

REPUBLIC OF BELARUS

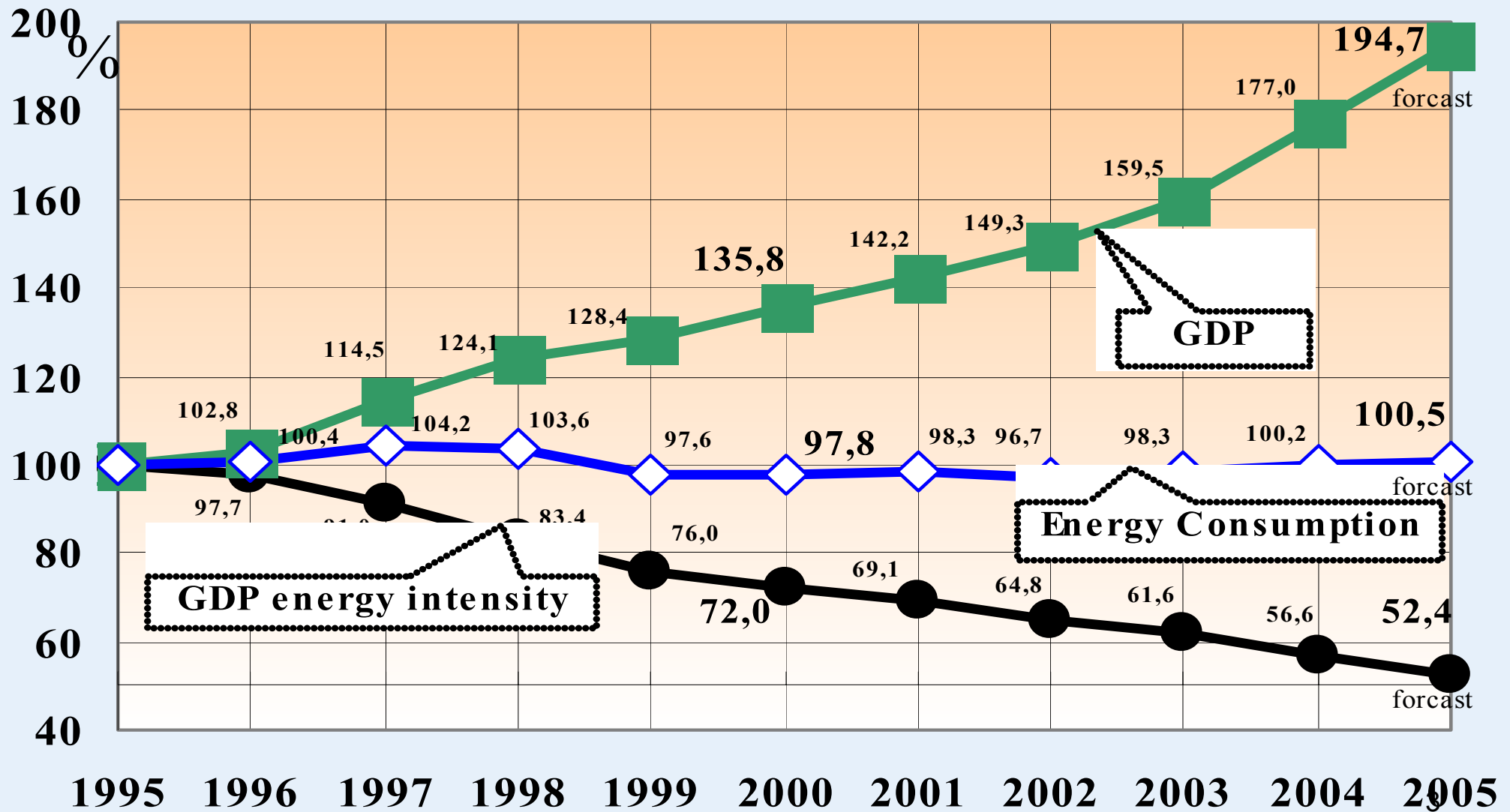
DUBOVIK Lev Antonovich

**The Committee for Energy Efficiency under the
Council