



«Reducing environmental footprint through energy efficiency and application of renewables in Belarus»

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Legislative framework for green economy, improving energy efficiency and the use of renewables in the Republic of Belarus

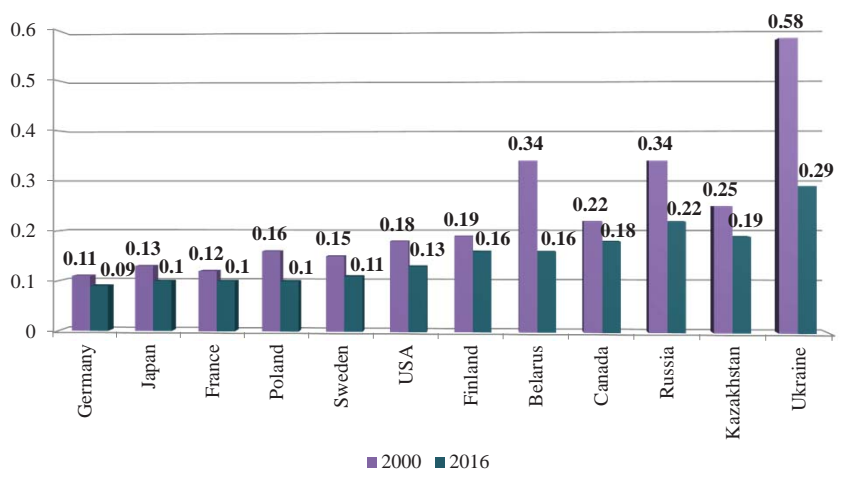
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1. National Plan of Action on Green Economy until 2020 adopted in 2016 includes:
 - energy efficiency in buildings;
 - re-use of wastes;
 - e-mobility;
 - increasing application of renewables.
2. Law on Energy Saving of 8 January 2015
3. State Programme «EnergySaving» for 2016-2020.
4. Law on Renewable Energy Sources of 27 December 2010
5. Decree of the President on Use of Renewable Energy Sources of 18 May 2015 r. №209 (establishing quotas and Feed-in-Tariffs)

Energy policy targets of the Republic of Belarus

Indicator	2016-2018 (achieved)	2016-2020	2025
GDP energy intensity decrease, %		-1,6	-4,6
Share of locally produced primary energy to total energy consumption, %	15,5	16	17
Share of renewables to total energy consumption, %	6,1	6	7
Saving of fuel energy resources due to implemented measures, Mtce	3100	5000	

World GDP energy intensity in 2016
(in 2010 year prices by purchasing-power parity) according to IEA
(World energy balances 2018)



Construction of renewables, 401 MW of installed electric capacity as of 01.01.2019

51 hydro power plants (95 MW)



Vitebsk HPP 40 MW

55 solar stations (156 MW)



Solar Station «Belarusneft», 56 MW, Gomel region

96 wind turbines (100 MW)



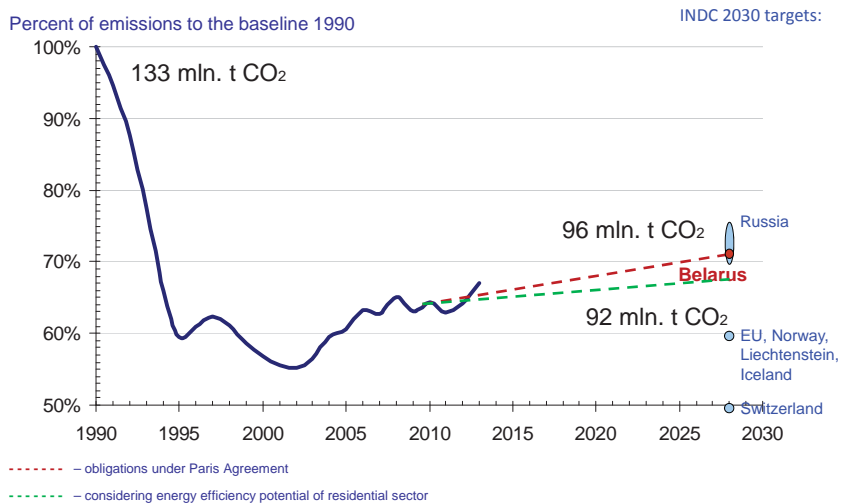
Wind power farm «Grabniki», 9 MW, Grodno region

25 biogas complexes (32,9 MW)



Biogas complex «Rassvet», 4,8 MW, Mogilev region

Obligations under Paris Agreement – achieve 28 % reduction of CO₂ in 2030 to the baseline of 1990



Residential sector – about 10 % in the structure of CO₂ emission
Measures on energy efficiency in residential sector built before 1996 will allow:

- achieve 50 % of energy consumption in these block of flats
- reduce 3,11 mln. tons of CO₂ emissions annually

UNDP project «Improving Energy Efficiency in Residential Buildings in the Republic of Belarus» – 4,5 mln. \$. (2012-2018).



