Біоенергетична асоціація України

Development and Prospects of Bioenergy in Ukraine

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We are greening the energy!

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UABio Members

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LLC “Salix Energy”

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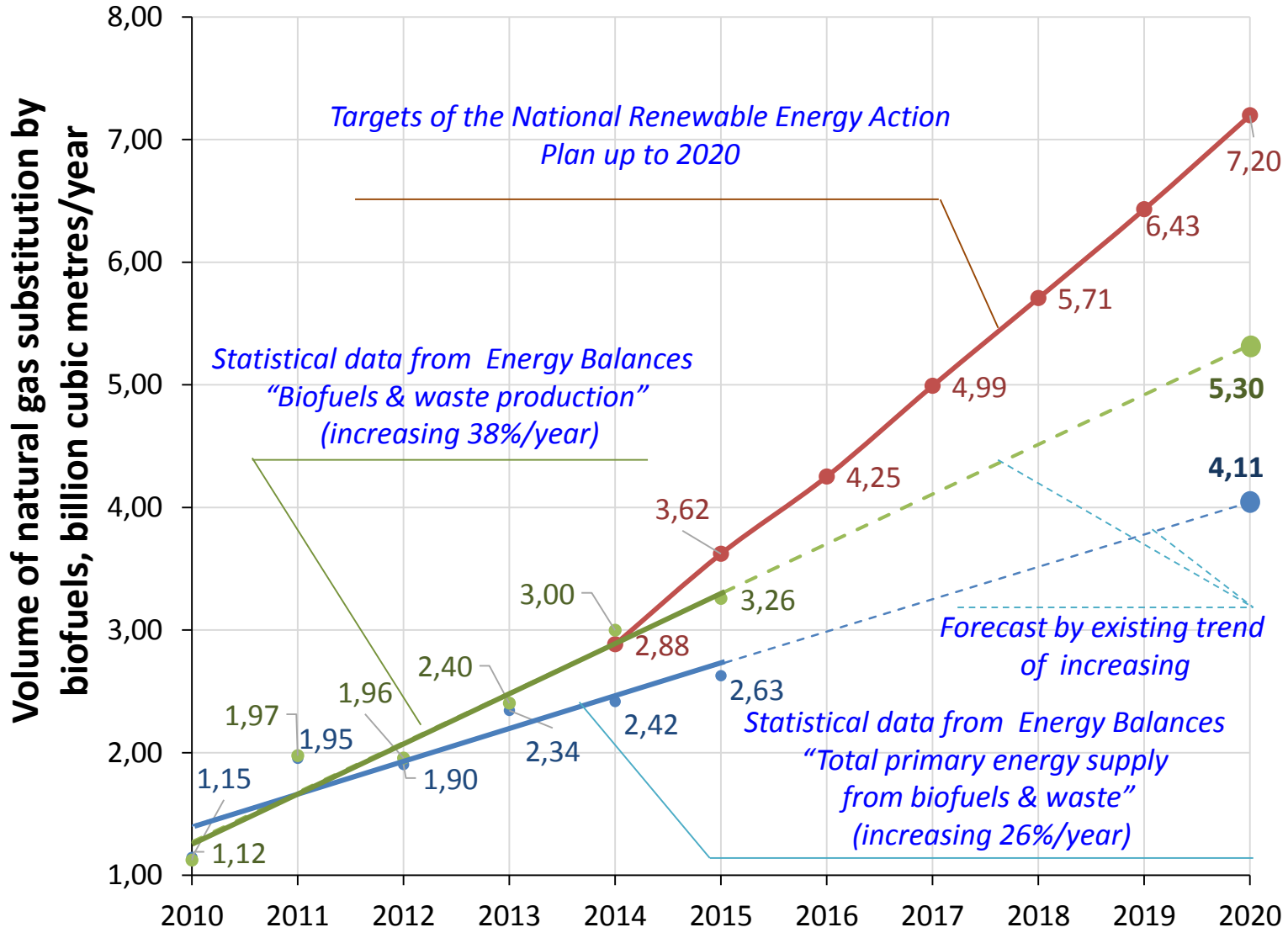
LLC “Smilaenergopromtrans”

LLC “ETPC “ENERGYDESIGN”

LLC “Metropoliya Science and Technology Company”

Physical persons: Maraykin R., Petrov Ya., Ilchuk M., Bereznytska M., Savytsky O.

