

**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>	Uruguay
<b>Request title:</b>	<b>Development of roadmaps for non-conventional renewable energies (NCREs) prioritized by Uruguay's Technology Needs Assessment (TNA) process (wave, geothermal and concentrated solar) and energy storage technologies</b>
<b>NDE</b>	<p>Climate Change Division - Ministry of Housing, Regional Planning and Environment Zabala 1432, Flat 2, Montevideo, Uruguay +598 29170710 (ext. 1235)</p> <p>Ignacio Lorenzo Director of Climate Change Focal Point for CTCN <a href="mailto:ilorenzo@mvtoma.gub.uy">ilorenzo@mvtoma.gub.uy</a> <a href="mailto:secretaria.dcc@mvtoma.gub.uy">secretaria.dcc@mvtoma.gub.uy</a></p> <p>Jorge Castro Alternate Focal Point for CTCN +59829170710 (ext. 1234) <a href="mailto:jorge.castro@mvtoma.gub.uy">jorge.castro@mvtoma.gub.uy</a></p>
<b>Request Applicant:</b>	<p>National Directorate for Energy - Ministry of Industry, Energy and Mining Olga Otegui National Director of Energy <a href="mailto:directora@miem.gub.uy">directora@miem.gub.uy</a></p> <p>Wilson Sierra, Renewable Energies Department <a href="mailto:wilson.sierra@miem.gub.uy">wilson.sierra@miem.gub.uy</a></p> <p>Climate Change Division - Ministry of Housing, Regional Planning and Environment Carla Zilli, Assistant +59829170710 (ext.1227) <a href="mailto:carla.zilli@mvtoma.gub.uy">carla.zilli@mvtoma.gub.uy</a></p>

**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 (up to one page):**

According to the last national inventory published (7), in 2014 Uruguay's net total greenhouse gas (GHG) emissions were 28,341 Gg CO<sub>2</sub>eq using metric GWP100\_AR2 or 12,876 Gg CO<sub>2</sub>eq using metric GTP100\_AR5. Using the latter metric, 37.7 per cent of emissions were attributable to the energy sector (including transport), whereas this proportion drops to 20.1 per cent when using metric GWP100\_AR2. Furthermore, in 2014 the energy sector contributed 6199.6 Gg, representing 92.8 per cent of total CO<sub>2</sub> emissions. Historically the energy generation industries and transport sub-sectors have been the principal CO<sub>2</sub> emitters in this sector, despite their emissions having evolved along different paths. Levels of hydraulic energy generation were very good in 2014, reaching a new maximum electricity yield from hydraulic energy. In years with better hydraulic energy generation emissions fall. Adding this to the growth in recent years of electricity generation using non-conventional renewable energies (NCREs) means that the contribution of the energy generation sub-sector fell from 40 per cent of CO<sub>2</sub> emitted in 2012 (equal to the transport sub-sector) to 15 per cent in 2014 and 17 per cent in 2015 (9).

The growth of NCREs meant that in 2015 57 per cent of Uruguay's primary energy came from renewable sources, which in turn represented 90 per cent of the energy consumed by the industrial sector and 92 per cent of national electricity generation in the 2015 National Energy Balance (NEB) (9). National emissions from the energy sector in relation to the country's GDP (119 gCO<sub>2</sub>/USD in 2015) are very low compared with the global average, having halved between 1990 and 2017, despite national energy consumption having tripled over the same period. In addition to the sustained promotion of NCREs, energy efficiency measures have been implemented in the residential, industrial and transport sectors.

The historical cumulative annual growth of electricity demand in Uruguay has been 3.5 per cent, which is consistent with its status as a developing country. Projections used to optimize Uruguay's electricity generation investments for 2020-2040 have determined that growth will continue at this rate (14). The constant growth of electricity demand makes it necessary to continuously expand the energy generation system to cover demand. The optimization of investments in this area depends on four main variables: electricity demand, the cost of the technologies, the cost of fossil fuels and the level of regional integration (14). By nature, generation projects are investment intensive and involve construction timescales running from one year for simple projects to more than five years for large power stations. This means that decisions concerning significant amounts of capital must be made years in advance with the associated risk that the assumptions used to make the decisions will likely change during construction.

