

CHILE

RG-T3575

Experts Advisory Services for Assessing Options to Inform the Design of a Long-Term Strategy to Achieve Carbon Neutrality by 2050 in Chile Under Technological Uncertainty: Agriculture, FOLU, Waste and IPPU Sectors

TERMS OF REFERENCE

1. Background and Justification

- 1.1. The Government of Chile has set the target to achieve carbon neutrality by 2050. The Ministry of Environment of Chile (MMA) is leading efforts to inform the cations that can guide the country in the task to achieve such target.
- 1.2. The MMA is now formulating its long-term low greenhouse gas emission development strategy (Long Term Strategy-LTS) in accordance with Article 4, paragraph 19 of the Paris Agreement. The formulation of the LTS is led by MMA, which is leading an extensive consultation to co-design the strategy with other sectoral ministries and relevant local stakeholders to ensure viability, relevance and buy in of the LTS. This LTS is expected to clarify the required physical transformations and measures across sectors of the economy that will need to take place between now and 2050 in order to achieve the carbon neutrality objective while maximizing benefits to Chileans and leading to manageable costs for citizens, business, and the government.
- 1.3. As part of the LTS process the government considers as a fundamental element the development of analysis led by the academia that can consider uncertainty of long term planning, and the need to achieve multiples objectives, such a GHG emissions reduction, job creation, improvement of social equality and others; to inform a robust strategy to achieve carbon neutrality by 2050.
- 1.4. In this context, the authorities have expressed interest in analyzing how the carbon neutrality to 2050 can be translated into sectorial targets, measures and actions in the short, medium and long term, across the economy needed to reach carbon neutrality, the challenges of future uncertainties, the need to achieve multiple development objectives across sectors and to carry out this analysis under the umbrella of co-design with local stakeholders. The Government requests expert technical assistance and input to this process, as described below, which responds to the objectives of the technical cooperation RG-T3575 which supports the design of Long Term Decarbonization Strategies.

2. Objectives

- 2.1. The objective of this consulting assignment is to carry out —working together with other member of the team under this project in Chile¹— modelling and simulations applying the robust decision making (RDM) method to inform Chile's LTS, including the range of physical transformations that will be required across sectors of the Chilean economy to achieve the objective of carbon neutrality by 2050 considering cost-benefits for citizens, private sector and the government, and a possible allocation of sectoral carbon budgets. The risk of carbon lock-in, irreversible investments, and the exposure of Chile to cost-benefits for the

¹ Team from another local university and international expert

government, private sector and society are all important issues to consider. This work also includes participation in regional activities under the DDP-LAC project.

3. Scope of Services

- 3.1. The consultants will carry out simulation and modelling according to a work plan agreed with IDB and Ministry of Environment - to inform the formulation of an LTS to achieve Chile's objective of carbon neutrality by 2050 in a cost-effective manner. This work should take into account the actions that were used to define Chile's NDC, the Carbon Neutrality goal, inputs from workshops carried out during the first semester of 2020 as part of the process of design of LTS, as well as new workshops defined in activity 3.2.
- 3.2. The consultants will prepare and deliver two virtual workshops to engage relevant national stakeholders in co-construction of inputs to the LTS according to the method of RDM. The first workshops will present midterm results to the stakeholders for validation of assumptions and to steer further research; the final workshop will serve to disseminate the findings about the feasibility, relevance, benefits and potential costs of long-term carbon neutrality options. The consultants will work with other members of the team and IDB personnel to develop the agenda, the content – such as presentations and concept note - and will facilitate the delivery of the workshops. The workshops should be scheduled and organized in close coordination with the Ministry of Environment.
- 3.3. The convening and hosting of national stakeholders are the responsibility of the government of Chile and the IDB.
- 3.4. The consultant will participate in regional meetings organized under the DDPLAC project.
- 3.5. The consultant will peer-review technical work of other country teams participating in the DDPLAC project.
- 3.6. The consultants will consolidate the results of the analysis, review of the relevant literature and develop a policy note with the results, including recommendations for the Ministry of Environment to inform the LTS of Chile using outputs from the activities described above. The consultant should consider ways to communicate the technical rigor of the analysis and how stakeholder inputs from workshops were considered.
- 3.7. The consultant will closely work with MMA's personnel working on mitigation and modeling exercises during the process, in order to build capacity within the Ministry.
- 3.8. The consultants will focus the analysis on the following sectors:
 - a. Agriculture
 - b. Forest and Other Land Uses (FOLU)
 - c. Industrial Processes and Product Use (IPPU)
 - d. Waste
- 3.9. The consulting requirements needed to make this project successful are a team with: i) Advanced academic degree in the field of economics, environmental sciences and/or social sciences; with at least 5 years of relevant professional experience in high-level advisory services in economic and environmental matters;

ii) Extensive experience with the design, implementation and evaluation of prospective modelling; iii) Demonstrated capacity to work with a variety of stakeholders, both political and technical; iv) Sound knowledge on Chilean's climate and development policy. Previous experience working with/in Chile, particularly in relation to climate change, energy and transport analysis and policy development; v) Ability to present technical concepts clearly to both technical and non-technical experts; vii) Experience in performing contracts for government authorities and international organizations; vii) Fluency in Spanish and English.

4. Key Activities

- 4.1. Design numerical experiments and carry out numerical simulations to identify robust strategies alternatives to achieve carbon neutrality by 2050 in Chile in a cost-effective manner, considering other relevant development objectives.
- 4.2. Design and moderate two stakeholder engagement workshops in Chile.
- 4.3. Elaborate reports in writing and power points presentations with final findings for Ministry of Environment, in English and Spanish.
- 4.4. Participate in regional DDPLAC meetings for knowledge and experience exchange with other DDPLAC teams working in LAC.
- 4.5. Peer-review the work of other DDPLAC teams working in LTS development in other LAC.
- 4.6. All activities are to be developed jointly with the other members of the team under this project in Chile.

5. Expected Outcome and Deliverables

- 5.1. The expected deliverables for this consultancy are the following, all products are to be developed jointly with other members of the team under this project in Chile:
- 5.2. **Product 1:** Work Plan
- 5.3. **Product 2:** Concept note presenting results (activity 4.1) of the numerical simulations and decarbonization pathways alternatives, to be shared with stakeholders ahead of the workshop to present midterm results.
- 5.4. **Product 3:** Material to deliver the workshop with local stakeholders to present midterm results. Including PPT, agenda and list of participants.
- 5.5. **Product 4:** Final report with findings and recommendations to inform the LTS of Chile as defined in 3.7.
- 5.6. **Product 5:** Material to deliver the workshop with local stakeholders to present final results. Including a power point presentation for public dissemination and agenda.

6. Project Schedule and Milestones

- 6.1. The resulting contract will be a lump-sum contract with a duration of eight months. Payments will be made with the approval of IDB, as follows:
- 6.2. **Product 1:** 1 weeks after signature of the contract.
- 6.3. **Product 2:** 2 months after signature of the contract.
- 6.4. **Product 3:** 3 months after signature of the contract.

6.5. **Product 4:** 6 months after signature of the contract.

6.6. **Product 5:** 8 months after signature of the contract.

7. Reporting Requirements

7.1. All reports should be presented in digital version, preferably in Word and PowerPoint, or as needed by the IDB in Spanish or English.

