

## Energizing the Future: Water, Climate and the challenges and opportunities for Kazakhstan

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Dear associates,  
We have finally left behind the long Kazakh winter with its tail of floods and floods. Now summer brings us to think positively and see blue sky. In fact, and this is one of the themes of this month, in Kazakhstan it is even more true than in other countries. An interesting graph that I want to share with you highlights how the winter months are real attack on health, as also happens in our Po Valley.

The graph represents the concentration of so-called PM2.5 particles in the air. that is, they are those particles so thin that they are not intercepted by industrial filters. They are the result of combustion processes. Whether from cars or thermal power plants or simply from the ugly practice of burning waste in the steppe.

If, on the one hand, we see that 2023 was a better year than the previous one, but is also true that we are talking about very high exceeding thresholds, in line with Kazakh law which authorizes an excess of up to 600 times the average!! For short-term situations.

I wanted to bring to the attention the issue of air pollution, but as far as water is concerned we have the same problem. We have talked about water these months, first to say that we have too little of it, and then to say that we have too much of it, or that in any case we are unable to manage the abundance when it is there. But we never talked about quality. Polluted water cannot be used for any industry, not even for agriculture, and indeed usually leads to the spread of even very serious diseases.

However, the concept of quality is not at the center of the discussion. And this is a huge mistake. We are not going to list the diseases generated by fine particulate matter, or by the intake of pollutants through water. But the concept that we must not pollute the critical and non-renewable resources of the planet should be clarified, and pollution considered a crime and not as a sin necessary for development.



Development that has now been concentrated in cities, creating dysfunctions that are impossible to correct unless at unacceptable costs to bear. In practice we all want to live close to each other, but this is not tolerable if it is not done in a sustainable way.

In other words, we cannot afford to pollute, because cleaning is impossible.

In the figure below we can see the incontrovertible data of cities as drivers of development and at the same time devourers of resources.

So sustainable cities don't just mean residential neighborhoods with villas and gardens, but they mean cities that don't pollute.

Since our letter talks about energy, we focus on this topic. What's happening in Kazakhstan? We hear a new one every day. In recent months there has been a lot of talks about the famous nuclear power plant that the Russians would like to set to cover the needs of eastern Kazakhstan. But we also heard of 3 coal-fired power plants, for the north of the country. And finally, the mega renewable projects from Arab investors. Lastly, the gas power plant projects assigned to Qatar.

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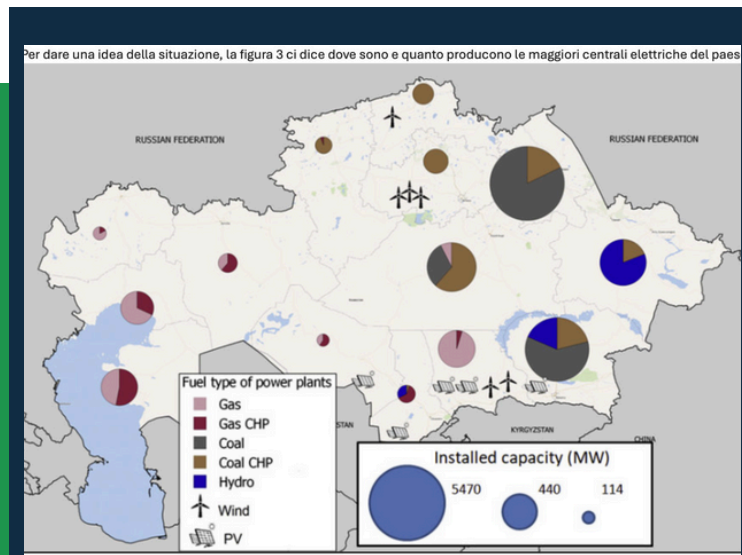
As can easily be seen, in the north coal is predominant, in the west there is gas, and the segment of renewables is concentrated in the Almaty area where hydroelectric dams can be installed. Renewables are in fact a minority and not influential in the overall panorama.

There are 155 power plants of various forms of ownership in Kazakhstan. On the 1st of January 2021, these power plants had a total installed capacity of 23,957 MW and available capacity of 19,004 MW. In 2021, these plants generated a total of 114.3 billion kWh of electricity. The needs of the power generation market are huge so Kazakhstan seeks to replace aging plants and equipment. About 65% of the equipment in power generation facilities has been in use for more than 20 years and about 31% for more than 30 years. Electricity transmission networks are inefficient, with estimated losses of 15% in transmission and distribution systems. The Government of Kazakhstan has developed an action plan for the development of electricity until 2030, which includes a list of power plants proposed for modernization or reconstruction, as well as construction of new plants. Samruk-Energo said that Kazakhstan is planning to install 14 GW of new power generation capacity by 2030. The government expects that investment in the energy sector reach \$63 billion over the next 18 years, of which \$37 billion dollars in energy production, \$9 billion in energy distribution networks, and \$17 billion in regional energy distribution organizations.

Now of all this, nothing is seen yet, or rather very little. There are a couple of modernization projects for Almaty, which needs it so much, but going back to the ridda of announcements apparently unrelated to each other, it seems that there is a certain disconnect between what is the Kazakhstan 2060 plan for a sustainable economy and it is then actually put into construction. Among other things, speaking of renewables, the only energy storage project announced would be that of Total, for 600m.

The commissioning date of this project is not known, but it is undoubtedly the only sign of attention to energy storage which is decisive for sustainability. If we return to the beginning of this letter regarding water and its quality, unless we definitely go on renewable energies there is no way to preserve the aquifer of the country, understood as a concept, given that in any case all electricity production systems connected to non-renewable energies consume water greatly. And when they consume, it means, that it is no longer reusable.

Undoubtedly the picture does not help to get an idea of what the main line of development could be, and what therefore is the point of failure of a truly sustainable economy. And now it is summer, we will think about it in October, when the heating of the Kazakh cities will bring us will bring to our attention the need to breathe... As for our monthly progress on initiatives related to green hydrogen, there is really not much to add to what was said last month, except that we are working closely and busily to increase Kazakhstan's connections with our country. This month we sponsored the first contact of an engineering faculty in Italy with the Gumilov University in Astana.



The logic is to create interchangeable study programs to offer technicians and engineers trained according to the most modern technologies in Kazakhstan Moderna. We still can not announce agreements, we hope we can do it soon. Meanwhile, the link is created.

As for the project for KMGE, we are working on a phased implementation that can start the project very quickly, taking advantage of what we already have available from the pilot project in Aksai and from the favorable moment in the solar panel market.