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INFORSE-EUROPE
International Network for Sustainable Energy

Transition Towards Sustainable Energy – Belarus

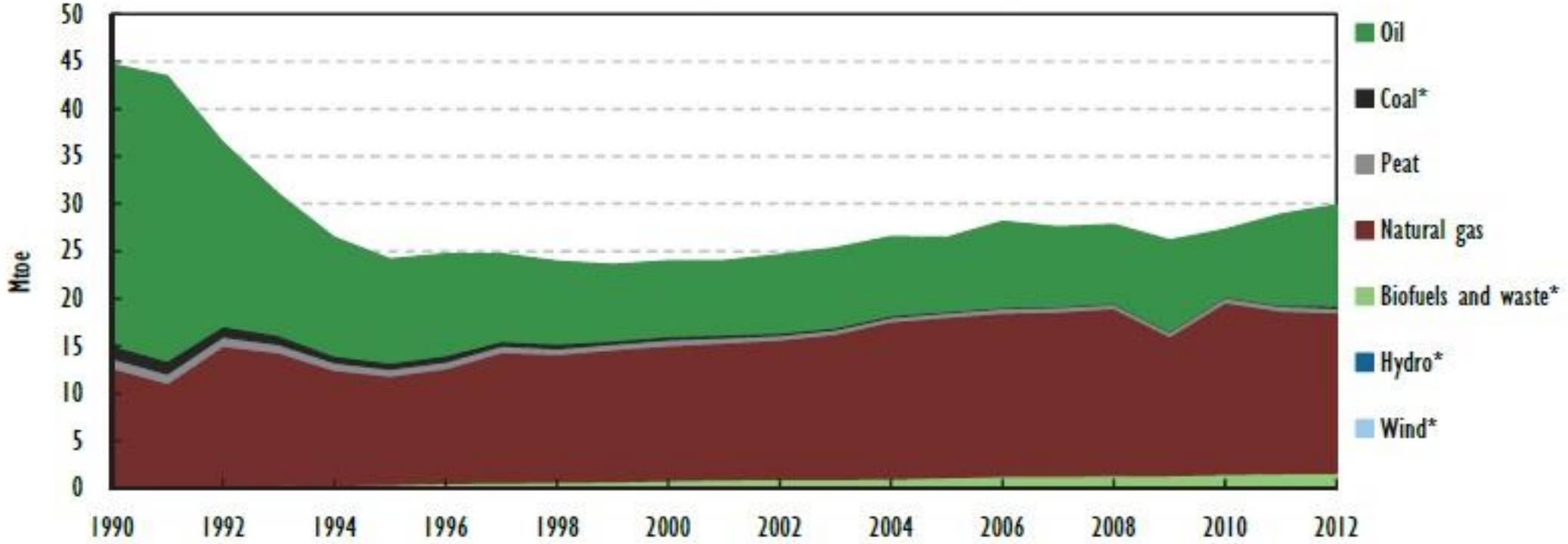
by Dzimitry Buronkin; August 21, 2017
Centre for Environmental Solutions

See the Program and the Proceedings at: http://www.inforse.org/europe/seminar_17_DK.htm

ENERGY SYSTEM OF BELARUS

21.08.2017

BELARUS ENERGY SYSTEM

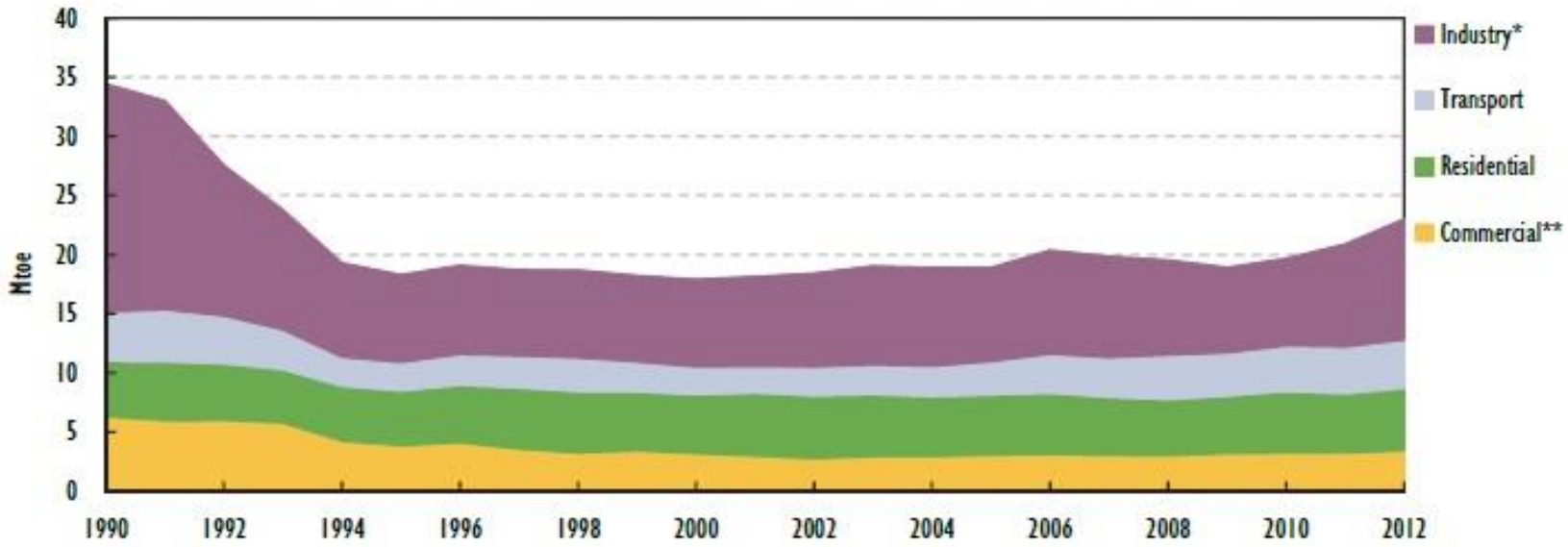


* Negligible.

Source: IEA (2014), *Energy Balances of Non-OECD Countries*, OECD/IEA, Paris.

