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PROMITHEAS Net

Kazakhstan Renewables: Clear Energy Market Promotion, Competitiveness and Benefits

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Introduction

- Kazakhstan is the Chairman of OSCE in 2010
- Summit OSCE will be held 1-2 December 2010 (for the first time more than 10 years)
- Issues to be discussed also include initiatives in Energy po
  energy development, Lo
  development, etc.

MCDE-6 ESCATO

- The Sixth Ministerial Conference on Environment and Development in Asia and the Pacific (MCED-6) has been hosted by the Government of the Republic of Kazakhstan from 27 September to 2 October 2010 in Astana. Participants 56 countries (http://mced6.org/en/)
- **The Astana Ministerial Declaration, affirming the commitment of countries in the Asia and Pacific region to the internationally-agreed development goals, presenting regional perspectives and priorities in pursuit of sustainable development, and endorsing concrete programmes and actions at the national, subregional and regional levels.**
- **The Regional Implementation Plan for Sustainable Development 2011-2015, specifying regional priorities, mapping out the way forward and launching specific thematic and programmatic initiatives, such as "*Zhasyl Damu*: Green Development"; and**
- **New partnerships for sustainable development: MCED serving as a unique regional forum for constructive dialogues between all stakeholders in pursuit of sustainable development, providing opportunities for governments, international organizations and NGOs to showcase their successful programme and practice, strengthen existing cooperation and build up new partnerships.**
- Synergy between the outcomes of MCED-6 and the European Environmental Ministerial Conference to be held by ECE in 2011 in Kazakhstan

Context

- RE in Central Asia
- Kazakhstan indicators, RES Potential and Perspectives
- RE barriers
  Involving Policy for RE (Wind)
- Scenarios with MARKAL :
  main results of investigation
- Examination of risks and extra benefits in RE projects relating to Kyoto
- Conclusions

