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soluciones innovadoras para  
un crecimiento sostenible

**April 2020**

# **Preparation of a national roadmap for the use of low-enthalpy geothermal energy for thermal conditioning in the residential, industrial and commercial sectors**

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## **Output 1**

Prepared for:



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**Preparation of a national roadmap for the use of  
low-enthalpy geothermal energy for thermal  
conditioning in the residential, industrial and  
commercial sectors**

Deliverable 1.1  
Detailed Work Plan

## Climate Technology Centre & Network (CTCN)

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# 1 Detailed work plan

The detailed work plan will detail all the activities to be carried out in the consulting service called "Preparation of a national roadmap for the use of low-enthalpy geothermal energy for thermal conditioning in the residential, industrial and commercial sectors", executed by DEUMAN and CEGA.

Similarly, a Gant Charter will be presented that will identify these activities with deliveries and products, specifying deadlines and responsibilities, as well as the detailed budget to implement this CTCN response plan.

Tabla 1 below presents the contractual terms of the six products to be delivered, in addition to the actors who develop the consultancy.

**Tabla 1 General Information Chart**

"Preparation of a national roadmap for the use of low-enthalpy geothermal energy for thermal conditioning in the residential, industrial and commercial sectors"			
<b>Implementer:</b>	Servicios de Ingeniería Deuman Limitada		
<b>Client:</b>	CTCN-ONU DI		
<b>Partner</b>	Centro de Excelencia en Geotermia de los Andes		
<b>Deadlines</b>	Contract Signing	12-Mar-20	
	Product 1	13-Abr-20	
	Product 2	12-Jun-20	
	Product 3	9-Set-20	
	Product 4	8-Nov-20	
	Product 5	5-Feb-21	
<b>Team DEUMAN</b>	Product 6	8-Mar-21	
	Project Director	Jaime Parada	JP
	GCF Framework Specialist	Rodrigo Valenzuela	RV
	General Coordinator	Cristhian Abanto	CA
	Local Support	Lucía Samaniego	LS
	Gender Specialist	Virginia Guzmán	VG
<b>Team CEGA</b>	Geothermal Energy Specialist	Joshua Carvacho	JC
	Geothermal Energy Specialist	Diego Aravena	DA
<b>Support DEUMAN</b>	Geothermal Energy Specialist	Mauricio Muñoz	MM
	Daniela Vera (Administración)	<b>Technical Counterpart</b>	Judit Rodriguez (CTCN)
	Itala Ferrer		
Danna Espinoza			

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The following Table 2 describes the main function of each member that comprise the project team for the present consultancy.

**Table 2 Project Team's Roles and Functions**

	Name	Code	Function
<b>DEUMAN Team</b>	Jaime Parada	JP	Head of Study whose function is to direct, supervise and enforce the Terms of Reference of the project.
	Rodrigo Valenzuela	RV	GCF specialist, responsible for the development of the Concept Note following the criteria of the Green Climate Fund (GCF).
	Cristhian Abanto	CA	General Coordinator who performs the function of organizing all meetings and monitoring the fulfillment of activities, commitments, etc. Responsible for the elaboration of general templates and communication between the client, the stakeholder and the consulting team.
	Lucía Samaniego	LS	Local Support in charge of contacting local stakeholders, organizing presentations and meeting with them, either in person or virtually.
	Virginia Guzmán	VG	Gender Specialist, responsible for social impact analysis, gender balance, identification of gender gaps and barriers, and will work with the beneficiary communities with the project.
	Joshua Carvacho	JC	Consultant specialist in Geothermal Energy in charge of providing specialized technical support.
<b>CEGA Team</b>	Diego Aravena	CEGA	Specialists in Geothermal Energy in charge of providing specialized technical support, their main contribution is the elaboration of the road map.
	Mauricio Muñoz	CEGA	
<b>Support DEUMAN</b>	Daniela Vera	DEUMAN	Administrator DEUMAN.
	Itala Ferrer		DEUMAN technical specialists, in charge of providing consultancy support.
	Danna Espinoza		



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1.2.1		Analysis of the indicators of the "closure and data collection report"	CA	Done	23/03/2020	24/03/2020														
1.2.2		Risk Analysis of the consulting service	JP	Done	24/03/2020	26/03/2020														
1.2.3		List of Key Performance Indicators	DEUMAN	Done	24/03/2020	24/03/2020														
1.2.4		Preparation of the evaluation and monitoring plan	DEUMAN	Done	27/03/2020	3/04/2020														
1.2.5		Validation of the evaluation and monitoring plan by the consulting team	Consulting team	Done	6/04/2020	8/04/2020														
1.2.6		Validation of the evaluation and monitoring plan by the CTCN	JR	Done	8/04/2020	9/04/2020														
1.3		<b>Activity 1.3: Description of CTCN Impacts</b>																		
1.3.1		Analysis of Risks and vulnerabilities of the consulting service	JP	Done	24/03/2020	26/03/2020														
1.3.2		Analysis of the CTCN Impacts description template	CA	Done	27/03/2020	27/03/2020														
1.3.3		Assessment of the impacts of the consulting service	JP	Done	30/03/2020	1/04/2020														
1.3.4		Analysis of the Gender Variable in the description of impacts	VG	Done	6/04/2020	6/04/2020														
1.3.5		Preparation of the CTCN Impacts description	CA	Done	7/04/2020	7/04/2020														
1.3.6		Validation of the CTCN impact description	JP	Done	8/04/2020	8/04/2020														
1.4		<b>Activity 1.4: Report closure and information gathering</b>																		
1.4.1		Analysis of CTCN Formats	CA	Done	8/03/2021	8/03/2021														
1.4.2		Preparation of the closing report and information gathering	JP	Unfinished	8/03/2021	8/03/2021														
CC1		<b>Product quality control</b>	Consulting team	Done	25/03/2020	10/04/2020														
		<b>Product 1: Includes deliverables 1.1, 1.2 and 1.3</b>	CA	Done	13/04/2020	13/04/2020														
	P1	<b>Product Presentation 1</b>	CA	Unfinished	29/04/2020	29/04/2020														
2		<b>Output 2: Diagnosis of the key actors for the use of low enthalpy geothermal energy</b>			12/06/2020															
2.1		<b>Activity 2.1: Diagnosis of key actors related to low enthalpy geothermal energy in the country</b>																		
2.1.1		Preparation of the Meeting Minutes and Attendance List Format	DEUMAN	Unfinished	30/03/2020	31/03/2020														
2.1.2		Preparation of the Agenda for the First Meeting	LS	Done	30/03/2020	31/03/2020														
2.1.3		Preliminary List of Information to Request	CEGA-JC-JP-LS	Done	26/03/2020	26/03/2020														
2.1.4		Preparation of Characterization Sheets (Experience, capacity and Commitment)	DEUMAN	Done	30/03/2020	3/04/2020														
2.1.5		Validation of Formats with the CTCN	JR	Unfinished	10/04/2020	10/04/2020														
2.1.6		Sending Meeting Requests considering the Gender analysis	VG	Unfinished	14/04/2020	14/04/2020														
	R3	Internal coordination meeting	CA	Unfinished	14/04/2020	14/04/2020														
2.1.7		Preparation of the Gender Equity Plan	VG	Unfinished	22/04/2020	27/04/2020														
2.1.8		Training of the gender variable for the consulting team	VG	Unfinished	24/04/2020	24/04/2020														