Block of flats for 180 families in Mogilev



Thermal energy consumption, in kWh/m² per year:
For heat and ventilation 25 (against 40-50 in the best local practice)
For hot water supply 20 (against 80-90 in best local practice)



EU project «Developing an Integrated Approach to a Stepped-UP Energy Saving Programme» for schools and kindergartens, 2 mln. Euro (2013-2017).



Solar collectors in machinery college in Vitebsk



Waste heat recovery in kindergarten № 6 in Oshmiany, Grodno region



Energy efficient equipment in the kitchen, school № 4 in Dzerzhinsk, Minsk region



Thermal insulation and double-glazing in kindergarten № 45 in Grodno»

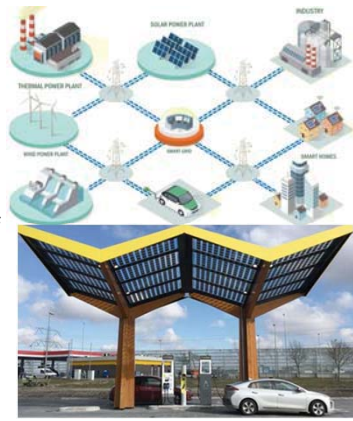
Accumulation of electricity and sector coupling

Coupling of electricity and transport sectors – to be introduced with the use of electricity in a short term perspective

Issues of balancing at electricity market and «smart» charge for electric vehicle

Integrated response management due to digitalization

Integration of renewables into the grid with the use of digitalization



Program on Establishing a National Electric Vehicle Charging Stations (2018) emphasizes:

- installation of 1304 electric charging stations along highways and in cities by 2030
- application of batteries (1 MW) at charging stations
- the network of electrical charging stations will be integrated by software and operated by PA “Belarusneft”

Two models of electric buses assembled at Belarusian plant «Belcommunmash»

Electrobus model E433 “VITOVТ MAX ELECTRO” – is three-axle low-floor linked type of vehicle, which is equipped with the supercapacitors enable to overcome the route off-line, charging on the route terminals.

- Passenger capacity, people 153
- Number of seats 38
- Unladen weight of electrobus, ready for operation 17,600
- Maximum mass, kg 28,000
- Continuous output of electric motor, kW 160
- Maximum speed, km/h 60



Electrobus E420 “Vitovt Electro”

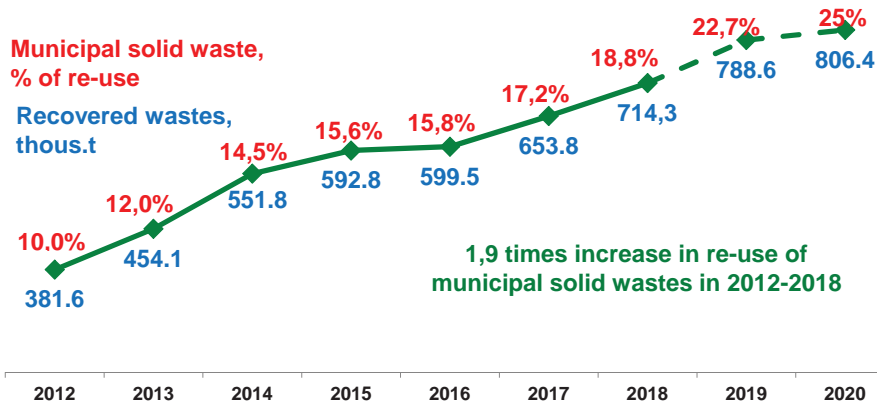


Electrobus E433 “Vitovt Max Electro”



Results for collection of recovered wastes

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- National Strategy for Management of MSW and Recovered Fuel until 2035
target for municipal solid waste re-use is 50 % by 2035
- Concept for Development and Production of Solid Recovered Fuel from Municipal Solid Wastes (2016)
- Concept for Creation Infrastructure and Landfills for Municipal Solid Waste Separation and Re-use until 2030 (due in 2019) – requires 451,6 mln.€

Directions for further cooperation

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- application of green bonds in terms of attracting investments to implement the National Energy Saving Program 2016-2020;
- thermal renovation and construction of energy efficient buildings;
- energy storage and integration of renewables into the national grid with the use of digitalization;
- e-mobility and promotion of infrastructure for electric vehicles;
- wastes recovery and energy efficiency

Thank you for your attention!