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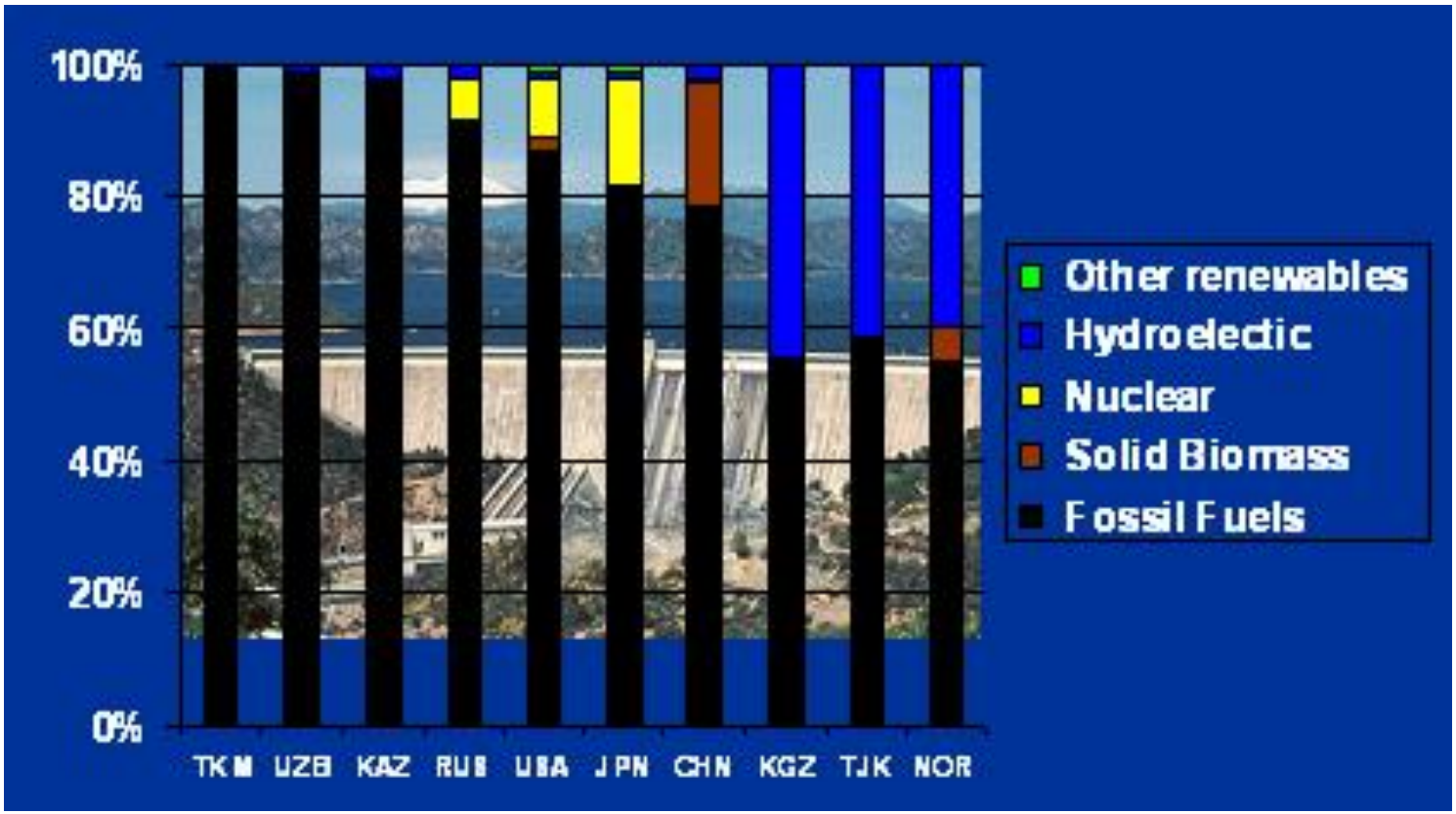
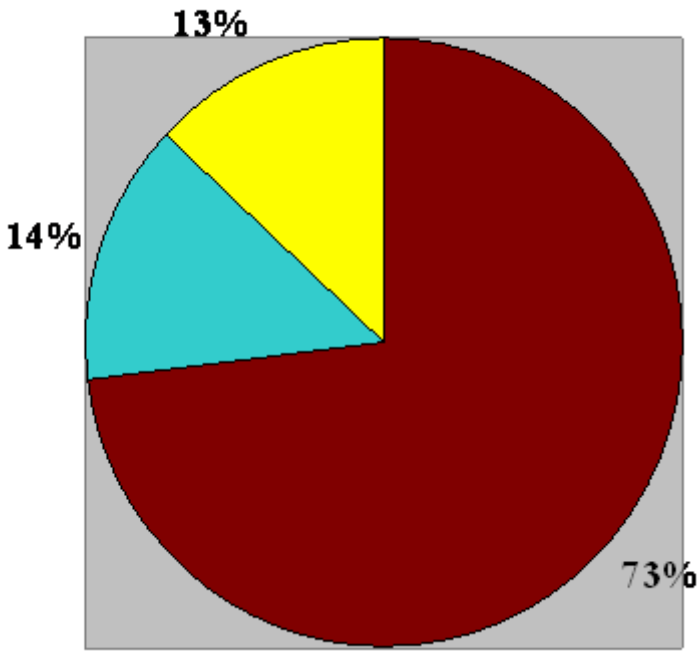
Energy Production by Type in Central Asia



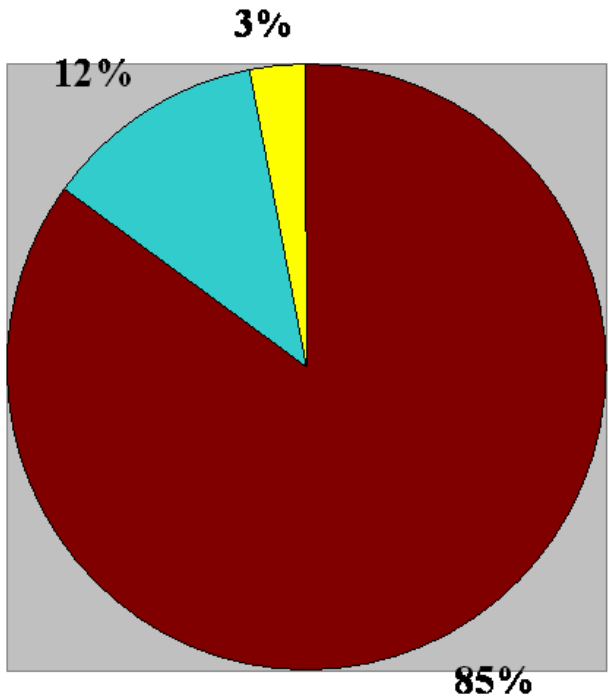
Source: http://earthtrends.wri.org

KAZ Generation capacity (18 500 MW)



- Coal based Thermal Power Stations
- Hydro Power
- Gas Power

KAZ Annual production of Electricity (67 BkWh)



- Heat Power Plants
- Hydro Power Plants
- Gas Power Plants

Importance of Renewables

- Renewables offer a portfolio of technologies that provide readily available, low carbon energy with co-benefits, such as environmental, financial risk minimization, and distributed economic benefits.
- They produce power with less GHGs and other air pollutants and conserve water and finite resources.
- Renewables also: enhance national energy security*, reduce exposure to fossil-fuel price volatility, and provide substantial economic benefits e.g., job creation and technology development.