Uruguay has already embarked on a path towards a diversified electricity/energy matrix with a strong

domestic renewable energy component. This path was chosen given that it is economically and environmentally optimal and able to withstand external price fluctuations. The expansion of wind and solar energy is limited to the capacity of the system to adapt to fluctuations in these resources. If this capacity is exceeded, it will be necessary to install new thermal power stations or new resources that would enable the system to adapt to the fluctuations. These adaptive resources could include: (1) measures to manage demand linked to the possibilities offered by new technologies that facilitate the flow of information along the whole electricity generation chain including the end-user; (2) improving exchanges with neighbouring systems (Argentina and Brazil); (3) installing specific adaptive equipment such as a pumped-storage plant or battery banks that could charge during lower cost hours and return the energy during higher cost hours; or (4) incorporating other NCREs that complement those already developed locally.

As outlined in the preceding paragraphs, it is necessary to build local capacities in relation to new NCREs and electricity storage technologies, taking into account future scenarios in which it is not only possible to store surplus in the region but local demand has also developed in sectors prone to consuming more electricity.

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

Uruguay participated in the UNEP-DTU Technology Needs Assessment (TNA) and within the energy sector the technologies prioritized for climate change mitigation were NCREs, more specifically, wave, geothermal and concentrated solar. Local levels of development these technologies have not reached pilot scale. The main component of the proposed Project Idea is to establish a roadmap for geothermal energy in Uruguay, for thermal heating, ventilation and air-conditioning (HVAC) in the residential, industrial and commercial sectors.

Uruguay still does not have sufficient resources to reliably assess its geothermal potential. Through a cooperation agreement between the National Directorate for Mining and Geology (DINAMIGE), the Faculty of Sciences of the University of the Republic (FCIEN) and the National Administration for Petroleum Products, Alcohol and Portland Cement (ANCAP), the intention is to utilize the hydrocarbon exploration activities carried out by the latter directly or through outsourcing in the north of the country and obtain the information required for this assessment. A recent publication (11) estimates the national geothermal potential and proposes possible alternatives for harnessing it, whether as thermal energy or electricity.

Electricity storage using hydraulic pumping stations has already been assessed in Uruguay (13) and three possible sites have been identified: Sierra de Tambores (Tacuarembó), Sierra de los Ríos (Cerro Largo) and Sierra de La Aurora (Rivera), with the latter being the most suitable. Furthermore, the use of electric vehicle batteries through the vehicle-to-grid (V2G) system was simulated for different local scenarios as part of a National Research and Innovation Agency - Sectorial Fund for Energy (ANII - FSE) project (15). Moreover, in 2013 the state-owned power company UTE signed an agreement with Chinese battery and electric vehicle manufacturer ByD to conduct specific studies on the use of its batteries as a means of supporting the electricity supply system provided by UTE. Finally, in 2017 Uruguay's standards institute, Instituto Técnico de Normalización de Uruguay (UNIT), formalized the creation of a technical working group on the standardization of batteries and electric vehicles.

Preparations for wave energy in Uruguay are primarily conducted by the Fluid Mechanics and Environmental Engineering Institute (IMFIA), which obtained funding for two wave energy projects from FSE and ANII. The first project, developed jointly with other Faculty of Engineering (FING)

institutes in 2009-2014, was titled "URU WAVE - Assessment of the use of wave energy in Uruguay". The project enabled the acquisition and installation of a new wave generator and was the basis of a doctoral thesis that estimated the wave energy potential of Uruguay's ocean coastline (10). The URU WAVE 2 project launched in April 2014 with the aim of improving the design of the wave energy converter using analytic and numerical models. The total cumulative cost of the projects was approximately USD 600,000.

With regard to concentrated solar energy, in 2014 the National Directorate for Energy (DNE) hired an international consultancy firm, the main purpose of which was to conduct a technical and economic pre-feasibility study for an investment in a concentrated solar power station in Uruguay. The consultancy firm was also required to advise on different aspects of the technology, such as types of pilot project, local equipment manufacture and radiation measurements (12).

