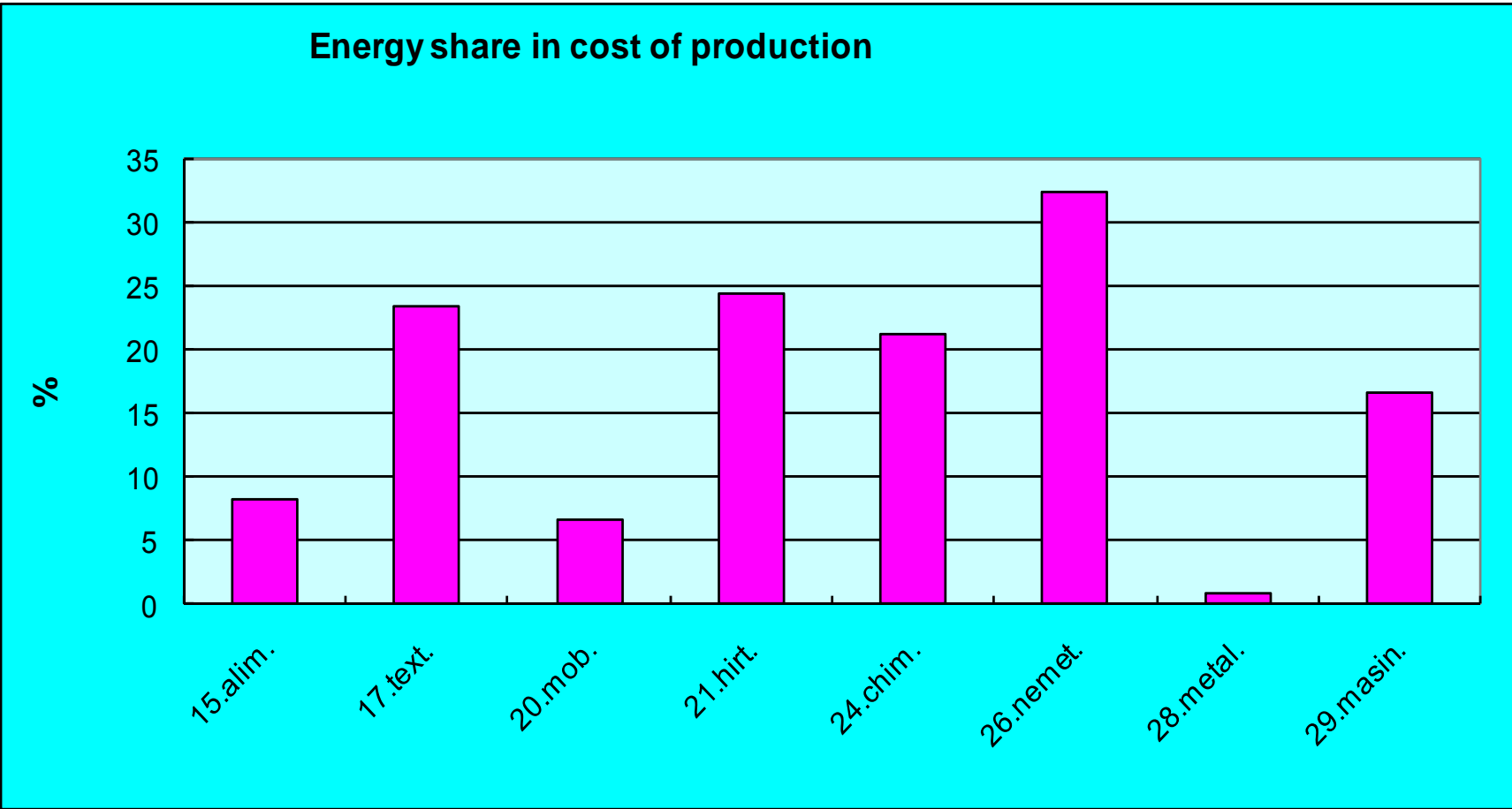
Dynamics of tariffs for electrical power delivered by state EN