BELARUS ENERGY SYSTEM

Belarus imports most of resources (mainly from Russia).
Crude oil imports amounted to 21.3 Mtoe, oil products 6.7 Mtoe (78% from Russia),
Gas imports were 20.3 billion cubic metres (90% of electricity) and originated from Russia. Gas imports have increased by 15.3% compared to 2002



* *Industry* includes non-energy use.

** *Commercial* includes commercial and public services, agriculture/fishing and forestry.

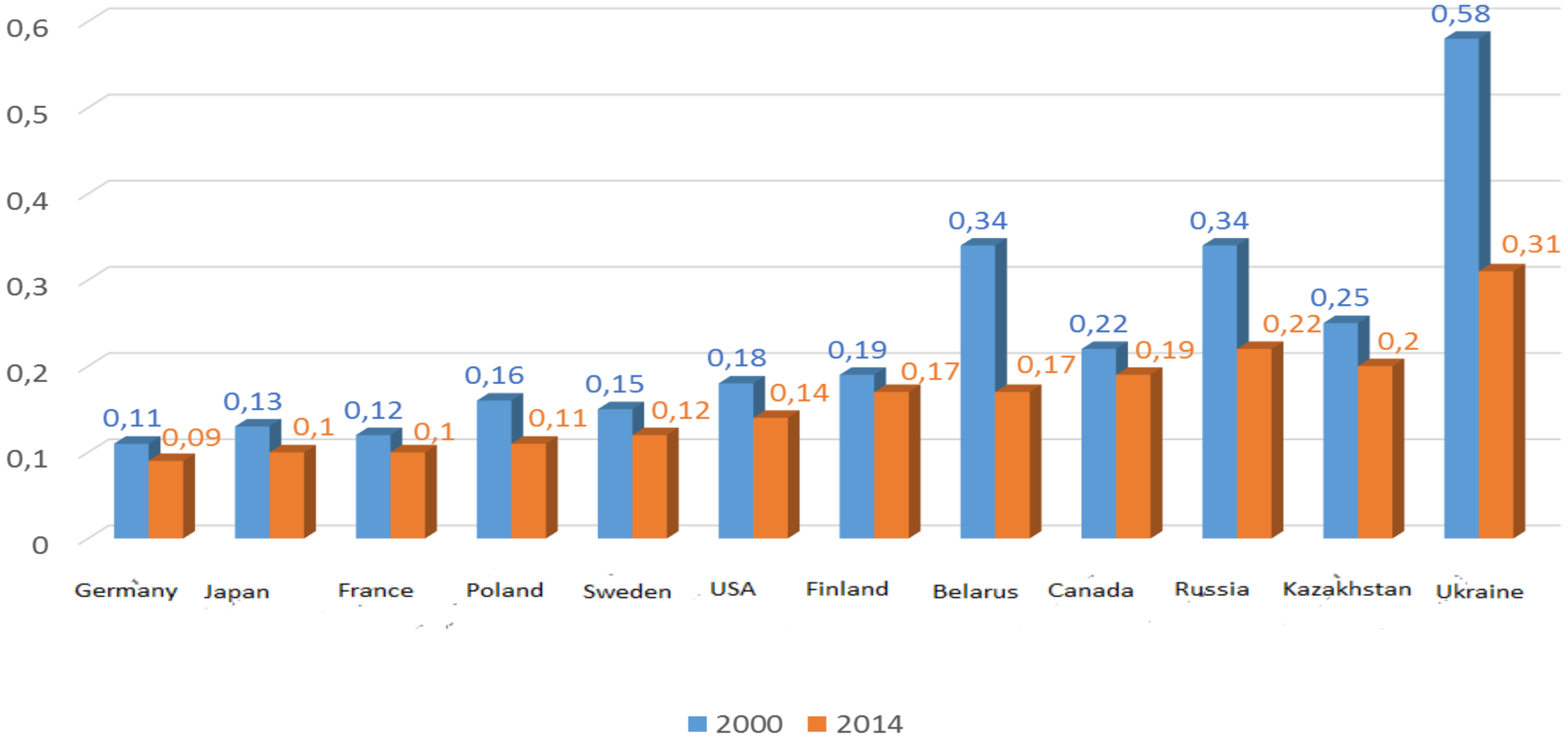
Source: IEA (2014), *Energy Balances of Non-OECD Countries*, OECD/IEA, Paris.

Total final consumption of energy was 23 Mtoe in 2012, made up of the industry sector (44.4%), residential (23%), transport (17.7%) and services sector (14.9%)

BELARUS ENERGY SYSTEM

- In fact, the whole system, with the exception of block stations, belongs to the State Enterprise "Belenergo“
- About half of the energy is produced at the CHP (CHP), which, on the one hand, raises the fuel utilization factor, on the other hand complicates the regulation because the CHP plants must work according to the demand schedule for heat energy
- It is started the construction of a nuclear power plant
- A significant share of heat is also produced from natural gas because of economic feasibility and availability (129 USD for thousand m3)
- At the state level, peat is considered a local type of fuel and its use is encouraged.

ENERGY INTENSITY OF GDP (2014)

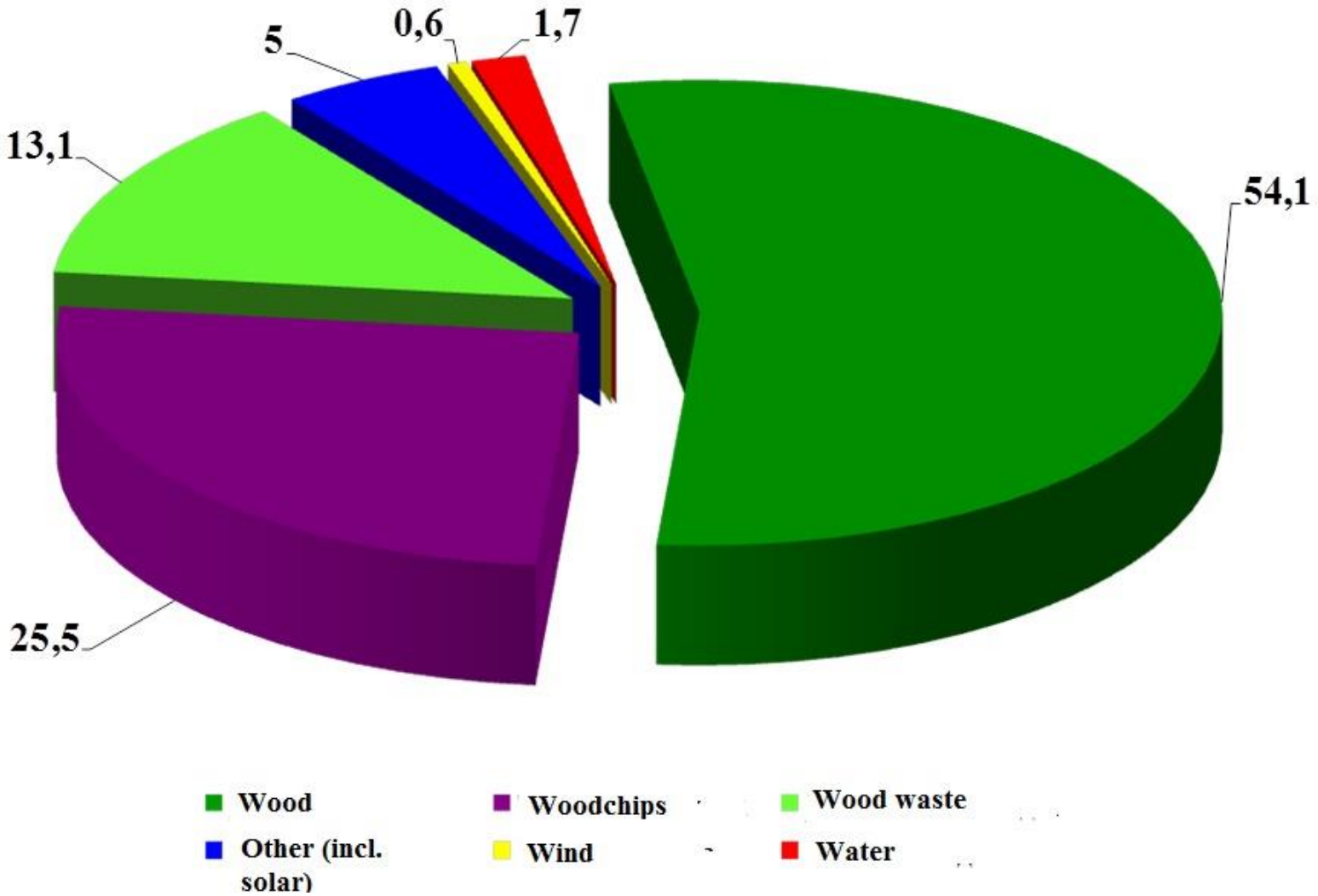


Share of renewables in total consumption of and % of renewables in the total production of electricity in 2015

Country	% to consumption of resources	% to the total production of electricity
Belarus	5,5 % (01.01.2016)	0,8 % (01.01.2016)
Germany	11,3 %	27 %
Austria	30 %	82 %
Denmark	26 %	56 %
Latvia	36 %	55 %
Finland	29 %	39 %
France	8 %	17 %
Czech	9 %	12 %
Sweden	36 %	56 %

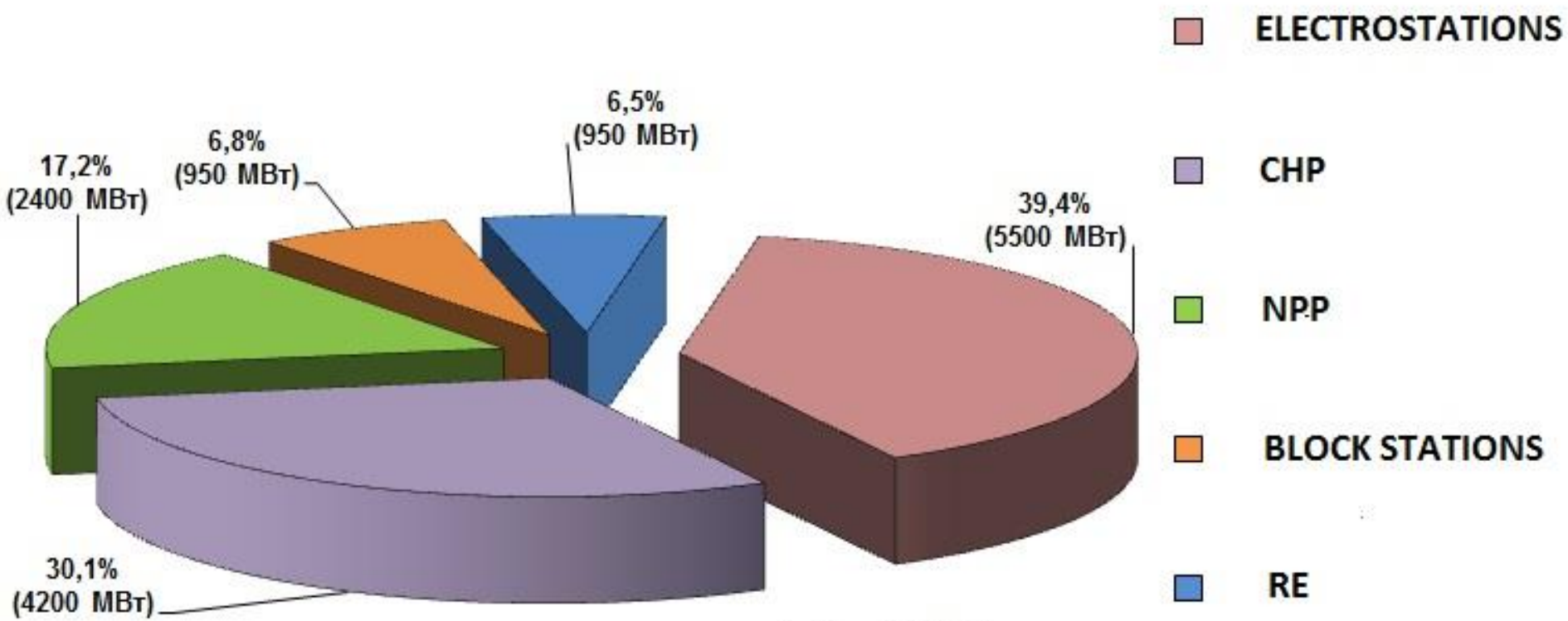
Source: European Commission. EU energy in figures. Statistical pocketbook 2016.

BALANCE OF RENEWABLES (2015)



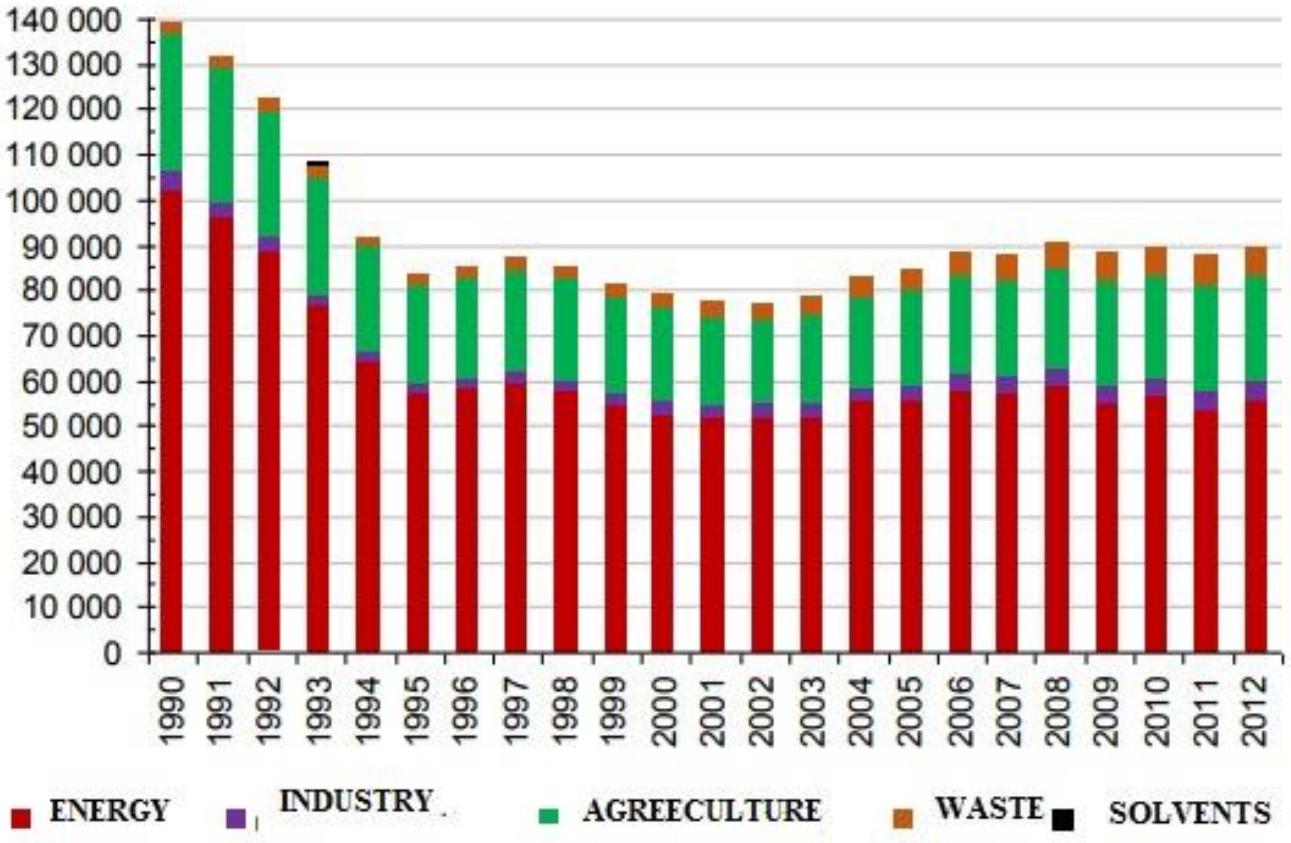
OFFITIAL PLAN TILL 2020

2020



∑P=13950 MBm

CO2 EMISSIONS IN BELARUS

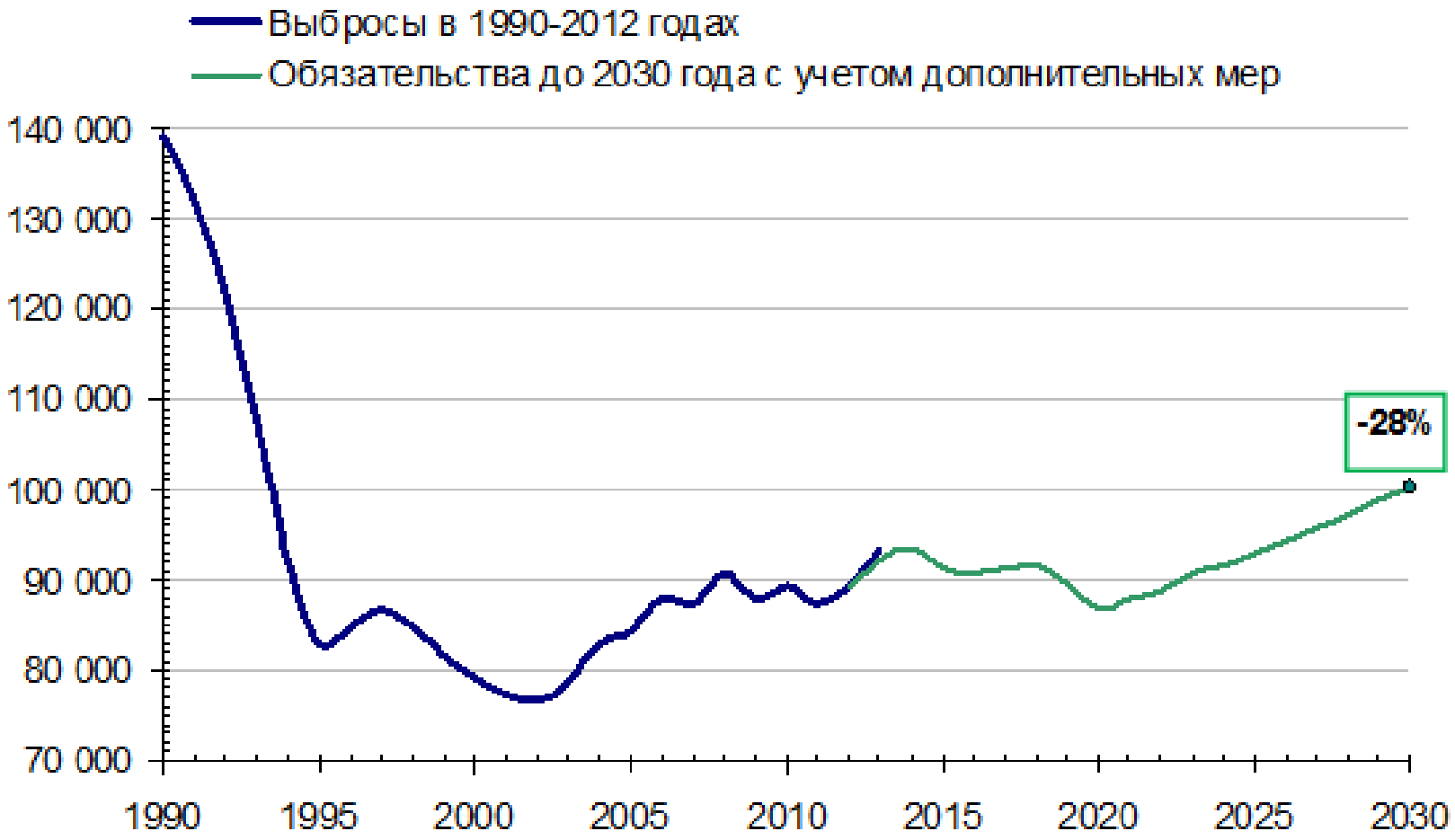


TOTAL EMISSIONS : 89283,33 thousand tons

EMISSIONS PER CAPITA: 9,39 tons

EMISSIONS PER CAPITA IN ENERGY SECTOR : 5,89 tons

PLANS TO DECREASE EMISSIONS (INDS)



According to Belarusian INDC (-28% from 1990) emissions in 2030 should be 100188,886 tones CO2. But actual emissions are 89283,33. SO INDC of Belarus is not very ambitious and suggests increase of emissions for about 8%

COVENANT OF MAYORS IN BELARUS

Ashmyany, BY	31,190	2020	
Beryoza, BY	64,217	2020	
Braslau, BY	26,324	2020	
Brest, BY	340,141	2020	
Bykhov , BY	29,753	2030 ADAPT	
Chavusy, BY	18,545	2020	
Gorodok, BY	12,186	2030 ADAPT	
Hlybokaye, BY	37,712	2020	
Ivie, BY	24,758	2030 ADAPT	
Klichev , BY	15,148	2030 ADAPT	
Kobryn, BY	85,928	2020	