Trends of bioenergy development in Ukraine



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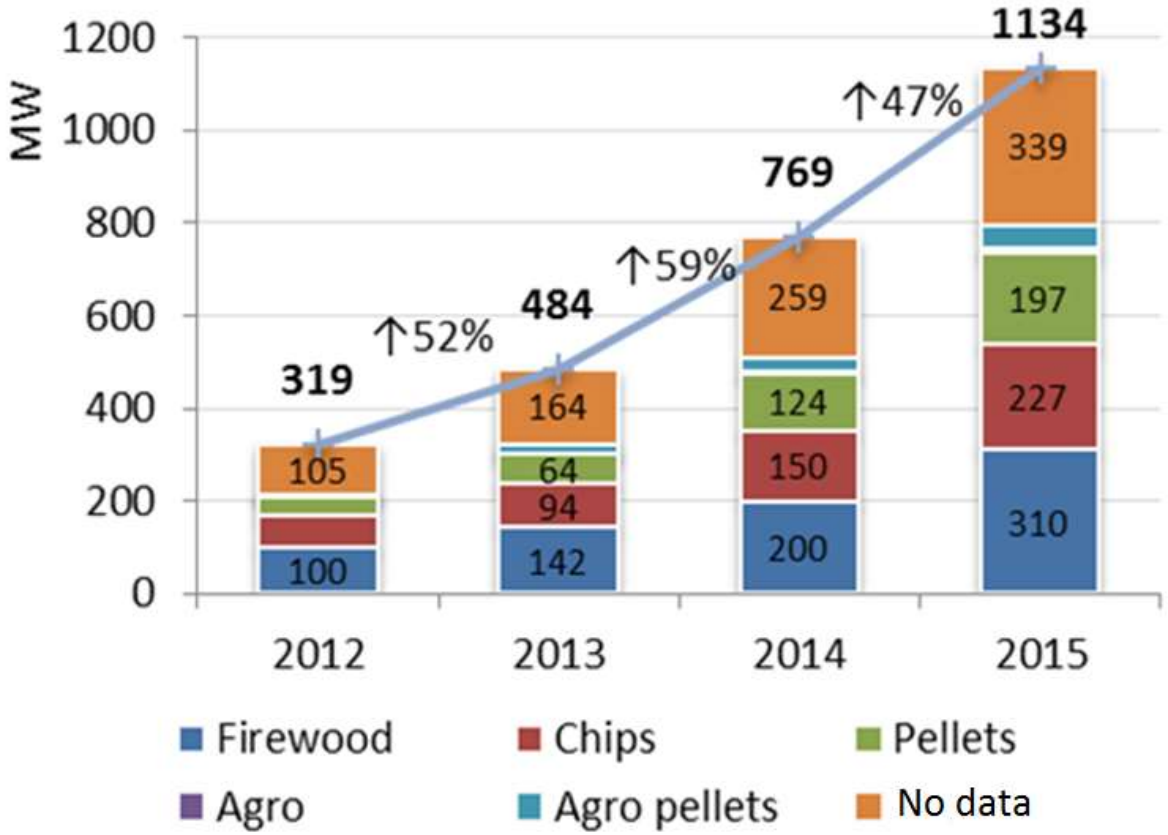
Total installed capacity of biomass boilers in district heating systems of Ukraine, MW



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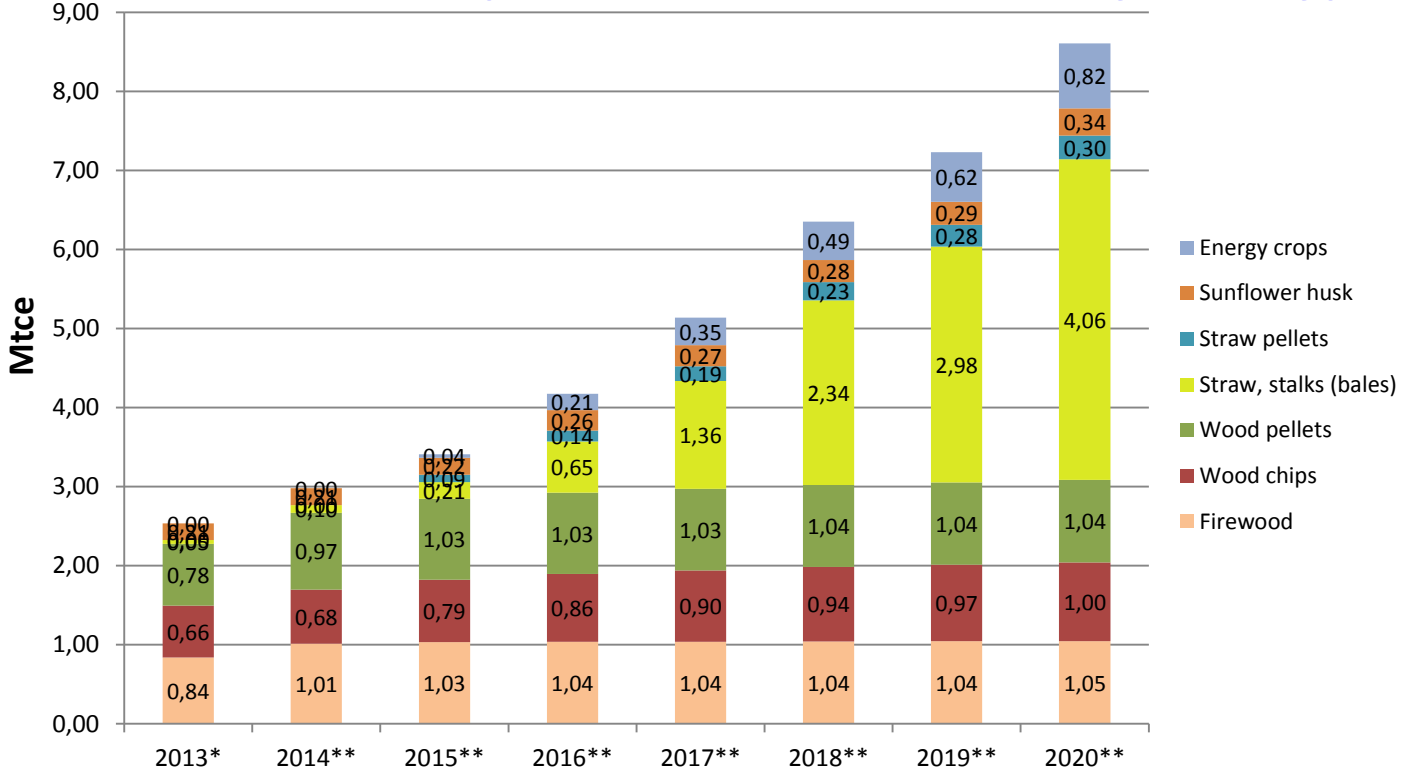
The use of biomass for energy production in Ukraine