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		<b>WT1</b>	First Working Table (Authorities of the Ministry of Environment and Energy)	Consulting team	Unfinished	29/04/2020	29/04/2020												
	<b>R4</b>		Internal coordination meeting	CA	Unfinished	01/05/2020	01/05/2020												
<b>2.1.9</b>			First interview with stakeholders of priority 1	LS	Unfinished	28/04/2020	15/05/2020												
<b>2.1.10</b>			First interview with Stakeholders of priority 2 and 3	LS	Unfinished	15/05/2020	29/05/2020												
<b>2.1.11</b>			Complete Characterization Sheet and prepare Minutes of meetings with Stakeholders	LS	Unfinished	28/04/2020	29/05/2020												
	<b>R5</b>		Internal coordination meeting	CA	Unfinished	20/05/2020	20/05/2020												
<b>2.1.12</b>			Selection of Additional members of the working table	CA-LS-JC	Unfinished	21/05/2020	21/05/2020												
<b>2.1.13</b>			Preparation of the Presentation for the Working Table	DEUMAN-LS	Unfinished	22/05/2020	25/05/2020												
<b>2.1.14</b>			Systematization of characterization sheets	DEUMAN	Unfinished	29/05/2020	01/06/2020												
<b>2.1.15</b>			Gender evaluation in the development of the meetings	VG	Unfinished	01/06/2020	01/06/2020												
<b>2.1.16</b>			Stakeholder evaluation matrix	JC-CEGA	Unfinished	29/05/2020	02/06/2020												
		<b>WT2</b>	Second Working Table	Consulting team	Unfinished	03/06/2020	03/06/2020												
<b>2.2</b>	<b>Tdr</b>		<b>Activity 2.2: Kick-off meeting to present the technical assistance to the key stakeholders</b>																
<b>2.2.1</b>		<b>PP1</b>	Presentation to the stakeholders to show the technical assistance plan to gather information from them	JP-LS	Unfinished	27/04/2020	27/04/2020												
<b>2.2.2</b>			Systematization of Meeting Minutes	DEUMAN	Unfinished	28/04/2020	28/04/2020												
<b>CC2</b>			<b>Product quality control</b>	CA-DEUMAN	Unfinished	25/05/2020	11/06/2020												
			<b>Product 2: Includes deliverable 2.1. Evaluation report that identifies and defines the key players</b>	CA	Unfinished	12/06/2020	12/06/2020												
			<b>Product 2: Includes deliverable 2.2: Minutes of the meeting</b>	CA	Unfinished	12/06/2020	12/06/2020												
	<b>P2</b>		<b>Product Presentation 2</b>	CA	Unfinished	16/06/2020	16/06/2020												
<b>3</b>	<b>Tdr</b>		<b>Output 3: Analysis of current scenario of geothermal energy</b>				9/09/2020												
<b>3.1</b>			<b>Activity 3.1: Analysis of the current low enthalpy geothermal energy scenario</b>																
<b>3.1.1</b>			Bibliographic review of secondary information	DEUMAN	Unfinished	20/04/2020	15/05/2020												
<b>3.1.2</b>			Review of international experiences and success stories.	DEUMAN	Unfinished	5/05/2020	22/05/2020												
<b>3.1.3</b>			Systematization of the primary information collected on the first visit of the interested parties	JP	Unfinished	18/05/2020	29/05/2020												
	<b>R6</b>		Internal coordination meeting	CA	Unfinished	2/06/2020	2/06/2020												
<b>3.1.4</b>			Analysis of current capacities (i, ii, iii and iv of the terms of reference)	JC-CEGA	Unfinished	15/06/2020	19/06/2020												
<b>3.1.5</b>			Definition of the physical characteristics of the Uruguayan territory.	JC	Unfinished	22/06/2020	23/06/2020												

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3.1.6		Second visit and interviews with key stakeholders	LS	Unfinished	22/06/2020	17/07/2020													
3.1.7		Definition of evaluation scenarios for the development of low enthalpy geothermal energy.	CEGA-JC-LS	Unfinished	23/06/2020	26/06/2020													
3.1.8		Analysis of the value chain of geothermal resource technology	JP-JC	Unfinished	23/06/2020	25/06/2020													
3.1.9		Econometric analysis of supply and demand using the characteristics of thermal consumption.	CEGA	Unfinished	24/06/2020	26/06/2020													
	R7	Internal coordination meeting	CA	Unfinished	29/06/2020	29/06/2020													
3.1.10		Analysis of the low enthalpy geothermal potential of the national territory	CEGA-JC	Unfinished	29/06/2020	2/07/2020													
3.1.11		Characterization of thermal / electrical energy consumption in Uruguay.	LS-CEGA	Unfinished	30/06/2020	2/07/2020													
3.1.12		Analysis of the potential use of low enthalpy geothermal energy	CEGA	Unfinished	2/07/2020	3/07/2020													
	R8	Internal coordination meeting	CA	Unfinished	14/07/2020	14/07/2020													
	WT3	Third working table	Consulting team	Unfinished	16/07/2020	16/07/2020													
3.1.13		Assessment of GHG reduction due to the development of the estimated potential by scenario	JP	Unfinished	20/07/2020	21/07/2020													
3.1.14		Contribution to the determined national contributions of Uruguay	DEUMAN	Unfinished	21/07/2020	23/07/2020													
3.1.15		Social impact analysis	VG	Unfinished	22/07/2020	22/07/2020													
3.1.16		Gender balance in the sector	VG	Unfinished	23/07/2020	23/07/2020													
3.1.17		Identification of gender gaps	VG	Unfinished	24/07/2020	27/07/2020													
	R9	Internal coordination meeting	CA	Unfinished	31/07/2020	31/07/2020													
3.1.18		Elaboration of the matrix of the legal framework.	JC	Unfinished	3/08/2020	4/08/2020													
3.1.18		Analysis of the regulatory framework	JP-JC	Unfinished	5/08/2020	6/08/2020													
3.1.19		Preparation of the presentation of the fourth work table	DEUMAN	Unfinished	11/08/2020	12/08/2020													
	WT4	Fourth working table	Consulting team	Unfinished	13/08/2020	13/08/2020													
	R10	Internal coordination meeting	CA	Unfinished	17/08/2020	17/08/2020													
3.1.20		Management of comments and incorporation of Feedback	DEUMAN	Unfinished	18/08/2020	20/08/2020													
3.2		<b>Activity 3.2: Organize a meeting for the presentation of the results to key stakeholders</b>																	
	PP 2	Presentation of results to stakeholders	CA	Unfinished	21/08/2020	21/08/2020													
3.2.1		Management of comments and incorporation of Feedback	DEUMAN	Unfinished	22/08/2020	23/08/2020													
3.2.2		Systematization of Meeting Minutes	DEUMAN	Unfinished	24/08/2020	24/08/2020													
CC3		<b>Product quality control</b>	Consulting team	Unfinished	29/06/2020	9/09/2020													
		<b>Product 3: Includes deliverable 3.1: Report on the current scenario of low-enthalpy geothermal energy in the country</b>	CA	Unfinished	9/09/2020	9/09/2020													

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		<b>Product 3: Includes deliverable 3.2: Minutes of the meeting</b>	CA	Unfinished	9/09/2020	9/09/2020													
	<b>P3</b>	<b>Product Presentation 3 to Uruguay authorities</b>	CA	Unfinished	12/09/2020	12/09/2020													
<b>4</b>	<b>Tdr</b>	<b>Product 4: Identification of existing barriers for the use of low enthalpy geothermal energy for thermal conditioning in the country</b>			9/11/2020														
<b>4.1</b>		<b>Activity 4.1: Identify barriers to the use of low enthalpy geothermal energy in the country and propose measures / recommendations to reduce them.</b>																	
	<b>R11</b>	Internal Coordination Meeting	CA	Unfinished	26/08/2020	26/08/2020													
<b>4.1.1</b>		Third visit and interviews with key stakeholders to validate the results obtained	LS	Unfinished	31/08/2020	7/10/2020													
<b>4.1.2</b>		Preparation of a Dashboard for capacity assessment	DEUMAN	Unfinished	31/08/2020	2/09/2020													
<b>4.1.3</b>		Preparation of a Dashboard of the National geothermal potential	DEUMAN	Unfinished	3/09/2020	7/09/2020													
<b>4.1.4</b>		Preparation of a Dashboard of the Potential for the use of geothermal applications	DEUMAN	Unfinished	8/09/2020	10/09/2020													
	<b>R12</b>	Internal Coordination Meeting	CA	Unfinished	11/09/2020	11/09/2020													
<b>4.1.5</b>		Review of the state of the art in gap analysis for the use of low enthalpy geothermal energy	JC	Unfinished	16/09/2020	17/09/2020													
	<b>WT5</b>	Fifth Working Table	Consulting team	Unfinished	17/09/2020	17/09/2020													
<b>4.1.6</b>		Identification of Natural Barriers	JC-JP	Unfinished	21/09/2020	22/09/2020													
<b>4.1.7</b>		Identification of Political Barriers and Regulatory Framework	JC	Unfinished	21/09/2020	22/09/2020													
<b>4.1.8</b>		Identification of technological barriers	CEGA-JC	Unfinished	22/09/2020	23/09/2020													
<b>4.1.9</b>		Identification of Economic Barriers	CEGA-JC	Unfinished	22/09/2020	23/09/2020													
<b>4.1.10</b>		Identification of Barriers in the value chain	JC	Unfinished	22/09/2020	23/09/2020													
<b>4.1.11</b>		Identification of Social Barriers	VG	Unfinished	25/09/2020	29/09/2020													
<b>4.1.12</b>		Identification of Environmental Barriers	JP	Unfinished	25/09/2020	29/09/2020													
	<b>R13</b>	Internal Coordination Meeting	CA	Unfinished	29/09/2020	29/09/2020													
	<b>WT6</b>	Sixth Working Table	Consulting team	Unfinished	29/10/2020	29/10/2020													
<b>4.1.13</b>		Risk Matrix and Gap Assessment	CEGA	Unfinished	28/09/2020	2/10/2020													
<b>4.1.14</b>		Assessment matrix for closing gaps and removing barriers	CEGA	Unfinished	30/09/2020	2/10/2020													
<b>4.1.15</b>		Proposal for actions to close gaps	CEGA	Unfinished	5/10/2020	7/10/2020													
<b>4.1.16</b>		Preparation of the Final Report	Consulting team	Unfinished	11/10/2020	15/10/2020													
<b>4.2</b>		<b>Activity 4.2: Organize a meeting with key stakeholders for the presentation of the barriers</b>																	
	<b>PP 3</b>	Presentation of results to Stakeholders	CA	Unfinished	9/10/2020	9/10/2020													
<b>4.2.1</b>		Management of comments and incorporation of Feedback	DEUMAN	Unfinished	12/10/2020	13/10/2020													
<b>4.2.2</b>		Systematization of Meeting Minutes	DEUMAN	Unfinished	14/10/2020	14/10/2020													



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5.3.2		Definition of objectives	CEGA-JP	Unfinished	16/12/2020	16/12/2020													
5.3.3		Definition of stakeholder commitments	CEGA	Unfinished	17/12/2020	17/12/2020													
5.3.4		Definition of milestones	JC	Unfinished	18/12/2020	21/12/2020													
5.3.5		Definition of the gender variable in the Roadmap	VG	Unfinished	18/12/2020	18/12/2020													
5.3.6		Updating the list of gaps and barriers	CEGA	Unfinished	22/12/2020	23/12/2020													
5.3.7		Establishment of action plans to overcome gaps and barriers	CEGA	Unfinished	24/12/2020	25/12/2020													
5.3.8		Schedule creation	CEGA	Unfinished	28/12/2020	30/12/2020													
CC5		<b>Product quality control</b>	Consulting team	Unfinished	31/12/2020	4/02/2021													
		<b>Product 5: Includes deliverable 5.1: Draft roadmap</b>	CA	Unfinished	5/02/2021	5/02/2021													
		<b>Product 5: Includes deliverable 5.2: Report on the two workshops held</b>	CA	Unfinished	5/02/2021	5/02/2021													
		<b>Product 5: Includes deliverable 5.3: Final roadmap document</b>	CA	Unfinished	5/02/2021	5/02/2021													
	P5	<b>Product Presentation 5 to Uruguay authorities</b>	CA	Unfinished	10/02/2021	10/02/2021													
6	Tdr	<b>Output 6: Preparation of a concept note for international climate finance</b>			8/03/2021														
6.1		<b>Activity 6.1: Prepare a concept note for international climate finance on the use of low enthalpy geothermal energy in thermal conditioning in the residential sector</b>																	
6.1.1		Definition of the scope of the Project	RV-JC	Unfinished	7/12/2020	9/12/2020													
6.1.2		Preparation of environmental impact assessment documents for the Project	JP	Unfinished	7/12/2020	9/12/2020													
6.1.3		Description of the work done with communities and gender	VG	Unfinished	7/12/2020	11/12/2020													
6.1.4		Gender analysis of the Project	RV	Unfinished	7/12/2020	8/12/2020													
6.1.5		Estimation of the reduction of CO2 emissions of the project	DEUMAN	Unfinished	7/12/2020	8/12/2020													
6.1.6		Analysis of the paradigm shift	RV	Unfinished	7/12/2020	8/12/2020													
6.1.7		Identification of main costs associated with the project	RV	Unfinished	9/12/2020	10/12/2020													
6.1.8		Determination of financial structuring	RV	Unfinished	11/12/2020	15/12/2020													
6.1.9		Analysis of the GCF evaluation criteria	RV	Unfinished	16/12/2020	18/12/2020													
	WT9	Ninth Working Table: Meeting with the accrediting entity	CA	Unfinished	21/12/2020	21/12/2020													
6.1.10		First Draft of the Concept Note	RV	Unfinished	22/12/2020	23/12/2020													
6.1.11		Establishment of exit strategy according to the proposed financial structure	RV-LS	Unfinished	24/12/2020	28/12/2020													
	R15	Internal Coordination Meeting	CA	Unfinished	29/12/2020	29/12/2020													
	WT10	Tenth Working Table // Workshop	CA	Unfinished	30/12/2020	30/12/2020													
6.1.12		Preparation of materials and dynamics for the workshop 3	DEUMAN	Unfinished	12/01/2020	13/01/2020													
	WSH3	Workshop 3	JP	Unfinished	14/01/2020	14/01/2020													
6.1.13		Final Draft of the Concept Note	RV.JP	Unfinished	18/01/2021	19/01/2021													



## 1.2 Principal Activities

Among the main activities in the Work Plan are internal coordination meetings, preliminary presentations, working tables, product presentations, workshops and courses . The description of each of them are detailed in Table 3.

**Table 3 Description of principal activities**

Distribution	Description
<b>Coordination meeting (R<sub>x</sub>)</b>	Periodic meetings of compulsory attendance of the entire Consulting Team with the presence of at least one representative of the CEGA Group
<b>Preliminary Update Meeting (PP<sub>x</sub>)</b>	Preliminary Presentations with the stakeholders identified as the most important ones in order to show the progress of the consultancy service and collect their comments to feed back the process
<b>Working Table (WT<sub>x</sub>)</b>	Periodic meetings with the National authorities, being able to invite other relevant Stakeholders in order to discuss important issues, show the degree of progress and receive feedback.
<b>Product Presentation (P<sub>x</sub>)</b>	Presentations to the CTCN and to the national authorities the content of each Product with the results and findings of the progress.
<b>Workshop (WSH<sub>x</sub>)</b>	Established meeting with especial and dynamic activities with Stakeholders to complement product 5 and 6.
<b>Courses (C<sub>x</sub>)</b>	Meeting with stakeholders to complement and explain the product 5.

The following **Table 4** presents the Calendar of Activities where the suggested dates to develop each of them are displayed.

**Table 4 Saving dates of Principal Activities**

Activities	Code	Date
<b>Coordination meeting (R<sub>x</sub>)</b>	R1	27/03/2020
	R2	7/04/2020
	R3	14/04/2020
	R4	1/05/2020
	R5	20/05/2020
	R6	2/06/2020
	R7	29/06/2020
	R8	14/07/2020
	R9	31/07/2020
	R10	17/08/2020

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	R11	26/08/2020
	R12	11/09/2020
	R13	29/09/2020
	R14	18/11/2020
	R15	29/12/2020
<b>Preliminary Update Meeting (PP<sub>x</sub>)</b>	PP1	27/04/2020
	PP2	21/08/2020
	PP3	9/10/2020
<b>Working Table (WT<sub>x</sub>)</b>	WT1	29/04/2020
	WT2	3/06/2020
	WT3	16/07/2020
	WT4	13/08/2020
	WT5	17/09/2020
	WT6	29/10/2020
	WT7	19/11/2020
	WT8	9/12/2020
	WT9	21/12/2020
	WT10	30/12/2020
<b>Product Presentation (P<sub>x</sub>)</b>	P1	29/04/2020
	P2	16/06/2020
	P3	12/09/2020
	P4	13/11/2020
	P5	10/02/2021
	P6	12/03/2021
<b>Workshop (WSH<sub>x</sub>)</b>	WSH 1	26/11/2020
	WSH 2	10/12/2020
	WSH 3	14/01/2021
<b>Courses (C<sub>x</sub>)</b>	C1	12/12/2020

Emphasis is placed on the implementation and importance of holding working tables for the constant accompaniment of the technical counterpart and some of the main stakeholders in order to obtain their opinions and suggestions that support the feedback of each deliverable, enabling the fulfilment of customer expectations and objectives of the Terms of Reference.

**In the following**

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, the objectives and agenda of the ten working tables to be developed throughout the consultancy are summarized.

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**Table 5 Description of the working tables**

Working table	Objective	Schedule	Assistants	Place	Date
WT1	Present the technical assistance plan to stakeholders, validate the list of stakeholders and map the expected literature review	<ol style="list-style-type: none"> <li>1. Presentation of Consultancy Planning</li> <li>2. Presentation of working dynamics</li> <li>3. Presentation of the list of stakeholders</li> <li>4. present gender considerations</li> <li>5. Revision of the list of documents to be requested</li> </ol>	Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determined)	29/04/2020
WT2	Provide specific, detailed and ongoing information on stakeholder meetings to the CTCN	<ol style="list-style-type: none"> <li>1. Report of meetings with stakeholders</li> <li>2. Analysis of the gender assessment report</li> <li>3. Validation of the stakeholder assessment matrix</li> </ol>	Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determined)	3/06/2020
WT3	Presentation of progress and validation of methodology and preliminary results of analysis	<ol style="list-style-type: none"> <li>1. Presentation of progress</li> <li>2. Validate scenarios for geothermal energy development</li> <li>3. Validation of the analysis of thermal/electrical energy consumption in Uruguay</li> <li>4. Suggestions and/or comments on the report submitted</li> <li>5. Agreements</li> </ol>	Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determined)	16/07/2020
WT4	Presentation of progress and validation of methodology and preliminary results of analysis	<ol style="list-style-type: none"> <li>1. Presentation of progress</li> <li>2. Analysis of the Legal Framework Matrix</li> <li>3. Suggestions and/or comments on the results presented</li> <li>4. Agreements</li> </ol>	Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determined)	13/08/2020
WT5	Development of the analysis of existing barriers to the use of low enthalpy geothermal energy	<ol style="list-style-type: none"> <li>1. Presentation of the state of the art</li> <li>2. Identification and analysis of existing barriers</li> <li>3. Suggestions and/or comments from stakeholders</li> <li>4. Agreements</li> </ol>	Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determined)	17/09/2020
WT6	Development of risk matrix analysis and gaps for the use of low enthalpy geothermal energy	<ol style="list-style-type: none"> <li>1. Analysis of the Risk and Gap Assessment Matrix</li> <li>2. Recommendations for the action plan to reduce risks and overcome gaps</li> <li>3. Agreements</li> </ol>	Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determined)	29/10/2020
WT7	Presentation of the draft road map for the implementation of low enthalpy geothermal energy in the country	<ol style="list-style-type: none"> <li>1. Analysis of the identification of institutions, consumers and interested organisations</li> <li>2. Establishment of roadmap milestones, barriers and limitations</li> <li>3. Evaluation of action plans to overcome gaps and barriers</li> <li>4. Suggestions and/or comments of the presentation</li> <li>5. Agreements</li> </ol>	Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determined)	19/11/2020
WT8			Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determined)	9/12/2020

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WT9	Presentation of analytical elements for the development of the GCF	<ol style="list-style-type: none"><li>1. Presentation of the financial structure</li><li>2. Presentation of the financial support</li><li>3. Presentation of the GCF evaluation criteria</li></ol>	Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determinated)	21/12/2020
WT10	Concept Note workshop and presentation	<ol style="list-style-type: none"><li>1. Concept Note Validation Workshop</li></ol>	Ministerio del Ambiente Ministerio de Energía CTCN Consultant team	TBD (to be determinated)	30/12/2020

## 1.3 Stakeholders

Stakeholders are the key actors involved in low-enthalpy geothermal energy in Uruguay. Interested parties have been classified according to the sector to which they belong to, namely government institutions, independent experts, private sector, academia and associations. Similarly, priority has been given to the degree of relationship with this non-conventional renewable energy:

- Priority 1: high ratio. In-person meetings (if possible).
- Priority 2: medium ratio. Videoconference meetings.
- Priority 3: low ratio. Videoconference or call meetings.

Table 6 shows the defined list of stakeholders to be considered in this project.

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**Table 6 List of stakeholders**

Stakeholder	Entity	Priority	Brief description	Estatus
<b>Government institutions</b>				
STKH1	Administración Nacional de Combustibles, Alcohol y Portland (ANCAP)	1	State company responsible for fuel supply. In the area of Production and Exploration, essential information is being collected in the exploration of hydrocarbons from the north of the country to evaluate the potential of geothermal energy.	Autonomous Body of Government
STKH2	Administración Nacional de Usinas y Trasmisiones Eléctricas (UTE)	1	It is responsible for the generation, transmission, distribution and marketing of electricity, as well as providing advisory services and technical assistance in the areas of its specialty and annexed, working to make electricity affordable in the country.	Autonomous Body of Government
STKH3	Intendencia de Paysandú	1	Departamental Government	Departamental government
STKH4	Intendencia de Salto	1	Departamental Government	Departamental government
STKH5	Ministerio de Industria, Energía y Minería (MIEM) - Dirección Nacional de Energía (DNE)	1	Set objectives for the energy sector, planning, organizing and monitoring human, material and financial resources. Efficiently implement policies and strategies for the fulfilment of the Directorate's specific goals and tasks. Applicant for technical assistance.	Public
STKH6	Ministerio de Industria, Energía y Minería (MIEM) - Dirección Nacional de Minería y Geología (DINAMIGE)	1	Design and implementation of policies to promote, regulate, control and supervise the rational exploitation of the country's mineral resources.	Public
STKH7	Ministerio de Turismo (MINTUR)	2	Defines, designs, promotes, implements, monitors and evaluates national public policies on tourism	Public
STKH8	Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente (MVOTMA) -Dirección Nacional de Aguas (DINAGUA)	1	The task of the National Water Directorate is to improve the quality of life of the inhabitants and ensure the sustainable use of the country's water resources, through the formulation of national water and sanitation policies, involving the various actors involved and coordinating with other public policies.	Public
STKH9	Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente (MVOTMA) -Dirección Nacional de Medio Ambiente (DINAMA)	1	Has the task of protecting the environment by promoting sustainable development through the generation and application of instruments aimed at improving the quality of life of the population and the conservation and environmentally responsible use of ecosystems, coordinating the environmental management of public entities and coordinating with the different social actors.	Public
STKH10	Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente (MVOTMA) -División Cambio Climático (DICAEL)	1	Counterpart and main node for inter-institutional coordination through its role as coordinator of the National Climate Change Response System.	Public
STKH11	Centro Regional para la Gestión de Aguas Subterráneas en América Latina y el Caribe (CeReGAS)	1	Articulates national and regional capacities at the public and/or private levels for the sustainable management of aquifers and the protection of water resources under a comprehensive approach that takes into account environmental, economic and social aspects, in line with the international commitments undertaken by the country and the region in the area of sustainable development.	UNESCO Category II Centre funded by MVOTMA
STKH12	Instituto Nacional de Investigación Agropecuaria (INIA)	2	It generates and adapts knowledge and technologies to contribute to the sustainable development of the agricultural sector and the country, taking into account State policies, social inclusion and the demands of markets and consumers.	Non-state public
STKH13	Ministerio de Ganadería, Agricultura y Pesca (MGAP)	2	To contribute to the permanent development of the agricultural and agro-industrial sectors, promoting their insertion in external markets, both regional and extraregional, based on the	Public

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			management and sustainable use of natural resources. Of importance are the rural development tables that they hold with different producers.	
STKH14	Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente (MVOTMA)- Dirección Nacional de Ordenamiento Territorial (DINOT)	2	Its mission is to promote and develop the processes of planning and environmental planning of the territory, ensuring its implementation at all territorial levels.	Public
STKH15	Intendencia de Artigas	3	Departamental government	Departamental government
STKH16	Intendencia de Canelones	3	Departamental government	Departamental government
STKH17	Intendencia de Cerro Largo	3	Departamental government	Departamental government
STKH18	Intendencia de Colonia	3	Departamental government	Departamental government
STKH19	Intendencia de Durazno	3	Departamental government	Departamental government
STKH20	Intendencia de Flores	3	Departamental government	Departamental government
STKH21	Intendencia de Florida	3	Departamental government	Departamental government
STKH22	Intendencia de Lavalleja	3	Departamental government	Departamental government
STKH23	Intendencia de Maldonado	3	Departamental government	Departamental government
STKH24	Intendencia de Montevideo	3	Departamental government	Departamental government
STKH25	Intendencia de Río Negro	3	Departamental government	Departamental government
STKH26	Intendencia de Rivera	3	Departamental government	Departamental government
STKH27	Intendencia de Rocha	3	Departamental government	Departamental government
STKH28	Intendencia de San José	3	Departamental government	Departamental government
STKH29	Intendencia de Soriano	3	Departamental government	Departamental government
STKH30	Intendencia de Tacuarembó	3	Departamental government	Departamental government
STKH31	Intendencia de Treinta y Tres	3	Departamental government	Departamental government
STKH32	Mesa Interinstitucional de Mujeres en Ciencia, Tecnología e Innovación	3	Its aim is to contribute to raising awareness of the under-representation of women in education and work, which brings together learning and the possibilities of developing skills in science, technology, engineering and mathematics (STEM) and the generation of proposals, at different levels and directed towards different actors, to reverse this situation.	Multisectoral
STKH33	Secretaría Nacional de Ambiente, Agua y Cambio Climático	3	It is responsible for coordinating and coordinating with public and private institutions and organizations the implementation of public policies relating to the environment, water and climate change.	Unit under the Office of the President of the Republic
STKH34	Unidad Reguladora de Servicios de Energía y Agua (URSEA)	3	Regulates the energy, fuel and water sectors throughout the country.	Executive Unit of the Presidency of the Republic
STKH35	Agencia Nacional de Investigación e Innovación	3	It is a governmental entity that promotes research and the application of new knowledge to the productive and social reality of the country. ANII makes funds available to the public for research projects, national and international postgraduate scholarships and programmes to encourage innovative culture and entrepreneurship, both in the private and public sectors. It was the one that financed the tomato irrigation project with hot springs.	Public
<b>Independent experts</b>				
STKH36	Guillermo Popelka geologist in charge of the geothermal project in Educational Center "Los Pinos"	1	Example of the use of Geotermia Somera in Montevideo.	Private

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Private sector				
STKH37	Centro Tecnológico del Agua	1	It focuses on improving the management and sustainable use of the country's water resources. Formed by collaboration between companies and academia, the Center aims to generate synergies and develop projects that impact on water competitiveness and productivity.	Private
STKH38	Cámara de Industrias del Uruguay (CIU)	3	The CIU is the representative business entity of the industrial sector with the aim of promoting the interests of the national industry, defending its rights and stimulating the industrial development of the country. The most important industries in the country and the most modest of the industrial workshops are represented.	Private
STKH39	Energy Service Companies (ESCO)	2	An ESCO is a company that offers services for the identification and implementation of opportunities for energy efficiency and the substitution of renewable energy sources for the end use of traditional energy sources. The ESCO acts as a promoter of energy efficiency projects by advising users at all stages of project development: from the design, identification of financing mechanisms, implementation and putting into operation of the measures, monitoring and verification of results.	Ministerio de Industria, Energía y Minería (MIEM), through the Dirección Nacional de Energía (DNE), keeps the register of Energy Service Companies (ESCO)
STKH40	La Casa Uruguaya	3	The Uruguayan house was a project awarded by the United Nations Environment Programme, in which a group of teachers and students from the University ORT of Uruguay made a sustainable house, although they did not use geothermal energy, we believe that their contributions can be interesting.	Private
Academia				
STKH41	Universidad de la República (UdelaR)- Centro Universitario Regional Norte - Departamento del Agua	1	They are responsible for giving the Bachelor's degree in Water Resources and Irrigation. The main activities of the department focus on the areas of Hydrology, Hydrogeology, Irrigation Systems and Water Quality. Carried out a project of the Sectoral Energy Fund called: Utilization of geothermal energy from thermal effluent for heating of tomato greenhouses.	Centre for Public Studies
STKH42	Universidad de la República (UdelaR) - Facultad de Ciencias (Instituto de Ciencias Geológicas)	1	Academic area concentrating basic capacities for the development of geothermal energy related to the geological and hydrogeological study of the subsoil.	Centre for Public Studies
STKH43	Universidad de la República (UdelaR)- Facultad de Ingeniería (Instituto de Ingeniería Mecánica y Producción Industrial)	1	They are responsible for the dictation of the matter "Geoterminia" and carry out investigations in this regard.	Centre for Public Studies
STKH44	Universidad de la República (UdelaR)- Facultad de Ingeniería (Instituto de Mecánica de los Fluidos e Ingeniería Ambiental)	1	Carries out research and university extension work on topics related to Fluid Mechanics and Environmental Engineering, in many cases within the framework of agreements with national or private institutions, or through research and development projects with external financing.	Centre for Public Studies
STKH45	Universidad de la República (UdelaR)- Facultad de Ingeniería (Instituto de Física)	2	Presents a line of research on energy efficiency.	Centre for Public Studies
STKH46	Universidad Tecnológica del Uruguay - Ingeniería en Energías Renovables	2	Training professionals to promote, design, implement and manage the use of clean energy from primary energy sources, such as solar, wind, hydro, etc., from the perspective of sustainable human and productive development throughout the territory.	Centre for Public Studies
STKH47	Universidad de la República (UdelaR) - Facultad de Arquitectura, diseño y Urbanismo (Instituto de la Construcción)	3	Concentrates capabilities that can be useful when building homes/industries/hotels/etc., that can use geothermal systems.	Centre for Public Studies

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<b>STKH48</b>	Universidad del Trabajo del Uruguay	3	Provide Specialization in Renewable Energy and Energy Efficiency.	Centre for Public Studies
<b>Associations</b>				
<b>STKH49</b>	Asociación de Hoteles y Restaurantes del Uruguay	2	Institution that represents the companies that integrate the hotel and gastronomic sectors at national level. It is committed to promoting its growth and sustainable development, in line with the care and maintenance of the environment and participating in innovation processes, among other things.	Civil association
<b>STKH50</b>	Asociación Uruguaya de Energías Renovables	1		Civil association
<b>STKH51</b>	Comisión Nacional de Fomento Rural	2	A core of approximately one hundred first-degree entities (Sociedad de Fomento Rural, Cooperativas Agrarias and other basic organizational forms) that in turn group and radiate their action on thousands of family producers throughout Uruguay, devoted to the most diverse agricultural sectors.	Civil association

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## 2 Budget to implement CTCN response plan

Activities and products	Human resources	Trips	Meetings and events	Equipment and material	Estimated cost
Output 1: Work plan development and related communication documents					<b>4,673.31</b>
Activity 1.1: Work plan	934.66				934.66
Activity 1.2: Monitoring and Evaluation Plan	934.66				934.66
Activity 1.3: CTCN impact Description	803.99				803.99
Activity 1.4: Closure and Data Collection Report					
Output 2: Diagnosis of key actors for the use of low enthalpy geothermal energy in the country					<b>14,708.27</b>
Activity 2.1: Diagnosis of key actors	10,385.13				10,385.13
Activity 2.2: Initial technical assistance presentation meeting with key stakeholders	1,298.14	500	2000	525	4,323.14
Output 3: Analysis of the current geothermal energy scenario in the country					<b>23,016.38</b>
Activity 3.1: Analysis of the current scenario of low-enthalpy geothermal energy in the country	18,693.24				18,693.24
Activity 3.2: Organize a meeting for the presentation of the results to key stakeholders	1,298.14	500	2000	525	4,323.14
Output 4: Identification of existing barriers to the use of low-enthalpy geothermal energy for thermal conditioning in the country					<b>15,746.79</b>
Activity 4.1: Identify the barriers to the use of low-enthalpy geothermal energy in the country and propose measures/recommendations to reduce them	11,423.65				11,423.65
Activity 4.2: Organize a meeting with key stakeholders for the presentation of the barriers to the use of low-enthalpy geothermal energy and suggested measures/ recommendations to overcome them	1,298.14	500	2000	525	4,323.14
Output 5: Preparation of the roadmap draft for geothermal energy in Uruguay					<b>34,532.09</b>
Activity 5.1: Preparation of the roadmap draft for the implementation of low-enthalpy geothermal energy for thermal conditioning in the residential, industrial and commercial sectors in Uruguay	23,885.81				23,885.81
Activity 5.2: Organization of two national consultation workshops with key stakeholders	2,596.28	1,000.00	6,000.00	1,050.00	10,646.28
Output 6: Preparation of a concept note for international climate financing					<b>12,462.16</b>
Activity 6.1: Prepare a concept note for international climate financing on the use of low-enthalpy geothermal energy in thermal conditioning in the residential sector	10,462.16	1000	1000		12,462.16
Estimated cost range for the entire response plan			<b>105,139.00</b>		



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Deliverable 1.2

Detailed monitoring evaluation plan

## 3 Monitoring and Evaluation Plan

### 3.1 Basic Information

The second deliverable is based on the CTCN Monitoring and Evaluation Plan and the Technical Assistance Response Plan, for the subsequent preparation of the closing report at the end of the assistance, in addition to the selection of relevant quantitative and qualitative indicators. The following Table 7 shows the main information of the project.

**Table 7 Basic Information**

Title of response plan	Preparation of a national roadmap for the use of low-enthalpy geothermal energy for thermal conditioning in the residential, industrial and commercial sectors.
Technical assistance reference number	2018000018
Country/ countries	Uruguay
NDE focal point and organisation	División de Cambio Climático - Ministerio de Vivienda, Ordenación del Territorio y Medio Ambiente (MVOTMA)
Sector(s) addressed	Residential, industrial and commercial
Implementation period and total duration	12 months
Total budget for implementation	105,139.00
Designer of the response plan	CTCN
Implementer of response plan	DEUMAN INGENIERÍA LIMITADA

For each of the products and activities to be presented, according to the Terms of Reference, a series of indicators have been carefully selected to measure our results. These are shown in Table 8.

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**Table 8 Indicators of the Monitoring and Evaluation Plan**

(A) Outputs and Activities as described in the Response Plan	(B) Indicator	(C) Expected results	(D) Method and frequency for data collection	(F) Comments
<b>Output 1: Development of implementation planning and periodical reporting documents</b>	Number of deliverables produced in this output:  b) Number of other information materials strengthened, revised or created	<u>Total: 5 deliverables</u>  1 work plan 1 monitoring and evaluation plan 1 Impact description 1 closure report (end of the technical assistance) 1 product presentation (ppt)	<b>Methodology:</b> Data will be collected at the beginning of the technical assistance, once the deliverables 1.1, 1.2 and 1.3 are finalised for the product presentation, and at the end of the technical assistance to complete deliverable 1.4.	CTCN templates documents will be used.
	Number of stakeholders proposed validated	51 stakeholders proposed validated	<b>Methodology:</b> Verify if the number of validated stakeholders approved by CTCN and national entities matches with the proposed list.  <b>Frequency:</b> At the end of the product 1.	As part of Activity 2.1 specifically for the elaboration of the Gender Equity Plan, it is possible to identify specific stakeholders working on the gender variable, which will be included during the development of the service
	Number of the working tables proposed validated	10 working tables proposed validated	<b>Methodology:</b> Verify the difference between the work tables that are proposed to be added or removed from the initially proposed list. Compared to document approved by CTCN and national entities.  <b>Frequency:</b> At the end of the product 1.	

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<p>Activity 1: Preparing the consultancy work plan, periodical progress reports and final reports</p>	<p>Number of deliverables produced in this activity:</p> <p>b) Number of other information materials strengthened, revised or created</p>	<p><u>Total: 5 deliverables</u></p> <p>1 work plan 1 monitoring and evaluation plan 1 Impact description 1 closure report (end of the technical assistance) 1 product presentation (ppt)</p>	<p>Data will be collected at the beginning of the technical assistance, once the deliverables 1.1, 1.2 and 1.3 are finalised for the product presentation, and at the end of the technical assistance to complete deliverable 1.4.</p>	<p>CTCN templates documents will be used.</p>
<p><b>Output 2: Diagnosis of key stakeholders for the use of low-enthalpy geothermal energy</b></p>	<p>Number of deliverables produced in this output:</p> <p>a) Number of tools and technical documents strengthened, revised or developed</p> <p>b) Number of other information materials strengthened, revised or created</p>	<p><u>Total: 3 deliverables</u></p> <p>1 evaluation report 1 meeting minutes (kick-off with stakeholders)</p> <p>1 product presentation (ppt)</p>	<p><b>Method:</b> Using product 2 template, a meeting minute template and by Verify the compliance of the product presentation 2 to the client and to the stakeholders verified so far.</p> <p><b>Frequency:</b> At the end of product 2.</p>	<p>The product presentation will be taken into account 3 to 5 working days after the CTCN Review to coordinate the presentation of the product to the customer.</p>
	<p>Number of working tables executed with Authorities of the ministry of environment and energy</p>	<p>2 working tables executed</p>	<p><b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.</p> <p><b>Frequency:</b> At the end of product delivery.</p>	<p>There is a minutes format which must be completed at the end of each meeting with its respective attendance sheet.</p>
	<p>Number of product presentations to Local Authorities</p> <p>a) Number of information materials created: Power Point</p>	<p>1 product presentation</p> <p>a) 1 information material created: Power point</p>	<p><b>Method:</b> Verify the compliance of the product presentation 2 to the client and to the stakeholders verified so far.</p> <p><b>Frequency:</b> At the end of product 2</p>	<p>It will be taken into account 3 to 5 working days after the CTCN Review to coordinate the presentation of the product to the customer.</p>

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	Percentage of men and women participants: a) working tables b) product presentation	50% of men and 50% of women participants at all meetings	<b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings. <b>Frequency:</b> At the end of product 2.	At the end of each meeting an attendance format will be filled with each minute, with signatures (face-to-face) or with an image of the participants (virtual).
Activity 2.1: Diagnosis of key actors	Total, number of meetings with stakeholders  a) Number of meetings with stakeholders Priority 1 b) Number of meetings with stakeholders Priority 2 c) Number of meetings with stakeholders Priority 3	<u>51 meetings with stakeholders</u>  a) 17 stakeholders of priority 1 b) 9 stakeholders of priority 2 c) 26 stakeholders of priority 3	<b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings. <b>Frequency:</b> At the end of activity.	At the end of each meeting an attendance format will be filled with each minute, with signatures (face-to-face) or with an image of the participants (virtual).
	Number of deliverables produced in this activity:  a) Number of tools and technical documents strengthened, revised or developed	<u>Total: 1 deliverable</u>  1 evaluation report	<b>Method:</b> An evaluation Matrix will be used inside the product 2 template <b>Frequency:</b> At the end of the activity.	The evaluation matrix will be follow a specific methodology to evaluate the level of decision and participation of each stakeholder for the development of low enthalpy geothermal energy.
Activity 2.2: Kick-off meeting to present the technical assistance to the key stakeholders.	Number of engagement events with relevant stakeholders	1 kick-off meeting to present the TA to key stakeholders	<b>Method:</b> An inquiry guidelines and PPT will be used. <b>Frequency:</b> At the beginning and during the meeting.	An inquiry guidelines is a document elaborated by the consulting team in order to provide specific objectives to be achieved with focal questions that help to collect information easily (It will be included in the annex)
	Number of participants in the event above	50% of men and 50% of women participants	<b>Method:</b> Recording of minutes and attendance lists <b>Frequency:</b> At the end of activity.	At the end of the meeting an attendance format will be filled with the minutes, with signatures (face-to-face) or with an image of the participants (virtual).

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	<p>Number of deliverables produced in this activity:</p> <p>a) Number of tools and technical documents strengthened, revised or developed</p>	<p><u>Total: 1 deliverable</u></p> <p>1 meeting minutes (kick-off with stakeholders)</p>	<p><b>Method:</b> Use of meeting minute report inside the product 2 template.</p> <p><b>Frequency:</b> At the end of the activity.</p>	<p>Product 2 have a template supervised by the consulting team that include deliverables of the activities 2.1 and 2.2</p>
<p><b>Output 3: Analysis of the current scenario of geothermal energy in Uruguay</b></p>	<p>Number of deliverables produced in this output:</p> <p>a) Number of tools and technical documents strengthened, revised or developed</p> <p>b) Number of other information materials strengthened, revised or created</p>	<p><u>Total: 3 deliverables</u></p> <p>1 Report on the current scenario 1 meeting minutes (Preliminary presentation to stakeholders)</p> <p>1 product presentation (ppt)</p>	<p><b>Method:</b> Using product 3 template, a meeting minute template and by Verifying the compliance of the product presentation 3 to the client and to the stakeholders verified so far.</p> <p><b>Frequency:</b> At the end of product 3.</p>	<p>The product Presentation will be taken into account 3 to 5 working days after the CTCN Review to coordinate the presentation of the product to the customer.</p>
	<p>Number of working table executed with Authorities of the ministry of environment and energy</p>	<p>2 working tables executed</p>	<p><b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.</p> <p><b>Frequency:</b> At the end of product 3.</p>	<p>There is a minutes format which must be completed at the end of each meeting with its respective attendance sheet.</p>
	<p>Number of product presentations to Local Authorities</p> <p>b) Number of information materials created: Power Point</p>	<p>1 product presentation</p> <p>b) 1 information material created: Power point</p>	<p><b>Method:</b> Verify the compliance of the product presentation 1 to the client and to the stakeholders verified so far.</p> <p><b>Frequency:</b> At the end of product 3.</p>	<p>It will be taken into account 3 to 5 working days after the CTCN Review to coordinate the presentation of the product to the customer.</p>

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	Percentage of men and women participants:  a) Working tables b) Preliminary presentation to Stakeholders c) product presentation to Local Authorities	50% of men and 50% of women participants at all meetings	<b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.  <b>Frequency:</b> At the end of product 3.	At the end of each meeting an attendance format will be filled with each minute, with signatures (face-to-face) or with an image of the participants (virtual).
Activity 3.1: Analysis of the current scenario of low-enthalpy geothermal energy in the country	Number of deliverables produced in this activity:  a) Number of tools and technical documents strengthened, revised or developed	<u>Total: 1 deliverable</u>  1 Report on the current scenario of low-enthalpy geothermal energy in the country.	<b>Method:</b> Product 3 Template will be used.  <b>Frequency:</b> At the end of the activity.	Product 3 have a template supervised by the consulting team that include deliverables of the activities 3.1 and 3.2
Activity 3.2: Organize a meeting for the presentation of the results to key stakeholders	Number of engagement events with relevant stakeholders (Preliminary Presentations of results to stakeholders)  b) Number of information materials created: Power Point	1 Preliminary Presentation  b) 1 information material created: Power point	<b>Method:</b> Develop a Power Point Presentation to show the results to stakeholders.  <b>Frequency:</b> During the activity.	
	Number of participants in the event above	50% of men and 50% of women participants	<b>Method:</b> Recording of minutes and attendance lists.  <b>Frequency:</b> At the end of the activity.	At the end of the meeting an attendance format will be filled with the minutes, with signatures (face-to-face) or with an image of the participants (virtual).
	Number of deliverables produced in this activity:  a) Number of tools and technical documents strengthened, revised or developed	<u>Total: 1 deliverable</u>  a) 1 Minute of the meeting, including the participant list.	<b>Method:</b> Use of meeting minute report template inside the product 3 template.  <b>Frequency:</b> At the end of the activity.	Product 3 have a template supervised by the consulting team that include deliverables of the activities 3.1 and 3.2

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<b>Output 4: Identification of existing barriers to the use of low-enthalpy geothermal energy for thermal conditioning in the country</b>	Number of deliverables produced in this output:  a) Number of tools and technical documents strengthened, revised or developed  b) Number of other information materials strengthened, revised or created	<u>Total: 3 deliverables</u>  1 evaluation report 1 meeting minutes (Preliminary presentation to stakeholders)  1 product presentation (ppt)	<b>Method:</b> Using product 4 template, a meeting minute template and by Verifying the compliance of the product presentation 3 to the client and to the stakeholders verified so far.  <b>Frequency:</b> At the end of product 4.	The product Presentation will be taken into account 3 to 5 working days after the CTCN Review to coordinate the presentation of the product to the customer.
	Number of working table executed with Authorities of the ministry of environment and energy	2 working tables executed	<b>Method:</b> Recording of minutes and attendance lists.  <b>Frequency:</b> At the end of product 4.	There is a minutes format which must be completed at the end of each meeting with its respective attendance sheet.
	Number of product presentations to Local Authorities  b) Number of information materials created: Power Point	<u>1 product presentation</u>  b) 1 information material created: Power point	<b>Method:</b> Verify the compliance of the product presentation 1 to the client and to the stakeholders verified so far.  <b>Frequency:</b> At the end of product 4.	It will be taken into account 3 to 5 working days after the CTCN Review to coordinate the presentation of the product to the customer.
	Percentage of men and women participants:  a) Work tables b) Preliminary presentation to Stakeholders c) Product presentation to Local Authorities	50% of men and 50% of women participants at all meetings	<b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.  <b>Frequency:</b> At the end of product 4.	At the end of each meeting an attendance format will be filled with each minute, with signatures (face-to-face) or with an image of the participants (virtual).

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Activity 4.1: Identify the barriers to the use of low-enthalpy geothermal energy in the country and propose measures/recommendations to reduce them.	Number of deliverables produced in this activity:  a) Number of tools and technical documents strengthened, revised or developed	<u>Total: 1 deliverable</u>  a) 1 Report of existing barriers to use of low-enthalpy geothermal energy in the country with their respective measures/recommendations to reduce them.	<b>Method:</b> Product 4 Template will be used.  <b>Frequency:</b> At the end of the activity.	Product 4 have a template supervised by the consulting team that include deliverables of the activities 4.1 and 4.2.
	Number of measures/recommendations for each of the identified gaps  a) Number of tools and technical documents strengthened, revised or developed	<u>Expected: 2 suggestion/recommendation by each gap/barrier</u>  a) Minimum 1 suggestion / recommendation related to climate change mitigation and 1 suggestion / recommendation related to climate change adaptation.	<b>Method:</b> Product 3 Template will be used.  <b>Frequency:</b> At the end of activity.	Product 4 have a template supervised by the consulting team that include deliverables of the activities 4.1 and 4.2.
Activity 4.2: Organize a meeting with key stakeholders for the presentation of the barriers to the use of low-enthalpy geothermal energy and suggested measures/recommendations to overcome them	Number of engagement events with relevant stakeholders (Preliminary Presentations of results to stakeholders)  b) Number of information materials created: Power Point	<u>1 Preliminary Presentation</u>  b) 1 information material created: Power point	<b>Method:</b> Develop a Power Point Presentation to show the results to stakeholders.  <b>Frequency:</b> During the activity.	
	Number of participants in the event above	50% of men and 50% of women participants	<b>Method:</b> Recording of minutes and attendance lists.  <b>Frequency:</b> At the end of the activity.	At the end of the meeting an attendance format will be filled with the minutes, with signatures (face-to-face) or with an image of the participants (virtual).
	Number of deliverables produced in this activity: a) Number of tools and technical documents strengthened, revised or developed	<u>Total: 1 deliverable</u>  1 Minute of the meeting, including the participant list.	<b>Method:</b> Use of meeting minute report template inside the product 4 template.  <b>Frequency:</b> At the end of the activity.	Product 4 have a template supervised by the consulting team that include deliverables of the activities 4.1 and 4.2.

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<b>Output 5: Preparation of the roadmap draft for geothermal energy in Uruguay</b>	Number of deliverables produced in this output:  a) Number of tools and technical documents strengthened, revised or developed  b) Number of other information materials strengthened, revised or created	<u>Total: 4 deliverables</u>  1 draft roadmap 1 report of the 2 Workshops 1 Final Roadmap  1 product presentation (ppt)	<b>Method:</b> Using product 5 template, a meeting minute template and by Verifying the compliance of the product presentation 3 to the client and to the stakeholders verified so far.  <b>Frequency:</b> At the end of product 5	The product Presentation will be taken into account 3 to 5 working days after the CTCN Review to coordinate the presentation of the product to the customer.
	Number of working table executed with Authorities of the ministry of environment and energy	2 working tables executed	<b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.  <b>Frequency:</b> At the end of product 5.	There is a minutes format which must be completed at the end of each meeting with its respective attendance sheet.
	Number of product presentations to Local Authorities  b) Number of information materials created: Power Point	<u>1 product presentation</u>  b) 1 information material created: Power point	<b>Method:</b> Verify the compliance of the product presentation 4 to the client and to the stakeholders verified so far.  <b>Frequency:</b> At the end of product 5.	It will be taken into account 3 to 5 working days after the CTCN Review to coordinate the presentation of the product to the customer.
	Percentage of men and women participants:  a) working table b) workshops c) courses d) product presentation	50% of men and 50% of women participants	<b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.  <b>Frequency:</b> At the end of product 5.	At the end of each meeting an attendance format will be filled with each minute, with signatures (face-to-face) or with an image of the participants (virtual).

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	Number of pilot projects proposed	2 pilot projects proposed	<p><b>Method:</b> Pilot projects for the development of low-enthalpy geothermal energy will be developed and proposed after knowing the geothermal potential in Uruguay, as part of the Roadmap.</p> <p><b>Frequency:</b> Next to the roadmap on product 5.</p>	
	<p>Anticipated number of direct and indirect beneficiaries as a result of the TA</p> <p>a) Direct beneficiaries</p> <p>b) Indirect beneficiaries</p>	<p>a) The direct beneficiaries of technical assistance through the programmes/projects proposed in the road map will be at least the populations of El Salto and Paysandú. In addition, all decision-makers are considered to use the following proposed Roadmap.</p> <p>b) The indirect beneficiaries will be the rest of the Uruguayan population due to co-benefits associated</p>	<p><b>Method:</b> Quantification of the population and direct consumers provided by stakeholders and national entities, for the identification of total beneficiaries (potential consumers, survey review, state data, studies, etc.).</p> <p><b>Frequency:</b> At the end of product 5.</p>	
	<p>Anticipated increased to climate change impacts as a result of technical assistance</p> <p>a) Anticipated increased economic resilience</p> <p>b) Anticipated increased health and wellbeing</p>	<p>a) (1) A low-cost air conditioning system for the economically vulnerable sector. (2) Generation of the enabling conditions for a labor market around the implementation and maintenance of heating systems that use low enthalpy geothermal energy.</p>	<p><b>Method:</b> Identification of the economic and financial variable of the low enthalpy energy implementation from the pilot projects proposed as part of the TA. Identification of the negative effects on the health and well-being of the population by using traditional heating systems and comparison of which will be avoided by making the change by the use of low enthalpy geothermal energy.</p>	

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		b) 100 % increase in the health and well-being of the population by avoiding the use of firewood (PM emission) as a heating system.	<b>Frequency:</b> At the end of TA.	
	Anticipated metric tons of CO2 equivalent (CO2e) emissions reduced or avoided as a result of CTCN TA	Reduction of at least the 25% in the use of electric energy, which means a reduction of 0.4 tons of Co2e for every Mwh avoided; and a 100% possible reduction in the emissions associated with the use of firewood for heating systems	<b>Method:</b> The difference between the calculated energy demands between the geothermal system implemented and another climate control system will determine the CO2 equivalent avoided. The source of electricity, whether renewable or not, also influences the calculation.  <b>Frequency:</b> At the end of TA.	
Activity 5.1: Preparation of the roadmap draft for the implementation of low-enthalpy geothermal energy for thermal conditioning in the residential, industrial and commercial sectors in Uruguay	Number of deliverables produced in this activity:  a) Number of tools and technical documents strengthened, revised or developed	<u>Total: 2 deliverable</u>  1 Draft roadmap for the implementation of low-enthalpy geothermal energy for thermal conditioning in the residential, industrial and commercial sectors in the country  1 Final roadmap document, including what was agreed upon during the workshops	<b>Method:</b> Product 5 Template will be used.  <b>Frequency:</b> At the end of the activity.	Product 5 have a template supervised by the consulting team that include deliverables of the activities 5.1 and 5.2

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	Number of stakeholders involved in the construction of the roadmap	10 stakeholders involved in the construction of the roadmap	<p><b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.</p> <p><b>Frequency:</b> At the end of the activity.</p>	At the end of each meeting an attendance format will be filled with each minute, with signatures (face-to-face) or with an image of the participants (virtual).
	Number of training sessions and capacity strengthening activities  a) Number of courses	1 training sessions and capacity strengthening activities  a) 1 course	<p><b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.</p> <p><b>Frequency:</b> At the end of the activity.</p>	There is a minutes format which must be completed at the end of each meeting with its respective attendance sheet.
	Number of communication and outreach activities carried out by proponents and implementing partners to showcase CTCN support	a) 1 newsletter presenting the roadmap b) 1 infographic presenting the roadmap	<p><b>Method:</b> The document will summarize all Technical Assistance developed and include an explanation of the road map developed.</p> <p><b>Frequency:</b> At the end of technical assistance.</p>	
Activity 5.2: Organization of two national consultation workshops with key stakeholders.	Number of Workshops with relevant stakeholders  b) Number of information materials created: Power Point	<u>2 Workshops executed</u>  b) 4 information material created: 2 Power point and 2 inquiry guidelines	<p><b>Method:</b> An inquiry guidelines and PPT will be use.</p> <p><b>Frequency:</b> At the beginning and during the meeting.</p>	An inquiry guidelines is a document elaborated by the consulting team in order to provide specific objectives to be achieved with focal questions that help to collect information easily (It will be included in the annex)

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	Number of participants in the event above	50% of men and 50% of women participants	<p><b>Method:</b> Recording of minutes and attendance lists.</p> <p><b>Frequency:</b> At the end of the activity.</p>	At the end of the meeting an attendance format will be filled with the minutes, with signatures (face-to-face) or with an image of the participants (virtual).
	Number of deliverables produced in this activity:  a) Number of tools and technical documents strengthened, revised or developed	<p><u>Total: 1 deliverable</u></p> <p>a) 1 report of the 2 workshops, including the participant list and gallery of photos</p>	<p><b>Method:</b> Use of meeting minute report template inside the product 5 template with a gallery of photos.</p> <p><b>Frequency:</b> At the end of the activity.</p>	Product 5 have a template supervised by the consulting team that include deliverables of the activities 5.1 and 5.2
<b>Output 6: Preparation of a concept note for international climate financing</b>	Number of deliverables produced in this output:  a) Number of tools and technical documents strengthened, revised or developed  b) Number of other information materials strengthened, revised or created	<p><u>Total: 4 deliverables</u></p> <p>2 concept notes for international climate financing on the use of geothermal energy in thermal conditioning in the residential sector. 1 report of the Workshop</p> <p>1 product presentation (ppt)</p>	<p><b>Method:</b> Using product 6 template, a meeting minute template and by Verifying the compliance of the product presentation 6 to the client and to the stakeholders verified so far.</p> <p><b>Frequency:</b> At the end of product 6.</p>	The concept notes will be follow the Green Climate fund's guideline
	Number of working tables executed with Authorities of the ministry of environment and energy	2 working tables executed	<p><b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.</p> <p><b>Frequency:</b> At the end of product 6.</p>	There is a minutes format which must be completed at the end of each meeting with its respective attendance sheet.

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	<p>Number of product presentations to Local Authorities</p> <p>b) Number of information materials created: Power Point</p>	<p><u>1 product presentation</u></p> <p>b) 1 information material created: Power point</p>	<p><b>Method:</b> Verify the compliance of the product presentation 1 to the client and to the stakeholders verified so far.</p> <p><b>Frequency:</b> At the end of product 6.</p>	<p>It will be taken into account 3 to 5 working days after the CTCN Review to coordinate the presentation of the product to the customer.</p>
	<p>Percentage of men and women participants:</p> <p>a) working table b) workshop c) product presentation</p>	<p>50% of men and 50% of women participants</p>	<p><b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.</p> <p><b>Frequency:</b> At the end of product 6.</p>	<p>At the end of each meeting an attendance format will be filled with each minute, with signatures (face-to-face) or with an image of the participants (virtual).</p>
Activity 6.1: Prepare a concept note for international climate financing on the use of low-enthalpy geothermal energy in thermal conditioning in the residential sector	<p>Number of Workshops with relevant stakeholders</p> <p>b) Number of information materials created: Power Point</p>	<p><u>1 Workshops executed</u></p> <p>b) 2 information material created: 1 Power point and 1 inquiry guidelines</p>	<p><b>Method:</b> An inquiry guidelines and PPT will be use.</p> <p><b>Frequency:</b> At the beginning and during the meeting.</p>	<p>An inquiry guidelines is a document elaborated by the consulting team in order to provide specific objectives to be achieved with focal questions that help to collect information easily (It will be included in the annex)</p>
	<p>Number of participants in the event above</p>	<p>50% of men and 50% of women participants</p>	<p><b>Method:</b> Recording of minutes and attendance lists.</p> <p><b>Frequency:</b> At the end of the activity.</p>	<p>At the end of the meeting an attendance format will be filled with the minutes, with signatures (face-to-face) or with an image of the participants (virtual).</p>
	<p>Number of meetings with the NDE to review the development of the concept note</p>	<p>1 meetings with the national authority designated to review the development of the concept note</p>	<p><b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.</p> <p><b>Frequency:</b> At the end of product activity.</p>	<p>There is a minutes format which must be completed at the end of each meeting with its respective attendance sheet.</p>

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	<p>Number of stakeholders involved in the elaboration of the Concept Note.</p>	<p>6 stakeholders involved in the elaboration of the Concept Note</p>	<p><b>Method:</b> Recording of minutes and attendance lists at all technical assistance meetings.</p> <p><b>Frequency:</b> At the end of product activity.</p>	<p>There is a minutes format which must be completed at the end of each meeting with its respective attendance sheet.</p>
	<p>Number of deliverables produced in this activity:</p> <p>a) Number of tools and technical documents strengthened, revised or developed</p>	<p><u>Total: 3 deliverable</u></p> <p>2 concept notes for international climate financing on the use of geothermal energy in thermal conditioning in the residential sector. 1 report of the workshops, including the participant list and gallery of photos</p>	<p><b>Method:</b> Use of meeting minute report template inside the product 6 template with a gallery of photos.</p> <p><b>Frequency:</b> At the end of the activity.</p>	<p>Product 6 have a template supervised by the consulting team that include deliverables of the activities 6.1 and 6.2</p>



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commercial sectors**

Deliverable 1.3

CTCN Impact Description

## 4 CTCN Impact Description

In this section, we describe the main impact of the study, presented in Table 9:

**Table 9 Impact Description**

Impact Statement	
Challenge	Uruguay has not focused until now on the development of projects or programmes in the public and/or private sector in relation to geothermal energy. This is because there are no real and/or conclusive assessments of geothermal potential in Uruguay. The limited knowledge and diffusion of technology, its applications and benefits, make it difficult to develop a regulatory framework to promote this type of energy, as prioritized in the report on the assessment of technological needs in the energy sector for climate change mitigation in Uruguay.
CTCN assistance	<ul style="list-style-type: none"> <li>• Analysis of the low enthalpy geothermal potential and its technical-economic viability for thermal conditioning (heat/cold).</li> <li>• Identification of barriers and measures to reduce them for the use of this technology.</li> <li>• Formulation of a roadmap to implement low-enthalpy geothermal energy in the residential, industrial and commercial sectors</li> <li>• Identify potential projects and prepare a concept note for the residential sector.</li> </ul>
Anticipated impact	<ul style="list-style-type: none"> <li>• 25% reduction in electric power use, meaning a decrease of 0.4 tons of CO<sub>2</sub> per Mwh avoided</li> <li>• A low-cost air conditioning system for the economically vulnerable sector</li> <li>• Creating enabling conditions for a labour market</li> </ul>
Anticipated co-benefits from the TA	<ul style="list-style-type: none"> <li>• Contribution to energy sovereignty by reducing dependence on oil.</li> <li>• Lower costs in a scenario of rising prices of fossil fuels.</li> <li>• Compensation for fluctuations in electricity generation in complementarity with other renewable energies.</li> <li>• Reduction of pollutant emissions associated with combustion in thermal power plants.</li> <li>• Potential generation of skilled jobs in one of the country's most socio-economically depressed areas (North-West)</li> <li>• Settlement of the rural population and increased demand for services around the creation of a new energy industry</li> <li>• Synergies with other economic activities since in certain technologies the residual geothermal potential can be used for the tourism industry (hot springs) or other (heating of horticultural greenhouses, heating of stables for keeping confined animals, etc.)</li> <li>• Contribution to generating in the population a culture of sustainable development</li> </ul>
Gender aspects of the TA	<p>The design of the TA defines that in Activity 5.1 the Road Map should incorporate the gender perspective transversely alongside Activity 6.1, which includes a gender analysis for the development of the concept note according to the standards of the Green Climate Fund. In addition, Activity 2.1 will add the gender equity plan, which seeks to ensure the active participation and outstanding of women. This will cover all levels, from project development to service development. Highlighting, throughout the process, the dignity and respect of women.</p> <p><i>Benefits:</i></p>

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	<ul style="list-style-type: none"> <li>• Equal participation of men and women in decision-making related to the development of national road maps for geothermal energy development.</li> <li>• Equal participation of men and women in current capacity assessment processes, in terms of development and underlying research, and in demonstration and development projects.</li> <li>• Attention to gender issues: identifying gender balance in the sector and proposing measures to reduce gaps.</li> <li>• Attention to gender issues for the development of the concept note under the standards of the green climate fund.</li> </ul>
Anticipated contribution to NDC	<p>This TA will contribute to Uruguay's Nationally Determined Contribution in the following goals:</p> <ul style="list-style-type: none"> <li>• Develop with the lowest possible intensity of GHG emissions, decarbonizing its economy over time.</li> <li>• Reduce the intensity of CO<sub>2</sub> emissions per unit of GDP by 24% (unconditionally) in 2025 in relation to 1990 values.</li> <li>• Reduce 29% of conditional intensity to specific additional means of implementation.</li> </ul>
The narrative story	<p>In Uruguay, increased energy demand encouraged the country to work in a diversified energy matrix with a high component in autoctonous renewable energy. As a result, in 2018 62% of primary energy came from renewable sources, which in turn accounted for 97% of the national electricity generation.</p> <p>With the aim of contributing to a more robust and decarbonized energy system, Uruguay is willing to increase the percentage of Non-Conventional Renewable Energy (NCRE). Therefore, the country requested a technical assistance on the feasibility of geothermal energy for thermal conditioning to the CTCN.</p> <p>Among the barriers identified for its use, the lack of a regulatory framework and the lack of knowledge about the technology, its applications and benefits prevents the use of this technology in the energy sector for climate change mitigation.</p> <p>Thus, this technical assistance will carry out a general analysis of the potential of geothermal energy for thermal use in the country and to evaluate the technical and economic feasibility of the development of low-enthalpy geothermal energy (open and closed system) for the purpose of thermal conditioning (heat/cold).</p>
Contribution to SDGs	<ul style="list-style-type: none"> <li>• <b>SDG 7.1:</b> Contributes to achieving this goal, especially in isolated solutions</li> <li>• <b>SDG 7.2:</b> The technical assistance will contribute to the increase of geothermal energy in the primary supply matrix.</li> <li>• <b>SDG 8:</b> The project is expected to open up opportunities for technology-related enterprise development and new jobs</li> <li>• <b>SDG 13.2:</b> Through technical assistance, a draft geothermal energy road map and a concept note for a project in the residential sector will be developed and eventually reflected in policies, strategies, national plans and climate commitments</li> </ul>