Scientific and Technical Advisory Panel

The Scientific and Technical Advisory Panel, administered by UNEP, advises the Global Environment Facility
(Version 5)

STAP Scientific and Technical screening of the Project Identification Form (PIF)

Date of screening: September 26, 2015 Screener: Lev Neretin

Panel member validation by: Ralph E. Sims
Consultant(s):

I. PIF Information *(Copied from the PIF)*
FULL SIZE PROJECT GEF TRUST FUND
GEF PROJECT ID: 9192
PROJECT DURATION : 5
COUNTRIES : Kazakhstan
PROJECT TITLE: De-risking Renewable Energy Investment In Kazakhstan
GEF AGENCIES: UNDP
OTHER EXECUTING PARTNERS: Ministry of Energy of Kazakhstan
GEF FOCAL AREA: Climate Change

II. STAP Advisory Response *(see table below for explanation)*

Based on this PIF screening, STAP's advisory response to the GEF Secretariat and GEF Agency(ies):
Minor issues to be considered during project design

III. Further guidance from STAP

1. The aim of the project is to stimulate large- and small-scale renewable electricity (RE) development by supporting policies, financing and reducing risks of private investments.
2. It is not clear to what degree renewable energy heating systems from biomass (including biogas and combined heat and power systems) and solar thermal (including solar water heating) are included, although they could also have a good mitigation potential and possibly at a lower investment cost per tonne of CO2-eq avoided.
3. In Component 3 (paragraph 21) it states "â€¦.the ultimate goal of this project is to achieve energy market transformation in Kazakhstan by significantly scaling-up the deployment of renewable energy in electricity generation,â€¦." But solar water heating is included in Table 5 (though this is barely readable in the pdf) as well as in the related text and also in Table 6 on "green heating". So it is confusing whether all the targets and policies as presented throughout the PIF relate to renewable electricity alone or to renewable energy in general (including heating/cooling). Also, if solar thermal is indeed included, then why not include biomass for heating, including pellet stoves, wood-fired boilers, combined heat and power plants fueled by biogas or landfill gas etc.?
4. Table 5, though obscured, appears to show that forty 10kW solar PV plants in urban areas would benefit 5,120 people but in rural areas only 500 people would benefit for the same investment cost. Why is this? In urban areas, assuming 2000 hours per year sunshine, the beneficiaries would each receive less than 1600 kWh electricity per year on average. The annual kWh generated per person in rural areas would be far higher. So is the power generated also to be used to power farm-equipment perhaps?
5. Table 6 needs careful interpretation as only the comparison of heat prices is shown. If the electricity options are based on grid electricity with a very high GHG emission factor (0.914kg CO2-eq/kWh due to 80% coal), displacing direct heating from coal with electricity (mainly from coal-fired plants at around 25% conversion efficiency) would produce around three times more CO2 / Gcal of useful heat. The national GHG emission levels are already very high and need to be reduced, not increased. Therefore Table 7 (also hard to read) should be amended to include all the green heat options presented in Table 6 to give the true comparison between options.
6. The assumptions used to produce Tables 7 and 8 are not provided. Table 8 assumes the 2014 electricity generation level (the baseline) will be maintained in 2030, when renewable electricity would have risen to a 30% share. But what is the projected electricity demand growth from 2014 to 2030? It is likely to be far higher so the 30% share of renewables will need to account for this.
7. Biogas is mentioned throughout, mainly for the farming sector. However, biogas production at the small farm scale of digester plant is fraught with problems of operation and maintenance. Farmers give priority to their crops and animals so farm-scale digesters and equipment tend to be neglected and only work over the

longer-term if large enough scale so that someone is dedicated to running the plant. Also there is no indication of how the biogas will actually be utilized â€“ e.g. whether it will be scrubbed of CO2 and corrosive H2S; used to fuel gas engines to power a generator; whether the heat can be utilized; or used as a vehicle fuel.

8. Supporting nomadic rural communities is commendable, but unclear how off-grid systems will be provided in practice. The solar PV technologies will need storage batteries to be effective, and these are heavy so not ideal for moving from place to place. Even at a fixed single location, off-grid systems are challenging due to the variable solar and wind resources usually used for such applications.
9. National resource mapping of solar and biomass resources is to be undertaken (Table B, Component 1). Yet wind and hydro also have good resources with higher potential than bioenergy for electricity generation as shown in Fig. 2. So why is an assessment of these resources not included?
10. Of all the forms of biomass, only biogas is discussed but not detailed. What about wood product waste biomass, forest residues, crop residues, etc. used for direct heating? For biogas, is animal manure the only feedstock? What about green crop residues?
11. It is commendable that training is to be undertaken for installing, operating and maintaining RE systems and several business models are proposed for the application of RE systems in urban and rural buildings. Employing UNDP's derisking RE investment (DREI) methodology is a good approach. Do proponents intend to assess equity costs of different de-risking instruments (Fig. 1), if so such calculation could be informative for other GEF projects.
12. The risks are clearly outlined; many are seen as high risks but none are insurmountable. The challenge is to unlock them to encourage private sector investment. For example, variable wind and solar capacity, at low initial penetration levels in the electricity grid mix, should not be a problem, especially with 10% hydro capacity that helps make the grid more flexible and reliable. At higher penetrations, energy storage and demand side management can also be considered (see http://srren.ipcc-wg3.de/report/IPCC_SRREN_Ch08.pdf for detailed analysis).
13. Several policies (such as a new feed-in-tariff) are in place to help meet RE targets by 2020 and beyond and increase the current 3% share of electricity generation. Baseline projects and initiatives to encourage greater RE deployment at both small and large scales are described.
14. UNDP experience supporting green mortgage schemes in Uzbekistan could possibly be utilized for this country also.

STAP advisory response	*Brief explanation of advisory response and action proposed*
1. Concur	In cases where STAP is satisfied with the scientific and technical quality of the proposal, a simple "Concur" response will be provided; the STAP may flag specific issues that should be pursued rigorously as the proposal is developed into a full project document. At any time during the development of the project, the proponent is invited to approach STAP to consult on the design prior to submission for CEO endorsement.
2. Minor issues to be considered during project design	STAP has identified specific scientific /technical suggestions or opportunities that should be discussed with the project proponent as early as possible during development of the project brief. The proponent may wish to: (i) Open a dialogue with STAP regarding the technical and/or scientific issues raised. (ii) Set a review point at an early stage during project development, and possibly agreeing to terms of reference for an independent expert to be appointed to conduct this review. The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.
3. Major issues to be considered during project design	STAP proposes significant improvements or has concerns on the grounds of specified major scientific/technical methodological issues, barriers, or omissions in the project concept. If STAP provides this advisory response, a full explanation would also be provided. The proponent is strongly encouraged to: (i) Open a dialogue with STAP regarding the technical and/or scientific issues raised; (ii) Set a review point at an early stage during project development including an independent expert as required. The GEF Secretariat may, based on this screening outcome, delay the proposal and refer the proposal back to the proponents with STAP's concerns.

	The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.