

# **Further development of the biogas sector as a source of renewable energy**

**/RES government regulation and support mechanisms. Prospects and potential of biogas production in the gas sector resource base/**



# ***Green economy transition concept***

## ***General approaches***

**1** *Efficient water management*

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**2** *Modernization of agriculture*

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**3** *Energy saving and energy efficiency improvement*

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**4** *Electric power industry development*

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**5** *Waste management*

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**6** *Air pollution abatement*

# **Concept for Transition of the Republic of Kazakhstan to "Green Economy"**

**the President's Resolution on the Concept for Transition of the Republic of Kazakhstan to "Green Economy"**

**The proportion of gas power plants in electric power production will be 20% by 2020**

**In Kazakhstan, the total available volume of feedstock for biomass energy is about 1.5 million tons per year (in 2015). This represents about 17% percent of the total waste generated.**

**The largest share of the available volume for biomass energy belongs to cattle (74%) and poultry (23%) management, and a very insignificant share belongs to pig management (3%).**

**The proportion of available volume of feedstock for biomass energy belongs to the number of large farms with the number of animals therein.**

# Article 1 of the Law on Renewable Energy Sources Use Support of the Republic of Kazakhstan

**Renewable energy sources** mean energy sources that are continuously renewed due to naturally occurring natural processes, including man-made sources of primary energy resources: biomass, **biogas** and other fuels from organic waste used to produce electrical and (or) thermal energy

# **Concept of the Development of the Gas Sector in the Republic of Kazakhstan until 2030;**

**Resolution of the Government of the Republic of Kazakhstan  
No. 1275 dated December 5, 2014**

## **Resource base of the gas sector of Kazakhstan:**

- associated petroleum gas, natural gas;**
- CBM (coal bed methane);**
- shale gas;**
- biogas**

# Amount of waste generated – manure

*In Kazakhstan, the total available volume of manure for biomass energy is about 1.5 million tons per year (in 2015). This represents about 17% percent of the total amount of manure generated.*

*The largest proportion of the available manure volume for biomass energy belongs to cattle (74%) and poultry (23%) management, and a very insignificant share belongs to pig management (3%). The proportion of available volume of manure for biomass energy belongs to the number of large farms with the number of animals therein.*

## Total indicators of production and available volume of waste (dry weight) - manure

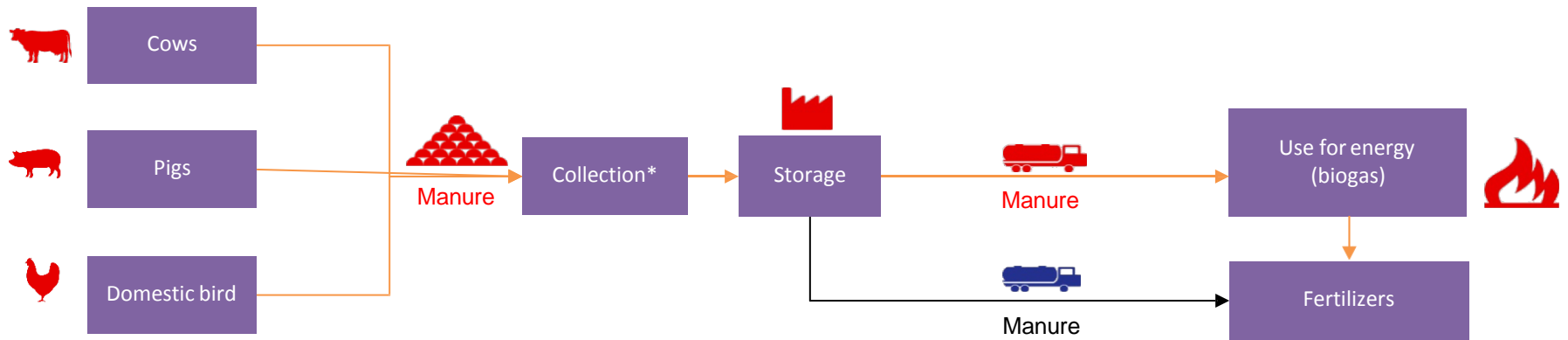
Region	Total production	Total available volume	(thousand tons per year)		
			Total available volume by animal type		
			Cattle	Poultry	Pigs
Almaty region	1,390.7	282.8	175.7	98.4	8.7
East Kazakhstan region	1,202.1	195.5	153.3	40.4	1.9
South-Kazakhstan region	1,187.7	101.4	82.6	17.0	1.9
Karaganda region	745.9	149.4	96.1	46.1	7.1
Kostanay region	696.4	144.5	109.7	30.5	4.3
West-Kazakhstan region	648.8	102.7	93.1	8.2	1.4
Akmola region	639.4	151.8	96.1	51.5	4.2
North-Kazakhstan region	566.8	109.5	73.2	31.7	4.5
Pavlodar region	565.9	92.3	79.5	8.7	4.2
Aktobe region	531.5	80.0	69.2	7.8	3.0
Zhambyl region	452.0	54.9	48.6	3.8	2.5
Kyzylorda region	355.0	31.7	31.5	0.2	0.0
Atyrau region	201.5	23.7	21.9	1.7	0.1
Mangistau region	21.3	2.5	2.3	0.2	0.0
Almaty	4.9	0.4	0.3	0.0	0.0
Astana	1.1	0.3	0.3	0.0	0.0
Total	9,211.2	1,523.4	1,133.4	346.1	43.9

**Total production:** Total waste generated

**Total available volume:** Total waste generated available for biomass energy

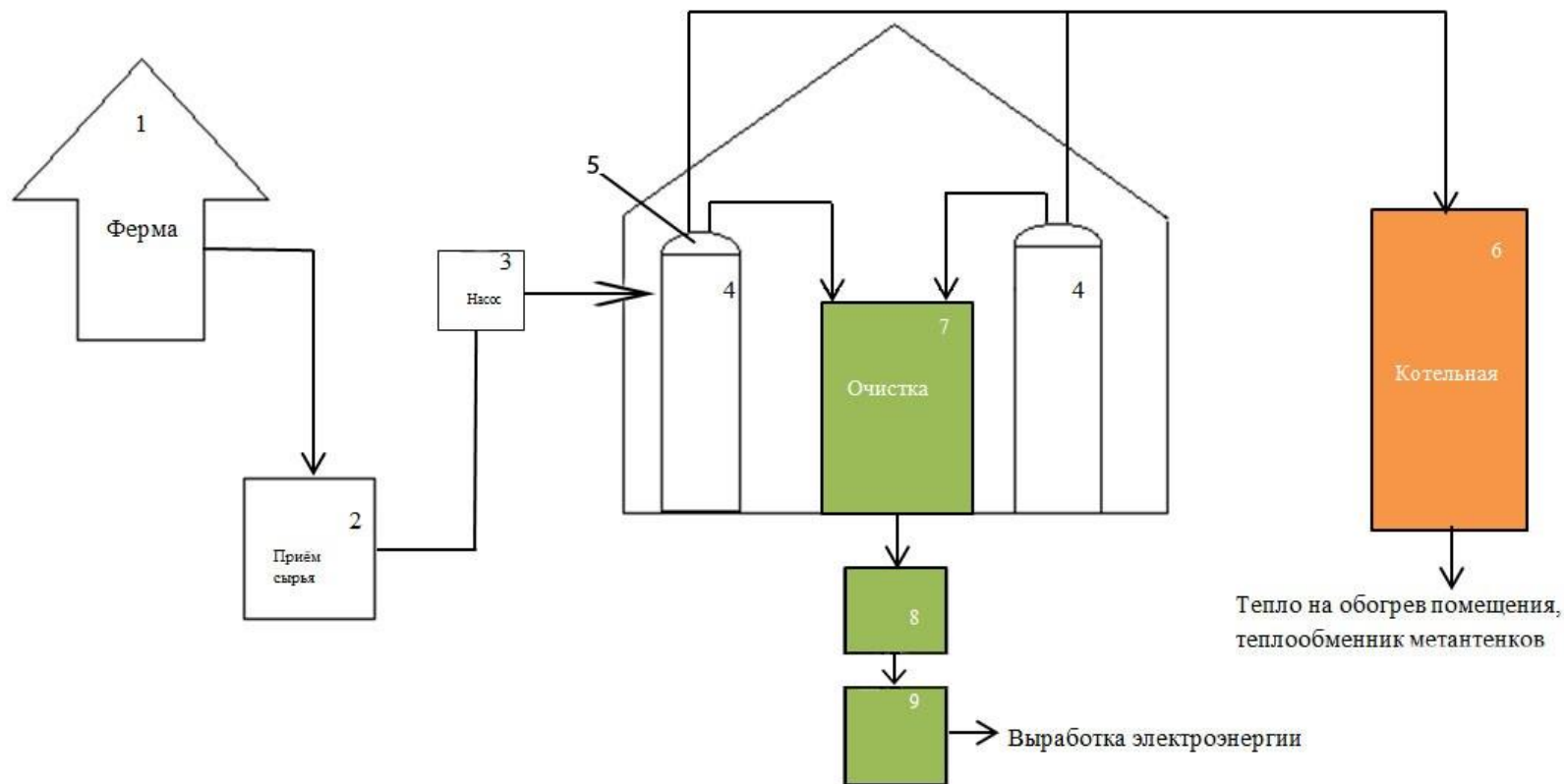
Manure produced at the pasture is considered to be unavailable  
 Manure from households: 10% is considered to be available.  
 Manure from medium-sized farms: 50% is considered to be available.