	2015	2020
	13 %	25 %
	1.2 %	15 %
	7 %	9 %
	0.08 %	1.3 %

Biofuels for heat production in Ukraine by fuel type, Mtce



Biomass type	2013*	2014**	2015**	2016**	2017**	2018**	2019**	2020**
Firewood	0,84	1,01	1,03	1,04	1,04	1,04	1,04	1,05
Chips	0,66	0,68	0,79	0,86	0,90	0,94	0,97	1,00
Wood pellets	0,78	0,97	1,03	1,03	1,03	1,04	1,04	1,04
Straw, stems (bales)	0,05	0,10	0,21	0,65	1,36	2,34	2,98	4,06
Straw pellets	0,00	0,00	0,09	0,14	0,19	0,23	0,28	0,30
Sunflower husk	0,21	0,21	0,22	0,26	0,27	0,28	0,29	0,34
Energy crops	0,00	0,00	0,04	0,21	0,35	0,49	0,62	0,82
Total, M tce	**2,54**	**2,98**	**3,41**	**4,17**	**5,14**	**6,35**	**7,23**	**8,60**

** Assessment according to Energy balance of Ukraine*
*** Forecast according to REAP and UABio assumptions*

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Potential of biomass available for energy in Ukraine (2014)

Type of biomass	Theoretical potential, mln. t	Share, available for energy, %	Economic potential, Mtoe	
Straw of grain crops	33.5	30	3.49	8 Mtoe (38%)
Straw of rape	4.0	40	0.55	
By-products of grain corn production (stalks, cobs)	37.0	40	2.83	
By-products of sunflower production (stalks, heads)	19.1	40	1.10	
Secondary agricultural residues (husk, bagasse)	8.8	80	0.84	
Wood biomass (firewood, felling residues, wood processing waste)	6.0	97	1.45	
Wood biomass (dead wood, wood from shelterbelt forests)	*10.6*	*57*	*1.72*	
Biodiesel (rapeseed)	-	-	0.25	
Bioethanol (corn and sugar beet)	-	-	0.68	
Biogas from waste and by-products of agriculture	1.6 billion m^3 CH_4	50	0.68	
Landfill gas	0.6 billion m^3 CH_4	34	0.18	
Sewage gas (industrial and municipal wastewater)	1.0 billion m^3 CH_4	23	0.19	
Energy crops:				
- willow, poplar, miscanthus (from 1 mill ha)	11.5	90	4.40	7 Mtoe (33%)
- corn for biogas (from 1 mill ha)	3.3 billion m^3 CH_4	90	2.58	
Peat	-	-	0.28	
TOTAL	-	-	21.20	

