EXECUTIVE SUMMARY

In January 2014, the Hungarian Government signed the Moscow pact and by doing so made an arbitrary decision without professional and social consultation to build Hungary's future energy management on the new Paks Nuclear Power Plant (Paks II). The public was flabbergasted at the far-reaching decision that came by surprise and many aspects of the clandestine negotiations still have not been revealed. One year passed since, and despite of the Energiaklub's numerous requests for information disclosure, we have hardly learned any new facts, and actually more questions arose instead. Nevertheless, it is still difficult to find adequate support for the government's arguments in favor of building the Paks II Nuclear Power Plant.

The Energiaklub has created a vision to point out that there are alternatives to Paks II, which alternatives, as of today, have not been compared and contrasted in an extensive professional dialogue. We would like to contribute to such dialogue by presenting a model—that was prepared last year and will be further developed in 2015—in this current publication.

The model constructed by Energiaklub, using the EnergyPLAN design software, outlines a new potential direction of development by 2030 that could be realistically achieved with high confidence levels and without the expansion to the Paks Nuclear Power Plant. Our findings show that by 2030 all Hungarian energy needs could be met without Paks II, and 27% of the electricity production could be supplied by renewable power plants. Energy rationalization, energy efficiency developments, treating renewable energy resources as a top priority, and creating a decentralized, flexible energy system instead of a centralized one would all contribute to achieving these goals.

The Energiaklub estimated that electricity demand would be lower than suggested by the forecast used to make the case for Paks II, therefore more time would available to address missing capacities. This could enable us to make an informed decision on the energy vision of Hungary after having a thoroughly thought out, extensive professional and social dialogue, hearing the pros and cons, and reviewing transparent background calculations. According to the Energiaklub, establishing Paks II would permanently set the path for the Hungarian energy scheme as a centralized system dominated by nuclear energy and a few large power plants (and large corporations); or we could choose a more sustainable, predominantly local, decentralized energy system using renewable resources. These are two different energy paradigms and the Energiaklub's vision clearly represents a flexible system that primary focuses on energy production using renewable resources.

The research carried out by Energiaklub has translated this concept into actual, realistic targets that could be met by 2030. For the purpose of this research, various resources created by different professional stakeholders were reviewed and analyzed, such as national and international statistics, trends, forecasts, research publications, potential energy

calculations, background studies, strategies and visions. The secondary research results were complemented by primary data as our own professionals and other contributors performed various calculations to create a comprehensive, data-intensive model.

In order to test the feasibility of the vision, the Energiaklub has utilized the Danish EnergyPLAN software. This program has been used worldwide since 1999 to help conduct and analyze scientific research and alternative visions in countries such as Great-Britain, Ireland, the USA, and China. The alternative solutions prepared by the Danish software developers have played an important role in shifting Denmark's official energy strategy to renewables only by 2050.

The software can model the entire energy economy of a country or a region, in other words, all types of energy demands of all sectors, including the public sector, agriculture, industry, services and transportation. The EnergyPLAN models the entire one-year operations of an energy system and analyses it by the hour. This feature was fundamental when selecting the software because of the weather-dependent renewables and the continuous fluctuation in electricity demand.

The program's appropriateness for the Hungarian context was verified by creating a domestic energy model for the year 2011. The difference between the program's results and the actual statistics for the same year was marginal.

The modeling of the Energiaklub's 2030 vision has the following results:

-the domestic energy system is sustainable without Paks II by 2030;

-the total electricity demand grows at a slower rate than officially forecasted (50,6 TWh); instead from the 40.2 TWh in 2012 it is expected to grow to 47.1 TWh by 2030

-the ratio of renewables used in power generation, even by conservative estimates, is more than 27%

-the electricity import is at minimum: 0.7 TWh (11.9 TWh in 2013);

-the resources needed for heating drops by 24% due to the energy efficiency investments and the new, low energy consumption buildings;

-the use of alternative fuel vehicles (gas, hybrid, electric) reaches 20%, and 30% of the transport of goods is shifted to railroads

- the country's total resources demand is 3% lower than in 2011

The Energiaklub welcomes any feedback or corrections to this publication which is aimed at starting a dialogue. Based on the above findings, the financial analysis of the 2030 vision be prepared to enable a comparison with that of Paks II. At last, an additional model will be

prepared for the decades after 2030 to examine the operations of the Hungarian energy system without nuclear energy.