of Ministers of Belarus**

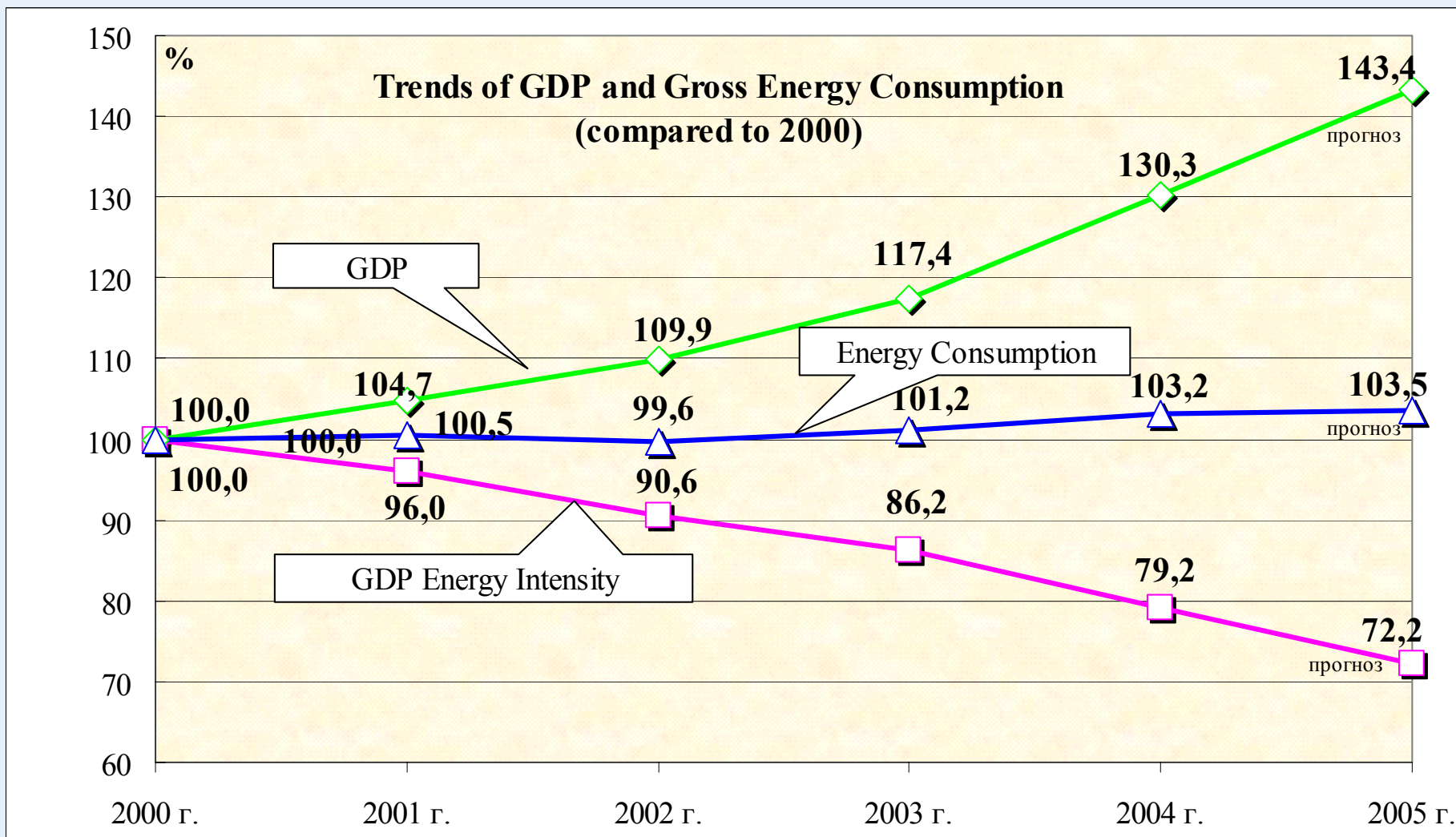
14th Session of the Committee on Sustainable Energy, Geneva, 30 June 2005

Energy Efficiency in the Republic of Belarus

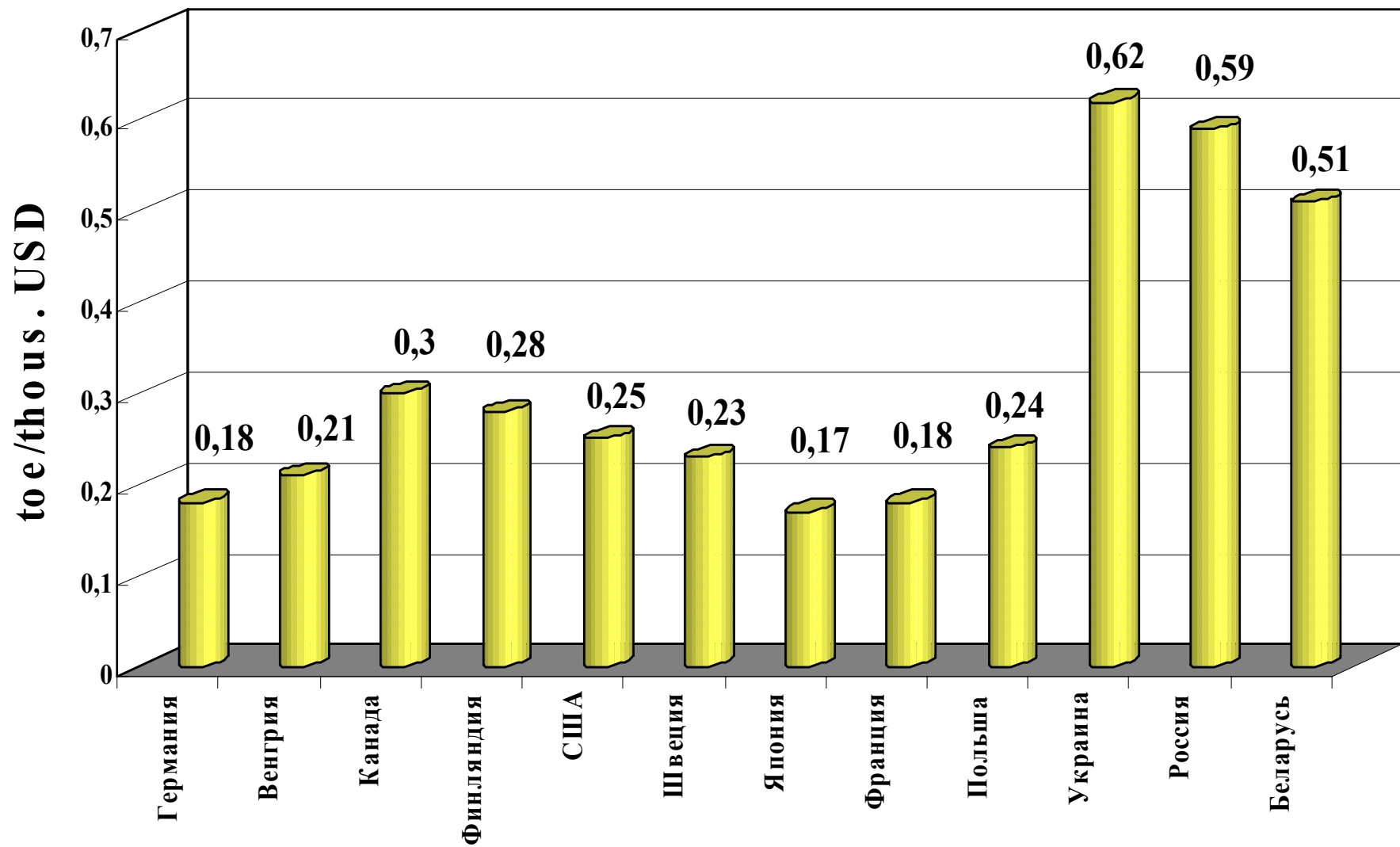
Trends of GDP, Energy consumption and GDP Energy Intensity (compared to 1995)