# Description of the value chain – manure



\* Sometimes different stages, farms and local / regional locations.

# Biogas production diagram for electric power generation; heat and gas production



1 – farm, 2 – feedstock receiver, 3 – pump, 4 – heated digestion tank, 5 – combined gas collector, 6 – boiler room, 8 – separate gas collector, 9 – cogeneration plant



# Classification and composition of biogas

Biogas components	Component content, % vol.		
	Biogas from waste water treatment plants	Biogas from agricultural production	Biogas from household waste
...			
CH <sub>4</sub>	60-65	55-75	35-80
CO <sub>2</sub>	16-34	27-44	0-34
N <sub>2</sub>	0-3	0-3	0-82
O <sub>2</sub>	-	-	0-31.6
H <sub>2</sub>	-	0.01-0.02	0-3.6
CO	-	0.01-0.02	2,8
H <sub>2</sub> S	-	Up to 1,0	0-70

# ***Law on RES Use Support dated July 4, 2009 (as amended in 2017)***

- 1** *Selection of projects through tender mechanism*

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- 2** *The Financial Settlement Centre (FSC) to purchase and sell the electric energy produced by RES facilities (establishment of a reserve fund) centrally has been determined.*

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- 3** *The purchase of the RES entire volume at a tender price for 15 years (annual indexation of tender prices) is guaranteed.*

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- 4** *The standard forms of FSC contracts with power generating companies using RES and conventional consumers have been approved.*

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- 5** *The Rules for centralized purchasing and selling the electric power produced by facilities using renewable energy sources by the Financial Settlement Centre have been approved.*

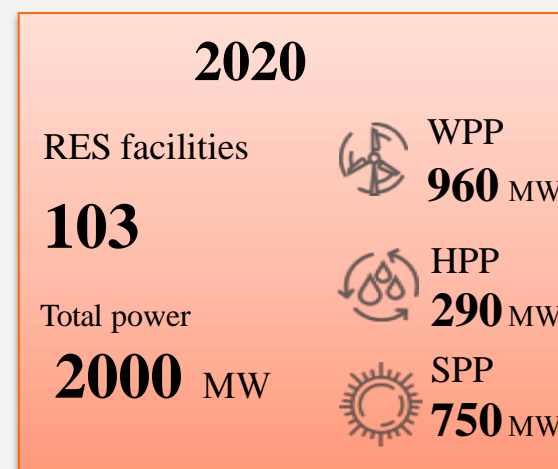
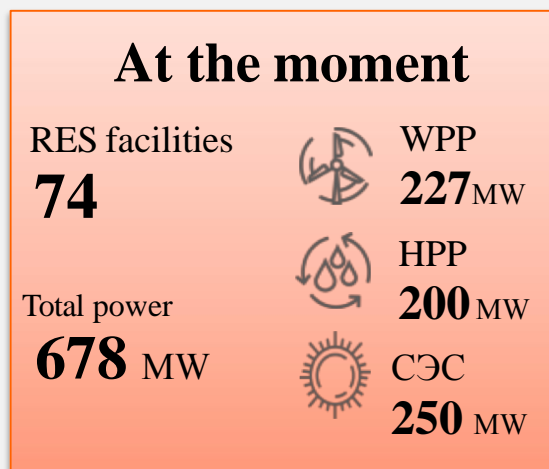
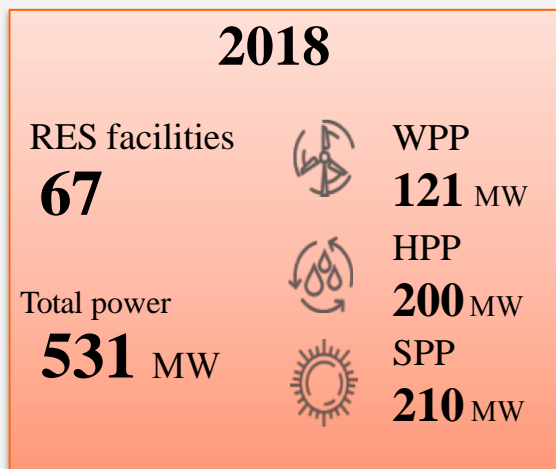
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- 6** *RES producers are exempt from paying for the transportation of electric power produced from renewable energy sources.*

# Renewable energy sources

## Objectives:

- in electric power industry: The proportion of renewable electric power should reach **3% by 2020 and 10% by 2030**



## Tender results in 2018:

- There were bids for 3422 MW (113 companies from 9 countries); the demand volume exceeded the supply volume by 3.4 times;
- 30 companies from 6 countries won*; total power is 857.93 MW;
- Reduction of tariffs (weighted average/**maximum**) for WPPs by 12.2%/**23%**, small HPPs by 12.12%/**23%**, SPPs by 35.71%/**48%**.

# Limit tender prices (2019)

Ser. No.	Renewable energy source technology used to generate electric power	Tariff value tenge/kWh (net of VAT)
1	Wind power plants	22.66
2	Photovoltaic solar energy converters	29
3	Small hydropower plants	15.48
4	Biogas plants	32.15

# ***Tender schedule***

***Order of the Ministry of Economy of the Republic of Kazakhstan No. 97 dated  
March 19, 2019***

## **1 Acceptance of documents:**

- From July 29 till September 10, 2019
- Financial security for bid at the rate of 1 kW of installed project capacity 2000 tenge/kW

## **Tenders for BGP sales:**

- Date: September 18, 2019
- Time: from 02-00 pm to 05-00 pm
- Volume of the installed capacity purchased: 10 MW
- UPS zone: all zones

**2**

## **Project implementation:**

- Financial security for the fulfillment of the purchase agreement terms at the installed project capacity of 10,000 tenge/kW
- Conclusion of an agreement with FSC for 15 years
- Commissioning date – 36 months from the date of conclusion of the Agreement with FSC

