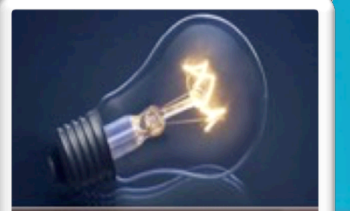
ELECTRIC ENERGY IN THE REPUBLIC OF KAZAKHSTAN



How the power sector works in RK

1 Generating plant

Electric and thermal power is generated

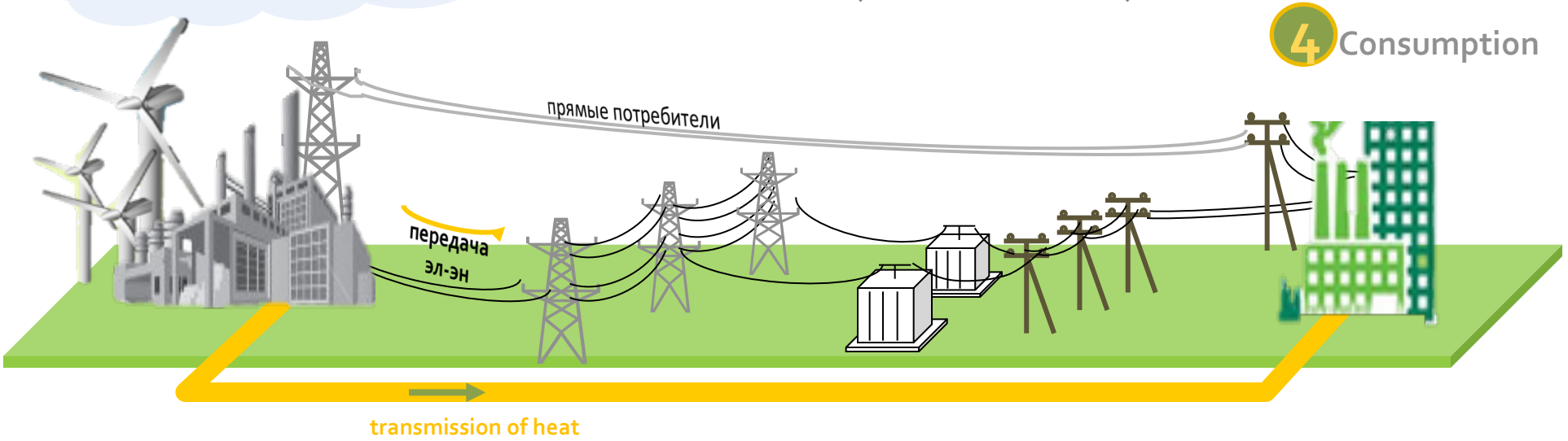
2 High-voltage power lines

The power is transmitted between regions to RPCs (or directly to major consumers)

3 Distribution power grids and substations

Regional and city RPCs reduce the voltage and electricity is transmitted to end users (wholesale and retail)

