



ASSOCIATION OF RENEWABLE ENERGY OF KAZAKHSTAN



Mr. Arman Kashkinbekov
CEO, Association of Renewable
Energy of Kazakhstan

ITALIA-KAZAKHSTAN
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Main goals of AREK:



Creation of favourable investment climate for development of renewable energy industry



Reduction of greenhouse gas emissions



Creation of export-oriented renewable energy industry



Increase local content in the renewable energy projects



Improve collaboration between inventors and scientists for introduction of innovations to the industry



Facilitate technology transfer and technological development



Investment in Renewable projects increased in last 10 years

Global investment in Renewable Energy by region, 2004-2014

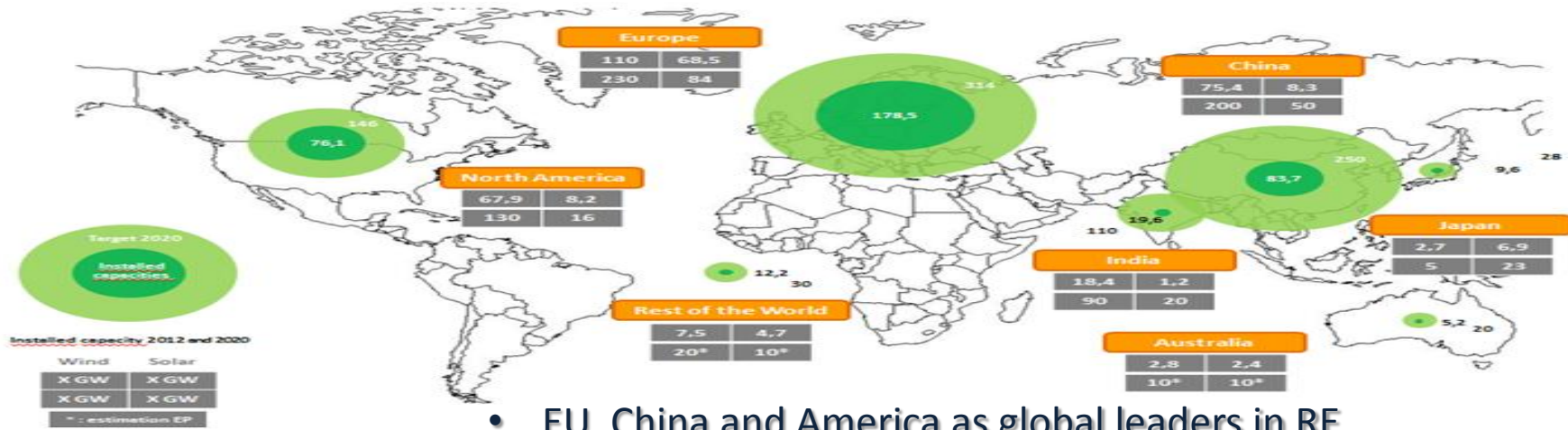


- Significant growth in developing countries of South-East Asia, China, Latin America
- Myth of RE only in developed World is not sustainable