Dynamics of tariffs for electrical power delivered by ICS "Union Fenosa"



4. Energy Performance of Moldovan Industry



Energy Efficiency in the Industrial Sector of Moldova

4. Energy Performance of Moldovan Industry

Category	Activities	Output (2007), mil. lei	Output by enterprise, mil. lei /enterprise	One worker output, thousand lei / pers.	Energy intensity MJ/ leu	Energy weight, %
15.	Manufacture of food products and beverages	8605,8	32,4	296	0,47	8,1
17.	Manufacture of textiles	637,7	23,1	131,9	0,9	23,5
26.	Manufacture of other non-metallic mineral products	2664,7	64,3	355,9	3,2	32,5
29.	Manufacture of machinery and equipment	340,7	12,11	95,36	0,42	16,5



5. Barriers to Improved Industrial Energy Efficiency

General impediments:

1. Lack of adequate energy conservation policies in the country: Ministry of Energy was liquidated, National Agency for Energy Conservation practically disappeared, there is no ESCO, laws in the energy area are adopted slowly, and the ones that are approved fail to function, energy conservation is discussed only at some scientific seminars and conferences etc.
2. Economic agents' uncertainty delay investments in general and impose the priority of investing in the technological equipment, which is commonly cheaper and less energy efficient.
3. The relatively low share of energy cost in the cost price of most of the priority industries' products in the republic: food, beverage, textile does not raise the interest of technological staff and therefore the low level of their knowledge in the area of energy, energy management, energy conservation.



5. Barriers to Improved Industrial Energy Efficiency

General impediments (cont.):

4. Lack of capital at the enterprises and reduced availability of credits (bank interest too high, alternative forms of financing, outside banks, are underdeveloped).
5. Poor investment climate in the country.
6. Lack of initiative among many managers, inherited from the Soviet administrative order system
7. High level of corruption and bureaucracy at all levels.



6. Barriers to sustainable energy financing for banks

- Uncertainties about market demand from companies for energy efficiency financing
- Lack of technical expertise for appraisal and risk assessment;
- No specific marketing or financing for such activities;
- Tenors longer than those of normal business lending may be necessary for financing;