# Biogas Tender

Concerning the Introduction of Amendments and Additions to Order of the Minister of Energy of the Republic of Kazakhstan No. 466 dated December 21, 2017, of the Rules for Organization and Conduct of Tenders

- cl.51. The organizer shall calculate prices under following conditions:
- 1) the total volume of installed capacity of bids for sale of at least 130% of the volume of demand for the installed capacity;
- 2) the number of tenderers registered and admitted to the corresponding tenders in the trading system - at least two;
- In case of non-fulfillment of the above conditions, the Organizer will not calculate prices, will close the bidding before the closing time of the trading session expires and declare the tender to be failed.
- *The provision of this paragraph has a change proposed -*
- *This provision should not be applied to bidding for the selection of projects using biomass, biogas and other fuels from organic waste used for the production of electric power.*

***The list of priority activities for implementation of investment projects  
(Government's Resolution on Implementation of the State Support for  
Investments No. 13 dated January 14, 2016).***

**1**  
**Exemption from customs charges and duties**

- appeal to the Investment Committee of the Ministry of Foreign Affairs of the Republic of Kazakhstan
- Investment preferences will be granted for certain parts of equipment under FEACN codes
- For 5 years from the date of the investment contract

**2**  
**Exemption from VAT on imports of feedstock**

- For 5 years from the date of commissioning of feedstock and materials used in the operation

# ***Law “On Architectural Urban Planning” dated July 5, 2004***

- 1 Nomenclature of construction products produced by domestic manufacturers to maintain the estimate standards database.

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  - 2 Annual collection of estimate standards

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  - 3 Price quotes (price lists)

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  - 4 The manufacturer's application directed to the Committee on Construction and Housing and Utility Services of the Ministry of National Economy of the Republic of Kazakhstan (Appeal to the Authority for Estimate Prices 742156, Zh.A. Abdullayev)
- complete manufacturer data
  - Standards or GOSTs (if available) -



***On approval of the Subsidy Rules for reimbursement of part of the expenses incurred by the subject of the agro-industrial complex during investing***