Global RE Capacity Growth & Costs Comparison

Global RE Installed Capacity by 2020

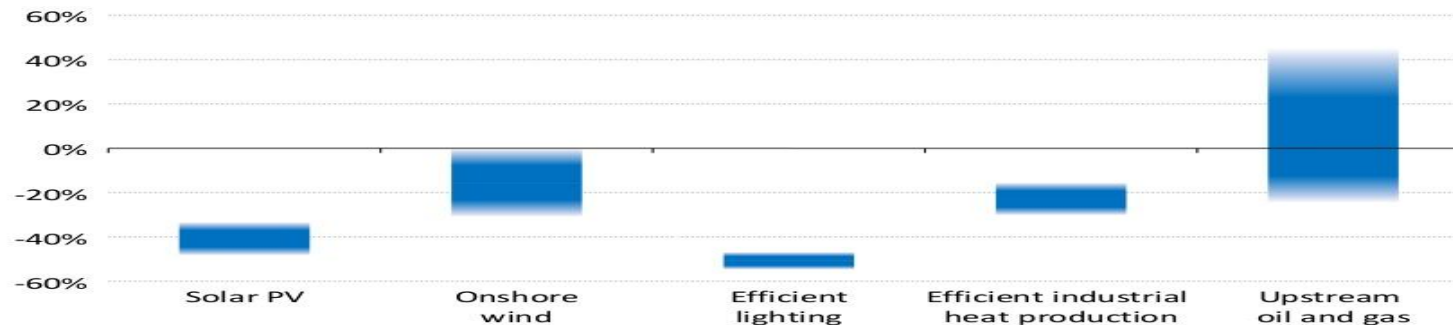


- EU, China and America as global leaders in RE

Policies spur innovation and tip the balance towards low-carbon

World Energy Outlook 2015

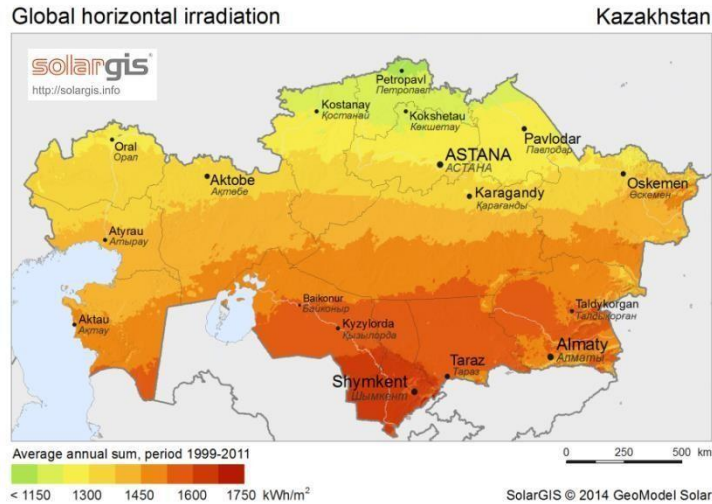
Costs in 2040 for different energy sources/technologies, relative to 2014



Innovation reduces the costs of low-carbon technologies & energy efficiency, but – for oil & gas – the gains are offset by the move to more complex fields



Kazakhstan has huge potential in Renewable Energy generation



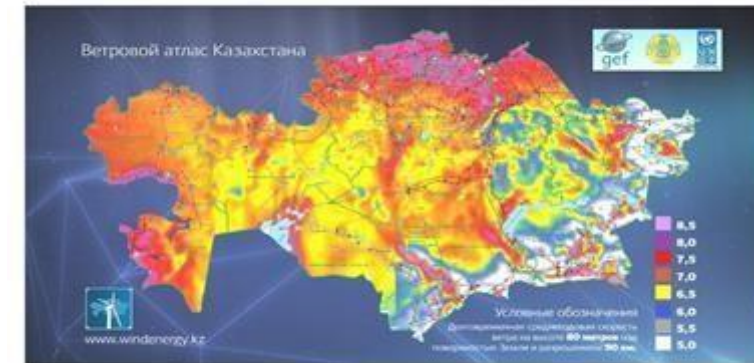
Solar energy resource

Average insolation duration	2200-3000 hr/yr
Average insolation	1300-1800 kW/m ² /yr
Potential	3,76 TWh

Wind energy resource

Average wind speed	<ul style="list-style-type: none"> - More than 50% of territory 4-5 m/s; - More than 10 places 8-10 m/s
Favorable allocation	South, East and Southeast Kazakhstan
Potential	1,8 TWh