8. Acceptance Criteria

8.1. Payments will be authorized upon Bank acceptance of TORs-specified products. The Bank will have up-to two weeks to provide written comments/recommendations to the reports submitted by the consulting firm. Unless previously determined otherwise, the Bank shall normally accept deliverables upon confirmation by the consulting firm of: (i) reception and further inclusion of comments/recommendations in a revised version; and (ii) provision of date for submission of the revised versions of submitted deliverables. It is expected that the consulting firm will include these comments and recommendations presented by the Bank in a new version submitted to the Bank in no more than two weeks counted from the delivery of written comments by the Bank.

9. Supervision and Reporting

9.1. [Marcela Jaramillo](#) and [Cristian Salas](#) will be the technical focal points for this consultancy and Adrien Vogt-Schilb (avogtschilb@iadb.org) will be the person to authorize final work (deliverables) presented by the consulting firm. The IDB will work closely with MMA in reviewing and providing feedback to the products.

10. Schedule of Payments

10.1. The schedule of payment is as follow:

- a. 50% upon submission and approval of Product 1, 2 and 3.
- b. 50% upon submission and approval of Products 4 and 5.

CHILE

RG-T3575

Experts Advisory Services for Assessing Options to Inform the Design of a Long-Term Strategy to Achieve Carbon Neutrality by 2050 in Chile Under Technological Uncertainty: Energy sectors

TERMS OF REFERENCE

1. Background and Justification

- 1.1. The Government of Chile has set the target to achieve carbon neutrality by 2050. The Ministry of Environment of Chile (MMA) is leading efforts to inform the cations that can guide the country in the task to achieve such target.
- 1.2. The MMA is now formulating its long-term low greenhouse gas emission development strategy (Long Term Strategy-LTS) in accordance with Article 4, paragraph 19 of the Paris Agreement. The formulation of the LTS is led by MMA, which is leading an extensive consultation to co-design the strategy with other sectoral ministries and relevant local stakeholders to ensure viability, relevance and buy in of the LTS. This LTS is expected to clarify the required physical transformations and measures across sectors of the economy that will need to take place between now and 2050 in order to achieve the carbon neutrality objective while maximizing benefits to Chileans and leading to manageable costs for citizens, business, and the government.
- 1.3. As part of the LTS process the government considers as a fundamental element the development of analysis led by the academia that can consider uncertainty of long term planning, and the need to achieve multiples objectives, such a GHG emissions reduction, job creation, improvement of social equality and others; to inform a robust strategy to achieve carbon neutrality by 2050.
- 1.4. In this context, the authorities have expressed interest in analyzing how the carbon neutrality to 2050 can be translated into sectorial targets, measures and actions in the short, medium and long term, across the economy needed to reach carbon neutrality, the challenges of future uncertainties, the need to achieve multiple development objectives across sectors and to carry out this analysis under the umbrella of co-design with local stakeholders. The Government requests expert technical assistance and input to this process, as described below, which responds to the objectives of the technical cooperation RG-T3575 which supports the design of Long Term Decarbonization Strategies.

2. Objectives

- 2.1. The objective of this consulting assignment is to carry out —working together with other member of the team under this project in Chile²— modelling and simulations applying the robust decision making (RDM) method to inform Chile's LTS, including the range of physical transformations that will be required across sectors of the Chilean economy to achieve the objective of carbon neutrality by 2050 considering cost-benefits for citizens, private sector and the government, and a possible allocation of sectoral carbon budgets. The risk of carbon lock-in, irreversible investments, and the exposure of Chile to cost-benefits for the

² Team from another local university and international expert

government, private sector and society are all important issues to consider. This work also includes participation in regional activities under the DDP-LAC project.

3. Scope of Services

- 3.1. The consultants will carry out simulation and modelling according to a work plan agreed with IDB and Ministry of Environment - to inform the formulation of an LTS to achieve Chile's objective of carbon neutrality by 2050 in a cost-effective manner. This work should take into account the actions that were used to define Chile's NDC, the Carbon Neutrality goal, inputs from workshops carried out during the first semester of 2020 as part of the process of design of LTS, as well as new workshops defined in activity 3.2.
- 3.2. The consultants will prepare and deliver two virtual workshops to engage relevant national stakeholders in co-construction of inputs to the LTS according to the method of RDM. The first workshops will present midterm results to the stakeholders for validation of assumptions and to steer further research; the final workshop will serve to disseminate the findings about the feasibility, relevance, benefits and potential costs of long-term carbon neutrality options. The consultants will work with other members of the team and IDB personnel to develop the agenda, the content – such as presentations and concept note - and will facilitate the delivery of the workshops. The workshops should be scheduled and organized in close coordination with the Ministry of Environment.
- 3.3. The convening and hosting of national stakeholders are the responsibility of the government of Chile and the IDB.
- 3.4. The consultant will participate in regional meetings organized under the DDPLAC project.
- 3.5. The consultant will peer-reviewing technical work of other country teams participating in the DDPLAC project.
- 3.6. The consultants will consolidate the results of the analysis, review of the relevant literature and develop a policy note with the results, including recommendations for the Ministry of Environment to inform the LTS of Chile using outputs from the activities described above. The consultant should consider ways to communicate the technical rigor of the analysis and how stakeholder inputs from workshops were considered.
- 3.7. The consultant will closely work with MMA's personnel working on mitigation and modeling exercises during the process, in order to build capacity within the Ministry.
- 3.8. The consultants will focus the analysis on the following sectors:
 - a. Energy (electricity, transport, industry and Commercial, Public and Residential)
- 3.9. The consulting requirements needed to make this project successful are a team with:
 - i) Advanced academic degree in the field of economics, environmental sciences and/or social sciences; with at least 5 years of relevant professional experience in high-level advisory services in economic and environmental matters;
 - ii) Extensive experience with the design, implementation and evaluation of prospective modelling;
 - iii) Demonstrated capacity to work with a variety of stakeholders, both political and technical;
 - iv) Sound knowledge on Chilean's climate and development policy. Previous experience working with/in Chile, particularly in relation to climate change, energy and transport analysis and policy

development; v) Ability to present technical concepts clearly to both technical and non-technical experts; vii Experience in performing contracts for government authorities and international organizations; vii) Fluency in Spanish and English.

4. Key Activities

- 4.1. Design numerical experiments and carry out numerical simulations to identify robust strategies alternatives to achieve carbon neutrality by 2050 in Chile in a cost-effective manner, considering other relevant development objectives.
- 4.2. Design and moderate two stakeholder engagement workshops in Chile.
- 4.3. Elaborate reports in writing and power points presentations with final findings for Ministry of Environment, in English and Spanish.
- 4.4. Participate in regional DDPLAC meetings for knowledge and experience exchange with other DDPLAC teams working in LAC.
- 4.5. Peer-review the work of other DDPLAC teams working in LTS development in other LAC.
- 4.6. All activities are to be developed jointly with the other members of the team under this project in Chile.

5. Expected Outcome and Deliverables

- 5.1. The expected deliverables for this consultancy are the following, all products are to be developed jointly with other members of the team under this project in Chile:
- 5.2. **Product 1:** Work Plan
- 5.3. **Product 2:** Concept note presenting results (activity 4.1) of the numerical simulations and decarbonization pathways alternatives, to be shared with stakeholders ahead of the workshop to present midterm results.
- 5.4. **Product 3:** Material to deliver the workshop with local stakeholders to present midterm results. Including PPT, agenda and list of participants.
- 5.5. **Product 4:** Final report with findings and recommendations to inform the LTS of Chile as defined in 3.7.
- 5.6. **Product 5:** Material to deliver the workshop with local stakeholders to present final results. Including a power point presentation for public dissemination and agenda.

6. Project Schedule and Milestones

- 6.1. The resulting contract will be a lump-sum contract with a duration of eight months. Payments will be made with the approval of IDB, as follows:
- 6.2. **Product 1:** 1 week after signature of the contract.
- 6.3. **Product 2:** 2 months after signature of the contract.
- 6.4. **Product 3:** 3 months after signature of the contract.
- 6.5. **Product 4:** 6 months after signature of the contract.
- 6.6. **Product 5:** 8 months after signature of the contract.

7. Reporting Requirements

- 7.1. All reports should be presented in digital version, preferably in Word and PowerPoint, or as needed by the IDB in Spanish or English.

8. Acceptance Criteria

- 8.1. Payments will be authorized upon Bank acceptance of TORs-specified products. The Bank will have up-to two weeks to provide written comments/recommendations to the reports submitted by the consulting firm. Unless previously determined otherwise, the Bank shall normally accept deliverables upon confirmation by the consulting firm of: (i) reception and further inclusion of comments/recommendations in a revised version; and (ii) provision of date for submission of the revised versions of submitted deliverables. It is expected that the consulting firm will include these comments and recommendations presented by the Bank in a new version submitted to the Bank in no more than two weeks counted from the delivery of written comments by the Bank.

9. Supervision and Reporting

- 9.1. [Marcela Jaramillo](#) and [Cristian Salas](#) will be the technical focal points for this consultancy and Adrien Vogt-Schilb (avogtschilb@iadb.org) will be the person to authorize final work (deliverables) presented by the consulting firm. The IDB will work closely with MMA in reviewing and providing feedback to the products.

10. Schedule of Payments

- 10.1. The schedule of payment is as follow:
- a. 50% upon submission and approval of Product 1, 2 and 3.
 - b. 50% upon submission and approval of Products 4 and 5.

CHILE

RG-T3575

Experts Advisory Services to Assess Options to Achieve Carbon Neutrality by 2050 in Chile under Technological Uncertainty

TERMS OF REFERENCE

1. Background and Justification

- 1.1. The Government of Chile has set the target to achieve carbon neutrality by 2050. The Ministry of Environment of Chile (MMA) is leading efforts to inform the cations that can guide the country in the task to achieve such target.
- 1.2. The MMA is now formulating its long-term low greenhouse gas emission development strategy (Long Term Strategy-LTS) in accordance with Article 4, paragraph 19 of the Paris Agreement. The formulation of the LTS is led by MMA, which is leading an extensive consultation to co-design the strategy with other sectoral ministries and relevant local stakeholders to ensure viability, relevance and buy in of the LTS. This LTS is expected to clarify the required physical transformations and measures across sectors of the economy that will need to take place between now and 2050 in order to achieve the carbon neutrality objective while maximizing benefits to Chileans and leading to manageable costs for citizens, business, and the government.
- 1.3. As part of the LTS process the government considers as a fundamental element the development of analysis led by the academia that can consider uncertainty of long term planning, and the need to achieve multiples objectives, such a GHG emissions reduction, job creation, improvement of social equality and others; to inform a robust strategy to achieve carbon neutrality by 2050.
- 1.4. In this context, the authorities have expressed interest in analyzing how the carbon neutrality to 2050 can be translated into sectorial targets, measures and actions in the short, medium and long term, across the economy needed to reach carbon neutrality, the challenges of future uncertainties, the need to achieve multiple development objectives across sectors and to carry out this analysis under the umbrella of co-design with local stakeholders. The Government requests expert technical assistance and input to this process, as described below, which responds to the objectives of the technical cooperation RG-T3575 which supports the design of Long Term Decarbonization Strategies.

2. Objectives

- 2.1. The objective of this consulting assignment is to carry out —working together with teams of local universities³— modelling and simulations applying the robust decision making (RDM) method to inform Chile's LTS, including the range of physical transformations that will be required across sectors of the Chilean economy to achieve the objective of carbon neutrality by 2050; The risk of carbon lock-in, irreversible investments, and the exposure of Chile to cost-benefits for the government, private sector and society are all important issues to consider. This work also seeks to build technical capacity in local academic teams on applying

³ Universidad de Chile and Universidad Católica

robust decision-making method and participation in regional activities under the DDP-LAC project.

3. Scope of Services

- 3.1. The consultants will carry out simulation and modelling according to a work plan agreed with IDB and Ministry of Environment - to inform the formulation of an LTS to achieve Chile's objective of carbon neutrality by 2050 in a cost-effective manner. This work should take into account the actions that were used to define Chile's NDC, the Carbon Neutrality goal, inputs from workshops carried out during the first semester of 2020 as part of the process of design of LTS, as well as new workshops defined in activity 3.2.
- 3.2. The consultants will prepare and deliver two virtual workshops to engage relevant national stakeholders in co-construction of inputs to the LTS according to the method of RDM. The first workshops will present midterm results to the stakeholders for validation of assumptions and to steer further research; the final workshop will serve to disseminate the findings about the feasibility, relevance, benefits and potential costs of long-term carbon neutrality options. The consultants will work with the local teams and IDB personnel to develop the agenda, the content—such as presentations and concept note—and will facilitate the delivery of the workshops. The workshops should be scheduled and organized in close coordination with the Ministry of Environment.
- 3.3. The convening and hosting of national stakeholders are the responsibility of the government of Chile and the IDB.
- 3.4. The consultant will collaborate and coordinate proactively with the teams from local universities to deliver the analysis and organize meetings and other activities to facilitate collaboration and knowledge transfer to local universities and personnel of Ministry of Environment to apply RDM.
- 3.5. The consultant will participate in regional meetings organized under the DDPLAC project.
- 3.6. The consultant will peer-reviewing technical work of other country teams participating in the DDPLAC project.
- 3.7. The consultants will consolidate the results of the analysis and develop a policy note with the results, including recommendations for the Ministry of Environment to inform the LTS of Chile using outputs from the activities described above. The consultant should consider ways to communicate the technical rigor of the analysis and how stakeholder inputs from workshops were considered.
- 3.8. The consulting requirements needed to make this project successful are a team with: i) Advanced academic degree in the field of economics, environmental sciences and/or social sciences; with at least 5 years of relevant professional experience in high-level advisory services in economic and environmental matters; ii) Extensive experience with the design, implementation and evaluation of prospective modelling; iii) Demonstrated experience using robust decision making techniques to inform long-term investment decisions iv) Demonstrated capacity to work with a variety of stakeholders, both political and technical; v) Ability to present technical concepts clearly to both technical and non-technical experts; vi) Experience in performing contracts for government authorities and international organizations; vii) Fluency in Spanish and English.

4. Key Activities

- 4.1. Design numerical experiments and carry out numerical simulations to identify robust strategies alternatives to achieve carbon neutrality by 2050 in Chile in a cost-effective manner, considering other relevant development objectives.
- 4.2. Design and moderate two stakeholder engagement workshops in Chile.
- 4.3. Build local capacity on the design of LTS using RDM approach.
- 4.4. Elaborate reports in writing and power points presentations with final findings for Ministry of Environment, in English and Spanish.
- 4.5. Participate in regional DDPLAC meetings for knowledge and experience exchange with other DDPLAC teams working in LAC.
- 4.6. Peer-review the work of other DDPLAC teams working in LTS development in other LAC.
- 4.7. All activities are to be developed jointly with local consultants that are part of the project.

5. Expected Outcome and Deliverables

- 5.1. The expected deliverables for this consultancy are the following two; both products are to be developed jointly with local consultants that are part of this project providing inputs to the design of Chiles' LTS:
- 5.2. **Product 1:** Work Plan
- 5.3. **Product 2:** Concept note presenting results (activity 4.1) of the numerical simulations and decarbonization pathways alternatives, to be shared with stakeholders ahead of the workshop to present midterm results.
- 5.4. **Product 3:** Material to deliver the workshop with local stakeholders to present midterm results. Including PPT and agenda.
- 5.5. **Product 4:** Final report with findings and recommendations to inform the LTS of Chile as defined in 3.7.
- 5.6. **Product 5:** Material to deliver the workshop with local stakeholders to present final results. Including a power point presentation for public dissemination and agenda.

6. Project Schedule and Milestones

- 6.1. The resulting contract will be a lump-sum contract with a duration of eight months. Payments will be made with the approval of IDB, as follows
- 6.2. **Product 1:** 1 weeks after signature of the contract.
- 6.3. **Product 2:** 2 months after signature of the contract.
- 6.4. **Product 3:** 3 months after signature of the contract.
- 6.5. **Product 4:** 6 months after signature of the contract.
- 6.6. **Product 5:** 8 months after signature of the contract.

7. Reporting Requirements

- 7.1. All reports should be presented in digital version, preferably in Word and PowerPoint, or as needed by the IDB in Spanish or English.

8. Acceptance Criteria

- 8.1. Payments will be authorized upon Bank acceptance of TORs-specified products. The Bank will have up-to two weeks to provide written comments/recommendations to the reports submitted by the consulting firm. Unless previously determined otherwise, the Bank shall normally accept deliverables upon confirmation by the consulting firm of: (i) reception and further inclusion of comments/recommendations in a revised version; and (ii) provision of date for submission of the revised versions of submitted deliverables. It is expected that the consulting firm will include these comments and recommendations presented by the Bank in a new version submitted to the Bank in no more than two weeks counted from the delivery of written comments by the Bank.

9. Supervision and Reporting

- 9.1. Marcela Jaramillo (marcelaja@iadb.org) will be the technical focal point for this consultancy and Adrien Vogt-Schilb (avogtschilb@iadb.org) will be the person to authorize final work (deliverables) presented by the consulting firm. The IDB will work closely with MMA in reviewing and providing feedback to the products.

10. Schedule of Payments

- 10.1. The schedule of payment is as follow:
- a. 50% upon submission and approval of Product 1, 2 and 3.
 - b. 50% upon submission and approval of Products 4 and 5.

COLOMBIA

RG-T3575

Experts Advisory Services to Assess Options to Reach Zero Net Emissions in Colombia

TERMS OF REFERENCE

1. Background and Justification

- 1.1. In 2019, the Government of Colombia begun developing the 2050 Strategy (E2050), which will be presented to the UNFCCC as the Long-Term Strategy of the country in COP26, as per the Paris Agreement Article 4, paragraph 19. The E2050 seeks to identify the objectives and guidelines to reach carbon neutrality and long-term resiliency by 2050.
- 1.2. The design process of the E2050 has gathered a wide range of stakeholders, seeking to align the strategy to Colombia's development goals and integrate the views of the different sectors and realities of the Country. On the technical side, the process will be fed by a series of different studies on carbon neutrality and resilience.
- 1.3. The Government of Colombia, through the financial support of the AFD and operational support of Expertise France, has requested the IDB to inform the development of the LTS using the capacities and modeling exercises developed within the University of Los Andes and University of Ibagué under the Deep Decarbonization Path Pathways in LAC project in Colombia funded the Inter-American Development Bank¹.
- 1.4. Jointly with the AFD, the IDB has started a second phase of the initiative, DDPLAC2 (RG-T3575). The objective of DDPLAC2 is to support the design of net-zero LTS in LAC countries using co-construction techniques that, through strong engagement with stakeholders, enable a design process that includes broader development objectives, including costs and benefits, and that account for uncertainties. The support will be provided by local technical teams, which will be trained by international teams on the use of such techniques, such as the Robust Decision Making (RDM) approach.
- 1.5. Using the modelling capacity developed during DDPLAC1, the *Universidad de los Andes* and *Ibagué* will continue working with the Government of Colombia and the IDB, under the objectives of DDPLAC2 on assessing the potential of the mitigation measures to achieve carbon neutrality by 2050 in terms of mitigation, costs and benefits. The objective of the present assignment is to provide expert guidance to the Universidad de los Andes and Ibagué to maximize its ability to inform strategic decisions using model simulations and stakeholder engagement. Specifically, the consultant will help the local teams apply the principles of Robust Decision Making when engaging with different stakeholders and designing numerical simulations of the Colombian mitigation measures.

2. Objectives

- 2.1. The objective of this consulting assignment is to support the University of Los Andes and University of Ibagué apply the principles of Robust Decision Making (RDM) for the project.

3. Scope of Services

- 3.1. The consultant will, with IDB personnel and the other team members, develop agendas for workshops and stakeholder engagements
- 3.2. The consultant will design and moderate in the running workshops associated with this project in Colombia
- 3.3. The consultant will design, review and revise the technical scopes of the work to effectively deploy RDM
- 3.4. The consultant will attend web meetings to provide advice and guidance for implementing RDM
- 3.5. The consultant will review the technical work of the team members.

4. Key Activities

- 4.1. Key activities to be carried out by the consultant include:
 - (i) Participate in regional DDPLAC meetings for knowledge and experience exchange with other DDPLAC teams working in LAC.
 - (ii) Peer review the work of other DDPLAC teams working in LTS development in other LAC countries.
 - (iii) Design and moderate three stakeholder engagement workshops in Colombia.
 - (iv) Design numerical experiments that use existing and new models to assess cost-effective decarbonization pathways in Colombia.
 - (v) Carry out numerical simulations and analyze results to identify decarbonization pathways alternatives.
 - (vi) Elaborate reports in writing and power points presentations for both technical and non-technical audiences, in English and Spanish.
 - (vii) Build local capacity on the design of decarbonization pathways using RDM approach.

5. Deliverables

- Product 1: Concept note with the XLRM/DAMI Matrix, to be shared with stakeholders.
- Product 2: Concept note presenting results (activity 4.iv and 4.v) of the numerical simulations and decarbonization pathways alternatives, to be shared with stakeholders ahead of the second workshop.
- Product 3: PPT for the second workshop and the list of participants to be invited to the workshop.
- Product 4: High-level take away conclusions in terms of both (i) stakeholder engagement for the rest of the projects and (ii) design of experiments to use numerical simulations to pursue the agenda. These will be provided in memorandum format to IDB
- Product 5: Policy note draft that includes the results for the Government to be integrated on the LTS and a power point presentation for public dissemination

- Product 6: Academic paper

6. Projected Schedule and Milestones

- 6.1. **Product 1 and 2:** 2 weeks after signature of the contract.
- 6.2. **Product 3:** 2 months after signature of the contract.
- 6.3. **Product 4:** 3 months after signature of the contract.
- 6.4. **Product 5:** 3 months after signature of the contract.
- 6.5. **Product 6:** 6 months after signature of the contract.