4 Consumption



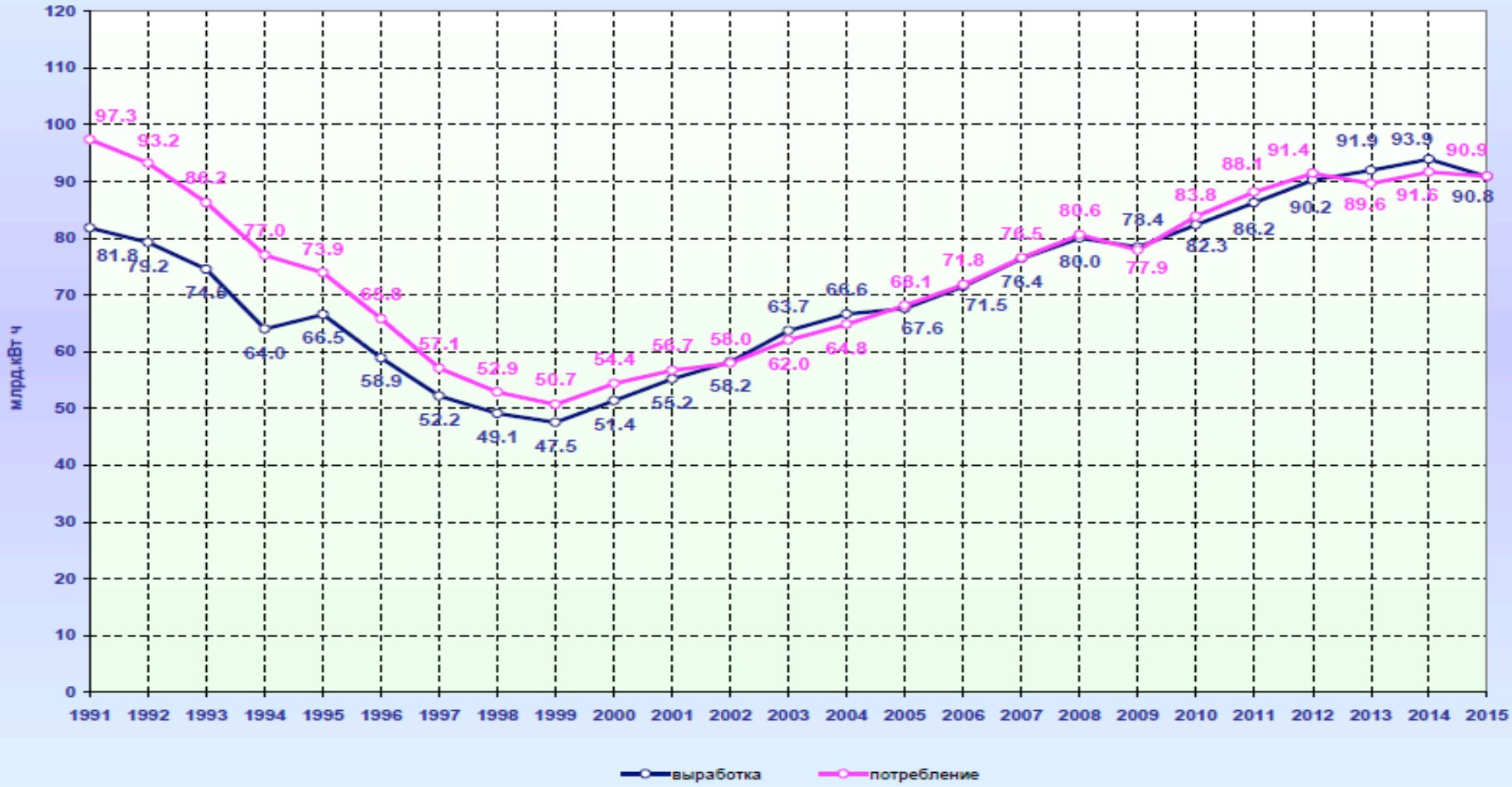
Main task of the power sector:

100% reliable provision of power to the economy depending on the state of the industry itself …

…which **in its turn,** is determined by the technical level, level of investments and quality of management