Korma, BY	7,610	2030 ADAPT	
Krasnapollie, BY	9,713	2030 ADAPT	
Masty , BY	28,554	2030 ADAPT	
Mogilev, BY	378,077	2030 ADAPT	
Novogrudok, BY	46,098	2020	
Orsha, BY	158,290	2030 ADAPT	
Polotsk, BY	108,643	2020	
Pukhovichi district, BY	65,984	2030 ADAPT	
Rogachev, BY	58,331	2020	
Sharkovshchina, BY	15,453	2030 ADAPT	
Slavgorod, BY	13,238	2030 ADAPT	
Vetka, BY	17,776	2030 ADAPT	
Vileyka, BY	48,102	2030 ADAPT	
Vitebsk, BY	376,226	2030 ADAPT	

25 cities (and districts)

TOTAL POPULATION – 2, 020 Mil people

EVERY 5th person in BELARUS live in the city which joined Covenant of Mayors

10 Cities (817 thousand people) already provided SEAP

BUT

In cities with already provided plans live 8,6 % of total population but they declared only 1,73% of Emissions.

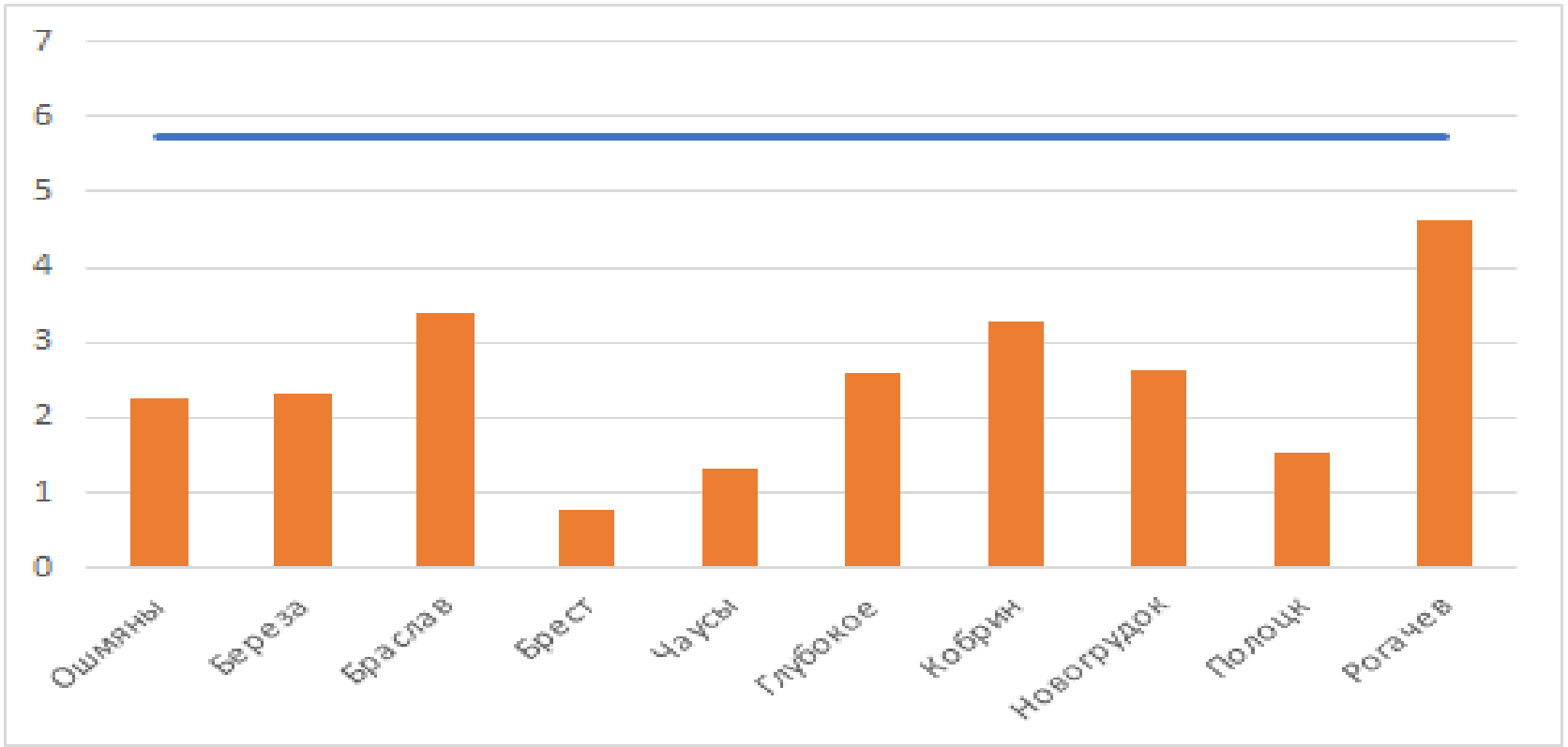
Cities declare not all the emissions but only the sectors, which they can influence.

