QUESTIONNAIRE - ENERGY TRANSITION BAROMETER

Note: If you think that the answers to some questions require technical competencies that you do not possess, skip those questions or part of the questions.

A. ASSESSMENT OF THE CURRENT SITUATION AND STRATEGIC ASPECTS OF SUSTAINABLE ENERGY TRANSITION

As a comprehensive analysis of the current situation (e.g., political commitment and / or capacity in terms of countries' readiness for a sustainable transition) is not publicly available, as well as the assessment of a clear vision of the future / desirable state of the power sector, this section of the questionnaire explores views on these topics. As an economically efficient energy transition can be realized only by coordinating activities between the countries of the region of the Southeast Europe and with the support of the EU, this part of the questionnaire also examines expert assessments of the results of these forms of cooperation in the past.

I THE CURRENT SITUATION IN THE POWER SECTOR FROM THE ASPECT OF SUSTAINABLE ENERGY TRANSITION

1. Assess the current operation of public power companies in terms of their ability to implement the energy transition. (Possible answers: 5 - I completely agree, 4 - I mostly agree, 3 - I agree, 2 - I partially agree, 1 - I do not agree at all). Enter the number of your answer in the space provided:

a) Public electric power companies have a long-term vision of sustainable development (in accordance with the principles of the energy transition) and appropriate operational plans. Your answer:

b) The financial operation of the public power companies is satisfactory. Your answer:

c) Power companies have necessary skills to operate in the electricity markets. Your answer:

d) Public power companies have the ability to independently invest (without assistance from the government) in new production facilities. Your answer:

2. Economically efficient energy transition can only be realized within a functional market environment. Evaluate your position on the following aspects of the current electricity market condition in your country. (Possible answers: 5 - I completely agree, 4 - I mostly agree, 3 - I agree, 2 - I partially agree, 1 - I do not agree at all). Enter the number of your answer in the space provided:

a) There is an electricity market in your country that fulfills all the functions of a competitive trading (e.g., encourages competition, provides information needed to make investment decisions as well as to design market-based schemes for the support of renewables). Your answer:

b) The functioning of the market in your country is hampered by the provision of the unallowed state aid to the mining sector. Your answer:

c) Cross subsidizing the price of electricity for households makes it difficult to establish a functioning market. Your answer:

d) The functioning of the market is hampered by restrictions on the use of interconnection lines, which are imposed to protect the current privileged position of the public power companies. Your answer:

e) It is not possible to establish a functional market in which private companies and public power companies, mostly state-owned, operate at the same time. Your answer:

3. Assess the readiness (commitment and capacity) for the energy transition of state institutions (parliaments, governments, ministries, and regulators), acting according to a "top-down" approach. (Possible answers: 5 - I completely agree, 4 - I mostly agree, 3 - I agree, 2 - I partially agree, 1 - I do not agree at all). Enter the number of your answer in the space provided:

a) There is an understanding among state institutions of the broader picture of the energy transition as a key component of sustainable development and the third industrial revolution. Your answer:

b) State institutions have a long-term vision of sustainable development and consistent energy transition plans. Your answer:

c) There is an institutional capacity to run complex, long-term, transformative processes such as the energy transition. Your answer:

d) There is transparency in the work and participation of citizens and the businesses in planning and implementation of the energy transition. Your answer:

e) Institutions have the ability to reach consensus on complex policy challenges and social issues and in the past have expressed efficiency in making important decisions. Your answer:

f) Administrative procedures for the construction of energy facilities are transparent and efficiently implemented. Your answer:

4. Assess the readiness of non-governmental actors (non-governmental organizations, academic and professional community, businesses, and citizens) to participate in the energy transition, acting according to the "bottom-up" approach. (Possible answers: 5 - I completely agree, 4 - I mostly agree, 3 - I agree, 2 - I partially agree, 1 - I do not agree at all). Enter the number of your answer in the space provided:

a) Non-governmental organizations (NGOs) actively participate in the energy transition and provide constructive contribution in facilitating the process. Your answer:

b) The academic and professional community is actively involved in the energy transition and are important actors in this process. Your answer:

c) The businesses, and especially small and medium-sized enterprises (SMEs), are well informed about the energy transition and its effects on their operation. Your answer:

d) Citizens are well informed about the situation in the energy / power sector and about the challenges and opportunities of implementing the energy transition. Your answer:

e) Non-governmental actors have the necessary competencies to actively participate with government institutions in planning and implementing the energy transition. Your answer:

f) There is a trust and a cooperation between governmental institutions and non-governmental actors that enable the achievement of social consensus on key issues of the energy transition. Your answer:

II VISION OF THE FUTURE STATE OF THE POWER SYSTEM / SECTOR

5. The electric power system / sector of your country in 2050 will feature: (Possible answers: 5 - I completely agree, 4 - I mostly agree, 3 - I agree, 2 - I partially agree, 1 - I do not agree at all). Enter the number of your answer in the space provided:

a) *Decarbonization* - electricity production will be with low greenhouse gas emissions. Your answer:

b) *Digitization* - information and communication technologies, and advanced network control and management algorithms (according to the Smart Grids concept) will be predominantly used. Your answer:

c) *Decentralization* - in managing the electric power system the usage / influence of distributed energy resources (DER) - distributed generators, electric batteries, electric vehicles, electrified heating, decentralized hydrogen production and demand management will prevail. Your answer:

d) *De-monopolization* of the electricity sector - many actors will participate in the electricity market (i.e., private producers, private traders and suppliers and virtual power plants). Your answer:

e) *Democratization* - consumers will be important actors in the sector, i.e., the role of active consumers, producer-consumers, civic energy communities and aggregators in the electricity market will be significant. Your answer:

f) The electricity sector (generation, trade, and supply) will be mainly privately owned. Your answer:

6. Sustainable energy transition is primarily: (Possible answers: 5 - I completely agree, 4 - I mostly agree, 3 - I agree, 2 - I partially agree, 1 - I do not agree at all). Enter the number of your answer in the space provided:

a) Transition that does not jeopardize energy security requirements. Your answer:

b) The most economically efficient way of decarbonization of the power sector. Your answer:

c) Transition that respects all EU environmental standards. Your answer:

d) Transition that causes the least socio-economic disruptions (i.e., implementing just transition programs). Your answer:

e) Inclusive transition with an active participation of the citizens and companies. Your answer:

III BARRIERS AND LEADERS OF THE ENERGY TRANSITION

7. Assess the impact of barriers to implementing the energy transition. (Possible answers: 5 - great impact, 4 - significant impact, 3 - moderate impact, 2 - small impact, 1 - no impact at all). Enter the number of your answer in the space provided:

a) Policy of electricity pricing implemented to maintain social peace. Your answer:

b) Loss of jobs in the power sector. Your answer:

c) The need for economic restructuring of the mining regions. Your answer:

d) Insufficient professional human and institutional capacities to manage the transition process. Your answer:

e) Inadequate education system and lack of research. Your answer:

f) Inertia of the public power companies that seek to maintain the status quo. Your answer:

d) Resistance of the existing structures which are based on the fossil fuel policy and economy. Your answer:

h) Lack of or expensive sources for financing the transition. Your answer:

8. The key leaders / promotors of the energy transition will be: (Put X to a maximum of 3 answers):

a) Ministries and state institutions in the sector (as policy makers). Your answer:

b) Parliaments and governments (as decision makers). Your answer:

c) Public power companies. Your answer:

d) Private investors, including prosumers. Your answer:

e) Professional and academic community and think-tank organizations (as opinion makers). Your answer:

f) Non-governmental organizations (in their function of the watch dogs). Your answer:

d) Media and public in general. Your answer:

IV EU INTEGRATION AND COOPERATION WITHIN THE REGION

9. Even after 15 years of membership in the Energy Community of your country, there is no significant progress in reforms in the electricity sector, which is especially reflected in the insufficient level of investment in energy transition projects. The reasons for this delay are: (Possible answers: 5 - I completely agree, 4 - I mostly agree, 3 - I agree, 2 - I partially agree, 1 - I do not agree at all). Enter the number of your answer in the space provided:

a) Formal acceptance and actual obstruction of reforms by the governments of the Energy Community member states. Your answer:

b) Insufficient focus of EU institutions to implement reforms and not clear vision of the EU about the future of the energy sector in this region. Your answer:

c) The Energy Community Treaty, unlike the EU membership treaty, is not a sufficiently strong binding international document that will enable implementation of the reforms and creation of a reliable legal environment for investments. Your answer:

d) The Energy Community Secretariat inconsistently implemented the Energy Community Treaty, which is currently reflected through challenges in implementation of the National Emission Reduction Plans (NERPs). Your answer:

10. In order to improve cooperation within the region and with EU institutions, it is necessary to: (Possible answers: 5 - high priority, 4 - significant priority, 3 - partial priority, 2 - low priority, 1 - not priority at all). Enter the number of your answer in the space provided:

a) Establish organized markets (power exchanges) and couple them with the EU market. Your answer:

b) Introduce an emissions trading system (EU ETS) in the region. Your answer:

c) Condition the receipt of IPA III and other EU funds by achieving the results in implementation of the energy transition. Your answer:

d) Coordinate creation of the development plans (i.e., NECPs) at the regional level. Your answer:

e) Significantly increase involvement of non-governmental actors (non-governmental organizations, academic and professional community, professional associations, businesses, and citizens) in implementation of the transition at the national and regional level. Your answer:

B. ABANDONMENT OF COAL USAGE FOR ELECTRICITY PRODUCTION (COAL PHASE-OUT)

Due to the importance of coal in electricity production in the region, a key component of sustainable energy transition is the systematic abandonment of its use in the power sector (Coal Phase-Out). This part of the questionnaire explores attitudes about the current operation of the thermal power sector, political, economic, and social aspects of abandoning the use of coal for the electricity production as well as the speed and key aspects of this, currently most important, component of the energy transition in the region.

V ABANDONING THE USE OF COAL FOR ELECTRICITY PRODUCTION (COAL PHASE-OUT)

11. Given the commitments made in the Paris Climate Agreement and the Sofia Declaration, by which date do you expect your country will completely abandon the use of coal for the electricity production? (Put X in only one answer):

a) after 2050. Your answer:

b) by 2050. Your answer:

c) by 2045. Your answer:

d) by 2040. Your answer:

e) by 2035. Your answer:

f) by 2030. Your answer:

12. The biggest challenges in the operation of thermal power plants (TPPs) in your country in the open regional electricity market will be: (Put X with a maximum of two answers):

a) Low productivity of the coal mines. Your answer:

b) Challenges of maintenance the existing (old) TPPs. Your answer:

c) Meeting the requirements of modernization due to the requirements to achieve targets and objectives from the National Emission Reduction Plan (NERP), in accordance with the EU Large Combustion Plants Directive (LCPD) and the Industrial Emissions Directive (IED). Your answer:

d) Expected introduction of CO2 emission allowance payments (in the form of ETS or the CBAM). Your answer:

e) Non-competitive price of electricity production from TPP on the regional market. Your answer:

13. What do you think will crucially affect the rate of abandonment of coal-fired power generation in your country? (Put X in a maximum of three answers):

a) Political will or political factor and commitment of the authorities. Your answer:

b) The "pressure" of the so-called international factors, especially the EU. Your answer:

c) Market and market pressures on the electricity prices due to cheaper production from the renewable sources. Your answer:

d) Economic and financial position of public power companies. Your answer:

e) Introduction of an emissions trading system (like the Emission Trading System - ETS scheme). Your answer:

f) Introduction of the EU mechanism for protection against the "leakage" of CO2 (cross-border fees - Carbon Border Adjustment Mechanism - CBAM schemes). Your answer:

14. What do you think will be crucial for an economically efficient and fair transition, i.e., abandoning the production of electricity from coal with minimal socio-economic consequences? (Put X in a maximum of two answers):

a) Vision, firm commitment and socially agreed strategy of abandoning coal production supported by all relevant social actors (political decision makers, public power companies, local communities, businesses, trade unions and NGOs). Your answer:

b) Technical and professional assistance for the transition and reduction of GHG emissions from the electricity sector by the international organizations and countries that are already going through this process. Your answer:

c) Provision of financial resources for the transition from domestic budgets, funds of public enterprises and government funds. Your answer:

d) Providing financial support from foreign funds and loans from the international financial institutions. Your answer:

e) Participation of foreign and domestic investors in the transition process. Your answer:

15. Given the consequences of the COVID-19 pandemic on the economy and society, do you think that: (Put X in only one answer):

a) The process of scaling-down the production of electricity from coal should be postponed until the economy and society recover at least a bit and put themselves on the path of economic growth. Your answer:

b) The process should continue at the currently planned pace. Your answer:

c) The process should be accelerated as much as possible, considering a fair transition component. Your answer:

C. INCREASING THE USE OF RENEWABLE ENERGY SOURCES AND THEIR INTEGRATION IN THE ELECTRIC POWER SYSTEM (RENEWABLES PHASE-IN)

Sustainable energy transition is based on a controlled increase in the use of renewable energy sources (RES) and a reduction in fossil fuel production. The largest use of RES technologies based on solar and wind energy, which are variable, intermittent, and difficult to predict energy flows, is expected. Therefore, the integration of wind farms (WPPs) and photovoltaic power plants (PVs) into the power system requires increased flexibility capacities to balance their production. This part of the questionnaire explores the views of experts on the development of RES, their impact on conventional power plants and their efficient integration into the power system. Some questions are like the questions from the questionnaire in the REPCONS 1 project (conducted in 2019), as intention is to identify trends in the attitudes of experts on certain aspects of RES development.

16. The development of the electricity sector in your country by 2030 should be based on: (Possible answers: 5 - high priority, 4 - significant priority, 3 - partial priority, 2 - low priority, 1 - not priority at all). Enter the number of your answer in the space provided:

a) Accelerated and organized reduction of the use of coal for electricity production. Your answer:

b) Accelerated development of renewable energy sources. Your answer:

c) Establishment and development of a power exchange in your country and its coupling with power exchanges in the region and in the EU. Your answer:

d) Significant support for the development of distributed generators, especially for the categories of prosumers and production for self-consumption. Your answer:

17. Decarbonization of the power sector in your country in the period 2021-2030 should be based on the following technologies: (Put X with a maximum of three answers):

a) Large solar photovoltaic power plants. Your answer:

b) Distributed (small) solar photovoltaic power plants. Your answer:

c) Wind farms. Your answer:

d) Small hydropower plants. Your answer:

e) Large hydropower plants. Your answer:

f) Reconstruction of thermal power plants for cofiring of coal and biomass. Your answer:

g) Biomass / biogas thermal power plants (including cogeneration plants). Your answer:

h) Gas thermal power plants (including cogeneration plants). Your answer:

i) Nuclear power plants. Your answer:

VI TECHNICAL CHALLENGES (CAUSED BY THE IMPACT OF VARIABLE RENEWABLE SOURCES ON THE GRID AND ON OPERATION OF THE POWER SYSTEM) CAUSED BY THE ACCELERATED SCALE-UP OF RENEWABLE ENERGY SOURCES