RES Potential and Perspectives in Kazakhstan

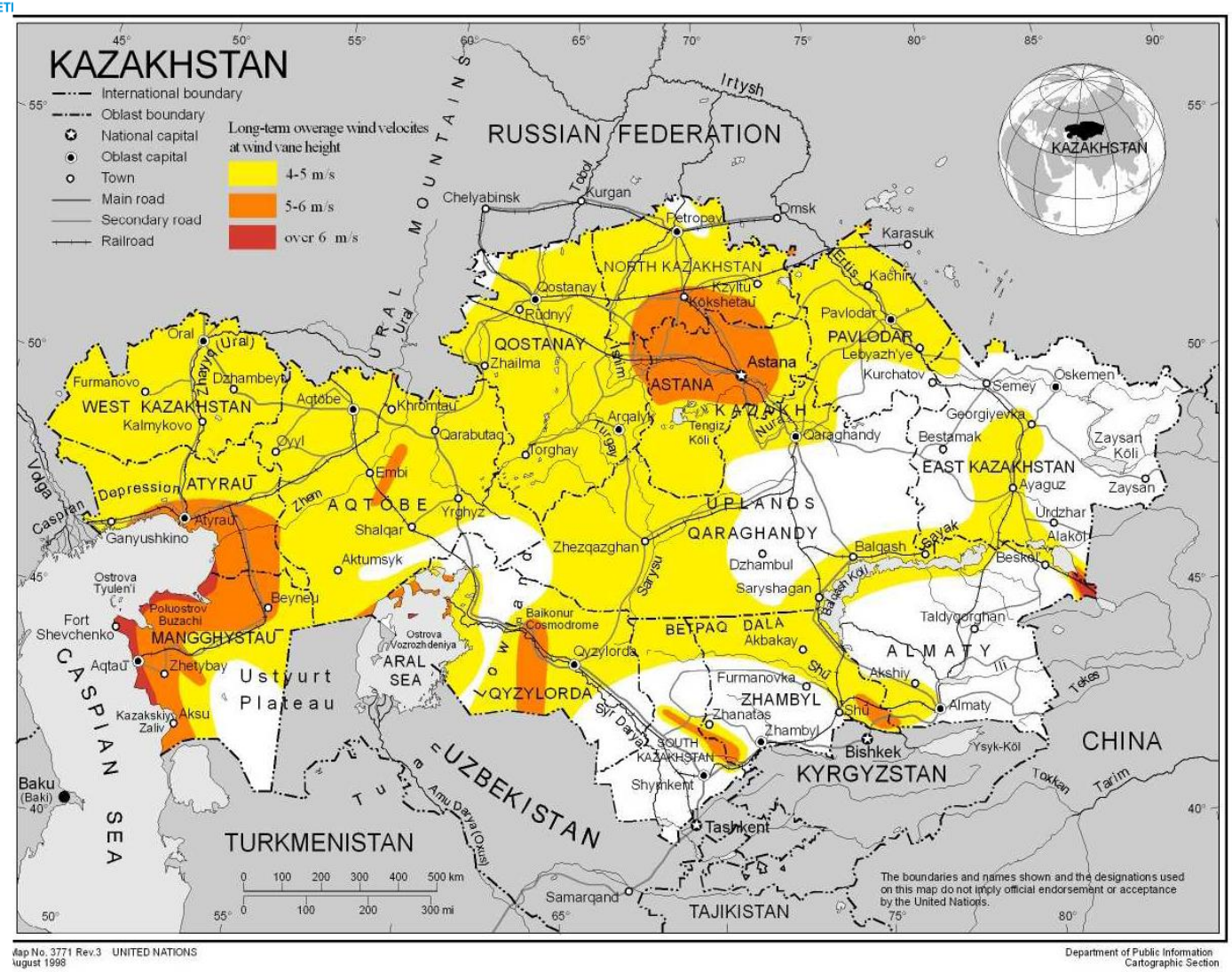
- Potential

- Hydro – 170 billion kWh per year (in use 5%)
- Solar energy – 1300-1800 kWh/м2 per year
- Wind energy – 1820 MWh per year
- Biogas- 54 000 toe/year
- Geothermal energy – 520 MW