***Order of the Acting Minister of Agriculture of the Republic of Kazakhstan No. 317 dated July 23, 2018***

***Registered in the Ministry of Justice of the Republic of Kazakhstan on August 29, 2018 under No. 17320.***

**Project Data Sheet No. 25 - Acquisition of machines and equipment for poultry manure processing.**

Investments reimbursement share - 25%

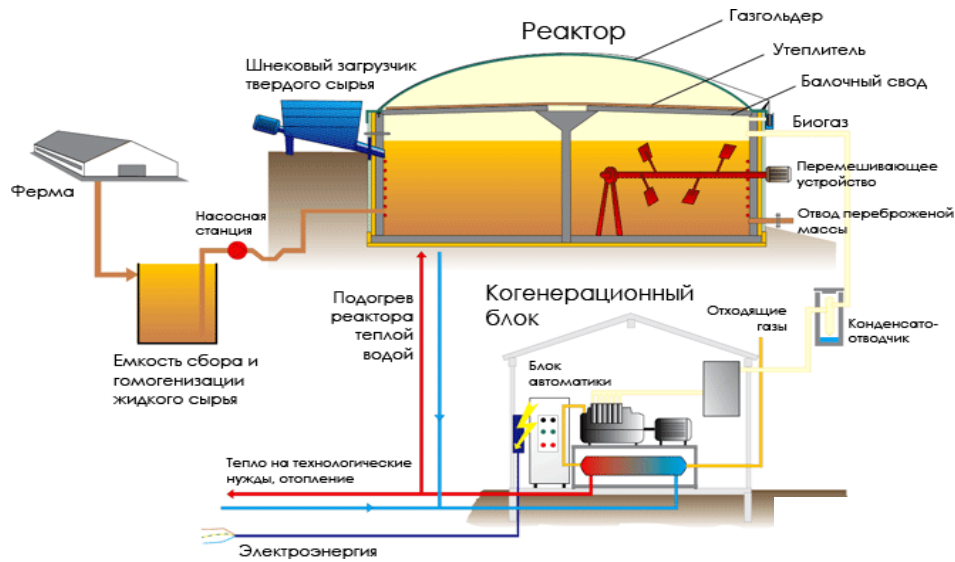
**Fertilizer drying equipment**

**Biogas plant**

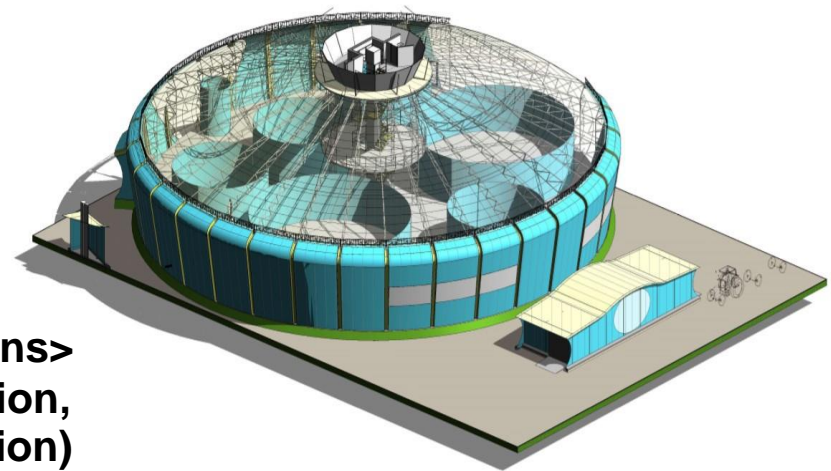
**Fertilizers packaging equipment**

(For consultations contact I. Mukhlisov, Tel. 555564, Department of Animal Breeding of the Ministry of Agriculture)

# Typical biogas and electric power generation scheme



< In the southern regions



In the northern regions>  
(heated digestion tank inside the pavilion,  
recommended construction)

# Targeted aid

**Paragraph 10 of Article 9** of the Law on Renewable Energy Sources  
Use Support of the Republic of Kazakhstan dated July 4, 2009

**The state provides individual consumers with targeted aid in the amount of fifty percent of the cost of the renewable energy source plants with a total power of not more than five kilowatts in the manner determined by the authorized body. Targeted aid shall be paid after the renewable energy source plant is put in operation.**

# The list of documents necessary to receive targeted aid

- 1 application for targeted aid  
*(the application form is specified in Appendix 1 of the Rules approved by the Order of the Minister of Energy of the Republic of Kazakhstan No. 161 dated November 28, 2014)*
- 2 copies of an identity document and certificates of state registration of a private entrepreneur (for individuals) or a copy of a certificate\* of state registration (re-registration) of a legal entity
- 3 copy of the contract of an individual consumer with a supplier of plants using renewable energy sources, produced in Kazakhstan
- 4 act of acceptance for operation of RES plants
- 5 bank certificate supporting the presence of a personal account in second-tier banks

# Net-consumer support

**Paragraph 9 of Article 9** of the Law on Renewable Energy Sources Use Support of the Republic of Kazakhstan dated July 4, 2009

**The net-consumer shall pay to the power provider serving the net-consumer at the power provider's current tariff for the amount of electric power from the electric power system, consumed by the net-consumer during the billing period, after deduction of the volume supplied to the electric power system during the same period.**

# Перечень документов для подключения электросети и заключения договора

- 1 Notification according to the form  
*(the form is specified in Appendix 1 of the Rules approved by the Order of the Minister of Energy of the Republic of Kazakhstan No. 309 dated 6/8/2016)*
- 2 *Notarized copies of certificates for RES facility and (or) its components, as well as the technical characteristics of the main generation equipment of RES facility*
- 3 *Copy of the scheme for the connection of RES facility to the electric power systems*
- 4 *Predicted annual volumes of electric energy generation broken down by months*
- 5 *For the contract – personal identification or constituent documents; a copy of the certificate on the metering device; bank details*