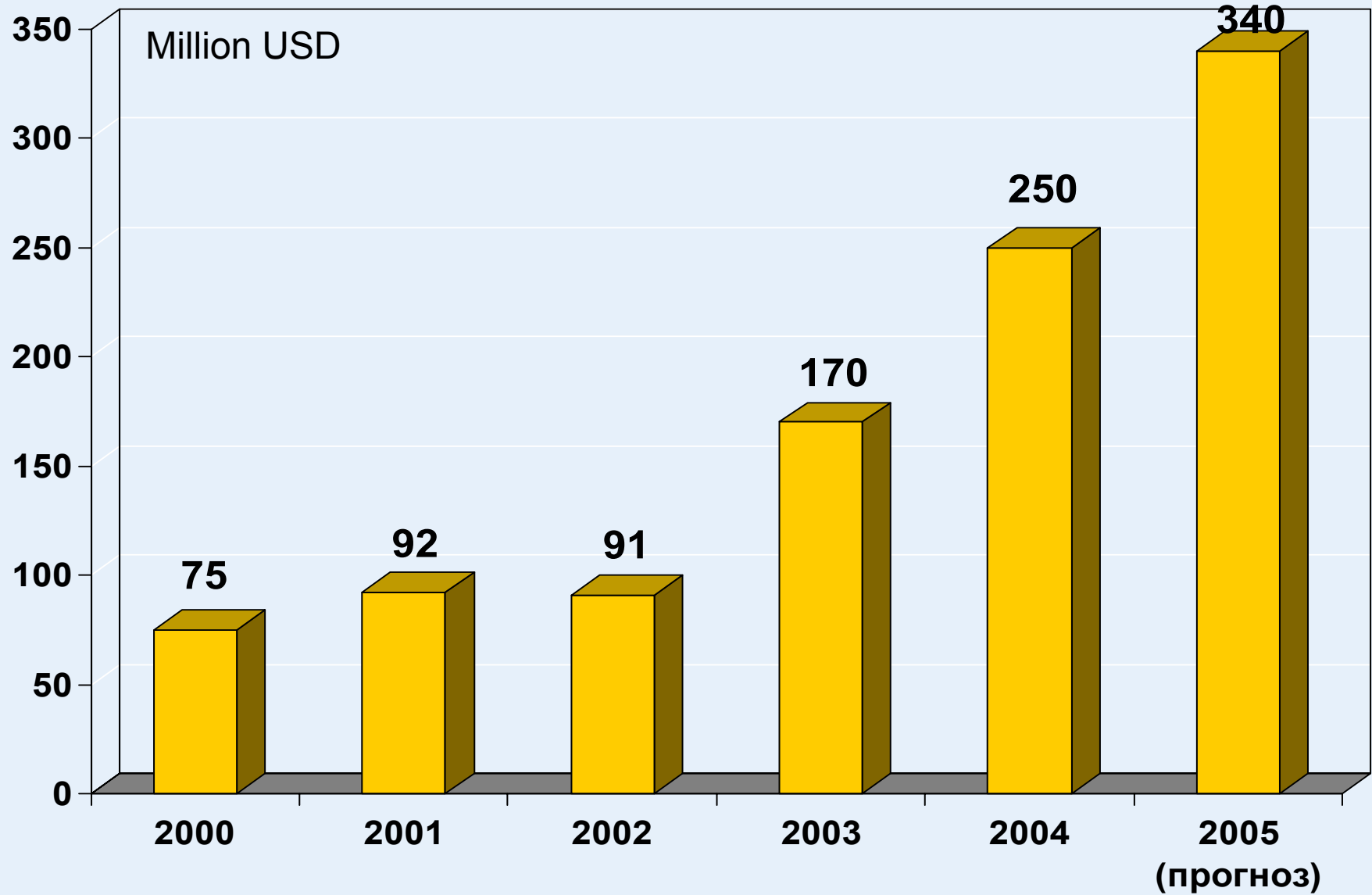
Trends of GDP, and Energy Consumption (compared to year 2000)