-Perspectives

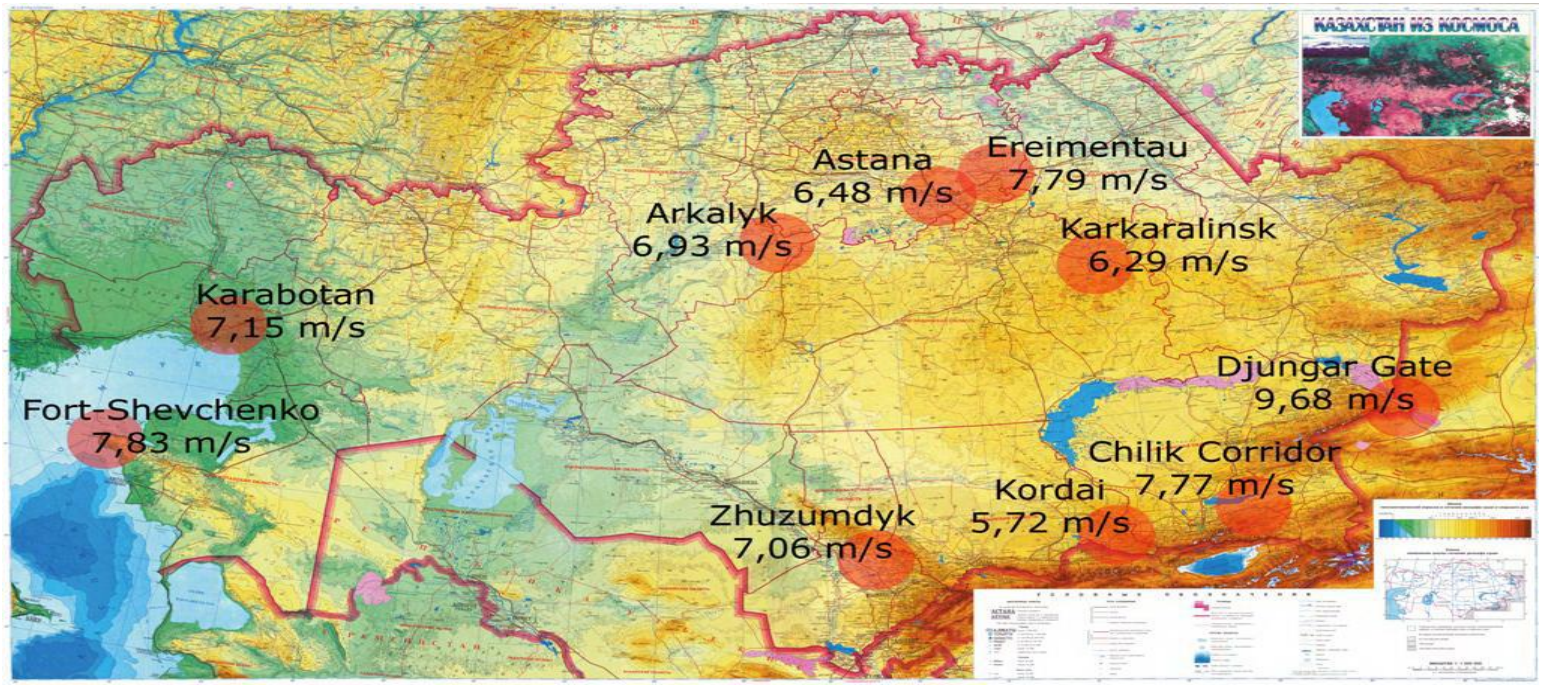
Introduction of 1460 Mw Hydro Power in South and East by 2030, including 300 MW by 2015
Introduction of Wind Power 520 MW, including pilot in Dgungar Gates 5MW by 2010
Introduction of solar collectors for hot water supply

Wind Atlas Kazakhstan



Land demand to cover annual electricity demand
- 2763 Км 2

Features of Wind demand in Kazakhstan



One of the issues, concerning all Kazakhstan regions, is of the supply of energy to remote rural consumers. The large scale of the territory of Kazakhstan and low the density of population in rural area means that significant rural transmission lines extension is necessary, which currently forms about 360 thousands km. Maintenance of the power circuits for such an extension, as well as significant losses (25-50%) of energy transmitted will greatly increase energy cost.

