

**Guidelines:**

- This Request Submission Form should be completed by the organisation requesting technical assistance from the Climate Technology Centre & Network (CTCN) in collaboration with the National Designated Entity (NDE) of the country in question
- The Form must be signed by the NDE. Please see updated contact list of NDEs here: <http://unfccc.int/ttclear/support/national-designated-entity.html>
- The Form can be submitted as a Word file containing a digital signature or as a signed and scanned PDF file in combination with an un-signed Word file
- For requests submitted by multiple countries, all the NDEs of the respective countries shall sign identical Forms before official submission to the CTCN
- NDEs have the opportunity to submit CTCN requests in collaboration with National Designated Authorities (NDAs) for the Green Climate Fund (GCF) if targeting the GCF Readiness Programme.

<b>Requesting country or countries:</b>	Georgia
<b>Request title:</b>	Tkibuli Coal Mine Methane Development project
<b>NDE</b>	Ministry of Environmental Protection and Agriculture of Georgia Mr. Grigol Lazrievi Head of the Climate Change Unit of the Environment and Climate Change Department Email: <a href="mailto:g.lazrievi@mepa.gov.ge">g.lazrievi@mepa.gov.ge</a> Address: Marshal Gelovani Ave. # 6, 0159 Tbilisi, Georgia.
<b>Request Applicant:</b>	Georgian Industrial Group contact person – Levan Vepkhvadze, Adviser to CEO/member of board of directors <a href="mailto:L_vepkhvadze@gig.ge">L_vepkhvadze@gig.ge</a>

**Climate objective:**

- Adaptation to climate change
- Mitigation of climate change
- Combination of adaptation and mitigation of climate change

**Geographical scope:**

- Community level
- Sub-national
- National
- Multi-country

If the request is at a sub-national or multi-country level, please describe specific geographical areas

(provinces, states, countries, regions, etc.).

**Problem statement related to climate change:****A: Introduction**

Coal mining is a significant emission source of methane: a potent GHG with a global warming potential (GWP) 28-34 that of carbon dioxide over a period of 100 years (Intergovernmental Panel on Climate Change's Fifth Assessment Report, 2014). Moreover, the IPCC report also underscores that methane totals 20% of global anthropogenic GHG emission significant part of which accounts for methane released during coal mining.

Generally, methane emissions from coal mining operations can be reduced through recovery and utilization projects that collect methane gas from coalmines for productive use. Alongside with coal mining safety improvement, the primary reason for methane recovery from coal mines is to reduce GHG emissions and mitigate methane adverse effect in climate change globally.

In Georgia, for the period of 1998-2003 methane was the leading greenhouse gas, however from 2004, with economic advancement, CO<sub>2</sub> emissions have been rising and currently, methane is the second largest contributor, accounting 28.2% of total GHG emissions. The main source of methane emissions is the energy sector, where its share in the years 2000 and 2012 was 51.3% and 50.0% respectively.

Tkibuli-Shaori coal deposits account more than 75 percent of Georgian coal reserves. The only mine operating in Georgia is now owned by Saknakhshi-GIG (a subsidiary of GIG – Georgian Industrial Group), which resumed coal extraction in 2008 after a 15-year break. It should be noted that CMM is not currently drained from the mine, either by in-seam boreholes or via gob drainage. Methane is diluted in ventilation air and carried to the surface where it is emitted to the atmosphere.

Hence, Georgia is in urgent need of capacity building and transfer of technology related to the reduction of methane emissions from coal mining. This project is especially interested in the study of feasibility of CMM utilization in Georgia that ultimately should create additional social benefits such as lower GHG emissions from mining activities as well as lower hazards during coal mining.

**B: Problem Description**

Several problems can be noted in conjunction with the capturing and production of CMM in Georgia. The first and foremost problem is the lack of knowledge related technological and economic aspects of a CMM project development. In this regard, it should be mentioned that during the decades of coal production from Tkibuli-Shaori coalfield unfortunately there have not been implemented any single project of CMM utilization neither at the times of Soviet Union nor after reviving the production in the late 2000s. Hence, a lack of knowledge along with the existing financial loss risk factors hampers a private company's investment. Respectively, the lack of knowledge and experience makes it almost impossible to encourage activities that will mitigate methane emissions and, as a result, reduce Georgian footprint on global climate change.