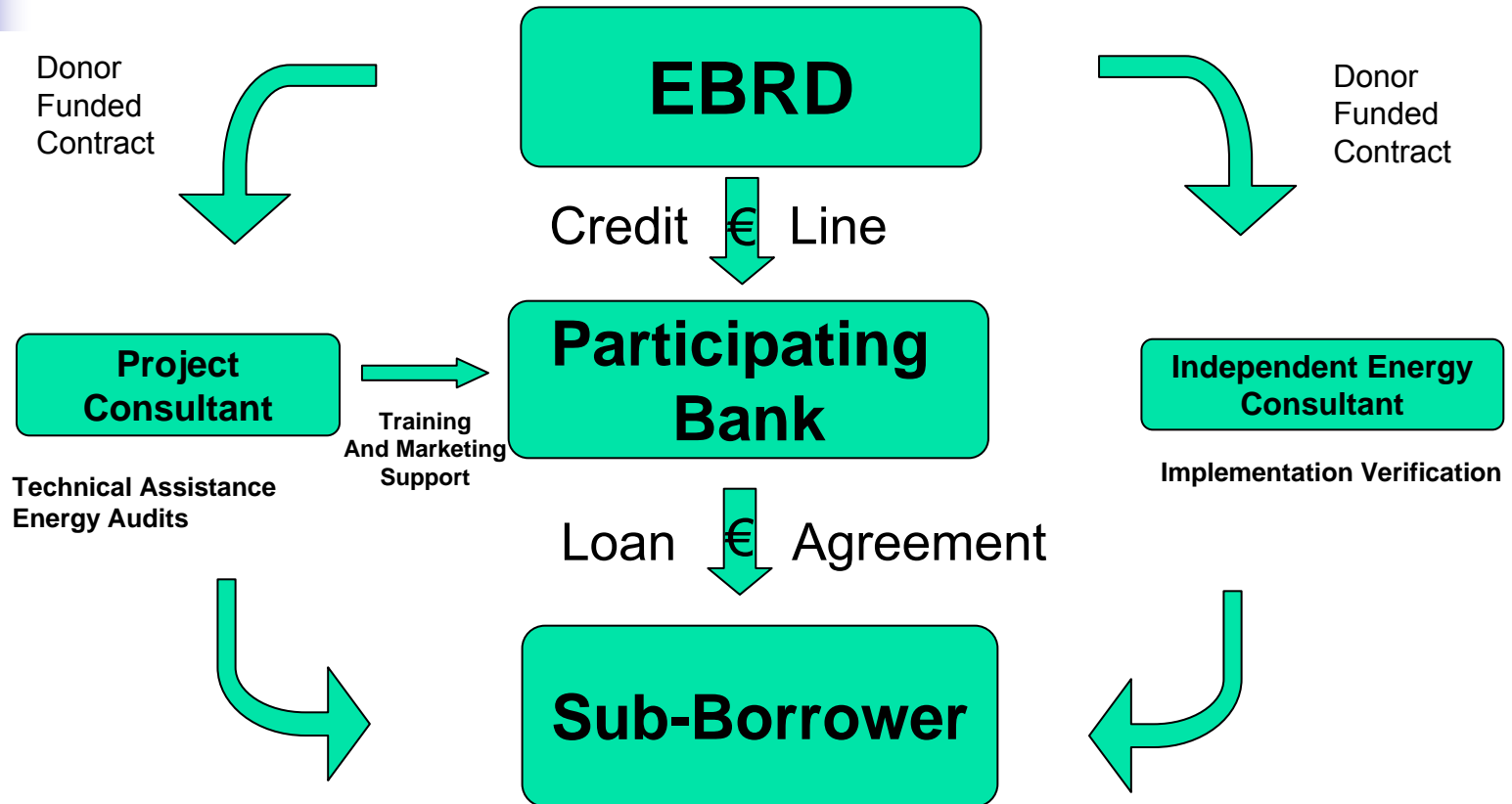
7. Barriers to sustainable energy investments for Sub-borrowers



- Low awareness of energy efficiency.
- Tendency to focus on core business and short term objectives. Expansion investments are perceived as more attractive;
- Uncertainty and lack of information about available options and their financial reward;
- Energy bill as a proportion of cost base may not be high enough for efficiency improvements to be a priority. Future tariff increases or environmental obligations are not taken into account;
- A limited market for energy saving technologies in Moldova;
- The absence of effective support mechanisms for sustainable energy in Moldova;

Energy Efficiency in the Industrial Sector of Moldova

8. Structure of the Moldova Sustainable Energy Financing Facility (MoSEFF) to be launched by ERBD



** Incentive payments paid upon completion of investments to Participating Banks and Sub-borrowers*

Energy Efficiency in the Industrial Sector of Moldova

9. Sustainable Energy Financing Facilities through financial intermediaries

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- Credit lines through partner banks for on-lending to investments in sustainable energy (in case of MoSEFF the focus will be on Energy Efficiency (EE) in industries, agribusiness and commercial buildings as well as Renewable Energy (RE) production).
 - Donor (EU TACIS) funded technical assistance from specialised consultants to Sub-borrowers and Participating Banks
 - Incentive payments paid to Participating Banks and completion fees paid to Sub-borrowers upon successful implementation of eligible investments
 - Successful track record in Bulgaria (€155 million industrial EE and RE framework & €50 million residential EE framework)
 - SEFFs are currently at the implementation stage also in Ukraine (industry), Russia (industry), Georgia (industry and residential), Slovakia (industry and housing associations), Romania (industry), Western Balkans (industry), Hungary and Slovakia (municipalities) and Kazakhstan (industry).