Renewable Electricity: barriers

Barriers	Centralized Renewables	Distributed Renewables
Economic	Expense	
	Unique project & finance structures	
Regulatory/Structural	Lack of long-term policies & regulatory certainty	
	Land access & siting	Local ordinances & siting
	Transmission access	Inconsistent & limiting state interconnection policies
	Market & grid operations	Grid integration codes & standards
Behavioral	Lack of information on technologies & benefits	
Availability	Manufacturing and supply-chain constraints	
		Availability of skilled technicians

Many of these barriers are regulatory and non-economic.

RE: Overcoming Barriers

- Making Renewables Cost-Competitive
  - Refine existing technologies
  - Invent new technologies
  - Price GHG emissions
  - Regulate usage
- Overcome Transmission Constraints
  - Develop innovative financing
  - Include the non-wires option
  - **Manage Variability**

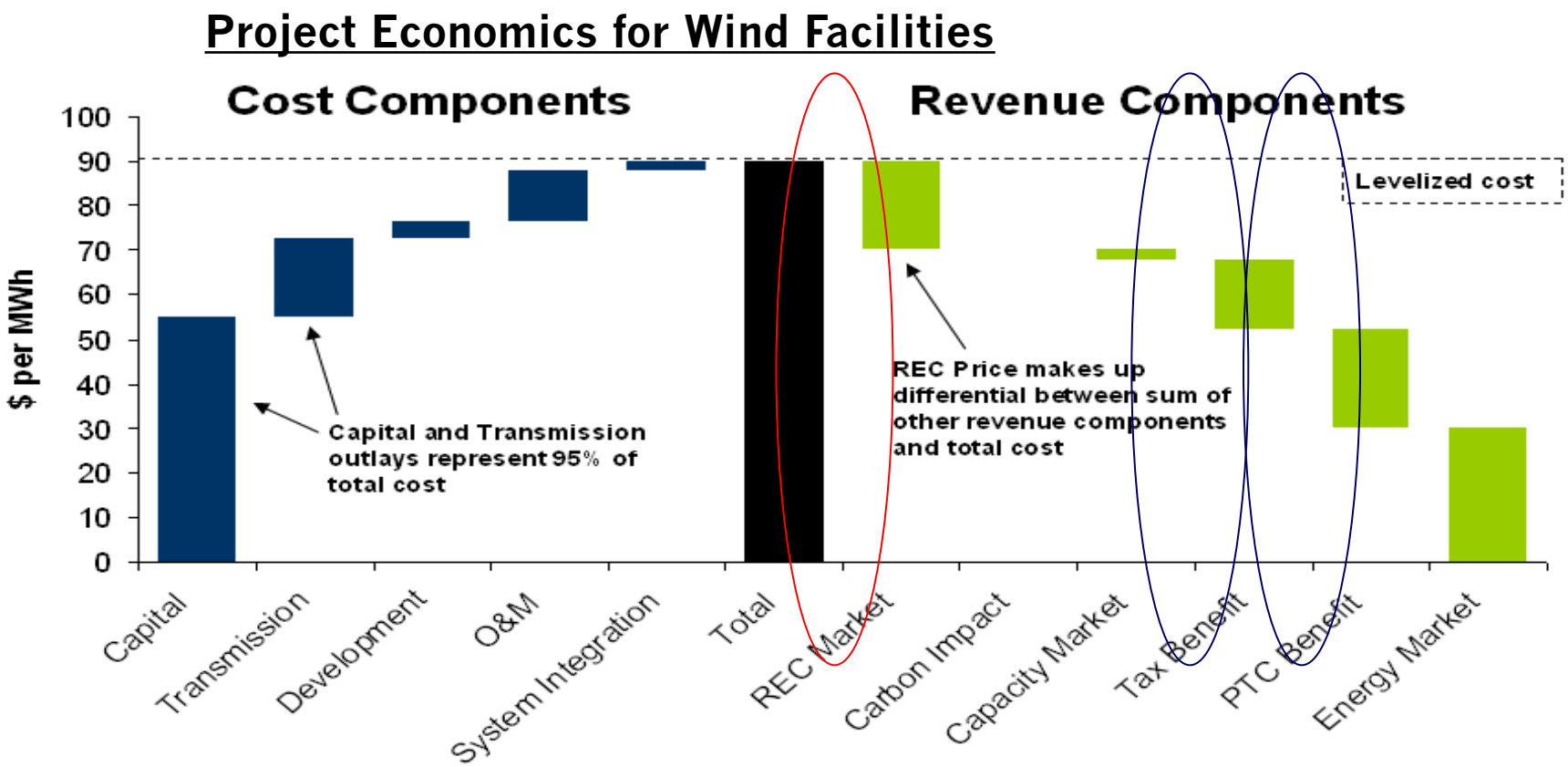
Evolving Policy Support for Renewable Energy