Furthermore, Georgia does not have any specific rules, which would regulate methane emissions from coal mining, that is to say, it is not prohibited to ventilate methane directly to the atmosphere from the existing coal mining activities. At the same time, according to the Georgian legislation, currently CMM exploration and production are based on petroleum leasing legislation; in particular, it is regulated by the Oil and Gas Law which implies that the CMM exploration and production is assigned to oil and gas operations. The latter defines all hydrocarbons as a petroleum product. Therefore, there might be a gap in legislation because the latter does not encourages private companies to use CMM in an economically feasible way.

Finally, it is projected that the production of coal in Georgia approximately will double for the next five years from 350k metric tons up to 700k metric tons. The reason for such an upsurge is directly linked with the high demand on primary energy sources stipulated by the growing demand on electricity in Georgia, which has been increasing by almost 10% annually and, also, by the fact that coal is the only fossil fuel in Georgia. As a result, it is expected that methane emissions also doubled for the next five years: according to UNFCCC, in 1990 when the coal production was 956,000 tons per year the

estimated emissions of CMM was 18.79 million m<sup>3</sup>. Respectively, for the level of 700k tons, methane emissions presumably will be in the range 12-13 million cubic meters.

To sum up, it is obvious, that the lack of knowledge and the possible gap in the legislation impedes the development of methane projects while it is expected that the methane emissions for the next five years significantly increases because of the projected doubling of coal production which is, in turn, driven by the growing demand on electricity in Georgia.

**Past and on-going efforts to address the problem** (up to half a page):

Unfortunately, at the times of Soviet Union, climate change and the negative impact of industrial activities on the environment were not considered in the list of priorities of the government. Therefore, the latter approach created a gap in the legislation even after the collapse of the Soviet Union.

Currently, the on-going effort can be considered at both the governmental and the organization levels. The process at the governmental level differs from that of the organizational: the country is in its early stage of industrial policy development. To address this challenge, within Association Agreement with EU, Georgia commits an ambitious reform agenda in key areas such as trade, economic recovery and growth, governance. Enhanced cooperation between the EU and Georgia in many areas including environmental protection, social development, transport, industry, and energy. Within the process, the country has been developing a number of policies/regulations, which should be in line with EU acquis. Specifically, when it comes to the industrial emissions standard, the Directive EU/2010/75 on industrial emissions (integrated pollution prevention and control) will be the main instrument for regulating pollutant emissions from industry. In addition, in this regard joining the Paris Agreement by Georgia deserves special mention. In particular, Georgia signed the protocol on December 12, 2015, which has been in force since June 2017. According to the protocol, Georgia took the responsibility to reduce GHG emissions in the range 15-25% in comparison to the business as usual scenario for the year 2030.

As for the organizational level, since resuming the coal mining operations, Sakhshiri-GIG – the only coal license owner in Georgia - has made all effort to increase safety standards in coal mines by equipping coal mines with a methane early detection systems. This effort can be considered as a necessary but not sufficient step for addressing the CMM related challenges. In particular, actually, the methane early detection system, as well as increasing air-ventilation capacity, is not able to address the primary objective of CMM capture such as the reduction of GHG emission.

**Specific technology<sup>1</sup> barriers** (up to one page):

The objective of the current application is to study a CMM project's technical feasibility and economic viability in Georgia that is a full-scale comprehensive feasibility study including technology demonstrations or pilot installations. As it was mentioned above, the primary obstacle for the study is the lack of knowledge and experience as well as an existence of technical equipment necessary for both sample acquiring and tests conducting in order to study local coal characteristic.