AMBITIONS OF BELARUSIAN CITIES

EMISSIONS PER CAPITA: 9,39 tons

EMISSIONS PER CAPITA IN ENERGY SECTOR : 5,89 tons

AVERAGE EMISSIONS IN CITIES WITH SEAP PER CAPITA: 1,89 tons



Reasons for this situation

1. There is no requirement to cover all known consumption (incl. agriculture and industry)
2. No methodologies for estimating consumption in sectors where statistics are not available (personal transport)
3. The minimum requirement to reduce (-20%) stimulates cities not to show sectors of the economy in which it is difficult to achieve the required reduction in consumption
4. SEAP analysis shows inconsistency between the data submitted.
5. There is no national requirement to calculate emissions

POTENTIAL OF COVENANT OF MAYORS IN BELARUS

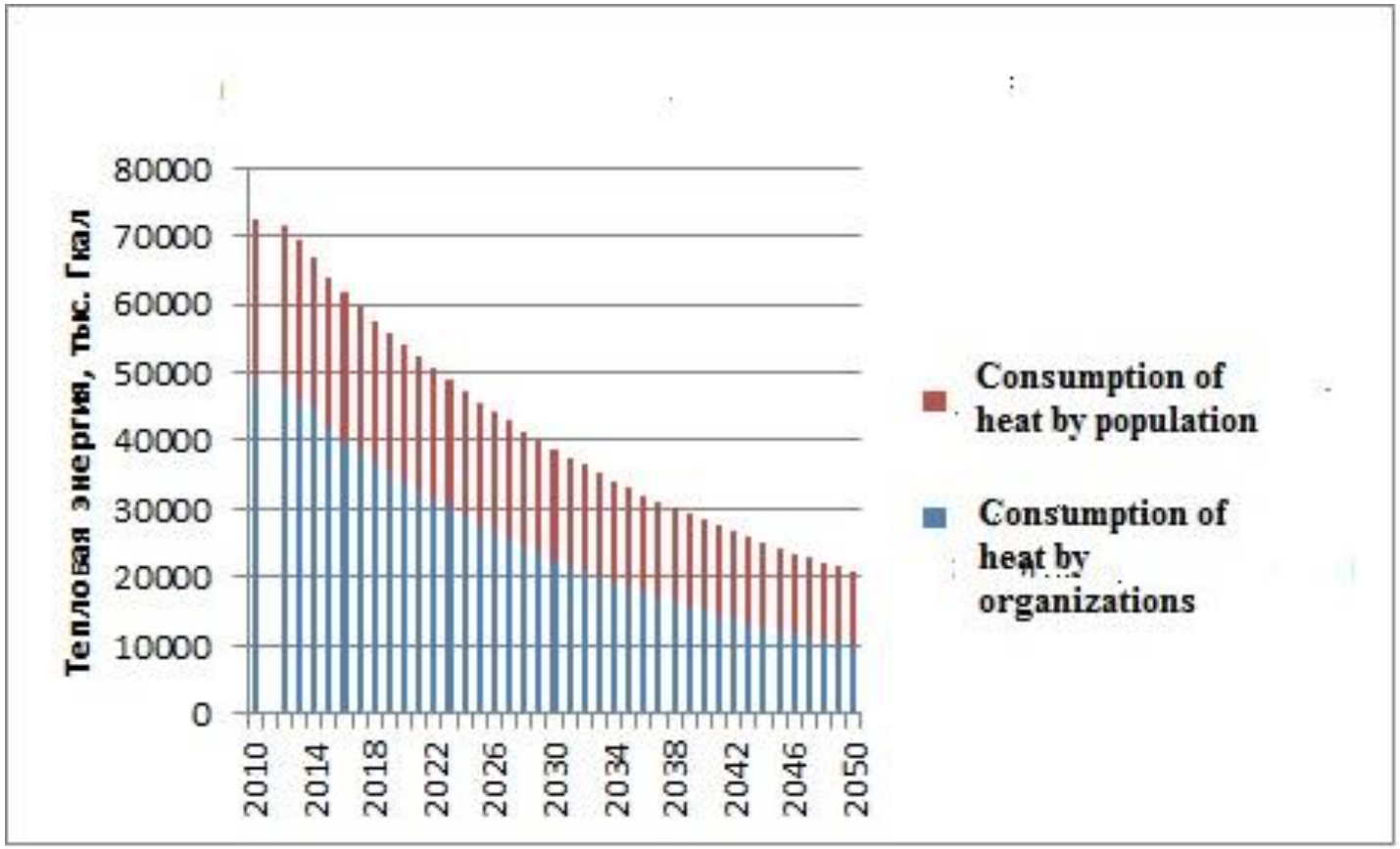
	% of reduction from total emissions		
	at the rate of 1,89 tons per capita	at the rate of 3,09 tons per capita	at the rate of 5 tons per capita
ONLY THE CITIES, WHICH ALREADY SIGNED	1,3	2,1	3,4
50% OF CITIES (EXEPT MINSK)	2,2	3,68	5,96
100% OF CITIES (EXEPT MINSK)	4,5	7,36	11,92

