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Impact of future energy policy on water resources in Kazakhstan

Pedro Rivotti (1), Marat Karatayev (2), Zenaida Sobral Mourão (3), Nilay Shah (1), Michèle Clarke (2), and D. Dennis Konadu (3)

(1) Centre for Process Systems Engineering, Imperial College London, United Kingdom (p.rivotti@imperial.ac.uk), (2) Energy Technologies Research Institute, Nottingham University, United Kingdom, (3) Department of Engineering, University of Cambridge, United Kingdom

As part of its commitment to become one of the top-30 developed countries in the world, Kazakhstan set out an ambitious target of increasing the share of renewables and alternative sources of energy in its power generation mix to 50% by 2050. This vision greatly contrasts with the current situation, with coal and natural gas power plants producing around 90% of total electricity in 2016. While this transition provides a unique opportunity to improve the sustainability of the national energy system, major natural resources challenges currently faced in the country should be taken into account. Particularly in the case of water resources management, the current system is characterised by significant losses, heavy reliance on irrigation for the agricultural sector, unevenly distributed surface water, vulnerability to climate change and variations in transboundary inflows, amongst other issues.
In this context, this study aims to investigate the future availability of water resources to support food production and the transition to a new energy system. Given the challenges mentioned above, tackling this question requires an integrated analysis of the water-energy-food systems in Kazakhstan. This is done in three stages: (1) characterising the water supply and demand in the country; (2) establishing the linkages between water resources and activities in the power production and agricultural sectors; and (3) identifying potential conflicts at the nexus between water, energy and food, taking into account future energy policy scenarios, trends for food production and water resource use.