On the other hand, the feasibility study requires the proper consideration of all risks related to the capturing and utilization of CMM. Specifically, there are several risks related to any CMM project that should be evaluated at the stage of a feasibility study. In particular:

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<sup>1</sup> ***“any equipment, techniques, practical knowledge and skills needed for reducing greenhouse gas emissions and adapting to climate change”*** (Special Report on Technology Transfer, IPCC, 2000)

- Resources availability – In order to access properly the amount of Methane from coal mining several tests including permeability, porosity, and sorption isotherms should be carried out. These tests should reveal the amount of Gas in Place as well as the possible methane outflow rate from coal seams. In addition, the mentioned tests should indicate coal seam stimulation technologies (if any) in order to receive sustainable gas outflow. None of the technology mentioned above is available in Georgia currently.
- Design, Installation and Operational risks – an inability to outline appropriate design in line with the absence of CMM installation in Georgia stipulates one of the primary technological impediments for a CMM project in Georgia. The latter exacerbated by the potential problems of interference with mining operations. In general, drainage from blocks of coal ahead of mining apparently produces consistent gas flows of high purity but pre-drainage is generally only effective when the permeability and gas contents of the coal are sufficient to allow significant gas flow. On the other hand, coordinating gas production and use with coal operations requires both detailed planning and great attention in implementation, which could potentially distract or interfere with coal production. Unfortunately, all these issues are not common practice in Georgia and can be seen as technological barriers for any CMM project in Georgia.
- Commercial and financial risk – the latter is partly linked with resource availability that is any CMM developer in Georgia cannot be able to present justified cash flow analysis without understanding the methane outflow rate as well as properly estimate costs for a coal seam drainage and stimulation technologies.

Of particular note is the fact that technology transfer process requires adequate human capacity as well as incentivizing legal and institutional frameworks coupled with appropriate regulatory provisions. Concerning the latter, it should be noted that currently all hydrocarbons are treated as petroleum products. Hence, assigned to conventional natural gas, its utilization requires the general license for oil and gas operations. As for human capacity, it is obvious that without improving local capacities under which technology transfer could be provided, the development of a CMM project would not be feasible.

**Sectors:**

Please indicate the main sectors related to the request:

- |   |   |  |  |
|---|---|--|--|
| <input type="checkbox"/> Coastal zones        | <input type="checkbox"/> Early Warning and Environmental Assessment | <input checked="" type="checkbox"/> Human Health | <input type="checkbox"/> Infrastructure and Urban planning |
| <input type="checkbox"/> Marine and Fisheries | <input type="checkbox"/> Water                                      | <input type="checkbox"/> Agriculture             | <input type="checkbox"/> Carbon fixation                   |
| <input checked="" type="checkbox"/> Energy    | <input type="checkbox"/> Forestry                                   | <input checked="" type="checkbox"/> Industry     | <input type="checkbox"/> Renewable energy                  |
| <input type="checkbox"/> Transport            | <input type="checkbox"/> Waste management                           |  |  |

Please add other relevant sectors:

**Cross-sectoral enablers and approaches:**

Please indicate the main cross-sectoral enablers and approaches

- |   |   |   |  |
|---|---|---|--|
| <input type="checkbox"/> Communication and awareness        | <input checked="" type="checkbox"/> Economics and financial decision-making | <input checked="" type="checkbox"/> Governance and planning | <input type="checkbox"/> Community based |
| <input checked="" type="checkbox"/> Disaster risk reduction | <input type="checkbox"/> Ecosystems and biodiversity                        | <input type="checkbox"/> Gender                             |  |