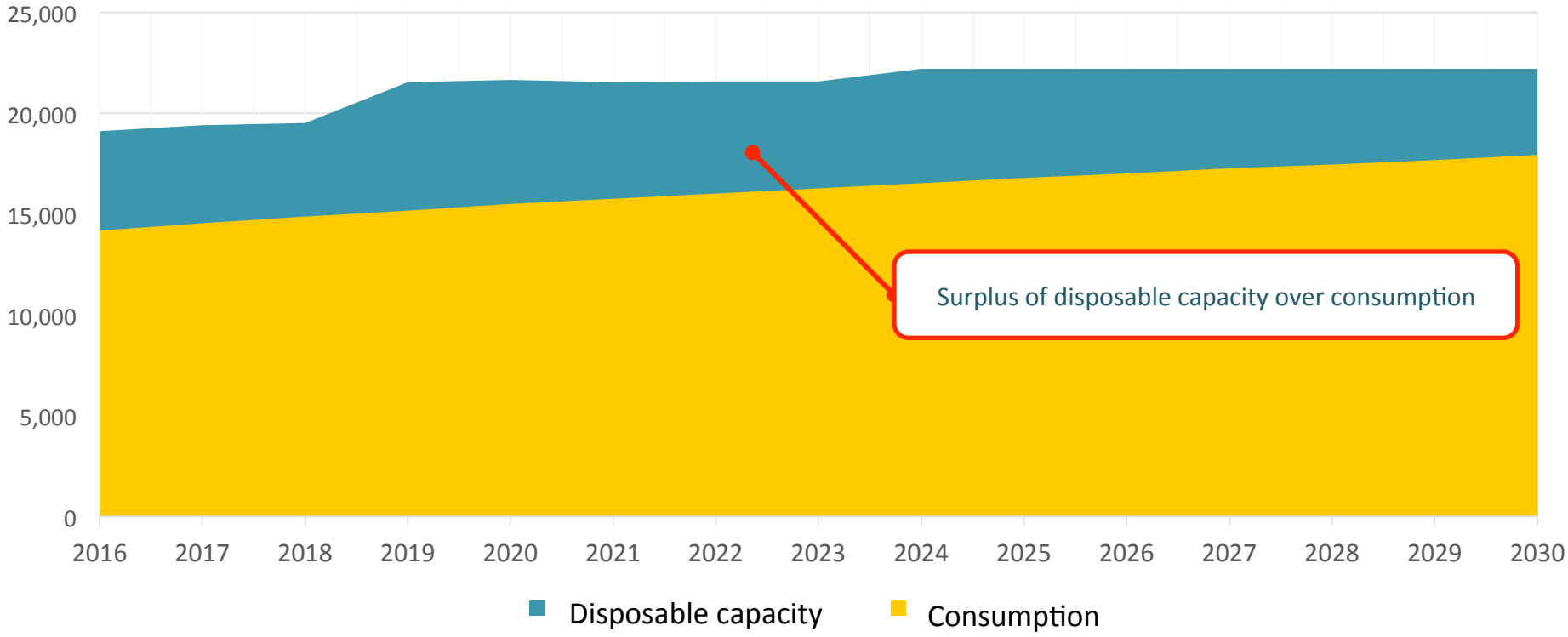
Historic dynamics of power generation and consumption

After the downturn of the economy in 2008 power generation has grown confidently and beginning in 2013 it exceeded the demand for electricity



Balance of electric power and electric capacity in the RK until 2030

The balance shows that the power sector satisfies the needs of Kazakhstan's economy until 2030

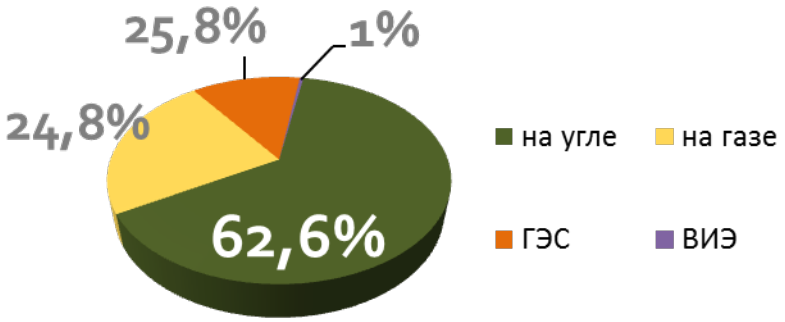


PLANTS

1 **Number of power plants – 111**

2 **Installed capacity 22 055 MW**

As of January 1 2017



Annual maximum load in Kazakhstan in 2016 reached **13 990 MW** whereas disposable capacity in the winter of 2017 reached **17500 MW**. Hence full coverage of consumption with a significant level of reserves.

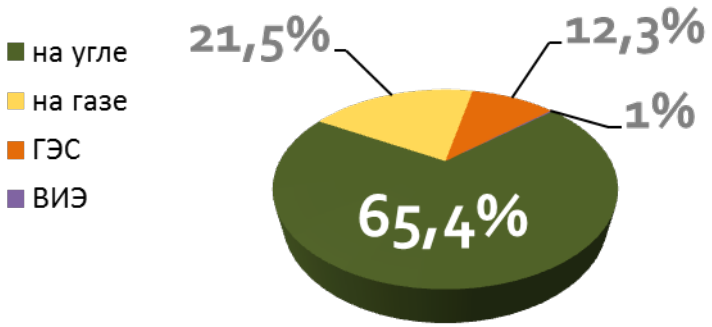
3 **Power generation**

billion kWh

2015 actual	2016 actual	2017 plan
90.8	94.1	94.2

4 **Total generation – 94,1 billion kWh**

as of January 1 2016



In 2016 power generation increased by 3.6% compared to 2015.