Indices of GDP energy intensity for different countries in 2002 (based on data of IEA & UNECE)



Trends of Financing of Energy Efficiency Measures in 2001 - 2005



Main goals aiming Energy Saving and increase of Energy Security of the Republic of Belarus

1. Reduction in 2006-2010 energy intensity of GDP by 25-30 percent compared to 2005 along with GDP growth by 143-151 percent in accordance with:

State complex program of Belarus Energy System production funds modernization and increase of utilization in the Republic local fuel and energy resources for 2006–2010 годы (draft)

2. Ensuring not less than 25% of total heat and electricity production in the Republic by use of local fuels and alternative sources of energy.

Special program of ensuring in the Republic not less than 25% of total heat and electricity production by use of local fuels and alternative sources of energy to 2012 (Council of Ministers Decree N 1680 dated 30.12.2004).

3. Achievement in 2015 the level of GDP intensity close to level of industrialized countries (about 0,3 toe/1000 USD).

Volumes and Sources of Energy Efficiency Funding to year 2010

Source of Funding	Share
Own Funds of Companies	about 35
Energy Efficiency Innovation Fund	about 12
Innovation funds of State Entities and other state institutions	about 23
Central budget and local budget funds	about 20
Loans and other attracted means	about 10
Total	100

Perfection of implementation tools for state policy in energy efficiency

Perfection of institutional and technical activities

- **Republican energy conservation programmes (for 5 years);**
- **Regional and sectoral energy conservation programmes (annual and for 5 years);**
- **Programme of ensuring of 25 per cent of electric and heat power production in Belarus by using domestic fuels and non alternative energy resources up to 2012;**
- **State complex programme of modernization of main production facilities of Belarusian energy system, energy conservation and increasing the usage of own fuel and energy resources for the period of 2006-2010;**
- **Special programmes:**
 - *Программа оптимизации теплоснабжения объектов социальной сферы в сельской местности;*
 - *Программа создания (перевода существующих) мини-ТЭЦ для работы на местных видах топлива на 2004-2006 годы;*
 - *Программа передачи тепловых нагрузок котельных на ТЭЦ.*
- **Programme of energy efficient equipment production.**

Perfection of legislative base of energy efficiency

- 1. Introduction of economical tools to facilitate energy conservation among :
 - organizations of a real sector of national economy;
 - organizations of social and budget sector.**
- 2. State expertise of energy efficiency of design solutions.**
- 3. Law of the Republic of Belarus on renewable energy resources**
- 4. Energy audits of enterprises and organizations.**
- 5. Regulation and assessment of fuel and energy resources consumption.**
- 6. Standardization in energy conservation field.**

Development of cooperation with international financial institutions

- **Implementation of projects with participation of UN ECE, UNDP and GEF :**
 - **“Biomass energy for heating and hot water supply in Belarus”;**
 - **“Removal of barriers to energy efficiency improvements in the state sector in Belarus, PDF B”;**
- **Implementation of the World Bank project “Social infrastructure retrofitting project”.**
- **Preparation of a new World Bank “Post Chernobyl recovery project”.**
- **Implementation of the “Social infrastructure retrofitting project – pilot project on climate change mitigation” within a grant of Japanese Government .**

Priority (main) energy efficiency activities in the Republic of Belarus

- 1. Transmission of heat loads from boiler houses of all kinds of property to CHP.**
- 2. Implementation of frequency converters for variable speed drives.**
- 3. Increase of heat recovery.**
- 4. Implementation of power plants on the basis of steam and gas turbines, gas piston engines..**
- 5. Optimization of heat supply systems, decenralization of big size sources of heat supply, elimination of long distance district heating systems..**
- 6. Ensuring efficient use of power production equipment.**
- 7. Elimination of electric boiler houses, and electric heaters, conversion to local fuels..**
- 8. Substitution of imported fuel (first of all coal and oil) with local fuels.**