11. MoSEFF Eligibility Criteria

- **For Participating Banks**
 - Subject to the usual EBRD due diligence
- **For Sub-borrowers**
 - Privately owned enterprises, firms, business, sole proprietors or other private legal entities in Moldova
 - Subject to credit approval in line with the Participating Bank's credit process
 - No gambling, real estate, banking, insurance or the manufacture and trade in arms etc.
- **For Investments (Sub-projects)**
 - Projects leading to reduction in energy consumption / improvement of energy performance in industries, agribusiness and commercial buildings
 - Investment up to €2 million and Sub-loan size of €25,000 - €2 million
 - Compliance with national environmental legislations (or relevant EU directives)
 - Minimum performance in energy savings/reduction of CO₂ emission
 - Criteria on minimum IRR- for large projects only (i.e. over €150,000)

12. Examples of eligible Sub-projects



- Rehabilitation and up-grade of heat & power energy systems, boilers, HVAC, MEI, control and automation;
- Process improvements including enhanced control, measurement and metering;
- Rehabilitation of steam distribution systems;
- Installation of new furnaces, kilns, ovens, etc;
- Installation of heat recovery from processes (e.g., economizers, heat recovery, etc.);
- Rehabilitation of compressed air systems (e.g., decentralisation and/or resizing of air compressors, replacing of old air compressors with new efficient ones)
- Rehabilitation of power distribution systems (e.g., replacement of old or oversized transformers, installation of capacitors to reduce reactive power consumption, etc.);



12. Examples of eligible Sub-projects (cont.)

- Refurbishment of heat and power distribution systems: pipelines, cabling;
- Hydraulic balancing of heating and cooling distribution systems;
- Additional thermal insulation of building envelope and technology equipment;
- Installation of new windows and glazing;
- Biomass & Biogas heat only and CHP plants (communal solid waste, waste water, animal breeding manure, agricultural waste)
- Solar thermal installations
- Other “soft” measures: installation of rolling doors or door lockers, etc;

13. Technical Assistance



- **Project Consultant (PC): Fichtner GmbH, Germany**

Consultancy firm working with the Participating Banks and Sub-borrowers to identify and confirm eligible sub-projects, conduct Energy Audits (for large sub-projects) or Energy Performance Assessment (for small sub-projects), assist on loan applications, undertake marketing activities, train loan officers and facilitates optimal uptake and utilisation of the facility.

- **Independent Energy Consultant (IEC)**

Consultancy firm to verify implementation of projects and confirm compliance with eligibility criteria. Necessary for providing incentive payment to Sub-borrowers and Participating Banks.

14. Incentive Payments



For Participating Banks

Fees will be paid to Participating Banks upon disbursement and completion of eligible sub-loans as an incentive to roll-out the facility and to compensate for additional monitoring & reporting requirements during the first two years of the availability period. Fees to participating banks will be paid semi-annually.

- *Following each disbursement the bank receives [up to 2%] *of the disbursed Sub-loan amounts as "Up-front Fees"*
- *Upon successful completion of each Sub-project the bank receives [up to 1%] *of the Sub-loan amount as "Success Fees"*

** The level of Up-front Fees and Success Fees will be substantially reduced for Participating Banks which will join MoSEFF after 1 July 2010*