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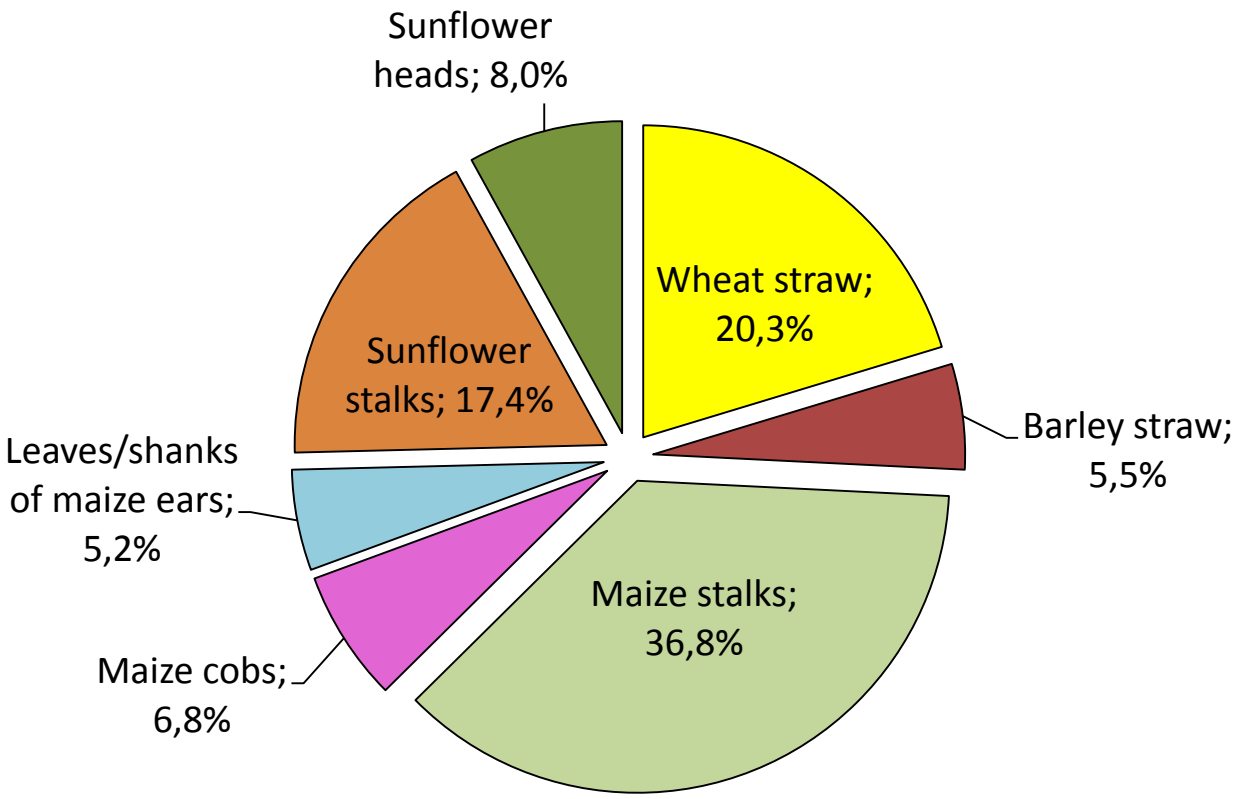
Structure of the energy potential of major primary agricultural residues in Ukraine (2013)

*in total, available for energy: **32.9** Mt*



This potential has been estimated as :

up to 30% *of the theoretical potential of grain crop straw and*

up to 40% *of the theoretical potential of maize and sunflower production residues*