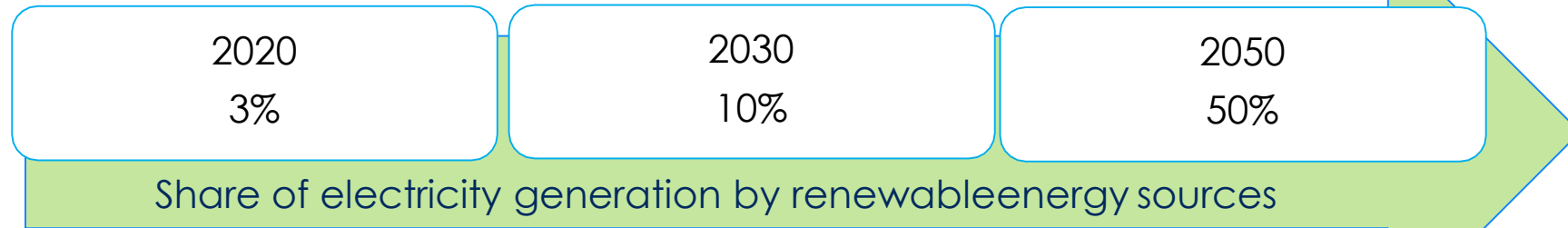
Wind Atlas Of Kazakhstan



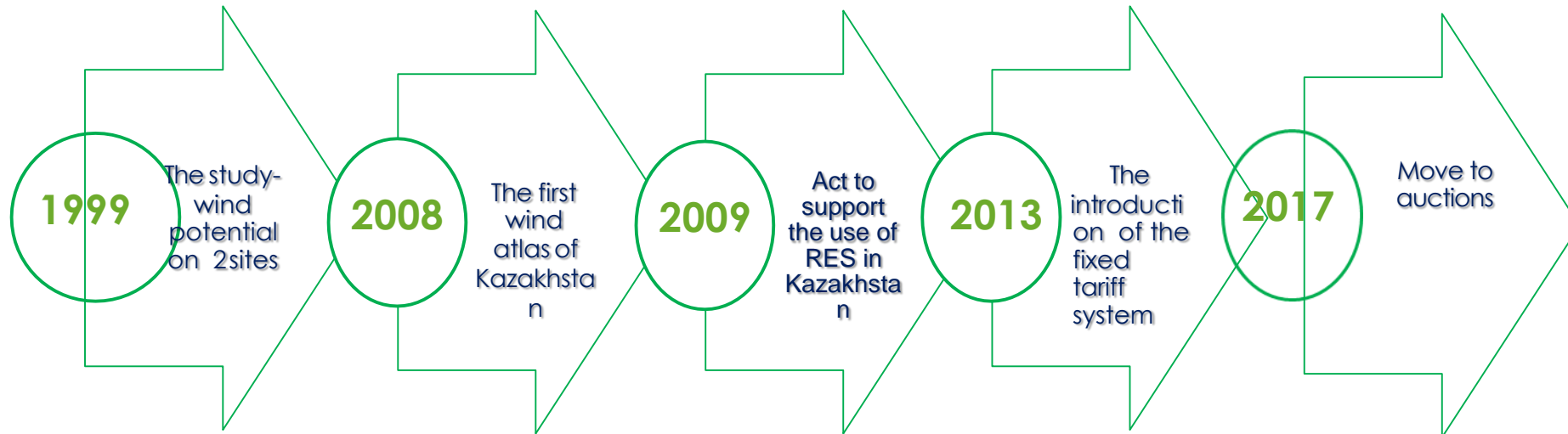


Policy Matters!

Key strategic indicators for Renewable Energy Development



The main stages of the development of renewable energy sources in Kazakhstan



Source: Decree of the President of the Republic of Kazakhstan Nazarbaev N.A. - "On the Concept of Transition of the Republic of Kazakhstan to the "Green Economy" on May 30, 2013 № 577

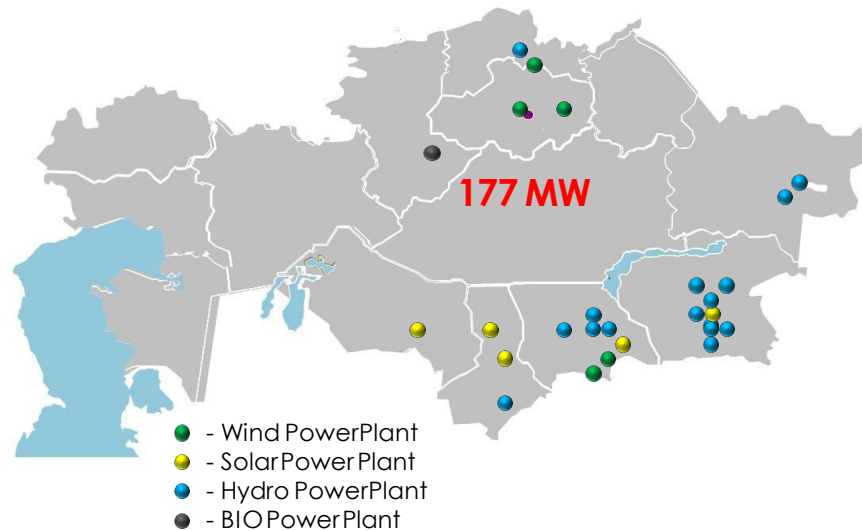


Expected Layout of Renewable Energy facilities until 2020

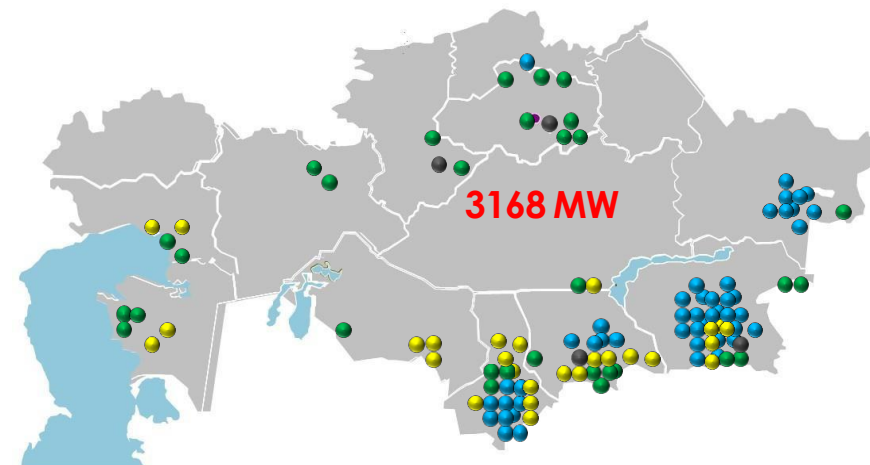
By 2020 it is planned to put into operation about 106 renewable energy facilities with a total installed capacity of 3054.55 MW:

34 Wind (1787 MW)	41 Hydro (539 MW)	28 Solar (713,5 MW)	3 BIO (15,05 MW)
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2014 - completed projects

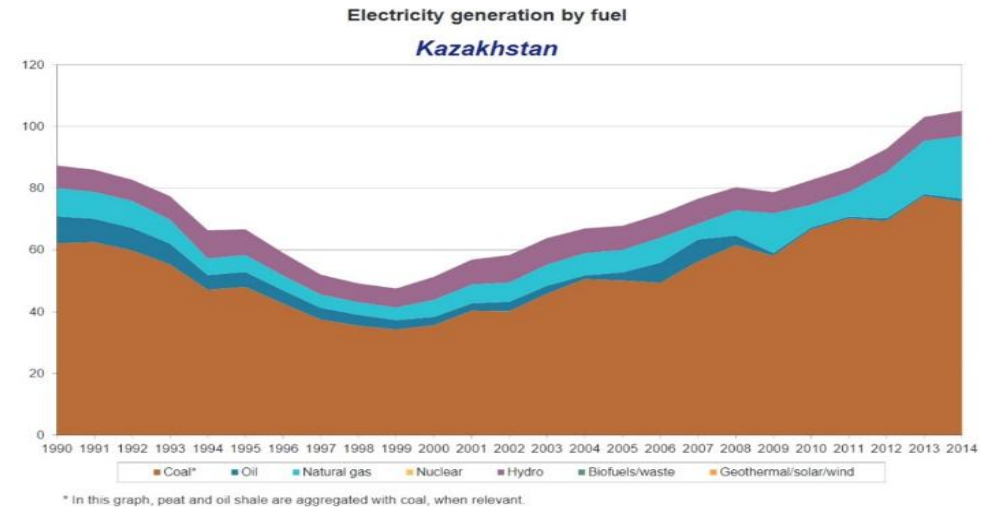


2020 - future projects





Overview of traditional electricity generation in Kazakhstan



Energetics of Kazakhstan

Generation and consumption of electricity in 2013:

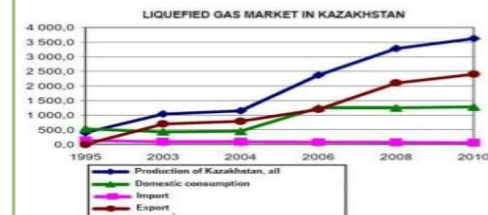
Development: 91 972,7 KWh
Consumption: 89 640, 8 KWh

The main producers of electricity:

1. "ECE" JSC 16%
2. "Ekibastuzskaya GRES-1" LLP 15%
3. "Ekibastuzskaya Station GRES-2" JSC 7%
4. "Kazakhmys Energy" JSC 5%
5. "Almaty Electric" JSC 4.4%
6. "Pavlodarenergo" JSC 3.8%
7. "Karaganda-Power Center" LLP 3.6%

Power consumption:
 ➤ industry - 68, 7%
 ➤ households - 9.3%
 ➤ service sector - 8%
 ➤ transport - 5.6%
 ➤ agriculture - 1.2%.

Production and consumption of natural gas in the Republic of Kazakhstan 2014:
 Production of gas - 45-50 bln. M3
 Consumption in the Republic of Kazakhstan - 18 bln. m3

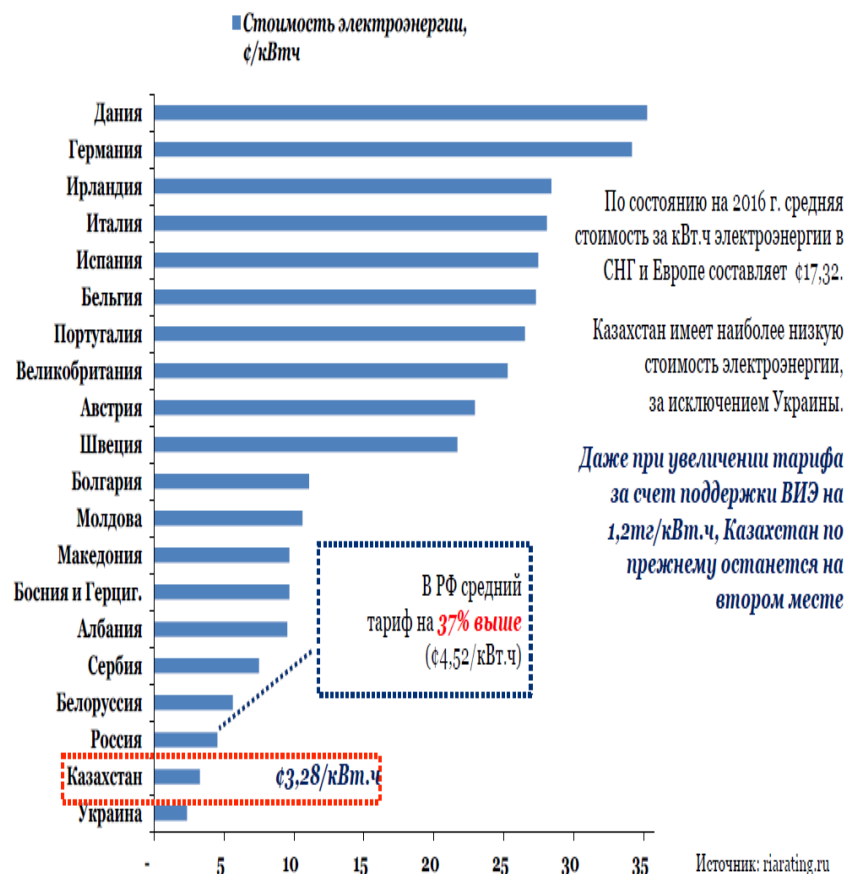


- Surplus in electricity
- Capacity retirement/ new thermal power stations' tariffs
- State subsidies for low electricity tariffs



Price of electricity & CO₂ emissions

Стоимость электроэнергии в Казахстане на сегодняшний день одна из самых низких в СНГ и Европе



Приложение 1: Казахстан имеет самый высокий в мире показатель по выбросам CO₂ на единицу ВВП

20 стран по интенсивности выбросов CO₂ на единицу ВВП (в кг CO₂/)

Место	Страны	2008	2009	2010	2011	2012	2013
1	Казахстан	1,380	1,200	1,312	1,221	1,204	1,171
2	Узбекистан	1,688	1,414	1,270	1,275	1,193	1,085
3	Украина	0,951	0,937	0,970	0,963	0,948	0,905
	Саудовская Аравия	0,704	0,744	0,774	0,755	0,773	0,802
5	Россия	0,763	0,773	0,781	0,783	0,758	0,737
6	Китай	0,836	0,804	0,782	0,782	0,740	0,712
7	Южная Африка	0,800	0,773	0,761	0,732	0,729	0,704
8	Иран	0,660	0,670	0,625	0,621	0,648	0,672
9	Кувейт	0,567	0,656	0,635	0,611	0,602	0,620
10	Тайвань	0,639	0,616	0,603	0,568	0,558	0,552
11	Венесуэла	0,490	0,504	0,553	0,464	0,481	0,494
12	ОАЭ	0,455	0,478	0,493	0,495	0,487	0,488
13	Австралия	0,534	0,534	0,513	0,503	0,495	0,486
14	Индия	0,453	0,474	0,451	0,440	0,456	0,463
15	Малайзия	0,499	0,459	0,467	0,469	0,454	0,447
16	Тайланд	0,433	0,433	0,434	0,447	0,442	0,430
17	Польша	0,484	0,455	0,464	0,439	0,419	0,418
18	Южная Корея	0,404	0,408	0,426	0,431	0,418	0,413
19	Индонезия	0,426	0,427	0,435	0,424	0,409	0,411
20	Канада	0,455	0,445	0,437	0,429	0,411	0,406

Казахстан также занимает 17-е место в мире по выбросам в атмосферу

(согласно данным МинЭнерго РК)



Current issues in Renewable Energy industry



1. **Legislation.** Frequent change in legislation: investors do not like it.
2. **Auctions.** New legislative framework is yet to developed.
3. **Financing.** Absence of tenge financing, IFCA support on green bonds and Islamic green finance.
4. **Devaluation.** Risk of further changes in exchange rate of national currency tenge vis-à-vis \$.
5. **Mining & metallurgical lobby.** Resolved.
6. **SMEs.** First pilot projects initiated by KZ GOV, not its turn for SMEs to take the lead.
7. **Expo.** Fear that RE story finishes after Astana Expo 2017.



THE WAY FORWARD: AFTER EXPO MEASURES

1. **Support of President of Kazakhstan's view.**
 - Remove subsidies to traditional energy, support RE.
 - Move to 30 most developed nations.
2. **Independent State Body or National Company.**
 - Ecology, CO2 emissions, RE devt, Paris agreement, waste treatment, green economy issues.
3. **State RE Development Programme.**
 - Legislation, financing, local content, education, PR campaign, support of SMEs.
4. **All EXPO Ideas & Recommendations.**
 - Best ones delivered at all conferences and events not to be forgotten, but implemented in practice.
5. **Kazakhstan as an active player on global RE arena.**
 - Made in Kazakhstan solar panels, wind turbines, electrical equipment, professional labor force.





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www.facebook.com/renergyKZ
info@kazrenergy.com