Priority (main) energy efficiency activities in the Republic of Belarus

- 9. Replacement of inefficient boilers.**
- 10. Implementation of modern industrial energy efficient technologies.**
- 11. Use of infrared gas heaters for heating..**
- 12. Implementation of energy efficient solutions in agriculture .**
- 13. Elimination of excess pump capacity..**
- 14. Implementation of measures for rational use of cold water..**
- 15. Decentralization of compressor stations and cooling plants , replacement of ammonia refrigerators to freon ones..**
- 16. Implementation of wide scale investment projects on energy efficiency.**

Сравнение эффективности вложения финансовых средств

А) Реконструкция Березовской ГРЭС **Б) Внедрение регулируемого электропривода**

А) Реконструкция Березовской ГРЭС	Стоимость реконструкции	Электр. мощн. после рек-ции	Удельная стоимость доп. введенной мощности (55 МВт)	Удельный расход топлива на отпущенную э/энергию после реконструкции	Годовой отпуск э/энергии	Годовая экономия топлива	Стоимость топлива (газ)	Экономия денежных средств за год	Срок окупаемости
	млн. \$	МВт	\$/кВт	гут/кВт·ч	млн. кВт·ч		млн. \$/1гут	млн. \$	лет
	34	215	618	307	1 720*	$(360 - 307) \cdot 215\,000 \cdot 4\,700^{**} = 53\,557$ тут $(320 - 307) \cdot 215\,000 \cdot 3\,300^{**} = 9\,224$ тут 53 557+9 224 = 62 781 тут	58,3	3,7	9,2
Б) Внедрение регулируемого электропривода	Затраты на внедрение	Электрическая мощность	Удельная стоимость оборудования	Экономия по мощности от внедрения (25%)	Время работы привода	Годовая экономия топлива	Стоимость топлива (газ)	Экономия ден-х ср-в за год	Срок окупаемости
	млн. \$	МВт	\$/кВт	=71 МВт	часов		млн. \$/1гут	млн. \$	года
	34	283	120	283·0,25 =	6000	$71\,000 \cdot 6\,000 = 426$ млн. кВт·ч $426 \cdot 344^{***} \cdot 1,1 = 161\,200$ тут	58,3	9,4	3,6

Примечание:

* - принято время работы агрегата 8000 часов в год (215 000 кВт · 8 000 ч = 1 720 млн. кВт·ч);

** - из общего времени работы агрегата принято, что 4700 ч (59%) вытесняется выработка электроэнергии с удельным расходом топлива 360 гут/кВт·ч и 3300 ч (41%) вытесняется выработка электроэнергии с удельным расходом топлива 320 гут/кВт·ч;

*** - средневзвешенная величина удельного расхода топлива на выработку электроэнергии (360·0,59+320·0,41=344 гут/кВт·ч).

**UNDP/GEF, UNECE,
Committee for Energy
Efficiency,**

«Biomass Energy» Project



Biomass Energy from Wood Waste

Total funding 8,94 млн. \$

including

GEF – 3,37 mill. \$

(including 1,64 mill. \$ – revolving fund)

Committee for EE – 2,2 mill. \$

Sites owners – 3,37 mill. \$



List of Demonstration sites

- 1. Boiler house of private company Volat-1
- 2. Mini CHP at JSC Mostovdrev
- 3. Mini CHP Minskenergo in Vileika town
- 4. Vileika Forestry (collection processing and transportation of wood waste)



Vileika region. Forest residues



First demonstration site of UNDP/GEF Project



**Expected reduction of green house gases
resulted by substitution of fossil fuel
with wood waste**

*1.08 million tones CO_2
during 15 years period*



Thank you for attention!

DUBOVIK Lev Antonovich

The Committee for Energy Efficiency

under the Council of Ministers of Belarus