7. Reporting Requirements

- 7.1 All reports should be presented in digital version, preferably in *Word* and *PowerPoint*, in *Spanish* or *English*.

8. Acceptance Criteria

- 8.1 Payments will be authorized upon Bank acceptance of TORs-specified products. The Bank will have up-to two weeks to provide written comments/recommendations to the reports submitted by the consulting firm. Unless previously determined otherwise, the Bank shall normally accept deliverables upon confirmation by the consulting firm of: (i) reception and further inclusion of comments/recommendations in a revised version and (ii) provision of date for submission of the revised versions of submitted deliverables. It is expected that the consulting firm will include these comments and recommendations presented by the Bank in a new version submitted to the Bank in no more than two weeks counted from the delivery of written comments by the Bank. [Valentina Saavedra](#) and [Jose Manuel Sandoval](#) will be authorized to accept the work (deliverables) presented by the consulting firm.

9. Supervision and Reporting

- 9.1. [Valentina Saavedra](#) and [Jose Manuel Sandoval](#) will be the technical focal point for this consultancy and will be the person to authorize final work (deliverables) presented by the consulting firm. The IDB will work closely with the Expertise France and the AFD in reviewing and providing feedback to the products.

10. Schedule of Payments

- 10.1. 20% upon submission and approval of Product 1 and 2.
- 10.2. 30% upon submission and approval of Products 3
- 10.3. 30% upon submission and approval of Products 4 and 5
- 10.4. 20% upon submission and approval of Products 6.

COLOMBIA

Experts Advisory Services for Assessing Options to Reach Zero Net Emissions in Colombia

TERMS OF REFERENCE

1. Background and Justification

- 1.1. In 2019, the Government of Colombia begun developing the 2050 Strategy (E2050), which will be presented to the UNFCCC as the Long-Term Strategy of the country in COP26, as per the Paris Agreement Article 4, paragraph 19. The E2050 seeks to identify the objectives and guidelines to reach carbon neutrality and long-term resiliency by 2050.
- 1.2. The design process of the E2050 has gathered a wide range of stakeholders, seeking to align the strategy to Colombia's development goals and integrate the views of the different sectors and realities of the Country. On the technical side, the process will be fed by a series of different studies on carbon neutrality and resilience.
- 1.3. The Government of Colombia, through the financial support of the AFD and operational support of Expertise France, has requested the IDB to inform the development of the LTS using the capacities and modeling exercises developed within the University of Los Andes and University of Ibagué under the Deep Decarbonization Path Pathways in LAC project in Colombia funded the Inter-American Development Bank¹.
- 1.4. Jointly with the AFD, the IDB has started a second phase of the initiative, DDPLAC2 (RG-T3575). The objective of DDPLAC2 is to support the design of net-zero LTS in LAC countries using co-construction techniques that, through strong engagement with stakeholders, enable a design process that includes broader development objectives, including costs and benefits, and that account for uncertainties. The support will be provided by local technical teams, which will be trained by international teams on the use of such techniques, such as the Robust Decision Making (RDM) approach.
- 1.5. Under this assignment, the Universidad del los Andes and Ibagué will continue working with the Government of Colombia and the IDB under the objectives of DDPLAC2 on assessing the potential of the mitigation measures to achieve carbon neutrality by 2050 in terms of mitigation, costs and benefits.

2. Objectives

- 2.1. The objective of this consulting assignment is to assess the extent to which national mitigation measures included in the NDC and other Climate Policies could play in the decarbonization of the Colombian economy, how they could be complemented or strengthened by 2050 to advance the long-term decarbonization objectives, and what costs and benefits are associated with their implementation. The risk of carbon lock-in, irreversible investments, and the exposure of Colombia to external uncertainties, such as the variations in the cost of technologies are all important issues to consider.

3. Scope of Services

- 3.1. The consultant will propose a framework to engage with local stakeholders and understand the most pressing research questions they face related to the

mitigation contribution, costs and benefits of the measures under uncertainty, and what resources (including models and data) they have that can be used to contribute to analyze these.

- 3.2. The convening and hosting of national stakeholders are the responsibility of the government of Colombia and the IDB.
- 3.3. The consultant will participate in meetings with local stakeholders convened by the government and the IDB, to present their work program, ongoing progress, and results; hear about relevant uncertainties and metrics for success to include in the analysis and adjust the work program accordingly.
- 3.4. The consultant will primarily use simple accounting tools and existing numerical models to explore a wide range of prospective scenarios of multi-sector decarbonization of Colombia, taking into account the perspective of national stakeholders. Existing models include models held by other entities in Colombia or elsewhere that the consultant may partner with or subcontract. The consultant may augment the existing models with a small set of mathematical relationships to proxy for models that do not currently exist or are not available for use by the consultant. The design of experiment, analysis of the simulations, and adjustment of the simulation plans are all the responsibility of the consultant.
- 3.5. The consultant will consider the alignment of short-term investments needed to enable technologies with the goal of reaching full decarbonization of the economy sector by 2050.
- 3.6. The consultant will consider relevant uncertainties surrounding the evaluation of those technological choices as suggested by the stakeholders met in national workshops, including for instance the cost of technologies, enabling infrastructure, and long-term energy prices. They will also consider the multi-dimensional aspect of technology evaluation, as suggested by participants of national stakeholder engagement workshops, in the context of a national decarbonization strategies, including for instance impact on GHG emissions, alignment with zero-net emissions, but also as much as possible benefits for the sector, fiscal impacts, etc.
- 3.7. In a qualitative manner, the consultant will capture and record, during the workshops and from international literature, relevant governance, regulatory and policy reforms and other policy instruments to be considered for the operationalization of the decarbonization scenarios.
- 3.8. The consultant will derive robust findings from the analysis of the simulations, a review of the relevant literature, and consultations with different stakeholders, and communicate them to the IDB and local authorities.
- 3.9. The consulting requirements needed to make this project successful are a team with: i) Advanced academic degree in the field of economics, environmental sciences and/or social sciences; with at least 5 years of relevant professional experience in high-level advisory services in economic and environmental matters; ii) Extensive experience with the design, implementation and evaluation of prospective modelling; iii) Demonstrated experience using robust decision making techniques to inform long-term investment decisions iv) Demonstrated capacity to work with a variety of stakeholders, both political and technical; v) Sound knowledge on Colombia's climate and development policy. Previous experience working with/in Colombia, particularly in relation to climate change, energy and transport analysis and policy development; vi) Ability to present technical concepts

clearly to both technical and non-technical experts; vii) Experience in performing contracts for government authorities and international organizations; viii) Fluency in Spanish and English.

4. Key Activities

- 4.1. Participate in regional DDPLAC meetings for knowledge and experience exchange with other DDPLAC teams working in LAC.
- 4.2. Engage with Government officials to jointly discuss options of LTS design as the project progresses.
- 4.3. Peer review the work of other DDPLAC teams working in LTS development in other LAC countries.
- 4.4. Design and moderate three stakeholder engagement workshops in Colombia.
- 4.5. Design numerical experiments that use existing and new models to assess cost-effective decarbonization pathways in Colombia.
 - a. Problem scoping, in partnership with IDB and Colombian authorities, listing metrics to evaluate the success of a decarbonization strategy; technology and socioeconomic uncertainties to be considered; models, data, and relevant literature to consult, and technology policy options for the government of Colombia to pursue.
- 4.6. Carry out numerical simulations and analyze results to identify decarbonization pathways alternatives.
 - a. Simulations using simple accounting tools, and as needed, prospective models, to explore the economic outcome of the measures under various conditions and according to several metrics, as decided under the precedent activity.
- 4.7. Elaborate reports in writing and power points presentations for both technical and non-technical audiences, in English and Spanish.