**Technical assistance requested** (up to one page):

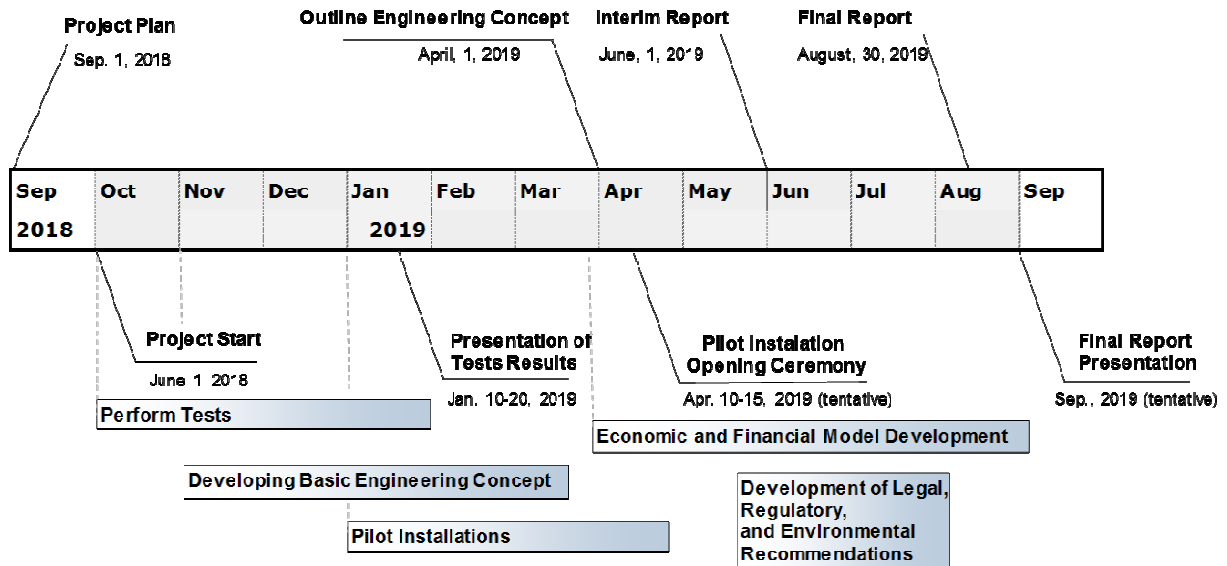
The assistance required from CTCN implies the conduct of full-scale comprehensive feasibility study including technology demonstrations.

In this regard, the following activities should be carried out:

- Data acquisition and on-site investigations at coal mines – a detailed assessment of available gas resources, this section apparently includes a certain fieldwork, lab or in-situ tests such as core analysis, permeability and porosity tests, gas content and sorption isotherm tests, and stress tests etc. Moreover, after core drilling, this part of the project also includes a technology demonstration by pilot installations.
- Independent forecast of total and utilisable gas emissions based on simulation technique used for the assessment of methane outflow rate from coal seams;
- Basic engineering for gas drainage, mine ventilation and mine safety – a detailed assessment of mine drainage and degasification techniques that should be used in order to achieve maximum quality and quantity of drained gas.
- A detailed assessment of technical possibilities to use the gas based on its quality where end uses includes power generation, gas sales to pipeline (with or without upgrade), coal drying, and mine heating. Also, this section should outline the basic CMM utilisation concepts for power generation;
- A detailed assessment of CMM project costs using estimates and financial projections. This section should take into consideration the best available estimates from technology vendors and technical experts;
- A detailed financial analysis for each technically viable scenario based on the market assessment and the overall project objectives with base, high and low cases. A sound financial model should justify the financial analysis.
- A detailed assessment of country legal, regulatory, and environmental issues, including the status of gas ownership rights. Moreover, the study should provide recommendations with incentivizing policy measures which could lead to CMM projects implementation in Georgia;
- A summary of key staff positions and requisite education and experience for those positions;
- A target schedule for project implementation and operation;
- A conclusion section that includes an assessment of the project's overall viability, whether

financial investment should be made, and any other appropriate recommendations.

**Expected timeframe (Tentative):**



**Anticipated gender and other co-benefits from the technical assistance:**

CMM pre-drainage significantly alters mining process and has social benefits such as greenhouse gas mitigation and mining safety.

Unlike Carbon Dioxide, Methane has a significantly higher negative impact on trapping radiation; particularly global warming potential of methane has 28 times more impact over a 100-year period than that of Carbon Dioxide. Generally, coal seam drainage projects should prevent methane emissions from coalmine directly to the atmosphere and thereby decrease the hazardous effects of mining. Hence, the project under consideration could create new opportunities for the achieving Georgia's climate policy goals.

Furthermore, the higher level of safety during coal mining is crucial in mines with gaseous coal seams similar to Tkibuli-Shaori coalfield. One of the solutions to the problem is to reduce methane content of coal seams in advance to mining activities. After studying the Saknakhiri-GIG five years development plan, the DMT technical adviser report also underscores the benefit of CMM utilization in conjunction with mine safety and characterizes it as a reasonable approach to managing the methane during the actual operations.

With regard to gender benefits, the feasibility study implies the preparation of summary on key staff positions and requisite education and experience for those positions. Hence, this section of the feasibility study will take into consideration the gender policy requirement in order to outline the possible positive impact on the local community.