- These policies must address **KEY CHALLENGES** …
  - Project economics in order to hasten deployment
  - Build transmission lines
  - Improve grid management systems to incorporate more renewables

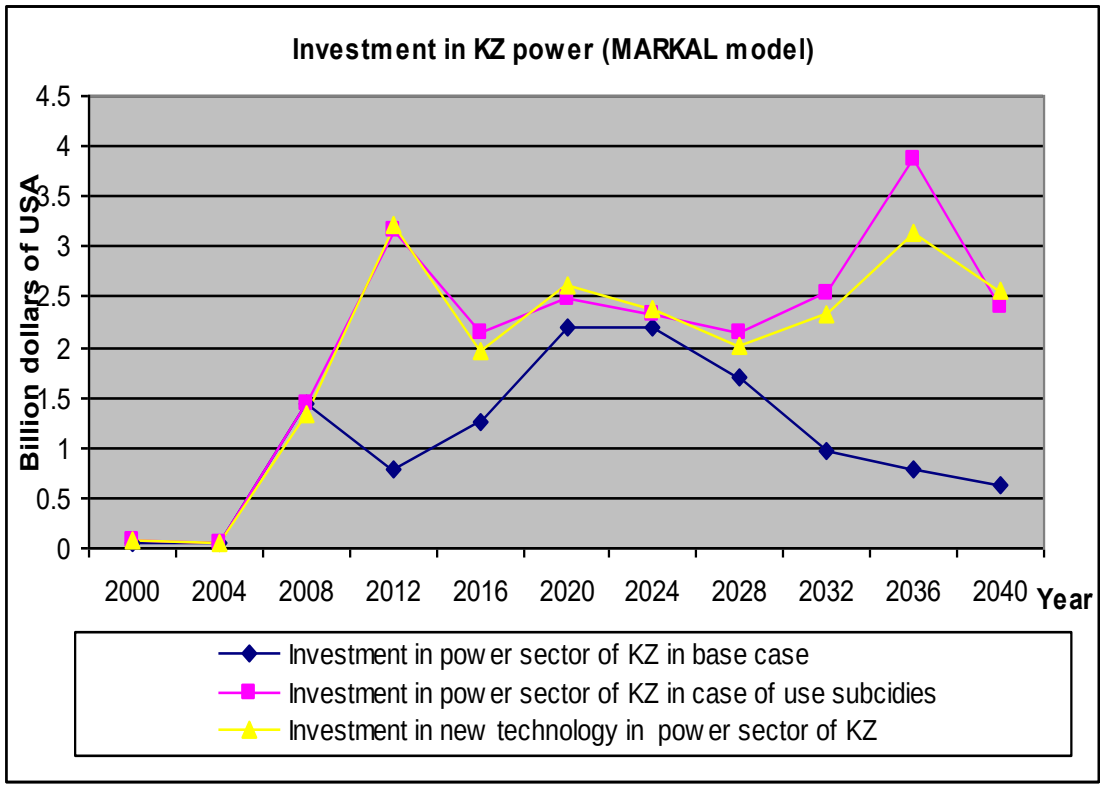
In 2009 new law of the Republic of Kazakhstan "«ABOUT SUPPORT OF USE OF RENEWABLE SOURCES OF ENERGY» and supporting regulations were adopted. Accordingly the national Program on RES development the target has been set to increase share of alternative sources of energy in energy balance up to 5% by 2024, in particular use of wind energy potential for electricity production in amount of 5 billion kWh in 2024.

Evolving Policy Support for Renewable Energy

- Renewables could use tax credits, accelerated depreciation, and RECs (voluntary & RPS) to bridge the gap between costs and power contract revenue.