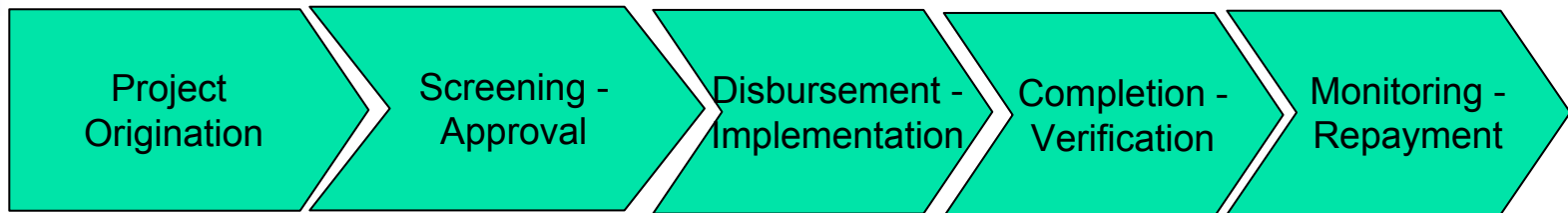
14. Incentive Payments

For Sub-borrowers

Completion Fees as below will be paid to sub-borrowers upon successful completion of eligible investments.

<i>Small EE / RE projects</i> (i.e. investment costs up to €150,000)	<i>10% of Sub-loan amount in general 20%, if Best Available Techniques are used in comprehensive manner</i>
<i>Large EE projects</i> (i.e. investment costs above €150,000)	<i>10 -20 % of Sub-loan amount depending on the level of energy savings/reduction of CO₂ emission</i>
<i>Large RE projects</i> (i.e. investment costs above €150,000)	<i>5-15% of Sub-loan amount depending on the estimated output of clean energy to be generated</i>

15. Project Life-Cycle



Project Consultant	Energy Audit or Energy Performance Assessment (EPA) Eligibility Check	Monitoring, Reporting		
Independent Energy Consultant			Verifies Completion	
Participating Bank	Credit Approval	Receives Up-front Fee	Receives Success Fee	Monitoring-Reporting
Sub-borrower	Loan Application	Implements Sub-project	Receives Completion Fee	Repays loan

16. Eligibility Check and Verification



Eligibility Check by PC

- Small sub-projects (up to €150,000) – Simplified approach based on the pre-approved list of Eligible Products, Components and Systems. PC will prepare EPA and confirm the eligibility within 2 working days from application
- Large sub-projects (above €150,000) – PC will conduct Energy Audit prior to application. PC will confirm the eligibility within 2 weeks from application

Verification by IEC

- Small sub-projects – Desk-based verification with limited spot checking (approximately 10% of sub-projects)
- Large sub-projects – verification through site visit

17. Next Steps on MoSEFF



- Consultants to settle in Moldova (Sept. 2009)
- Commitment of interest from local banks (Sept.-Oct. 2009)
- Loan agreements with Participating Banks (Nov. 2009)
- First projects financed (Dec. 2009 – Jan. 2010)



18. Conclusions on IEE in Moldova

1. Republic of Moldova industry, till the actual crisis, had had a growth rate of about 6% per year, which was mostly due to inflation.
2. In the industrial production output, the absolute largest share is held by food and beverage branches of industry.
3. RM industry's energy intensity is relatively low, thanks to predomination of less or non-energy consuming branches.
4. From energy saving point of view, the following industries present more interest:
 - 15 – food and beverage products,
 - 17 – textile industry,
 - 26 – non-metal minerals products manufacture.



18. Conclusions on IEE in Moldova

5. National Strategies and Programs of economic development in general, and of industry, in particular, pay due attention to energy efficiency
6. Legislation necessary for the respective Strategies and Programs objectives' realization has been developed, but is approved with some difficulties and is inadequately complied with.
7. Insufficient attention is given to enhancing energy efficiency in the Republic of Moldova.
8. A number of impediments are in the face of enhancing energy efficiency in the RM: (a) Managerial – lack of interest from the government, ministries, leadership of some enterprises; (b) Economic – lack of capital, reduced availability of credits, poor investment climate etc.; (c) Psychological – uncertainty caused by the unstable situation in the country and economic crisis, lack of initiative among staff at all levels.
9. MoSEFF to be launched by the end of 2009 by ERBD offers large possibilities to improve the IEE and RES implementation in the Republic of Moldova.



Thank you for your attention !

For more information:

Vasile Scorpan

Email: v.scorpan@yahoo.com

Tel: (+373 22) 23 22 47