**Key stakeholders:**

Please list the stakeholders who will be involved in the implementation of the requested CTCN technical assistance and describe their role during the implementation (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.).

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity	NDA will oversight the technical assistance, additionally it will provide consultations to CTCN and GIG.
Georgian Industrial Group	GIG as an initiator of the application in question is responsible for comprehensive support to technology developer and feasibility study provider; also, GIG coordinates all actions for the identification and implementation of transferring technologies.
Saknakhshiri-GIG	Saknakhshiri-GIG is one of the beneficiaries of the project as well as the company will be in close coordination with a technology developer, in particular, Saknakhshiri-GIG provides all technical assistance required for pilot installations while the reduction of methane emissions will enhance the safety of mining operations undertaken by the latter.
CBM Georgia	CBM Georgia owns the licence for oil and gas operations on the territory that coincides with the Tkibuli-Shaori Coalfield. Unless there is no legal definition of CMM ownership, all activities on the ground should be aligned with the general licence for oil and gas operations. CBM Georgia as a subsidiary of Saknakhshiri-GIG will provide all necessary permissions required for the full-scale feasibility study.
Please add as many stakeholders and lines as required.	

**Alignment with national priorities** (up to 2000 characters including spaces):

Please describe how the technical assistance is consistent with national climate priorities such as: Nationally Determined Contribution, national development plans, poverty reduction plans, technology needs assessments, Low Emission Development Strategies, Nationally Appropriate Mitigation Actions, Technology Action Plans, National Adaptation Plans, sectorial strategies and plans, etc.

Technical assistance request is fully aligned with national policies and related documents (NDC, LEDS, NEEAP and etc.). Within NDC Georgia plans to unconditionally reduce GHG emissions by 15% below the Business as usual scenario (BAU) for the year 2030. This is equal to the reduction in emission intensity per unit of GDP by approximately 34% from 2013 to 2030. The 15% reduction target will be increased up to 25% in a conditional manner, subject to a global agreement addressing the importance of

technical cooperation, access to low-cost financial resources and technology transfer. Having high GWP, reduction of methane emissions is a priority for NDC implementation.

Problem is also raised in number of strategic documents:

- a) Low Emission Development Strategy identifies a number sectors (transport, industry, waste management, agriculture) and measures for reducing methane emissions;
- b) 3rd National Communication stresses about modern technology development in industry sector, that will significantly reduce emissions such as CO<sub>2</sub> and CH<sub>4</sub>;
- c) National Energy Efficiency Action Plan (NEEAP) provides concrete measures for industrial efficiency.

<b>Reference document</b> (please include date of document)	<b>Extract</b> (please include chapter, page number, etc.).
Nationally Determined Contribution (NDC)	Direct alignment and contribution to NDC implementation is required for all CTCN technical assistances. Please include a direct reference to the INDC/NDC document (chapter, page number, etc.). NDC Georgia, p-3;
Technology Needs Assessment	N/A
National Adaptation Plans	N/A
Nationally Appropriate Mitigation Actions	N/A
LEDS	Multiple pages

**Development of the request** (up to 2000 characters including spaces):

Georgian industrial group (GIG), which owns and operates coalmines in Georgia via its subsidiary Saknakshiri-GIG initiated the process of CTCN technical assistance request.

The request points were elaborated during the following meetings:

1. Meetings at the Ministry of Environmental Protection and Agriculture of Georgia, Meeting were attended by the representatives of the Climate Change Unit of the Integrated Management Department, Deputy Ministers and Georgian Industrial Group, Meeting Dates: 07/02/2017, 24/07/2017, 08/09/2017, 3/05/2018
2. Meetings at the Ministry of Energy, Meeting were attended by the representatives of the Oil and Gas Agency and CBM-Georgia, subsidiary of Saknakshiri-GIG, Meeting Dates: 07/08/2017, 12/10/2017, 27/12/2017
3. 12th Session, Group of Experts on Coal Mine Methane, UNECE, 24-25 October, 2017, Geneva, Available at: <https://www.unece.org/index.php?id=44868>
4. Workshop: Coal Mine Methane as a Valuable energy Source, 28 February, 2018, Cracow, Poland, UNECE Group of Experts on Coal Mine Methane, the International Centre of Excellence on Coal Mine Methane in Poland (ICE-CMM in Poland), and the Global Methane Initiative (GMI), the School of Underground Mining (SUM), Available at: <http://www.unece.org/index.php?id=48354>