5. Expected Deliverables and Schedule

- 5.1. The expected deliverables for this consultancy are:
 - Product 1: Concept note with the XLRM/DAMI Matrix, to be shared with stakeholders.
 - Product 2: Concept note presenting results (activity 4.iv and 4.v) of the numerical simulations and decarbonization pathways alternatives, to be shared with stakeholders ahead of the second workshop.
 - Product 3: PPT for the second workshop and the list of participants to be invited to the workshop.
 - Product 4: High-level take away conclusions in terms of both (i) stakeholder engagement for the rest of the projects and (ii) design of experiments to use numerical simulations to pursue the agenda. These will be provided in memorandum format to IDB
 - Product 5: Policy note draft that includes the results for the Government to be integrated on the LTS and a power point presentation for public dissemination
 - Product 6: Academic paper

6. Reporting Requirements

All reports should be presented in digital version, preferably in *Word* and *PowerPoint*, in *Spanish or English*.

7. Acceptance Criteria

- 7.1. Payments will be authorized upon Bank acceptance of TORs-specified products. The Bank will have up-to two weeks to provide written comments/recommendations to the reports submitted by the consulting firm. Unless previously determined otherwise, the Bank shall normally accept deliverables upon confirmation by the consulting firm of: (i) reception and further inclusion of comments/recommendations in a revised version and (ii) provision of date for submission of the revised versions of submitted deliverables. It is expected that the consulting firm will include these comments and recommendations presented by the Bank in a new version submitted to the Bank in no more than two weeks counted from the delivery of written comments by the Bank. [Valentina Saavedra](#) and [Jose Manuel Sandoval](#) will be the persons authorized to accept the work (deliverables) presented by the consulting firm.

8. Supervision and Reporting

- 8.1. [Valentina Saavedra](#) and [Jose Manuel Sandoval](#) will be the technical focal point for this consultancy and will be the person to authorize final work (deliverables) presented by the consulting firm. The IDB will work closely with the Expertise France and the AFD in reviewing and providing feedback to the products.

9. Schedule of Payments

- 20% upon submission and approval of Product 1 and 2.
- 30% upon submission and approval of Products 3
- 30% upon submission and approval of Products 4 and 5
- 20% upon submission and approval of Products 6.

REGIONAL

RG-T3575

Lessons learnt from the design of long-term decarbonized development strategies in Colombia, Chile, and Peru

TERMS OF REFERENCE

1. Background and Justification

- 1.1. This technical cooperation supports the design of long-term decarbonization strategies in Colombia, Peru, and Chile with the use of prospective modelling.
- 1.2. In each country, the IDB has organized workshops with national stakeholders, using the XLRM method, to understand what actions are available to sectorial authorities to decarbonize (or L for levers), how to measure outcomes of decarbonization actions in each sector (M for metrics for outcomes), what uncertainties each sector is concerned about (X), and what relationships, data and models are available to quantify the link between these things (R). The results are compiled in what is known as an XLRM matrix.
- 1.3. Based on the XLRM matrix, universities under IDB contract in each country will generate numerical simulations to quantify the outcomes of possible decarbonization strategies in their countries. Then, they will present intermediate and final results to the same sectoral stakeholders. Finally, they will produce a written report on lessons learnt for the design of decarbonization strategies for their national government.

2. Objectives

- 2.1 The objective of this assignment is to write a publication that analyzes lessons learnt from these three projects and draws lessons for global policymakers interested in designing and implementing decarbonization strategies.

3. Key Activities

- 3.1 Key activities to be carried out by the consultant include:
 - (i) Participate in virtual workshops convened by the IDB with modelling teams from universities and sectoral stakeholders in Colombia, Peru, and Chile.
 - (ii) Compile and compare the XLRM matrices produced in the three countries, drawing attention to similarities and differences across countries.
 - (iii) Review the international literature on policy instruments available to policymakers to incentivize decarbonization actions, chosen in consultation with the IDB among the most relevant levers (L) studied by the three universities.
 - (iv) Compile and compare numerical results from the three countries, and draw lessons in terms of how decarbonization levers (L) can help countries reach outcomes (M) while navigating uncertainties (X).
 - (v) Produce a report in English for a wide audience sharing the results of the above activities.

4. Deliverables

- Product 1: Written document that synthesizes lessons from comparing the XLRM matrices in the three countries
- Product 2: Draft report for IDB comments and feedback.
- Product 3: Final report ready for publication

5. Projected Schedule and Milestones

- 5.1 **Product 1:** 4 weeks after signature of the contract.
- 5.2 **Product 2:** 2 months after signature of the contract.
- 5.3 **Product 3:** 5 months after signature of the contract.

6. Reporting Requirements

- 6.1 All reports should be presented in digital version, preferably in Word, in English.

7. Acceptance Criteria

- 7.1 Payments will be authorized upon Bank acceptance of TORs-specified products. The Bank will have up-to two weeks to provide written comments/recommendations to the reports submitted by the consulting firm. Unless previously determined otherwise, the Bank shall normally accept deliverables upon confirmation by the consulting firm of: (i) reception and further inclusion of comments/recommendations in a revised version and (ii) provision of date for submission of the revised versions of submitted deliverables. It is expected that the consulting firm will include these comments and recommendations presented by the Bank in a new version submitted to the Bank in no more than two weeks counted from the delivery of written comments by the Bank. The senior climate change economist Adrien Vogt-Schilb (avogtschilb@iadb.org), will be the person authorized to accept the work (deliverables) presented by the consulting firm.

8. Supervision and Reporting

- 8.1 The senior climate change economist Adrien Vogt-Schilb (avogtschilb@iadb.org), will be the technical focal point for this consultancy and will be the person to authorize final work (deliverables) presented by the consulting firm. The IDB will work closely with the Peruvian Climate Change Directory in reviewing and providing feedback to the products.

9. Schedule of Payments

- 1.1 30% upon submission and approval of Product 1.
- 1.2 40% upon submission and approval of Product 2.
- 1.3 30% upon submission and approval of Product 3.