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

The Barrier Analysis and Enabling Framework report for the TNA project (5) identified barriers to the development of wave energy in Uruguay. Some of these barriers are the same for geothermal and concentrated solar energy, which were assessed in the context of Uruguay as part of the prioritization process during the first stage of the TNA project (4). The following are among the barriers identified for these NCREs which could fall within the scope of the request for technical assistance to CTCN:

- The links between actors that would facilitate the implementation the new technology are weak and the stakeholders are fragmented.
- There are no comprehensive applied research plans or programmes specifically linked to the use of these NCREs, with the exception of isolated academic initiatives.
- The specialists required to assess projects on these NCREs have insufficient technical, environmental and socio-economic knowledge.
- The public is generally in favour of renewable energies, but it is feasible that conflicts of interest could arise between certain stakeholders as a result of the use of these resources (fishing, shipping, tourism, leisure, etc.).
- A lack of knowledge among the public regarding the numerous benefits of wave energy and its potential negative impacts on some activities prevents them from making informed decisions.
- There is limited information in certain areas to evaluate the installation of a full-sized generator.
- The expansion of electricity generation using renewable energies is currently limited as renewable energies fluctuate to a greater or lesser degree, making it difficult to manage supply and demand.
- It is difficult to access technical information. Beyond that recorded in the patents, detailed information on critical aspects of the technology is not readily available.
- There is no full-scale local experience of these NCREs.

The variability of NCREs makes it necessary to adapt to two seasonal levels. This issue is mitigated in part by the complementarity of the different sources. The technological option of adapting by storing

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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)

energy in batteries is advancing rapidly globally, but there are barriers to its sustainable development in Uruguay. These barriers are linked to technology needs, specific regulations and the technical and organizational capacities required to properly manage the batteries throughout their lifecycle. This includes monitoring the entry of the batteries into the country, assessing their performance at testing facilities in accordance with standardized methods, processing and disposing of depleted batteries.

**Sectors:**

Please indicate the main sectors related to the request:

- |   |   |                                       |  |
|---|---|---------------------------------------|--|
| <input type="checkbox"/> Coastal zones        | <input type="checkbox"/> Early Warning and Environmental Assessment | <input 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 type="checkbox"/> Energy Efficiency    | <input type="checkbox"/> Forestry                                   | <input type="checkbox"/> Industry     | <input checked="" 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 type="checkbox"/> Disaster risk reduction     | <input type="checkbox"/> Ecosystems and biodiversity                        | <input checked="" type="checkbox"/> Gender                  |  |

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

The overall objective of the technical assistance is to develop a framework for longer-term planning in relation to the measures that Uruguay should pursue for wave, geothermal and concentrated solar energy. Through this planning, it is hoped that the country will acquire sufficient capacities and information in relation to these NCREs to assess their potential incorporation into Uruguay's energy matrix. In parallel, the planning should consider the development of the local capacities required to incorporate energy storage systems aimed at adapting to seasonal fluctuations in NCRE generation.

The priority activities to be carried out as part of the technical assistance are as follows:

1. Developing a national roadmap for geothermal energy, for HVAC in the residential, industrial and commercial sectors.

2. Developing a national roadmap for the development of energy storage technologies.
3. Developing a gender-sensitive technical and economic pre-feasibility study for the implementation of a pre-commercial-scale residential HVAC pilot project.

The lower priority activities to be carried out include:

4. Developing a national roadmap for wave energy.
5. Developing a national roadmap for concentrated solar power.

Following the Battelle methodology (16,17), the development of the roadmaps could be broken down into the following stages:

Stage 1 - Declaration of the vision: define the main objective for 2020-2050.

Stage 2 - Analysis of the current context: evaluation of current capacities in terms of on-going foundational research, demonstration and development projects, both with gender approach, research and test centres and infrastructure, national and international networks.

Stage 3 - Route and destination for risk management: the challenges associated with deploying the technology should be considered (for example, the capacity for economies of scale), as should commercial challenges (for example, the identification of appropriate policies and frameworks to bring the technology to market), technical challenges (the main focus of the R&D strategy) and the main gender gaps, such as obstacles to equality in each sector involved.

Stage 4 - Design a pilot for implementation.

The outputs of the technical assistance would be the respective national roadmaps and the pre-feasibility report for the geothermal energy pilot, for residential HVAC.

**Expected timeframe:**

12 months

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

The equitable participation of men and women in decision-making in relation to developing the national roadmaps for the development of the NCREs chosen will be ensured. Furthermore, when assessing current capacities, in terms of on-going foundational research, and demonstration and development projects, gender-related topics will be addressed. The gender balance in the sector will be determined and affirmative measures will be proposed to reduce gaps. These will be taken into account in the design of the pilot project.