Investment dynamics in power sector



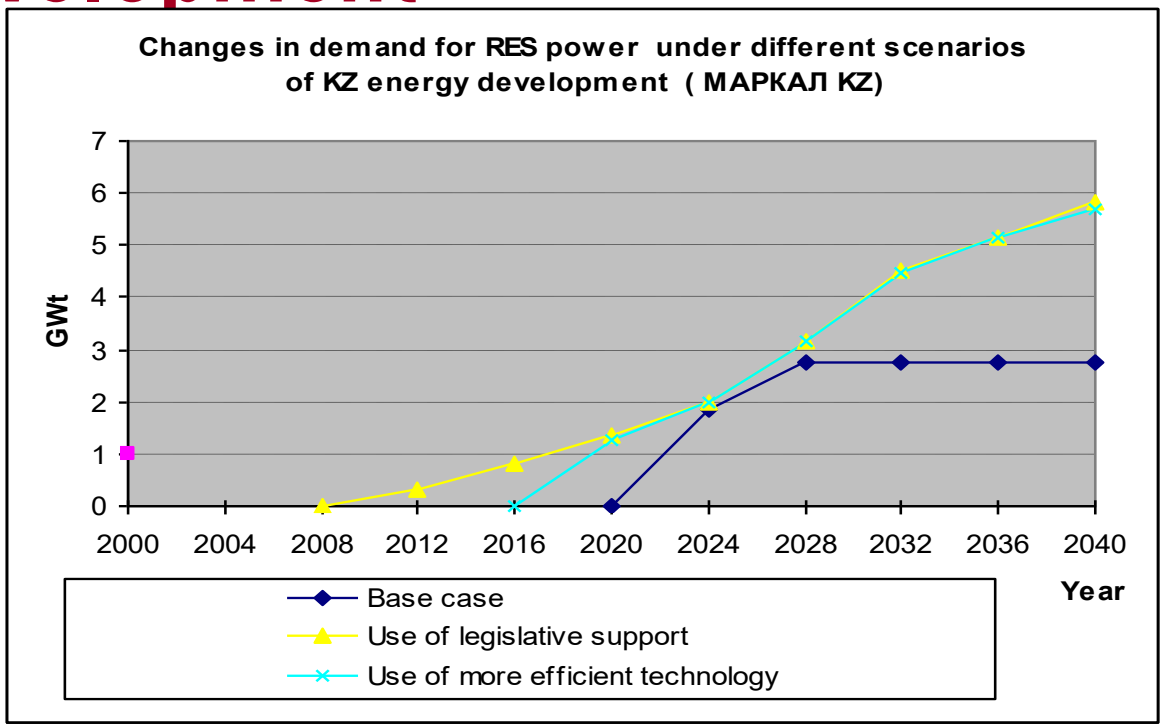
Coal fired power stations – price 1cent/kWh

Wind power stations – estimated price 5 cents/kWh

According to scenarios developed with MARKAL model wind power plants are not competitive in the power sector of Kazakhstan until to at least since 2016.

if the wind electricity is subsidized with 3.2 US cents/kWh in this case in 2016 wind power produces 0.58 TWh, which is about 0.5% of the total electric generation, up from 0.1% in the base case, in 2024 it covers 3% of the demand with 4.1 TWh.