PERU

RG-T3575

Experts Advisory Services to Assess Options to Reach Zero Net Emissions in Peru

TERMS OF REFERENCE

1. Background and Justification

- 1.1 The Ministry of Environment of Peru (MINAM) developed the National Climate Change Strategy in 2015 (*Estrategia Nacional ante el Cambio Climático*), which incorporates approaches that contribute to achieving a satisfactory and sustainable development for the Peruvian society, based on a low carbon economy. In order to promote a coordinated climate action in the country, the Government created the Multisectoral Working Group of temporary nature (GTM-NDC), which main mandate is to develop technical information to guide the implementation of the Nationally Determined Contributions (NDC) of Peru.
- 1.2 Under the framework of such Strategy, the GTM-NDC published in 2018 the Mitigation Measures Catalog, which presents 62 mitigation measures in the energy, industry and product use, agriculture, land use, land use change and silviculture, and waste sectors.
- 1.3 MINAM has expressed interest in exploring options to formulate a long-term low greenhouse gas emission development strategy (Long Term Strategy-LTS) mandated by the Paris Agreement in accordance of Article 4, paragraph 19⁴, using the 62 mitigation measures, and in line with Peru's commitment with its Nationally Determined Contributions (NDCs), and with the first modeling exercises developed under the Deep Decarbonization Pathways in LAC (DDPLAC1) initiative⁵.
- 1.4 Jointly with the AFD and the Platform 2050 Pathways, the IDB has started a second phase of the initiative, DDPLAC2 (RG-T3575). The objective of DDPLAC2 is to support the design of net-zero LTS in LAC countries using co-construction techniques that, through strong engagement with stakeholders, enable a design process that includes broader development objectives, including costs and benefits, and that account for uncertainties. The support will be provided by local technical teams, which will be trained by international teams on the use of such techniques, such as the Robust Decision Making (RDM) approach.
- 1.5 Using the modelling capacity developed during DDPLAC1, the *Universidad del Pacífico* will continue working with the Government of Peru, IDB, and the 2050 Platform under the objectives of DDPLAC2 on assessing the potential of the mitigation measures defined in the Mitigation Measures Catalog to achieve carbon neutrality by 2050 in terms of mitigation, costs and benefits. The objective of the present assignment is to provide expert guidance to the Universidad del Pacífico to maximize its ability to inform strategic decisions using model simulations and stakeholder engagement. Specifically, the consultant will help Universidad del Pacífico apply the principles of Robust Decision Making when engaging with

⁴ The COP, by its decision 1/CP 21, paragraph 35, invited Parties to communicate to the secretariat, by 2020, their mid-century, long-term low greenhouse gas emission development strategies in accordance with Article 4, paragraph 19, of the Agreement.

⁵ IDB, 2050 Platform, Universidad del Pacífico.

different stakeholders and designing numerical simulations of the Peruvian mitigation measures.

2. Objectives

- 2.1 The objective of this consulting assignment is to support the *Universidad del Pacífico* apply the principles of Robust Decision Making (RDM) for the project.

3. Scope of Services

- 3.1 The consultant will, with IDB personnel and the other team members, develop agendas for workshops and stakeholder engagements
- 3.2 The consultant will design and moderate in the running workshops associated with this project in Peru
- 3.3 The consultant will design, review and revise technical scopes of work to effectively deploy RDM
- 3.4 The consultant will attend web meetings to provide advice and guidance for implementing RDM
- 3.5 The consultant will review the technical work of the team members.

4. Key Activities

- 4.1 Key activities to be carried out by the consultant include:
- (i) Participate in regional DDPLAC meetings for knowledge and experience exchange with other DDPLAC teams working in LAC.
 - (ii) Peer review the work of other DDPLAC teams working in LTS development in other LAC countries.
 - (iii) Design and moderate three stakeholder engagement workshops in Peru.
 - (iv) Design numerical experiments that use existing and new models to assess cost-effective decarbonization pathways in Peru.
 - (v) Carry out numerical simulations and analyze results to identify decarbonization pathways alternatives.
 - (vi) Elaborate reports in writing and power points presentations for both technical and non-technical audiences, in English and Spanish.
 - (vii) Build local capacity on the design of decarbonization pathways using RDM approach.

5. Deliverables

- Product 1: Concept note with the XLRM/DAMI Matrix, to be shared with stakeholders.
- Product 2: Concept note presenting results (activity 4.iv and 4.v) of the numerical simulations and decarbonization pathways alternatives, to be shared with stakeholders ahead of the second workshop.
- Product 3: PPT for the second workshop and the list of participants to be invited to the workshop.
- Product 4: High-level take away conclusions in terms of both (i) stakeholder engagement for the rest of the projects and (ii) design of experiments to use

numerical simulations to pursue the agenda. These will be provided in memorandum format to IDB

- Product 5: Policy note draft that includes the results for the Government to be integrated on the LTS and a power point presentation for public dissemination
- Product 6: Academic paper

6. Projected Schedule and Milestones

- 6.1 **Product 1 and 2:** 2 weeks after signature of the contract.
- 6.2 **Product 3:** 2 months after signature of the contract.
- 6.3 **Product 4:** 3 months after signature of the contract.
- 6.4 **Product 5:** 3 months after signature of the contract.
- 6.5 **Product 6:** 6 months after signature of the contract.

7. Reporting Requirements

- 7.2 All reports should be presented in digital version, preferably in *Word* and *PowerPoint*, in *Spanish or English*.

8. Acceptance Criteria

- 2.1 Payments will be authorized upon Bank acceptance of TORs-specified products. The Bank will have up-to two weeks to provide written comments/recommendations to the reports submitted by the consulting firm. Unless previously determined otherwise, the Bank shall normally accept deliverables upon confirmation by the consulting firm of: (i) reception and further inclusion of comments/recommendations in a revised version and (ii) provision of date for submission of the revised versions of submitted deliverables. It is expected that the consulting firm will include these comments and recommendations presented by the Bank in a new version submitted to the Bank in no more than two weeks counted from the delivery of written comments by the Bank. The climate change economist Adrien Vogt-Schilb (avogtschilb@iadb.org), and Valentina Saavedra (valentinasa@iadb.org) and Jaime Fernandez-Baca (jaimofer@iadb.org) will be the persons authorized to accept the work (deliverables) presented by the consulting firm.

9. Supervision and Reporting

- 9.1 The climate change economist Adrien Vogt-Schilb (avogtschilb@iadb.org), consultant Valentina Saavedra (valentinasa@iadb.org) and Jaime Fernandez-Baca (jaimofer@iadb.org) will be the technical focal point for this consultancy and will be the person to authorize final work (deliverables) presented by the consulting firm. The IDB will work closely with the Peruvian Climate Change Directory in reviewing and providing feedback to the products.

10. Schedule of Payments

- 10.1 20% upon submission and approval of Product 1 and 2.
- 10.2 30% upon submission and approval of Products 3
- 10.3 30% upon submission and approval of Products 4 and 5
- 10.4 20% upon submission and approval of Products 6.

RG-T3575

Experts Advisory Services to Assessing Options to Reach Zero Net Emissions in Peru

TERMS OF REFERENCE

1. Background and Justification

- 1.1. The Ministry of Environment of Peru (MINAM) developed the National Climate Change Strategy in 2015 (*Estrategia Nacional ante el Cambio Climático*), aiming at achieving a satisfactory and sustainable development for the Peruvian society, based on a low carbon economy. To coordinate climate action in the country, the Government created the Multisectoral Working Group of temporary nature (GTM-NDC), with the mandate of developing technical information to guide the implementation of the Nationally Determined Contributions (NDC) of Peru.
- 1.2. Under the framework of such Strategy, the GTM-NDC published in 2018 the Mitigation Measures Catalog, which presents 62 mitigation measures in the energy, industry and product use, agriculture, land use, land use change and silviculture, and waste sectors.
- 1.3. MINAM intends to update the National Climate Change Strategy, including a long-term vision to 2050 (Long Term Strategy, LTS), as per the Paris Agreement Article 4, paragraph 19. MINAM has expressed interest in exploring options to formulate the LTS starting from the 62 mitigation measures, in line with Peru's commitment with its Nationally Determined Contributions (NDCs), and using the modeling exercises developed at the *Universidad del Pacífico* under the Deep Decarbonization Pathways in LAC project in Peru funded by the Platform 2050 and the Inter-American Development Bank⁶.
- 1.4. Jointly with the AFD and the Platform 2050 Pathways, the IDB has started a second phase of the initiative, DDPLAC2 (RG-T3575). The objective of DDPLAC2 is to support the design of net-zero LTS in LAC countries using co-construction techniques that, through strong engagement with stakeholders, enable a design process that includes broader development objectives, including costs and benefits, and that account for uncertainties. The support will be provided by local technical teams, which will be trained by international teams on the use of such techniques, such as the Robust Decision Making (RDM) approach.
- 1.5. Under this assignment, the *Universidad del Pacífico* will continue working with the Government of Peru, IDB, and the 2050 Platform under the objectives of DDPLAC2 on assessing the potential of the mitigation measures defined in the Mitigation Measures Catalog to achieve carbon neutrality by 2050 in terms of mitigation, costs and benefits.