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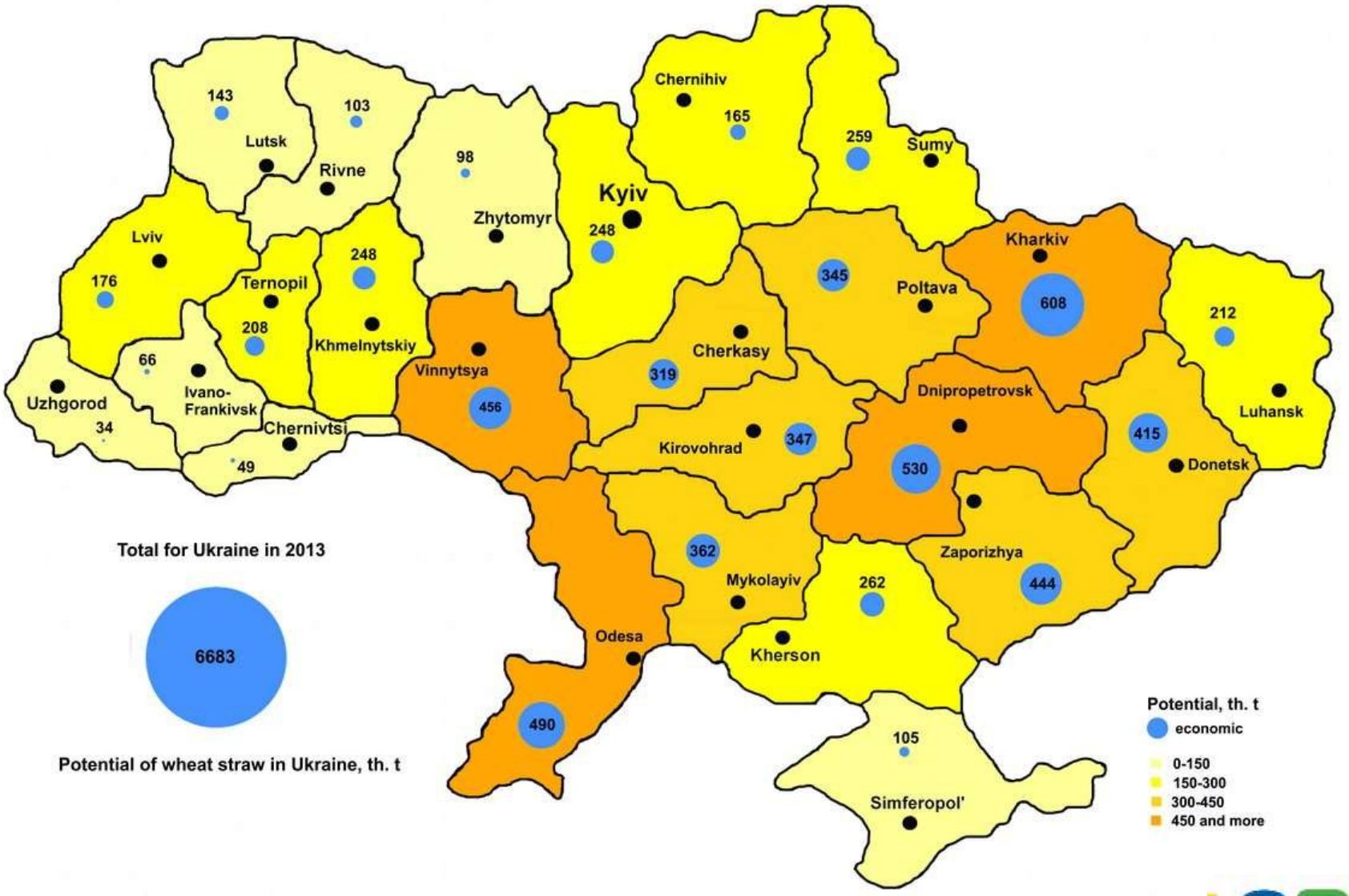
Potential of wheat straw in Ukraine (2013)

*in total, available for energy: **6.7** Mt*



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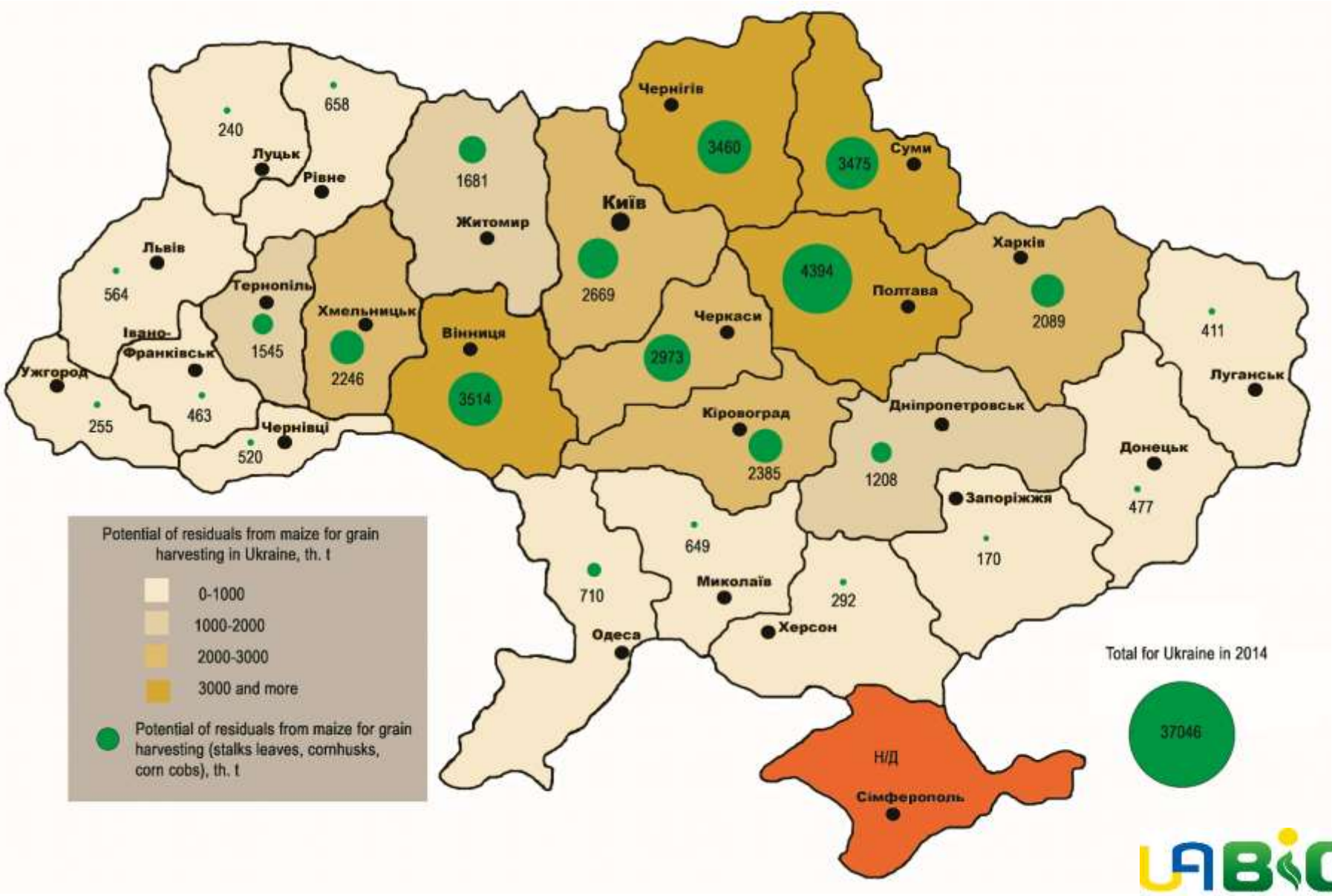
Potential of maize residues for grain harvesting in Ukraine