POWERLINES

KEGOC
110-1150 kV

→ 74 substations → 31 thousands of kilometers of power lines

Functions:

1) Ensures electrical linkages between regions of the republic and neighboring countries
2) Ensures power supply by power stations and its transmission to wholesale consumers
3) Performs technical dispatching
4) Plays the function of a system operator

RECs – 21
0.4-220 kV

→ above 5000 substations → roughly 500 thousands of kilometers of power lines

Functions:

1) Ensures electrical linkages inside the regions
2) Ensures transmission and distribution of power between retail consumers

Total number of power transmission organizations - 160

Within the framework of implementation of the "Nation's plan - 100 concrete steps for implementation of 5 institutional reforms" in 2015 the department of electric energy started activities to implement steps 50, 51 and 52:

STEP 50. Reorganization of the power sector Introduction of the "Single buyer" model (introduced from January 1 2019)

Step 51. Aggregation of regional energy network companies

(The Law was signed by President of the Republic of Kazakhstan on July 11 2017)

Step 52. Introduction of the new tariff policy in the power sector stimulating investments in the industry. (introduced from January 1 2019).

STEP 50. Reorganization of the power sector Introduction of the "Single buyer" model

By Law of the RK of 12 November 2015 No 394-V "On the introduction of changes and addenda to certain legislative acts in the area of electric power" the new Single Buyer model will be introduced from January 1 2019.

Purchase of the capacity by the Single buyer will take place as follows:

1. 1) Purchasing the capacity from existing power generating organizations

2. 2) Purchasing the capacity from new power generating organizations under direct long-term contracts based on the results of tenders

3. The law envisages an additional mechanism to purchase capacity from existing power generating organizations without tenders. This type of capacity purchase is brought about by the need to ensure long term guarantees for the return of investments made in modernization, reconstruction, renovation, expansion of the existing power producing organizations.

4. Guaranteed purchases of capacity from CHPs within technological minimums.

STEP 52. Introduction of a new tariff policy in the power sector stimulating investments in the industry

By Law of the RK of 12 November 2015 No 394-V "On the introduction of changes and addenda to certain legislative acts in the area of electric power" a new tariff policy in the power sector stimulating investments in the industry will be introduced from January 1 2019.

The existing power tariff will be split in two parts

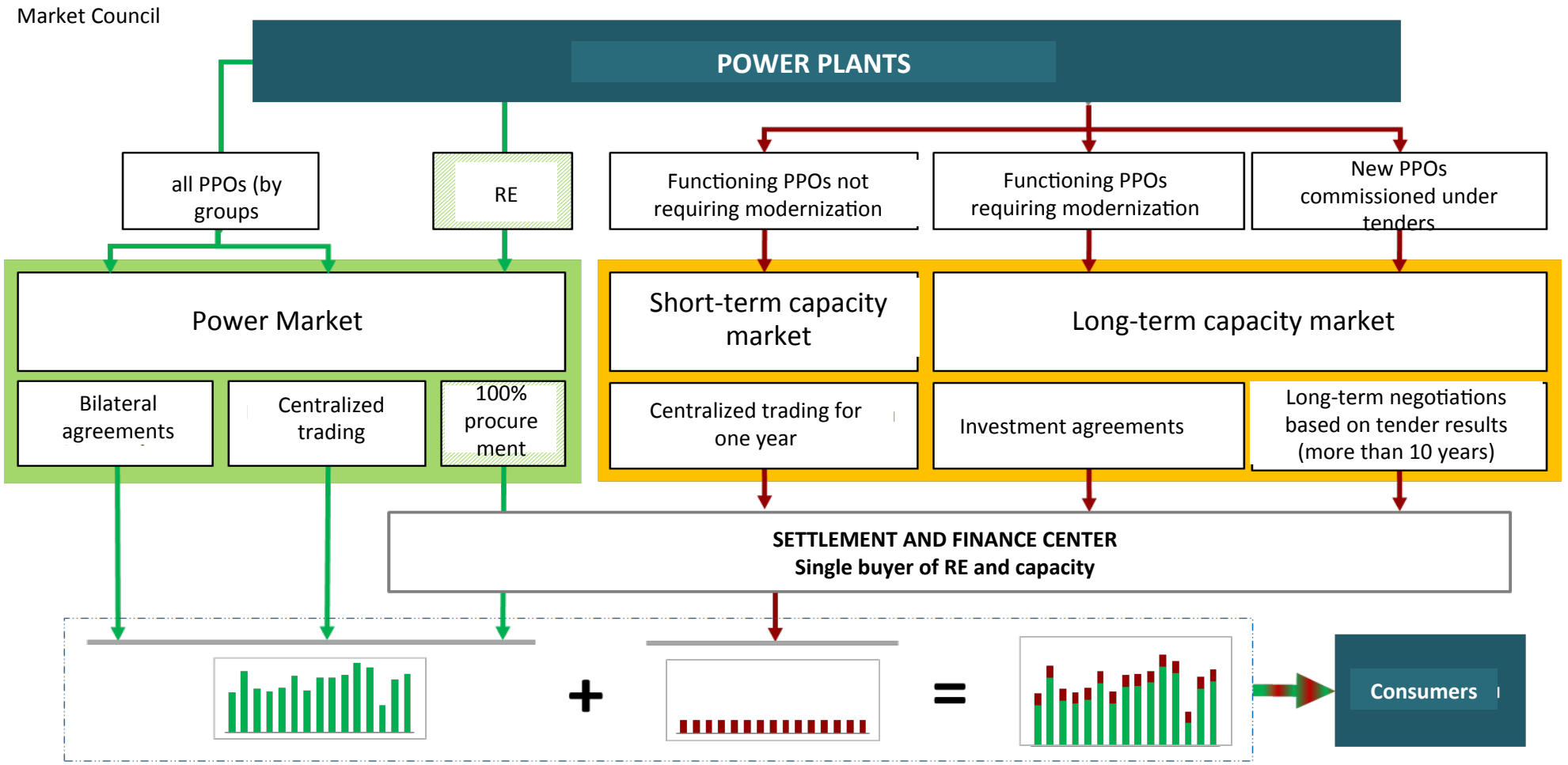
ELECTRIC POWER TARIFF:

variable part which will ensure return of costs for generating electric power.

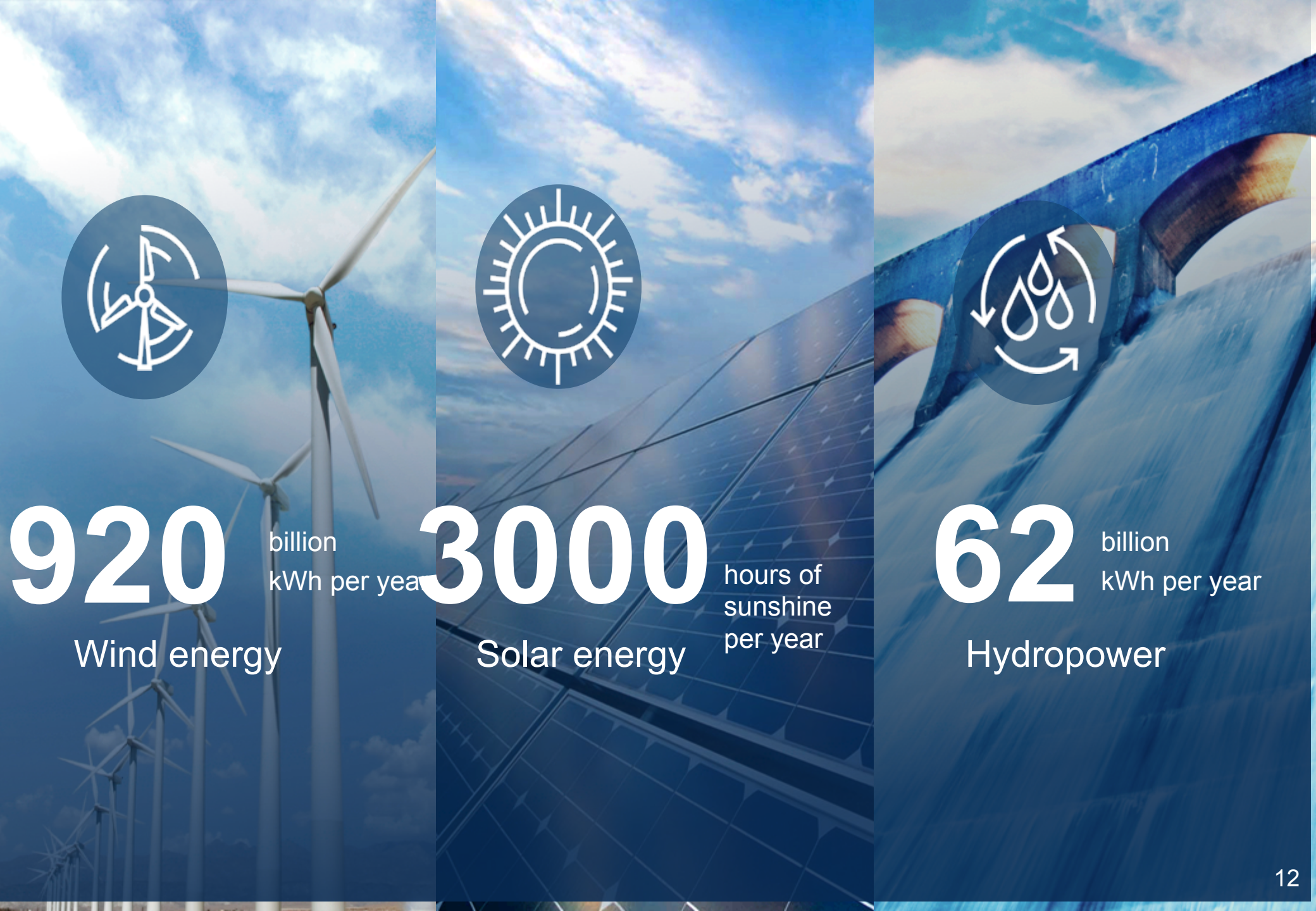
CAPACITY TARIFF:

the permanent part which will ensure return of investments made in the construction of new, and renovation, modernization, reconstruction and expansion of existing electrical capacity.

Market model according to the changes to the Law "On the electrical energy sector" within the framework of execution of steps from January 1 2019.



RESOURCE POTENTIAL OF RENEWABLE ENERGY IN THE REPUBLIC OF KAZAKHSTAN


920
billion
kWh per year
Wind energy
3000
hours of
sunshine
per year
Solar energy
62
billion
kWh per year
Hydropower

RE SECTOR DEVELOPMENT INDICATORS

2016

50 RE facilities till 2020

300 MW

total capacity

WPP
100 MW

HPP
142 MW

SPP
58 MW

2020

103 RE facilities till 2020

2000 MW

total capacity

WPP
960 MW

HPP
290 MW

SPP
750 MW

2016

50 RE facilities till 2020

300 MW

total capacity

WPP
100 MW

HPP
142 MW

SPP
58 MW

2020

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total capacity

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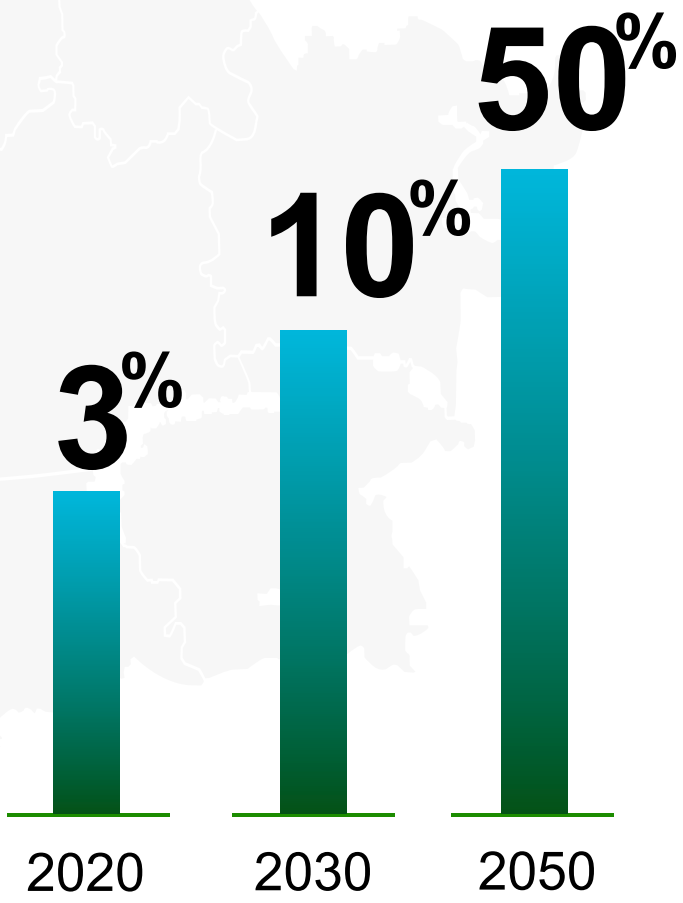
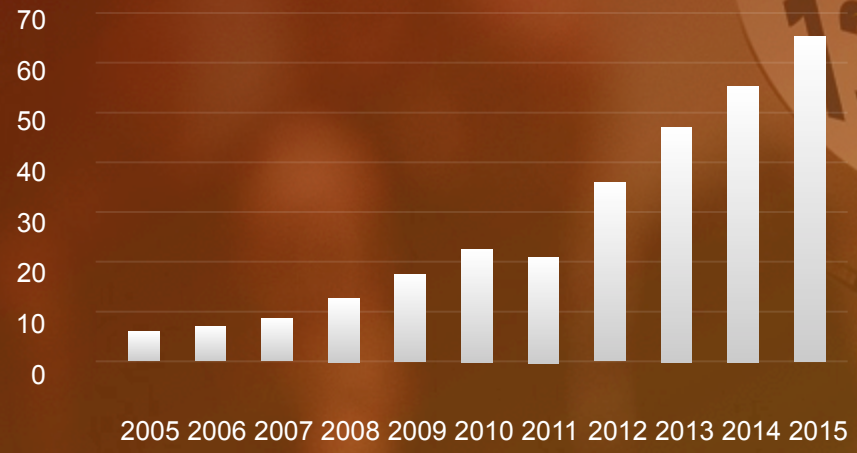
750 MW