The following potential indicators, proposed by CTCN, are suggested:

- Number and percentage of women and men who attend planning and participatory consultation meetings for the development of the roadmaps;
- Number of men and women members of technical teams and demonstration and development projects, by profession, academic level and position with a particular focus on those in decision-making or leadership roles in the planning process for the development of the NCREs chosen.

The technical assistance will set out a pathway for the development of NCREs with the primary objective of mitigating domestic GHG emissions, but that will also have other economic, environmental, social and cultural co-benefits with an emphasis on gender equality. These co-benefits could include:

increased energy sovereignty as a result of reduced dependence on oil; reduced costs in a context of increasing fossil fuel prices; smoothing out fluctuations in electricity generation by using other complementary renewable energies; a reduction in the pollutants associated with thermal power stations and vehicles (which would be substituted for electric transport, also reducing urban noise); potential job creation by the national energy industry, sensitive to gender issues; and the promotion of a culture of sustainable development among the population. The development of other NCREs would also act as an adaptive measure, given that it would reduce the impact of climate-related fluctuations in hydraulic energy generation levels.

**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	<b>Climate Change Division, MVOTMA.</b> Partner and main hub for interinstitutional coordination through its role as coordinator of the National Climate Change Response System.
Request Applicant	<b>National Directorate for Energy, MIEM.</b> Project leader. The central body responsible for preparing and implementing energy policy and its directives, it would be the main institutional sponsor. It would also monitor and evaluate the output of the technical assistance. <b>Climate Change Division, MVOTMA.</b>
Stakeholders	

- UTE: The public electricity generation, transmission and distribution company, it centralizes competence and the application of technical standards in this field; a potential stakeholder in NCRE developments in the medium and long term.
- Fluid Mechanics and Environmental Engineering Institute (IMFIA) (FING, UdelaR): National leader in applied research into wave energy in the Working Group on Renewable Energies, local partner for international cooperation on wave energy technology.
- Solar Energy Laboratory (LES) (FING, UdelaR): National leader in applied research into solar energy, local partner for international cooperation on solar energy technology.
- Institute of Geological Sciences (ICG) (FCIEN, UdelaR): Academic body focused on basic capacities for the development of geothermal energy, local partner for international cooperation on geothermal energy technology.
- Electrochemical Engineering Interdisciplinary Hub (FCIEN-FING, UdelaR): National leader in research into the electrochemical conversion of energy, local partner for international cooperation on technology for energy storage using batteries.
- Electrical Engineering Institute and Mechanical Engineering and Industrial Processes Institute (IIE - IIMPI) (FING, UdelaR): Academic bodies recently involved in a project that assessed the impact of the expansion and efficiency of networks for using the storage and distributed generation capacity of electric cars.

- National Directorate for the Environment (DINAMA) (MVOTMA): Responsible for granting prior environmental and operating permits to energy generation projects, and monitoring their impact in terms of their environmental performance, emissions and the environmental quality of their surroundings.
- National Directorate for Water (DINAGUA) (MVOTMA): The objective of this body is to improve the population's quality of life and ensure the sustainable use of the country's water resources, through the development of national water and sanitation policies, with the participation of a range of relevant actors and in coordination with other public policies.
- National Directorate for Aquatic Resources (DINARA) (MGAP): Responsible for the sustainable use of fishery resources and providing opinions on the impact of wave energy on these resources.
- National Directorate for Mining and Geology (DINAMIGE) (MIEM): Responsible for the sustainable use of geological resources and the assessment and conservation of groundwater resources, as well as providing opinions on the impact of geothermal energy on these resources.
- National Directorate for Regional Planning (DINOT) (MVOTMA): Responsible for implementing relevant measures for the coordination and cooperation of public national, regional and local institutions in relation to planning and environmental management in the country, at all territorial levels.
- Regional Centre for the Management of Groundwater (CEREGAS): Coordinates national and regional capacities in the public and private sector for the sustainable management of aquifers and the protection of this water resource, with an integrated approach that takes environmental, economic and social factors into account, in accordance with Uruguay's and the region's international commitments in relation to sustainable development.
- Eastern Regional University Centre (CURE) (UdelaR): National research centre working in the area where wave energy could be developed, it generates knowledge about socio-economic impacts and impacts on the marine biophysical environment where generators are installed.
- Regional Authorities of Rocha and Maldonado: Regional authorities in the areas with the highest wave energy potential, which together with the third level of government in the municipalities would have to harmonize their local policies with national ones.
- Regional Authorities of Paysandú, Salto and Artigas: Regional authorities in the areas with the highest solar and geothermal energy potential, which together with the third level of government in the municipalities would have to harmonize their local policies with the national ones.
- Ministry of Tourism (MINTUR): Responsible for tourism policies, it would provide opinions on the impact of the development of wave and geothermal energy in some of Uruguay's most valued tourist destinations.
- ANCAP: State-owned company responsible for supplying petroleum products with dozens of partnerships and collaborations with national and international research institutes and centres. Its Engineering and Maintenance Division has experience in marine construction that is applicable to wave energy, and in the field of production and exploration, in the course of its hydrocarbon prospecting activities in north of the country, it collects essential information for assessing geothermal energy potential.
- National Navy (in particular SOHMA, the Navy's Oceanography, Hydrography and Meteorology Service) and National Ports Administration (ANP): Public bodies involved in maritime activities that

could participate in the process of authorizing wave energy installations, as well as cooperate in their development in terms of technical and logistical support.

- Mesa Solar: A multi-sectoral initiative for promoting solar energy in Uruguay, comprised of NGOs, relevant public bodies, public and private universities, trade union organizations, technical institutes, business associations and consultants.
- NGOs working on environmental issues, or that, in the course of their activities, could be affected by the development of particular renewable energy projects (for example, surfers' associations, artisanal fishers, tour operators, etc.).
- Representatives of the private sector that could be interested in supplying goods and services for the development of a local industry linked to NCREs (for example, Cluster Naval Uruguay, Cámara de la Industrias Navales, Cámara Solar, etc.) or to batteries (for example, electric vehicle manufacturers).
- Interinstitutional Roundtable of Women in Science, Technology and Innovation, whose objective is to raise the profile of the underrepresentation of woman in the academic and work environment. It acts as a forum for learning and capacity-building in science, technology, engineering and mathematics (STEM) and generating proposals, at different levels and aimed at various stakeholders, to remedy this situation.

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

The reference document extracts demonstrate that the technical assistance is fully consistent with national priorities related to the promotion of renewable energies, in particular NCREs.

<b>Reference document</b> (please include date of document)	<b>Extract</b> (please include chapter, page number, etc.).
Nationally Determined Contribution (2) (03/11/2017)	<p>In addition to measures that favour the inclusion of renewable energies, Uruguay will contribute to the reduction of emissions by implementing measures to promote energy efficiency in the residential, industrial and transport sectors. ... This context enables Uruguay to contribute towards 2025 with an unconditional mitigation objective for an intensity reduction (CO2 emissions per GDP unit) of 24 per cent compared to 1990 values. It also allows the country to aspire to a 29 per cent mitigation objective conditional on additional and specific means of implementation by 2025 (p. 7).</p> <p>The list of the main measures to be implemented to contribute to achieving Uruguay's mitigation objectives which are conditional on additional and specific means of implementation include: Introduction of electricity storage technology, including storage and pumping systems: 300 MW installed by 2025 ... (p. 13).</p>
Technology Needs Assessment 4) (5) (6) (from sep-2015 to nov-2017)	<p>The prioritization of the renewable energy sub-sector, in particular wave, geothermal and concentrated solar NCREs have emerged as the result of the first stage of the TNA project (ref. 4, chap. 5). The Technology Action Plan (ref. 6) focused exclusively on wave energy, with the Project Idea being the development of a roadmap for wave energy and a pre-feasibility</p>

	study for a pilot generator (ref. 6, chap. 3).
National Climate Change Policy (1) (27/04/2017)	<p>Support the guidelines for policies related to climate change and variability, including the Energy Policy (ref. 1, para. 3, Line of Action iii, p. 5).</p> <p>Build capacities in R&amp;D and innovation on the subjects addressed by this Policy, within public and private institutions, through technical assistance, funding, and/or regulatory instruments or management tools promoting them (ref. 1, para. 6, Line of Action i, p.8). Promote strategies that facilitate the continued integration of renewable energies into the electricity matrix, in particular through the inclusion of energy storage systems in the management of variable energy sources. Strengthen the integration of renewable energies and other clean energy sources into the energy matrix (ref. 1, para. 18, Lines of Action i and ii, p. 15).</p>
Energy Policy 2005-2030 (3) (2008)	<p>Diversify the energy matrix, both sources and suppliers, with the aim of reducing costs and dependence on oil and promoting the integration of domestic energy sources, particularly renewables (Overall Objective of the Supply Pillar, p. 5).</p> <p>The introduction of energy sources that do not require subsidies will be promoted. Nevertheless, other forms of renewable energy will be trialled, through focused pilots (Specific Objective of the Supply Pillar #3, p. 5).</p> <p>Conduct work on prospective technologies on an on-going basis in order to prepare the country to introduce new energy sources (... wave, geothermal and concentrated solar) (Specific Objective of the Supply Pillar #9, p.6)</p> <p>The country has developed pilot schemes through the use of new energy sources and/or developing technologies (Targets for 2020, p. 9).</p> <p>Define a provisional timeline for the integration of electricity generation in the short, medium and long term, including targets for each source, while considering demand from new electricity-intensive productive enterprises (Lines of Action #10 and #11).</p> <p>Strengthen work on prospective energies and technologies, in order to adequately plan the introduction of new alternative energy sources in the long term (Line of Action #25).</p>
Voluntary National Report on the Sustainable Development Goals (8) (2017)	<p>For SDG 9 (Industry, Innovation and Infrastructure) Uruguay plans by 2030 to modernize its infrastructure and upgrade industries to make them sustainable (Target 9.4, p. 175). Despite the significant increase in GDP in the second half of the 2000s, emissions fell from 0.16 in 2000 to 0.09 in 2015. The technical assistance follows on from sustainable industrialization on the basis of reducing GHG emissions and is part of a process to help overcome the challenge of promoting R&amp;D in productive</p>

<p>Fourth National Communication to COP (7) (2016)</p>	<p>processes, in this case energy generation.</p> <p>In turn, the alternative of using electric car parks is being analysed, the strategy being to store power in the car batteries and return some of the charge to the system at times of higher demand. The country requires support to continue analysing these options, both in terms of the technology and the regulatory framework (Section 5.1 Obstacles, gaps and financial, technology and capacity needs, p. 123).</p>
<p>National Gender Equality Strategy (ENIG) (National Gender Council)</p>	<p>The ENIG approved by the National Gender Council, under the strategic line on climate change, sets out promoting opportunities to reduce gender gaps in productive and economic processes for the mitigation of GHG emissions and integrating a gender perspective into the generation of knowledge about climate change (ENIG, 2017).</p>

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

This request was initiated by DCC, in agreement with the NDE, once the TNA project had been finalized in November 2017, which led to the prioritization of sectors, sub-sectors and technologies for adaptation and mitigation.

The TNA project lasted three years, during which various workshops and consultations were run, using a participatory methodology, involving the most relevant stakeholders, with representatives from the public and private sectors. It should be noted that this process ran in synergy with the development of the National Climate Change Policy (PNCC), the intended NDC and the first NDC.

DCC (MVOTMA) was the national coordinator of the TNA. It also led the other processes developing the PNCC, the intended NDC and the NDC with the active participation of DNE.

During the TNA process, the prioritization of mitigation technologies led to a focus on four sectors (agriculture, energy and industry, transport and waste). Under the energy and industry sector, the renewable energy sub-sector was prioritized, in particular NCREs (wave, geothermal, concentrated solar).

The discussions related to the energy and industry sector were led by DNE and DCC, with the participation of all relevant stakeholders.

With the agreement of DNE, it was considered very important to continue to strengthen knowledge about these NCREs, in which Uruguay does not have a great deal of experience. However, initial studies have been carried out in the country in relation to the NCREs mentioned, by FING and DINAMIGE, which enabled the development of a roadmap to be considered for the purpose of planning future activities in these areas and contributing to the achievement of Uruguay's policies and commitments. Logically, storing the energy produced using these NCREs would be complementary given that NCREs fluctuate by nature.

The subject matter outlined on this form will not be presented to the Green Climate Fund at the present time. However, there may be synergies with other initiatives related to electric transport that are currently in the pipeline. Therefore, it is possible that in the future the content of this request could be included in a request to the Green Climate Fund.

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

**List of Acronyms and Abbreviations:**

ANCAP – Administración Nacional de Combustibles, Alcohol y Portland (National Administration for Petroleum Products, Alcohol and Portland Cement)

ANII – Agencia Nacional de Investigación e Innovación (National Research and Innovation Agency)

ANP – Administración Nacional de Puertos (National Ports Administration)

NEB – National Energy Balance

CEREGAS- Centro Regional para la Gestión de Aguas Subterráneas (Regional Centre for the Management of Groundwater)

UNFCCC – United Nations Framework Convention on Climate Change

COP – Conference of the Parties to the United Nations Framework Convention on Climate Change

CSP – Concentrated Solar Power

CURE (UdelaR) – Centro Universitario Regional del Este (Eastern Regional University Centre)

DINAGUA (MVOTMA) - Dirección Nacional de Aguas (National Directorate for Water)

DCC (MVOTMA) – División de Cambio Climático (Climate Change Division)

DINAMA (MVOTMA) – Dirección Nacional de Medio Ambiente (National Directorate for the Environment)

DINAMIGE (MIEM) – Dirección Nacional de Minería y Geología (National Directorate for Mining and Geology)

DINARA (MGAP) – Dirección Nacional de Recursos Acuáticos (National Directorate for Aquatic Resources)

DINOT (MVOTMA) – Dirección Nacional de Ordenamiento Territorial (National Directorate for Regional Planning)

DNE (MIEM) – Dirección Nacional de Energía (National Directorate for Energy)

TNA – Technology Needs Assessment

NCRE – Non-Conventional Renewable Energy

FCIEN (UdelaR) – Facultad de Ciencias (Faculty of Sciences)

FING (UdelaR) – Facultad de Ingeniería (Faculty of Engineering)

FSE – Fondo Sectorial de Energía (Sectorial Fund for Energy)

GNA – Gabinete Nacional Ambiental (National Environmental Office)

GTP100\_AR5 –Global Temperature change Potential in 100 years (5<sup>th</sup> Assessment Report)

GWP100\_AR2 –Global Warming Potential in 100 years (2<sup>nd</sup> Assessment Report)

ICG (FCIEN) – Instituto de Ciencias Geológicas (Institute of Geological Sciences)

IIE (FING) – Instituto de Ingeniería Eléctrica (Electrical Engineering Institute)

IIMPI (FING) – Instituto de Ingeniería Mecánica y Procesos Industriales (Mechanical Engineering and Industrial Processes Institute)

IMFIA (FING) – Instituto de Mecánica de los Fluidos e Ingeniería Ambiental (Fluid Mechanics and Environmental Engineering Institute)

LES (UdelaR) – Laboratorio de Energía Solar (Solar Energy Laboratory)

MIEM – Ministerio de Industria, Energía y Minería (Ministry of Industry, Energy and Mining)

MINTUR – Ministerio de Turismo (Ministry of Tourism)

MGAP – Ministerio de Ganadería, Agricultura y Pesca (Ministry of Farming and Fisheries)

MVOTMA – Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente (Ministry of Housing, Regional Planning and Environment)

SDG – Sustainable Development Goals

OPP – Oficina de Planeamiento y Presupuesto (Budget and Planning Office)

PAT – Plan de Acción Tecnológica (Technology Action Plan)

GDP – Gross Domestic Product

SNA – Sistema Nacional Ambiental (National Environmental System)

SNRCC – Sistema Nacional de Respuesta al Cambio Climático (National Climate Change Response System)

SOHMA – Servicio Oceanográfico, Hidrográfico y Meteorológico de la Armada (Navy's Oceanography,

Hydrography and Meteorology Service)

UdelaR – Universidad de la República Oriental del Uruguay (University of the Eastern Republic of Uruguay)

UKERC – United Kingdom Energy Research Centre

UNIT – Instituto Uruguayo de Normas Técnicas (Standards Institute of Uruguay)

UTE – Administración Nacional de Usinas y Trasmisiones Eléctricas (National Administration of Power Stations and Electricity Transmission)

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#### **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 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

<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)

assistance.

NDA name:

Date:

Signature:

**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.

I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country.

**Signature:**

NDE name: Climate Change Division - Ministry of Housing, Regional Planning and Environment

Date: 25-07-2018

Signature: Ignacio Lorenzo  
Director of Climate Change  
Focal Point for CTCN

**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.