2. Objectives

- 2.1. The objective of this consulting assignment is to assess the extent to which the 62 emission reduction measures of the Mitigation Measures Catalog could play in the decarbonization of the Peruvian economy, how they could be complemented or strengthened by 2050 to advance the long-term decarbonization objectives, and what costs and benefits are associated with their implementation. The risk of carbon lock-in, irreversible investments, and the exposure of Peru to external

⁶ IDB, 2050 Platform, Universidad del Pacífico

uncertainties, such as the variations in the cost of technologies are all important issues to consider.

3. Scope of Services

- 3.1. The consultant will propose a framework to engage with local stakeholders and understand the most pressing research questions they face related to the mitigation contribution, costs and benefits of the measures under uncertainty, and what resources (including models and data) they have that can be used to contribute to analyze these.
- 3.2. The convening and hosting of national stakeholders are the responsibility of the government of Peru, the Platform 2050 and the IDB.
- 3.3. The consultant will participate in meetings with local stakeholders convened by the government, Platform 2050, and the IDB, to present their work program, ongoing progress, and results; hear about relevant uncertainties and metrics for success to include in the analysis and adjust the work program accordingly.
- 3.4. The consultant will primarily use simple accounting tools and existing numerical models to explore a wide range of prospective scenarios of multi-sector decarbonization of Peru, taking into account the perspective of national stakeholders. Existing models include models held by other entities in Peru or elsewhere that the consultant may partner with or subcontract. The consultant may augment the existing models with a small set of mathematical relationships to proxy for models that do not currently exist or are not available for use by the consultant. The design of experiment, analysis of the simulations, and adjustment of the simulation plans are all the responsibility of the consultant.
- 3.5. The consultant will consider the alignment of short-term investments needed to enable technologies with the goal of reaching full decarbonization of the Peruvian economy sector by 2050.
- 3.6. The consultant will consider relevant uncertainties surrounding the evaluation of those technological choices as suggested by the stakeholders met in national workshops, including for instance the cost of technologies, enabling infrastructure, and long-term energy prices. They will also consider the multi-dimensional aspect of technology evaluation, as suggested by participants of national stakeholder engagement workshops, in the context of a national decarbonization strategies, including for instance impact on GHG emissions, alignment with zero-net emissions, but also as much as possible benefits for the sector, fiscal impacts, etc.
- 3.7. In a qualitative manner, the consultant will capture and record, during the workshops and from international literature, relevant governance, regulatory and policy reforms and other policy instruments to be considered for the operationalization of the decarbonization scenarios.
- 3.8. The consultant will derive robust findings from the analysis of the simulations, a review of the relevant literature, and consultations with different stakeholders, and communicate them to the Platform 2050, IDB and local authorities.
- 3.9. The consultant will closely work with MINAM's personnel working on mitigation and modeling exercises during the process, in order to build capacity within the Ministry.
- 3.10. The consulting requirements needed to make this project successful are a team with: i) Advanced academic degree in the field of economics, environmental

sciences and/or social sciences; with at least 5 years of relevant professional experience in high-level advisory services in economic and environmental matters; ii) Extensive experience with the design, implementation and evaluation of prospective modelling; iii) Demonstrated experience using robust decision making techniques to inform long-term investment decisions iv) Demonstrated capacity to work with a variety of stakeholders, both political and technical; v) Sound knowledge on Peruvian's climate and development policy. Previous experience working with/in Peru, particularly in relation to climate change, energy and transport analysis and policy development; vi) Ability to present technical concepts clearly to both technical and non-technical experts; vii) Experience in performing contracts for government authorities and international organizations; viii) Fluency in Spanish and English.

4. Key Activities

- 4.1. Participate in regional DDPLAC meetings for knowledge and experience exchange with other DDPLAC teams working in LAC.
- 4.2. Engage with Government officials to jointly discuss options of LTS design as the project progresses.
- 4.3. Peer review the work of other DDPLAC teams working in LTS development in other LAC countries.
- 4.4. Design and moderate three stakeholder engagement workshops in Peru.
- 4.5. Design numerical experiments that use existing and new models to assess cost-effective decarbonization pathways in Peru.
 - a. Problem scoping, in partnership with IDB, the Platform 2050, and Peruvian authorities, listing metrics to evaluate the success of a decarbonization strategy; technology and socioeconomic uncertainties to be considered; models, data, and relevant literature to consult, and technology policy options for the government of Peru to pursue.
- 4.6. Carry out numerical simulations and analyze results to identify decarbonization pathways alternatives.
 - a. Simulations using simple accounting tools, and as needed, prospective models, to explore the economic outcome of the measures under various conditions and according to several metrics, as decided under the precedent activity.
- 4.7. Elaborate reports in writing and power points presentations for both technical and non-technical audiences, in English and Spanish.

5. Expected Deliverables and Schedule

- 5.1. The expected deliverables for this consultancy are:
 - Product 1: Concept note with the XLRM/DAMI Matrix, to be shared with stakeholders.
 - Product 2: Concept note presenting results (activity 4.iv and 4.v) of the numerical simulations and decarbonization pathways alternatives, to be shared with stakeholders ahead of the second workshop.

- Product 3: PPT for the second workshop and the list of participants to be invited to the workshop.
- Product 4: High-level take away conclusions in terms of both (i) stakeholder engagement for the rest of the projects and (ii) design of experiments to use numerical simulations to pursue the agenda. These will be provided in memorandum format to IDB.
- Product 5: Policy note draft that includes the results for the Government to be integrated on the LTS and a power point presentation for public dissemination.
- Product 6: Academic paper.

6. Reporting Requirements

- 6.1. All reports should be presented in digital version, preferably in word, or as needed by the Platform 2050.

7. Supervision and Reporting

- 7.1. Valentina Saavedra (valentinasa@iadb.org) and Jaime Fernández-Baca (jaimefer@iadb.org) will be the focal points for this project, and Richard Baron will authorize final work (deliverables) presented by the consulting firm. The Platform 2050 and the IDB will work closely with the MINAM in reviewing and providing feedback to the products.

8. Schedule of Payments

- 8.1. The schedule of payment is as follow:
- a) 30% upon submission and approval of Product 1.
 - b) 20% upon submission and approval of Products 2 and 3
 - c) 30% upon submission and approval of Products 4 and 5
 - d) 20% upon submission and approval of Products 6.