RE share in the total power generation

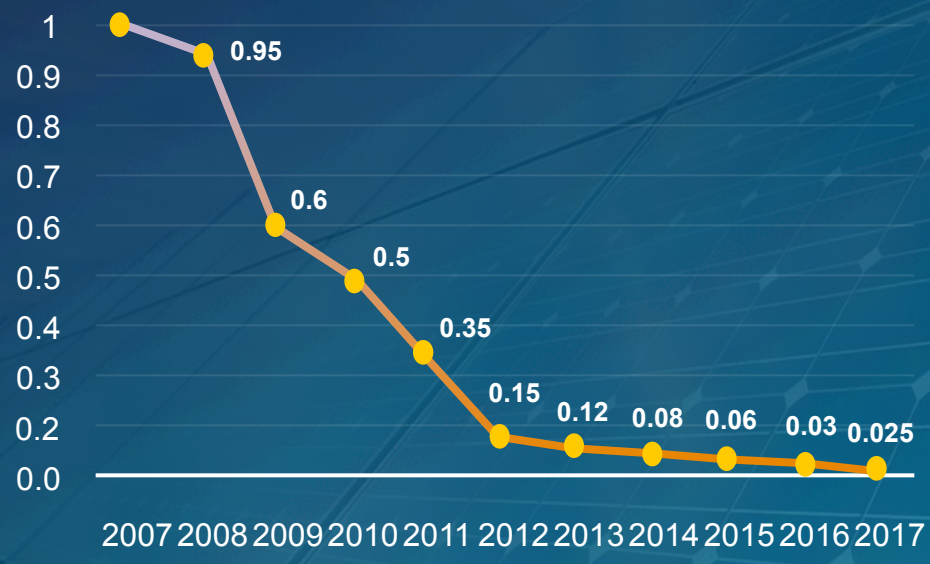


NUMBER OF COUNTRIES EMPLOYING THE AUCTION METHOD OF RE SUPPORT



At present 67 countries aroung the world use the auction method for RE support

SOLAR GENERATION TARIFFS, $/kWh

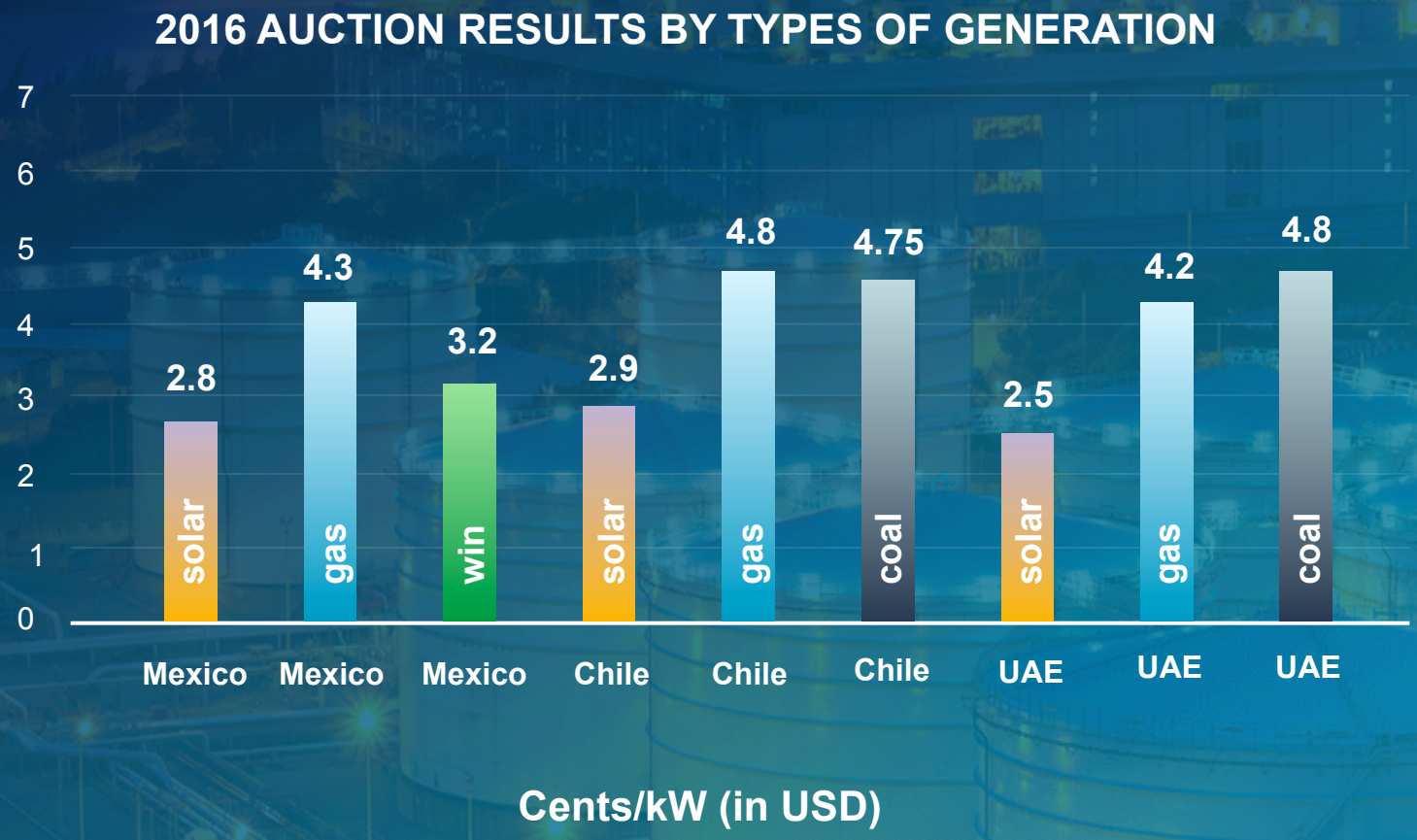


COMMISSIONING OF NEW SOLAR CAPACITY, GW

Over the last 10 yeas the cost of solar power declined from 1,0 to 0,025 USD
This has resulted from an economy of scale, cheapening technologies and the shift towards a market mechanism – the auction.


PRICE OF WIND ENERGY, $/kW
0.5
0.4
0.3
0.2
0.0
0.40
0.39
0.30
0.17
0.10
0.06
0.05
0.04
0.034
2009
2010
2011
2012
2013
2014
2015
2016
2017

The price of RE may be lower that new coal and gas-fired power plants



FURTHER DEVELOPMENT OF RE IN KAZAKHSTAN

It is necessary to address two important tasks:

1. Select and implement the most effective RE projects and attract the best investors with advanced technologies

2. Reduce RE burden on the country's economy

AUCTION MECHANISM

to RE support will enable us to address these two tasks