**Background documents and other information relevant for the request:**



- Please list all relevant documents that will help the CTCN analyse the context of the request and national priorities. Please note that all documents listed/provided should be mentioned in this request in the relevant section(s), and that their linkages with the request should be clearly indicated. For each document, please provide web-links (if available) or attach to the submission form. Please add any other relevant information as required.
- Please indicate if this request has been developed with the support of the CTCN Request Incubator.

➤ NDC Georgia

[http://www4.unfccc.int/ndcregistry/PublishedDocuments/Georgia%20First/INDC\\_of\\_Georgia.pdf](http://www4.unfccc.int/ndcregistry/PublishedDocuments/Georgia%20First/INDC_of_Georgia.pdf)

➤ Georgia's 3<sup>rd</sup> National Communication

[http://www.ge.undp.org/content/georgia/en/home/operations/projects/environment\\_and\\_ergy/enabling-activities-for-the-preparation-of-georgias-third-nation.html](http://www.ge.undp.org/content/georgia/en/home/operations/projects/environment_and_ergy/enabling-activities-for-the-preparation-of-georgias-third-nation.html)

➤ Low Emission Development Strategy

➤ First Biannual Update Report (BUR)

[http://unfccc.int/files/national\\_reports/non-annex\\_i\\_parties/biennial\\_update\\_reports/application/pdf/first\\_bur\\_-\\_georgia.pdf](http://unfccc.int/files/national_reports/non-annex_i_parties/biennial_update_reports/application/pdf/first_bur_-_georgia.pdf)

➤ EU/2010/75

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:334:0017:0119:en:PDF>

- Please indicate if this request has been developed with the support of the CTCN Request Incubator.

**No**

**OPTIONAL: Linkages to Green Climate Fund Readiness and Preparatory Support**

The CTCN is collaborating with the GCF in order to facilitate access to environmentally sound technologies that address climate change and its effects, including through the provision of readiness and preparatory support delivered directly to countries through their GCF NDA. These actions are in line with the guidance of the GCF Board (Decision B.14/02) and the UNFCCC, particularly paragraphs 4 and 7 of 14/CP.22 that addresses Linkages between the Technology and the Financial Mechanisms<sup>2</sup>.

The CTCN is therefore implementing some of its technical assistance using GCF readiness funds accessed via the country's NDA. Any application for GCF support, including the amount of support provided, is subject to the terms and conditions of the GCF and should be developed in conjunction with the NDA.

Please indicate whether this request has been identified as preliminarily eligible by the NDA to be considered for readiness support from the GCF.

Initial engagement: The GCF NDA of the requesting country has been engaged in the design of this request and the NDA will be involved in the further process leading to an official agreement for

<sup>2</sup> Please see:

[https://unfccc.int/files/meetings/marrakech\\_nov\\_2016/application/pdf/auv\\_cop22\\_i8b\\_tm\\_fm.pdf](https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf)

accessing GCF readiness support.

Advanced engagement (preferred): The GCF NDA of the requesting country has been directly involved in the design of this request and is a co-signer of this request, the signature indicating provisional agreement to use readiness national funds to support the implementation of the technical assistance.

NDA name: Ms. Nino Tandilashvili, Deputy Minister of Environmental Protection and Agriculture of Georgia

Date:

Signature:

*N. Tandilashvili* 12.06.2018

**Monitoring and impact of the assistance:**

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures.

**Signature:**

NDE name

Mr. Grigol Lazrievi, Head of the Climate Change Unit. Environment and Climate Change Department. Ministry of Environmental Protection and Agriculture of Georgia

Date:

Signature:

12.06.2018  
*G. Lazrievi*

THE COMPLETED FORM SHALL BE SENT TO THE [CTCN@UNEP.ORG](mailto:CTCN@UNEP.ORG)

The CTCN is available to answer all questions and provide guidance on the application process.