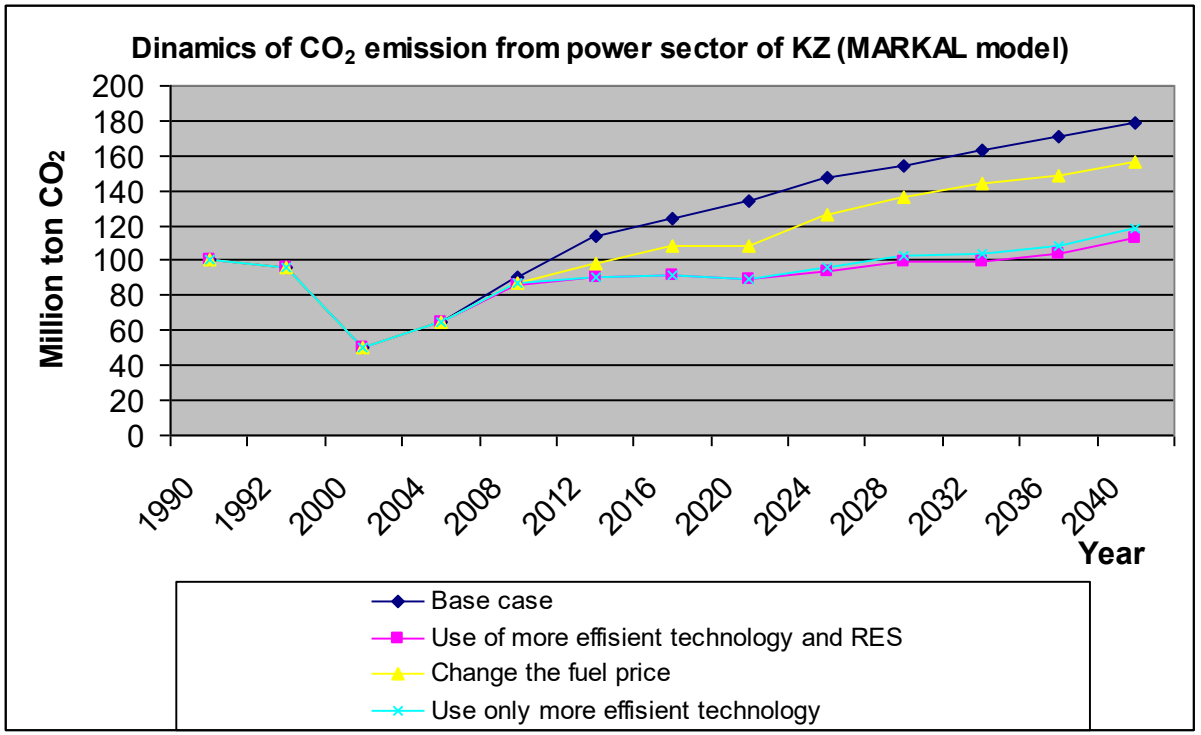
Impact of legislative support on Wind development



Analysis shows the impact of legislative support use of wind energy potential, in particular increase of wind energy capacity up to 300 MW by 2015 and about 2GW by 2024

“More efficient technologies” scenario includes potential for electricity production in amount of 5 billion kWh in 2024, investments into modernization of generating capacities (both indicators included into National Program 2024).

Dynamics of CO2 from power sector



While comparing the impact of two mechanisms: the scenario of use of more efficient technology and RES (pink one) and scenario of changing of fuel prices (yellow one) it is evident that GHG emission reduction is more essential because of more efficient technologies and RES use implementation, in this case the GHG emission reduction potential in 2024 could be about 34 million ton CO2

Examination of risks and extra benefits in RE projects relating to Kyoto

- The impact on RE project financial internal rates of return (IRRs) for a range of CDM and JI undertaken by the World Bank (WB) at a price of $4 per ton CO2 equivalent is 0.5–2.5% (hydro, wind) and carbon can contribute about $2.00–3.40 per MWh delivered (viability is critical).
- Project developers may apply to Kyoto on a voluntary basis to improve the bankability of their project by seeking additional finance for carbon reduction through selling verified credits in addition to electricity and RECs. In this case the developer will bear all risks on accreditation and registration under Kyoto. Besides, other benefits could be the following:
- Under Kyoto RECs may confirm the origin that electricity is generated from renewable energy sources for the purpose of UNFCCC and the Kyoto Protocol.
- RECs could be converted into emission reduction units which could be sold later on international market. Eligibility requirements to Kyoto Protocol should be satisfied.
- Share of RES could be interpreted as indicator of effective use of resources for achieving of Sustainable Development and contribute to UNFCCC.

Conclusions

- The hidden costs of non-renewable energy make renewable energy, in many cases, more desirable the fossil fuels or nuclear power.
- For regions with very good wind potential and an energy deficit in Kazakhstan, wind farms can be an economical alternative for the construction of new coal power stations, at the same time possessing indisputable ecological advantages.
- RES demand growth and competitiveness begins in 2016-2020 for Kazakhstan, capacity potential assessed up to 4,5 GW.
- Benefits for RES support in Kazakhstan include: Climate Change Mitigation, Urban Air Quality, Energy Security, Hedge against fossil fuels markets, Energy decentralisation.
- Mechanisms such as RECs, PRS and Kyoto could be advantage perspective for RES development in Kazakhstan
- Decision makers therefore need to stimulate action at the local government level in order to fully integrate RES and climate considerations into urban development strategies.

Thank You
for attention!

Ladies and gentleman!

- Many thanks to organizers of this Conference, who provided fruitful work to promote further cooperation between all our countries under BESEC Initiative.
- The National and Kapodistrian University of Athens (NKUA), the host of the Conference,
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- Dr. Popi KONIDARI ,Contact point, Eleni-Danai Mavraki; members of Scientific Committee,
- All participants
- I wish everybody successful work