10639,50 thousand tons of CO_2 is the potential

DEVELOPMENT SCENARIO

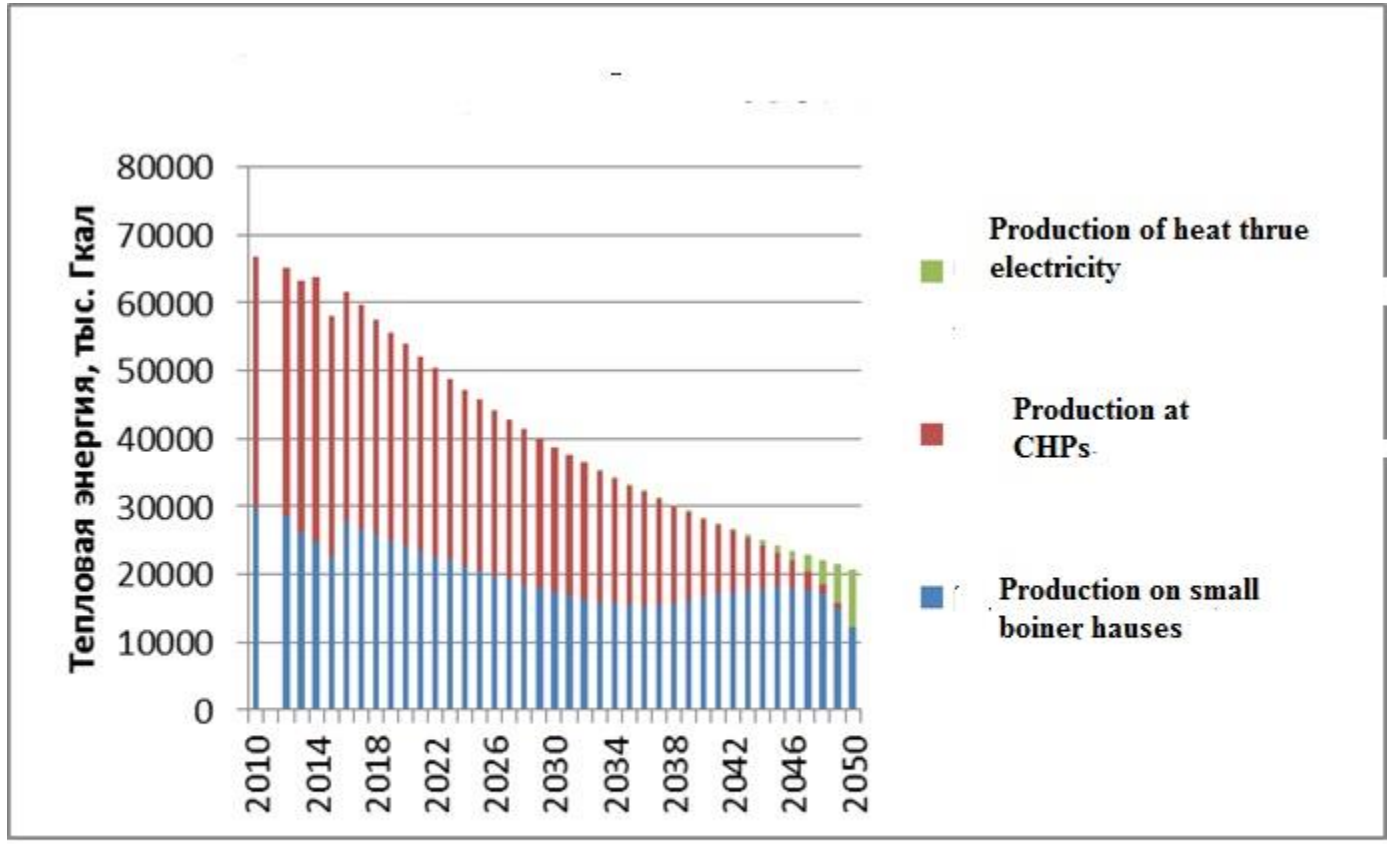
- The scenario involves the transition to almost fully (except NPP) provide the energy needs from renewable energy sources.
- The main trends that were laid in the scenario were economic growth, insignificant (within the limits of inflation growth in the cost of gas and oil), growth in GDP and growth of the population of the republic

CONSUMPTION OF HEAT



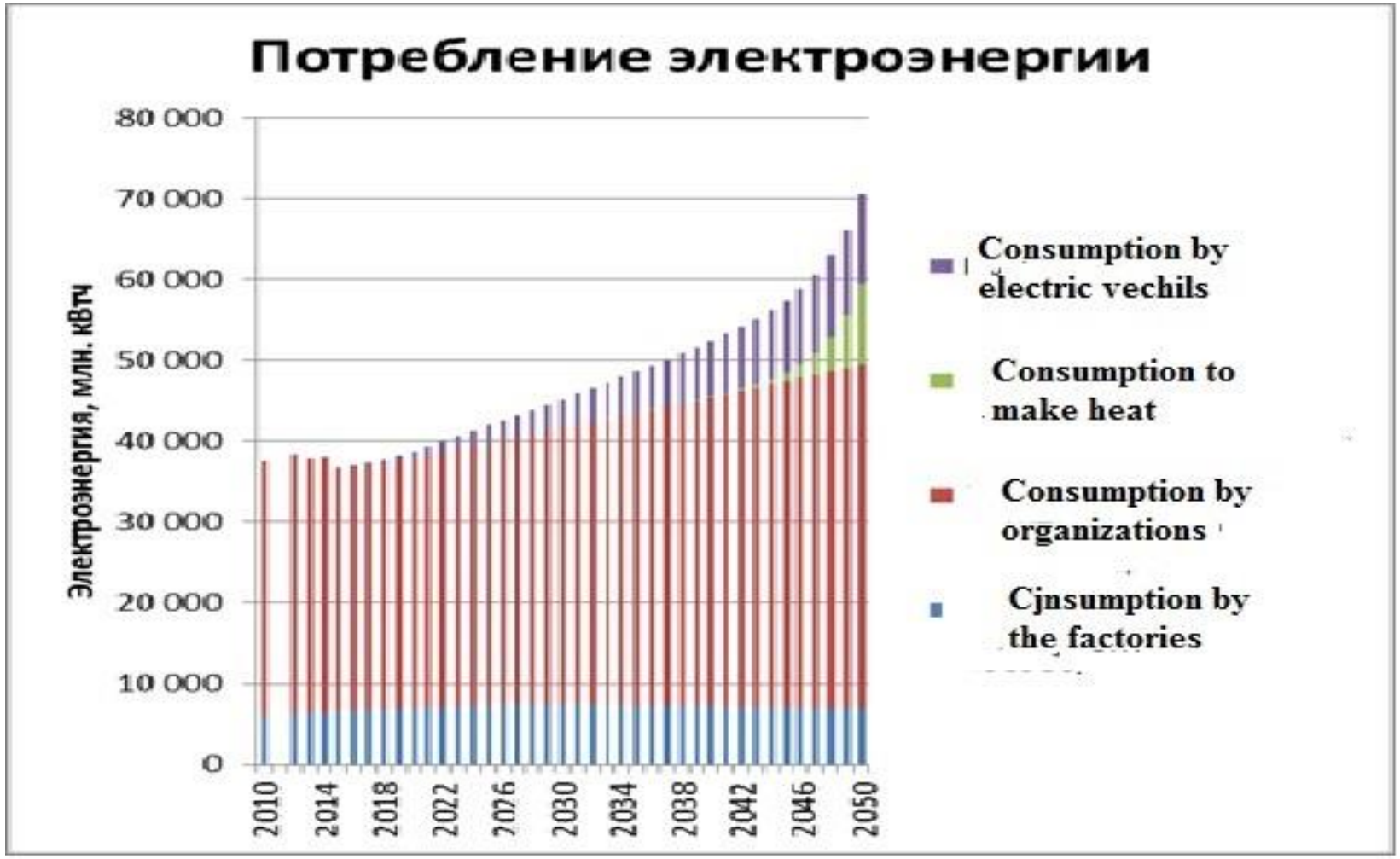
The consumption of heat is reduced as a result of the introduction of energy-saving measures and replacement of thermal energy by electric

