Expert Group Meeting on Sustainable and clean energy in North and Central Asia

Session 1: Synergies and trade-offs of sustainable and clean energy

BACKGROUND DOCUMENT

Objectives

- To evaluate the methodology used to map out interlinkages between SDG 7 indicators and other sustainable development indicators

- To discuss the synergies and trade-offs between sustainable & clean energy and other sustainable development indicators

- To suggest next steps for updating and utilizing presented material in the work of ESCAP and countries in the subregion

Points for discussion

- The analysis of interlinkages assumes symmetric relationship between the different SDG indicators. Hence, undirected edges are mapped between indicators of SDG 7 and other sustainable development goals indicators. How useful would it be to further analyze the causal relationship between the nodes? How can this causality analysis be conducted and mapped out?

- The subregion is divided into four different country groupings in terms of resource endowment. The interlinkage mapping show similar results for the four groupings. Is there a better classification criterion to divide countries in the subregion into different groupings?

- What limitations of the current analysis should be addressed to further enrich the analysis and obtain a more holistic picture?

- Currently, Pearson correlation coefficients are used to identify the correlation/ interlinkage between SDG 7 indicators and other sustainable development indicators. How can we better capture the interlinkages between SDGs if one or both parties are binary?

- Next steps for consideration include (i) SONCA to update analysis based on outcomes of the meeting, (ii) expert group volunteer to peer review updated analysis, (iii) updated working paper to be published on SONCA webpage, (iv) findings to be presented at other meetings/ SPECA meeting, (v) any opportunities for collaboration?

Content

Methodology

There are four steps to map the interlinkages between SDG 7 and other sustainable development goals. First steps are to identify relevant SDG indicators and perform data collection. Second step is to identify the relationship between SDG 7 and other sustainable development goals via literature review. Next steps are to quantify the relationship between the indicators of SDG 7 and other SDG goals, and visualize the interlinkages based on the computed correlation coefficients.

Data are checked for stationarity and correlation analysis is conducted only with stationary variables. Analysis was performed for four different country groupings, i) the resource-rich countries (Azerbaijan, Kazakhstan, Russian Federation, Turkmenistan and Uzbekistan) (ii) the hydro-reliant countries (Armenia, Georgia, Kyrgyzstan and Tajikistan), (iii) the whole subregion excluding the Russian Federation, as the Russian Federation tends to skew results of the analysis due to its size, and (iv) the whole subregion. Interlinkages are then mapped between Goal 7 and other sustainable development goals for each of the four country groupings using the network structure. Only correlation coefficients larger than 0.5 are captured in the network graph. The interlinkages and relationship are classified as significant positive, significant negative, insignificant positive and insignificant negative, with 0.05 cut-off p-value to determine significance. The network is defined as an undirected structure as the interlinkages between the nodes are of a symmetrical relationship instead of a causal relationship. The lack of data for certain indicators could also distort the significance and correlation coefficients.

Findings

The interlinkage patterns of network structure have overlapping patterns for the four different country groupings. Viewing Goal 7 indicators as the central nodes, the strongest significantly correlated indicators are those of Goal 1, Goal 4, Goal 9, Goal 13 and Goal 17, with each node connected to more than two indicators of Goal 7. Among the indicators of Goal 7, access to electricity is highly correlated with poverty elimination, access to quality education and life above land; renewable energy consumption is highly correlated with health and well-being, innovation and infrastructure, remittance costs and volume, and international partnerships and assistance. Energy intensity is highly correlated with manufacturing value added, responsible consumption and production, and land and animal protection. Edges connected to the access to clean fuel and growth of renewable energy capacity are mostly insignificant. Decomposing by the different country groupings, results for the whole subregion with or without Russia are similar, apart from the correlation with Goal 17. Results for resource-rich countries and hydro-reliant countries identified several distinct interlinkages. In addition to the strong significant correlation with Goals mentioned in the above paragraph, resource-rich countries have strong interlinkages with Goal 3 and Goal 12, while hydro-reliant countries have strong interlinkages with Goal 8 and Goal 15.

The network mapping revealed that Goal 7 is highly correlated with the other sustainable development goals in North and Central Asia. Countries should implement a systematic and coherent approach that treat SDG 7 in coordination with other sustainable development goals and integrate SDGs priority in policy deployment considering their own circumstances. It should also be noted that the interlinkage patterns between SDG 7 and other sustainable development goals may change over time due to different growth stages or national strategies.