in total, available for energy: ***14.8*** *Mt*



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Main barriers to bioenergy development and ways of their overcoming

1. Price of natural gas was much below market price in DH sector during many years. Under such conditions bioenergy could not compete with subsidized gas in DH.

   ***Decided**: From 1 May 2016 the market prices have been established both for DH and for population. From July 2016 new market tariffs on the heat energy have been established.*

2. Imperfect tariff system for heat energy from biomass (self cost + 6%).

   ***It is necessary**: to accept draft law № 4334 from 30.03.2016*

   (tariff on heat energy from biomass = tariff on heat energy from natural gas - 10%).

3. Imperfect model of DH supply (monopoly position of DH companies, problems with heating network connection for independent producers of heat)

   ***It is necessary**: To establish competitive market of heat under the model "single buyer" as it is done in the most EU countries.*

4. Complicated procedure of land allocation for renewable energy objects.

   ***It is necessary**: to accept draft law № 2529a from 26.08.2015.*

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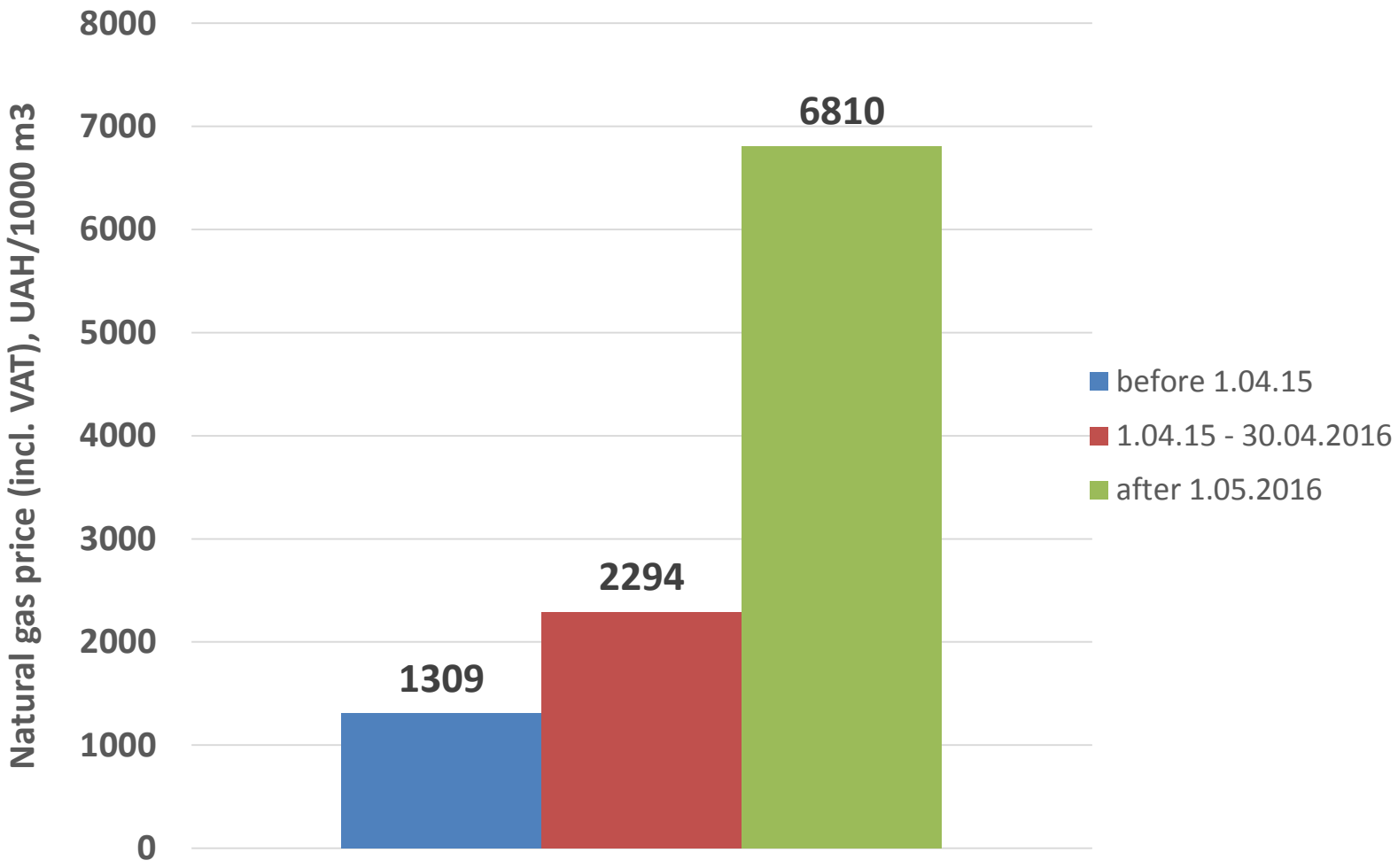
Natural gas prices for DH utilities providing heat for population



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Techno-economic indicators for biomass boiler and CHP (wood chips) for heating of population

To barrier 1: market price of natural gas for DH

Indicator	Wood chips boiler 10 MW	Wood chips CHP 6 MW_e + 35 MW_{th}
Price of biomass fuel with delivery, UAH/t without VAT	**750**	**750**
Fuel consumption, ths. t/year	35	98
Economical indicators:		
- gas saving, million m^3/year	9,5	27
Total investment, million Euro	1,4	21,0
Discounted payback period (discount rate is 10%), **years** - tariff on heat production: 950 UAH/Gcal without VAT *	**6,2**	**8,3**

* tariff rate of 0.9 in comparison with natural gas according Draft Law № 4334 from 30.03.2016
http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=58568

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To barrier 2: tariff system

Draft law N 4334 from 30.03.2016 «On amendments to Law of Ukraine "On Heat Supply" on stimulation of heat energy production from alternative energy sources".

Establishment by local authorities of tariffs for heat produced from alternative sources (including renewable energy) as **90%** of tariffs for heat produced from natural gas for public organizations and population.

Licensing by local authorities of production, transportation and supply of heat energy produced from alternative sources (including renewable energy)

Accepted by Verkhovna Rada in 1-st reading on 22 September 2016!
Final acceptance is expected in February 2017.

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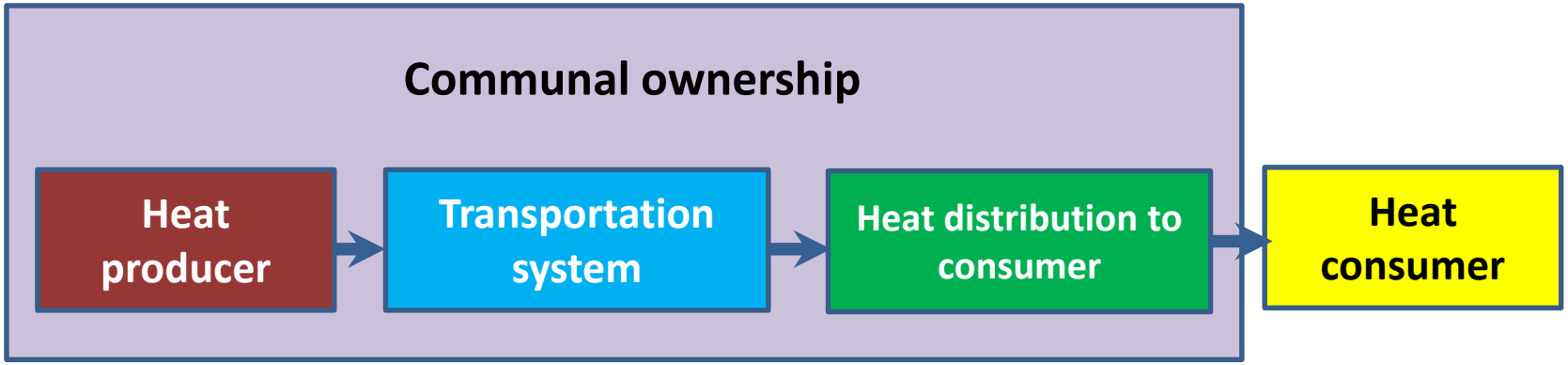
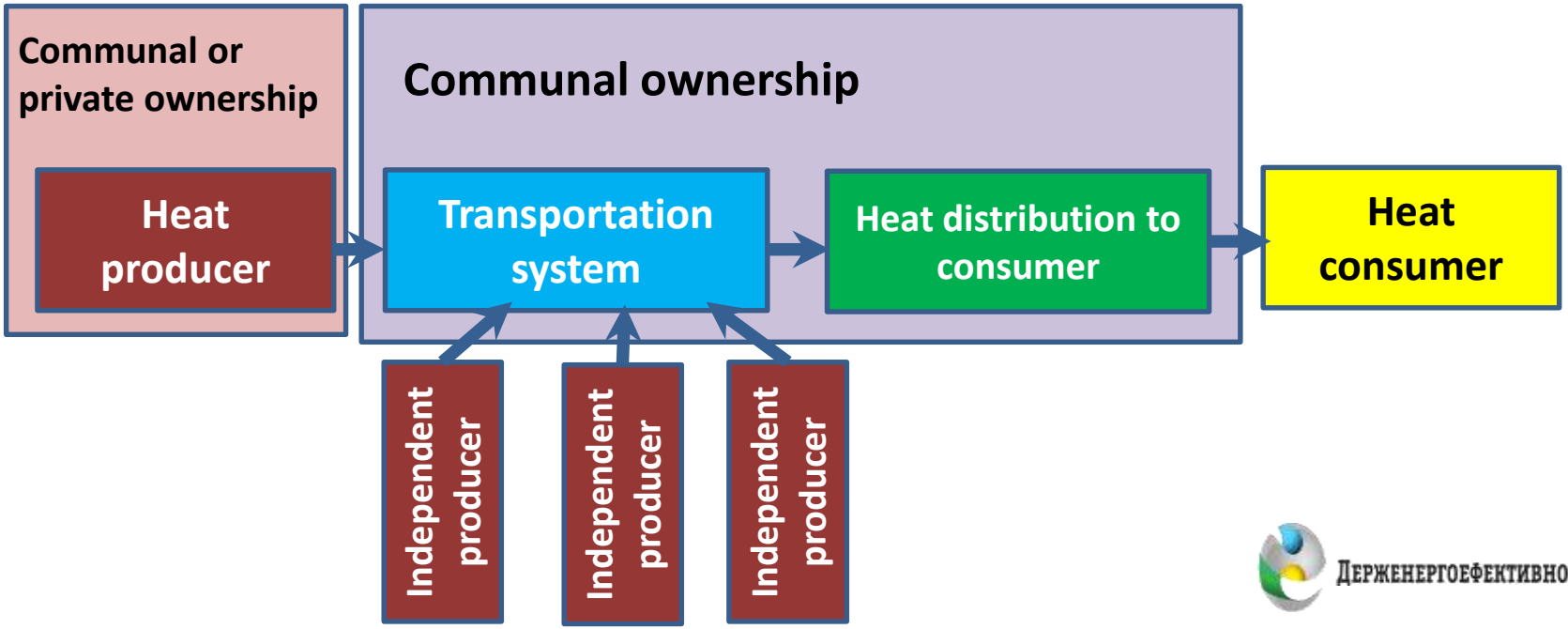
What is heat competitive market?

To barrier 3: competitive market of heat

Present situation in the heat supply sector:



Situation after competitive market implementation:



Держенергоефективності

Conclusions

- Bioenergy sector actually replaces 3.0 billion m^3/year of natural gas in Ukraine. About 5000 MW thermal on biomass is operated, including 2500 MW in private houses, 500 MW in public sector, 2000 MW in industry.

- National Action Plan on RE up to 2020, sets the task to achieve total gas replacement by biomass on 7.2 billion m^3/year in 2020.

- This requires significant increase of biomass heat generating equipment: from 5000 MW th in 2015 to 16000 MW th in 2020 and will reflect an actual capacity increase in 3.2 times.

- This requires significant increase of agricultural by-products and energy crops consumption. Capacity of boilers working on agricultural by-products and energy crops should be increased from about 500 MW th (10%) in 2015 up to 11000 MW th (70%) in 2020.

- Law 514-VIII (in force from July 2015) has removed most of barriers for development of RE power projects and settings of “green tariffs” for them (12,3 Eurocents/kW*h without VAT).

- Market is open and projects are mostly feasible in the next sectors:
  - heat production from biomass for private buildings;
  - heat production from biomass for public, industrial and commercial consumers;
  - power production from biomass (CHP is more feasible option);
  - large scale biogas projects with existing heat consumption.

- It is expected feasibility of biomass boilers and CHPs in DH sector in 2017 (after planned acceptance of Draft Law 4334).

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Thank you for attention!

Welcome to Ukraine and to UABio!

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