PRODUCTION OF HEAT



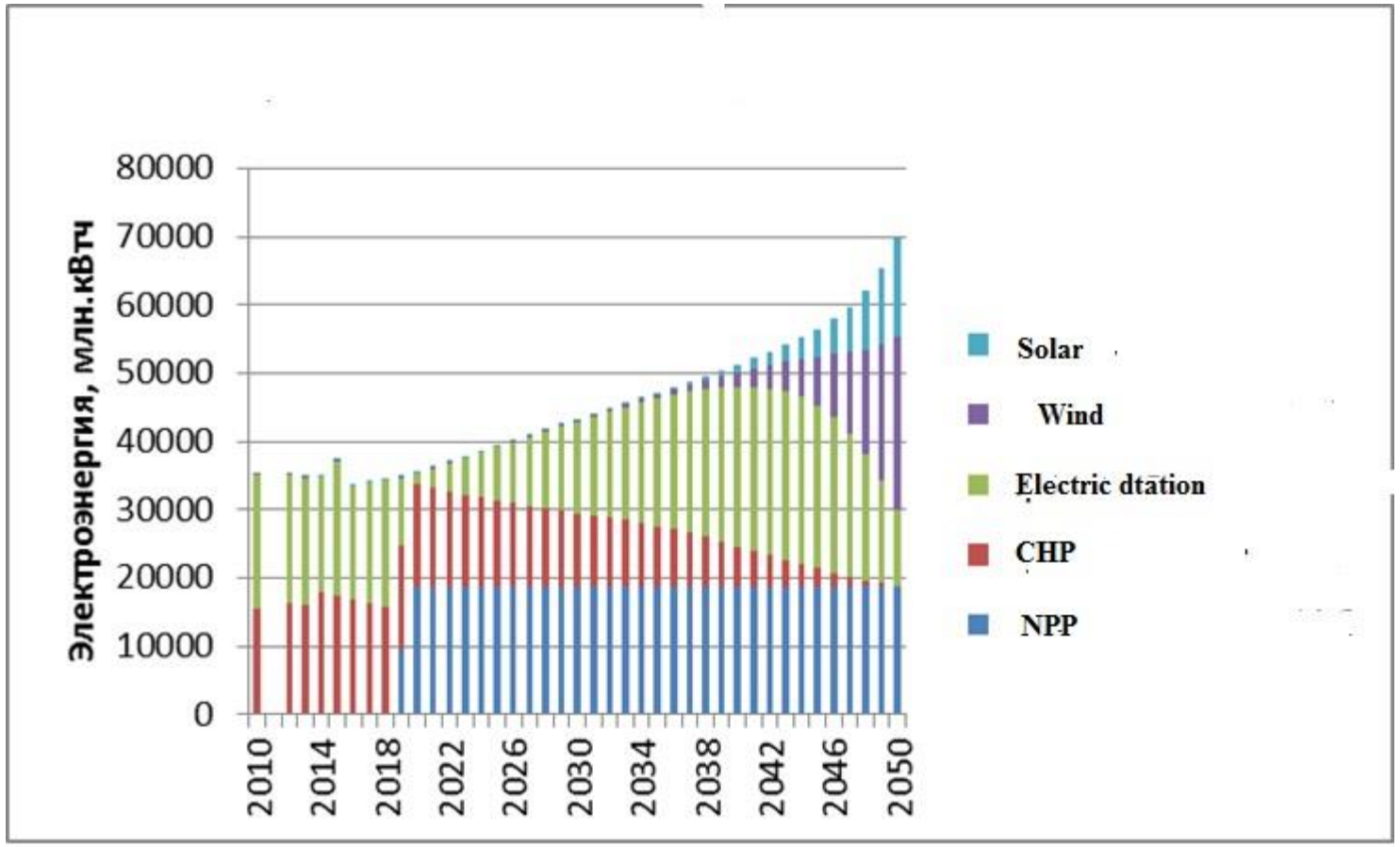
There is a decrease in the generation of thermal energy at CHPPs and boiler houses. The growth in output in boilers in the 2040s is explained by the outstripping transfer of boiler houses in district centers from natural gas to wood fuel

Consumption of Electricity



The increase in electric consumption is due to three drivers - economic growth and advisory consumption growth, substitution of thermal energy for electricity, use of electricity in transport (for electric vehicles)

PRODUCTION OF ELECTRICITY



After 2020, the nuclear power plant is introduced. The share of CHPP is reduced due to a decrease in demand for thermal energy and the share of CHP in this demand. After 2030, electricity production for renewable energy becomes more economical.

THANK YOU

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Transition Towards Sustainable Energy – Denmark

by Gunnar Boye Olesen; August 21, 2017
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