# ***Law on RES Use Support dated July 4, 2009 (as amended in 2016 within the framework of the Law on the Transition to Green Economy)***

**1**

## ***Clarification of the definition of “individual consumer of electrical and (or) thermal energy”***

*- a legal entity (n/r, farms, limited liability partnerships) operating autonomously in non-electrified settlements and (or) settlements with economically inadvisable centralized power supply can expect to receive targeted aid.*

**2**

## ***Clarification of the definition of "net-consumer of electric power"***

- a legal entity may be a net-consumer;*
- the restriction on the sale of surplus in the amount of 500 kW per month is removed;*
- the adopted limit on the installed capacity for the RES plant is 100 kW.*

## *List of NLAs adopted for implementation of the Law on the Support of RES*

- *Order of the Minister of Energy of the Republic of Kazakhstan on the definition of a Financial Settlement Centre for the Support of Renewable Energy Sources No. 256 dated March 31, 2015;*
- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of the Rules for Monitoring the RES use No. 74 dated February 11, 2015;*
- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of the Rules for Determining the Nearest Point of Connection to Electric or Thermal Networks and Connection of RES facilities No. 117 dated February 20, 2015;*
- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of Tariff Determination Rules for the Support of RES No. 118 dated February 20, 2015;*
- *Resolution of the Government of the Republic of Kazakhstan No. 271 dated March 27, 2014 on Approval of Rules for Determination of Fixed Tariffs;*
- *Resolution of the Government of the Republic of Kazakhstan on Approval of Fixed Tariffs No. 645 dated June 12, 2014;*



## *List of NLAs adopted for the implementation of the Law on the Support of RES*

- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of the Rules for Centralized Purchasing and Selling of Electric Power Produced by Facilities Using Renewable Energy Sources by the Financial Settlement Centre No. 164 dated March 2, 2015;*
- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of Standard Forms of Agreements for Purchasing of Energy Produced by a Power-Producing Company Using RES by the Financial Settlement Center at Fixed Tariffs and Tariffs not Exceeding the Level of Sale Price Established in the Feasibility Study Approved and Agreed with an Authorized or Local Executive Body for the project for the Construction of a Facility Using RES; Selling the Electric Power Generated by RES Facilities to a Conditional Consumer by the Financial Settlement Centre No. 163 dated March 2, 2015;*
- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of the Rules for the Provision of Targeted Aid to Individual Consumers No. 161 dated November 28, 2015;*

## *List of NLAs adopted for implementation of the Law on the Support of RES*

- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of the Rules for the Development of a Plan for Placement of the Facilities Using Renewable Energy Sources No. 345 dated July 27, 2016;*
- *Order of the Minister of Energy of the Republic of Kazakhstan on approval of the Rules for Sale and Purchase of Electric Power from Net-Consumers No. 309 dated July 8, 2016;*
- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of the Form of a Standard Contract for the Connection of Facilities Using Renewable Energy Sources, and the Rules and Deadlines for its Conclusion No. 343 dated July 27, 2016*
- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of the Target Indicators for the Development of the Renewable Energy Sector No. 478 dated November 07, 2016*

## *List of NLAs adopted for the implementation of the Law on the Support of RES*

- *Order of the Minister of Energy of the Republic of Kazakhstan on Determination of the Organizer of Tenders No. 280 dated August 07, 2017*
- *Order of the Minister of Energy of the Republic of Kazakhstan on Approval of the Rules for organizing and conducting Tender Bidding, including Qualification Requirements Imposed to Tender Participants, Content and Application Process, and Condition of Introduction and Return of Applications, Procedure for Summing up and Determination of Winners No. 466 dated December 21, 2018*