18. The connection of large variable renewable energy sources - vRES (wind and solar photovoltaic power plants) to the transmission grid in the period up to 2030 will have an impact on the following aspects of operation of the power system: (Put X at a maximum of two answers):

a) Occurrence of congestion on individual transmission lines. Your answer:

b) Inability to evacuate energy from areas with high potential for vRES and the need to upgrade the transmission network. Your answer:

c) Reduction of the capacity factor of thermal power plants. Your answer:

d) Increased balancing requirements due to variability of production from solar and wind power plants. Your answer:

e) The need for reserve capacities in thermal power plants for maintaining the security of supply. Your answer:

19. Connection of distributed generators - DG (mainly small PV plants) to the distribution network (DN) will have an impact on the following aspects of operation of low-voltage (LV) and medium-voltage (MV) DN. (Put X in a maximum of two answers):

a) Occurrence of increased voltage levels near the DG connection, especially in the LV network. Your answer:

b) Problems with voltage regulation in MV network. Your answer:

c) Increased losses in DN. Your answer:

d) Occurrence of overloads on individual DN elements. Your answer:

e) Reduction of voltage quality in DN due to injection of higher harmonics from power converters of distributed generators. Your answer:

20. Considering the technical characteristics of the power system in the region, the biggest challenges in operation with an increased participation of vRES in the period until 2030 in terms of flexibility will be. (Put X in a maximum of two answers):

a) Balancing short-term variability of production from WPPs and PVs and secondary frequency regulation. Your answer:

b) Managing rapid changes in the "net load" in the day-ahead markets. Your answer:

c) Quality of the primary frequency response and frequency stability. Your answer:

d) Adequacy of the power system (i.e., security of supply) with several days of significantly reduced production from vRES. Your answer:

e) Adequacy of the power system due seasonal and multi-year variability from HPPs. Your answer:

VII TECHNO-ECONOMIC ASPECTS OF INTEGRATION OF VARIABLE RENEWABLE SOURCES IN THE POWER SYSTEM

21. The following measures are important for the efficient integration of larger vRES capacities into the power system in the region until 2030: (Put X with a maximum of three answers):

a) Reliable forecast of vRES generation at the level of a balancing group. Your answer:

b) Investments in the transmission grid for the purpose of “accepting” the production from vRES. Your answer:

c) Construction of interconnection lines. Your answer:

d) Development of functional organized markets (power exchanges) and their coupling with the regional and EU markets. Your answer:

e) Regionally organized balancing services and the coupling of secondary frequency regulation. Your answer:

f) Transformation of distribution grids according to the concept of the smart grids with the use of energy storage and demand response / management. Your answer:

22. Express your views on the importance of the economic effects of distributed generation from solar photovoltaic power plants for self-consumption (prosumers) on the process of energy transition until 2030. (Possible answers: 5 - very significant, 4 - significant, 3 - partially significant, 2 - slightly significant, 1 - insignificant). Enter the number of your answer in the space provided:

a) The energy security of the system increases. Your answer:

b) There is a positive effect on consumers due to the reduction of energy costs and lower risk of changes in the electricity prices. Your answer:

c) Revenues of electric power companies are decreasing. Your answer:

d) Revenues of the distribution system operators are reduced if the existing tariff system for compensation for the distribution network is used. Your answer:

e) Democratization and decentralization of the electricity sector is enabled due to a greater participation and local ownership (in the form of civil energy, energy cooperatives). Your answer:

f) There are positive effects on the development of the local economy. Your answer:

23. The energy transition will be mainly financed by: (Put X with a maximum of two answers):

a) Consumers (businesses and households) through incentives for the energy produced from renewable sources. Your answer:

b) Fossil fuel producers due to introduction of the CO2 emission scheme / system (via ETS scheme). Your answer:

c) The state by taking favorable loans from the international financial organizations. Your answer:

d) Private capital (private investments in commercial RES projects). Your answer:

e) The businesses will directly finance the transition by investing in production for self-consumption. Your answer:

f) Citizens will directly finance the transition (e.g., through investments in prosumers, energy cooperatives and public-private partnership projects). Your answer: