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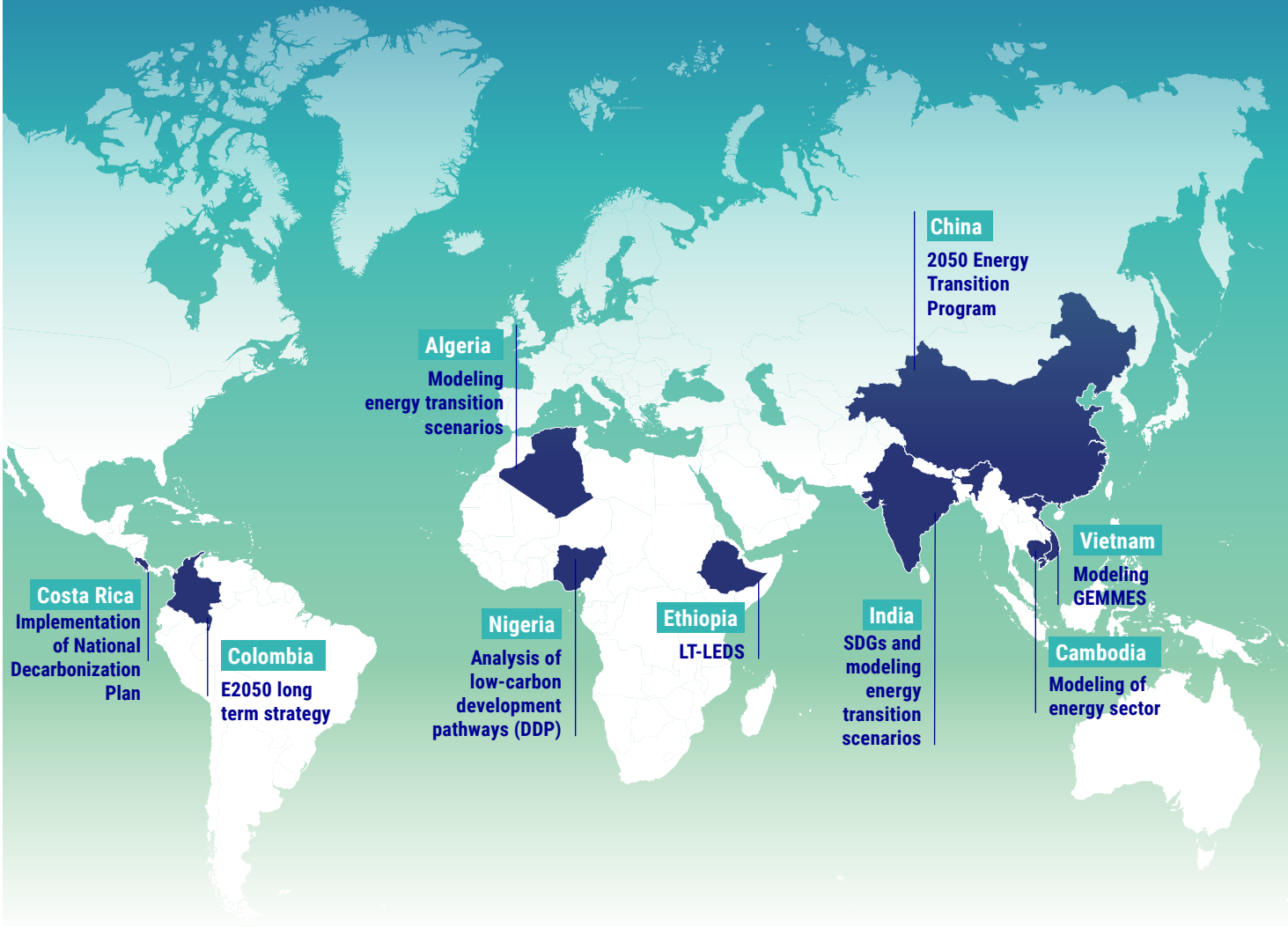
FACILITÉ 2050

UN OUTIL AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

CAPITALIZATION REPORT

Supporting fact sheets for the 2050 Facility

To support thirty of the most carbon-emitting or vulnerable developing countries in their just-transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.



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CAPITALIZATION REPORT

OVERVIEW OF A TYPICAL SUPPORT PROJECT

Analysis of low-carbon development pathways (DDP) in Nigeria

To support thirty of the most carbon-emitting or vulnerable developing countries in their transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.

Nigeria

In Nigeria, AFD has teamed up with the Institut du Développement Durable et des Relations Internationales (IDDRI) as part of the international *Deep Decarbonization Pathways* (DDP) initiative. This grant support the emergence of a Nigerian multi-disciplinary team at the Alex Ekwueme Ndufu Alike Federal University (AEFUNAI), to set up a process for co-building a long-term strategy for the country's inclusive, low-carbon and climate-resilient development.

LONG-TERM STRATEGY: SUBMITTED TO THE UNFCCC IN DECEMBER 2021

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BACKGROUND

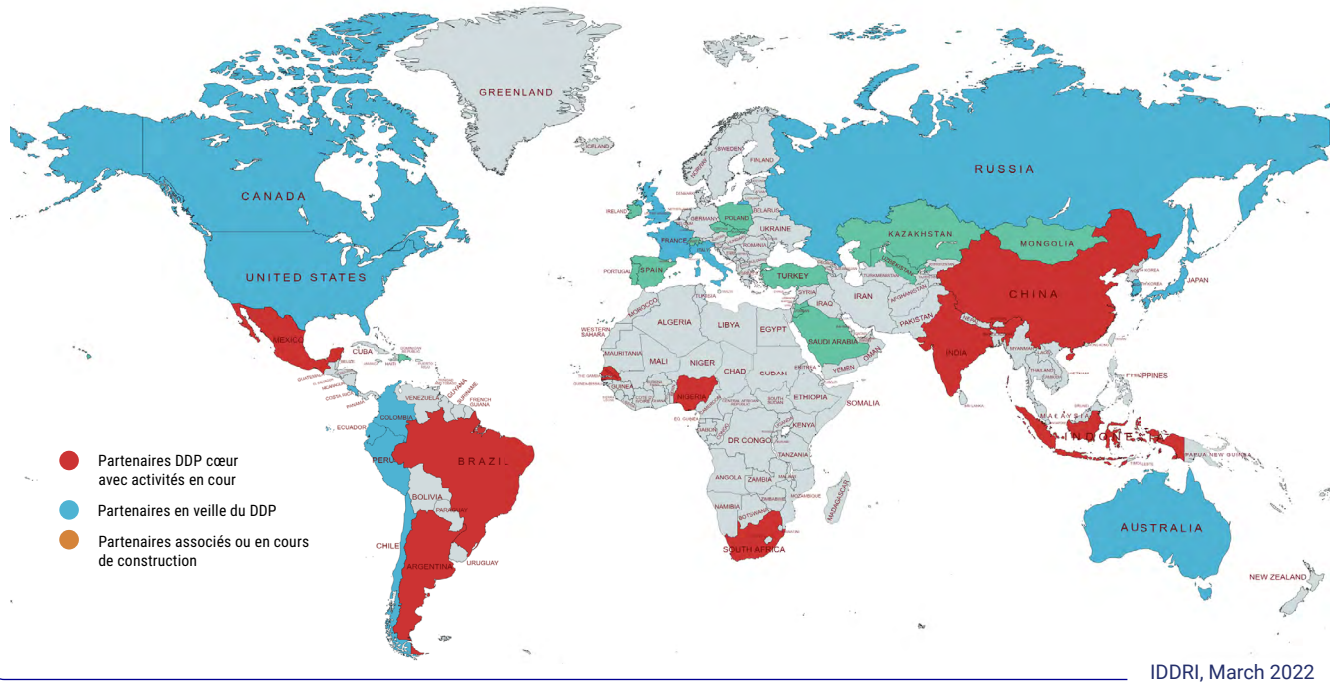
The International Deep Decarbonization Pathways (DDP) Initiative

The *Deep Decarbonization Pathways* (DDP) initiative is supported by a research network, with teams of national and international researchers whose aim is to help governments and non-state actors make the decisions needed to steer economies and societies towards a carbon-neutral world by the second half of the century. To achieve this, the teams:

- Draw up and analyze national pathways describing possible evolutions towards the joint achievement of socio-economic and climate objectives (carbon neutrality).
- And inform the decisions of players and stakeholders.

The work is led by a "country team" which proposes drawing up and analyzing national pathways and informing the decisions of players and stakeholders, in particular by strengthening research and expertise capacities.

The DDP network



IDDRI, March 2022

Low-carbon development pathways (DDP) in Nigeria

Nigeria is facing major challenges in terms of energy transition and reducing greenhouse gas emissions. The country is the economic powerhouse in its region and faces a number of socio-economic challenges as it looks set to become the third most populous country in the world by 2050 (World Bank). In addition, the country is highly vulnerable to the impacts of climate change, while its economy is heavily dependent on fossil fuel exports.

The country submitted its Nationally Determined Contribution (NDC) in 2015, and after updating it in 2021, wishes to develop a long-term strategy to prepare its economy for a low-carbon transition. Furthermore, Nigeria adopted the Climate Change Act in November 2021, which sets a net-zero target between 2050 and 2070. The law includes provisions for action plans to be adopted every five years.

DDP support in Nigeria emerged from this **convergence of interest in long-term strategy (LTS) foresight within AFD, the existing DDP initiative and a need expressed by the Nigerian Ministry of the Environment.**

KEY FIGURES

749,900 euros
AFD GRANT

2019 > 2024

SUPPORT IMPLEMENTATION PERIOD

- **A Nigerian team including 1 director, 5 researchers, 6 senior associate researchers and a 6-member advisory board.**
- **2 side events at COP26 and COP27**

HOW THE SUPPORT WORKS

Analysis of low-carbon development pathways in Nigeria

This support is structured around a Nigerian research team to develop a deep decarbonization pathway that is consistent with the country's development challenges. The purpose of this support is to:

- Establish a long-term commitment to low-carbon development pathways in a solid Nigerian research team.
- Conduct analysis on Nigeria's low-carbon transition.
- Disseminate and integrate the results into networks of national experts and decision-makers.
- Direct contribution to the Nigerian government's Long-Term Strategy development process and dissemination of the results to the international climate community to contribute to the global process under the Paris Agreement.
- Engage a reflection of a Nigerian development model in terms of the need for energy diversification and reducing inequalities.

This project consists of several phases:

- Setting up the support and building the team.
- Training the team to use the LEAP modeling architecture and the first phases of IMACLIM training (hybridization of national accounting and energy balance data, presentation of the KLEM precursor).
- Reviewing literature on sector-specific and cross-disciplinary issues, as well as collecting and analyzing data.
- Developing modeling tools and scenarios for consultation and contributing to drafting the LTS.
- Finalizing scenarios, an enriched model (on hybrid, multi-sector data with adapted macroeconomics), consultations, dissemination and domestic debate, with a focus on short-term political decisions as well as academic publications.

This support was also the subject of *side events* at COP26 and COP27.

ASSOCIATED STAKEHOLDERS

Various **stakeholders** were involved in this support, including:

- **The Federal Ministry of the Environment of Nigeria**, **the project** recipient.
- **IDDRI, the project's coordinating service provider,** whose role is to provide methodological support, liaise with the global DDP network and promote international climate discussions.
- **Alex Ekwueme Ndufu Alike Federal University**, by mobilizing a multi-disciplinary team **to implement the project**.
- **CIRED**, **contributing with the** IMACLIM method of hybrid engineer/economist modeling of transition pathways.
- **The *2050 Pathways Platform***, which **provides support for drawing up the LTS,** complementing the work done as part of this support.

In addition, there was coordination with the NDC planning and implementation working group.

EXPECTED IMPACT

What are the expected impacts of this support?

CREATING AND LEADING A PUBLIC POLICY DIALOG ON CLIMATE CHANGE

- AFD's grant for the analysis of low-carbon development pathways in Nigeria has enabled the structuring and coordination of a high-quality policy dialog with the various stakeholders involved in the program. In particular, a strong national ownership and an exclusively dedicated academic team, recognized for its work in climate governance, environmental policies and development, has enabled the involvement of the research community and Nigerian institutions (Federal Ministry of Environment, State Ministry of Environment, sectoral ministries, etc.), as well as greater visibility for the project.
- The project included meetings with various institutions and working groups and consultations are planned with local experts as part of developing modeling hypotheses and scenarios. In addition, the initial findings were presented to the international community at COP 27 in Sharm el-Sheikh in 2022.

EXPECTED IMPACT

BUILDING-CAPACITY OF LOCAL STAKEHOLDERS

- The support provided includes capacity building as a key component of the project. The project supports the emergence of a multi-disciplinary Nigerian team at AEFU-NAI that leads the process and co-constructs a long-term a long-term strategy with stakeholders for the country's inclusive, low-carbon, climate-resilient development.
- A lengthy process for co-building the support's logical framework enabled to determine the best intervention strategy, especially for the capacity-building aspect. This approach is based on ongoing collaboration with Nigerian stakeholders to implement and maintain skills development. In addition, training sessions on modeling tools (LEAP, KLEM and IMACLIM with CIRED) have been set up to build participants' capacity to create low-carbon development models at the national and regional levels.

SUPPORTING COUNTRY'S DECARBONIZATION EFFORTS

- The purpose of this support is to quantify goal the development pathways needed to achieve Nigeria's net-zero goal by 2060.
- In addition, the scientific and research community's participation is legitimates the initial results obtained and put in evidence the relevance of moving towards ambitious decarbonization and resilience paths.

MORE INFO

Deep decarbonization pathways in Africa (DDP-Africa) | IDDRI

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CAPITALIZATION REPORT

OVERVIEW OF A TYPICAL SUPPORT PROJECT

Support for developing a long-term low-emission development strategy (LT-LEDS) in Ethiopia

To support thirty of the most carbon-emitting or vulnerable developing countries in their transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.

Ethiopia

In Ethiopia, AFD financed its long term low emission development strategy (LT-LEDS) by 2050, a strategic framework document that the signatories to the Paris Agreement are urged to formulate and communicate.

LONG-TERM STRATEGY: PRESENTED AT COP27, COMMUNICATED TO UNFCCC

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BACKGROUND

Climate change in Ethiopia

Ethiopia is a low-emission LDC that is particularly vulnerable to the effects of climate change. With its population set to double over the next 30 years, Ethiopia is facing a major climate and demographic challenge and has decided to adopt a climate-resilient, long-term, low-carbon strategy to guide its development pathway and meet its international commitments.

The Ethiopian government committed to the climate agenda early on. Back in 2010, Ethiopia drew up a national *Climate Resilience and Green Economy* (CRGE) strategy, which served as the basis for its NDC (Nationally Determined Contribution).

This is why AFD wanted to support the Ethiopian government in formulating its climate-resilient, long-term, low-carbon strategy for 2050.

KEY FIGURES

1.1 million euro
AFD GRANT

24 months of
project implementation to support ministerial teams

- **7 technical working groups (5 sector-specific: Energy, Transportation, Agriculture, Forestry, Waste, and 2 cross-cutting: macroeconomics, adaptation) involving 32 experts appointed by the federal sectoral ministries, supported by international experts in sectoral and macroeconomic modeling.**

HOW THE SUPPORT WORKS

How can we support the development of a climate-resilient, low-carbon strategy?

In 2020, the Ethiopian government submitted a request to GGGI (*Green Growth Global Institute*), which has been involved in climate issues in Ethiopia since 2010, including the development of the CRGE strategy, to support it in drawing up its climate-resilient long-term low-carbon development strategy (LT-LEDS) for publication at the UNFCCC for COP27. As part of an AFD-GGGI partnership, the latter sought AFD funding for this support in Ethiopia and Burkina Faso. A grant agreement was signed with GGGI in May 2021, as well as an MoU (*Memorandum of Understanding*) between AFD, GGGI, and the Ethiopian Environment and Climate Change Commission, which will include the Ethiopian Ministry of Planning during the support period.

The project financed by AFD's 2050 Facility supports the entire LT-LEDS development process, from setting up the institutional organization until preparing the final document and its approval by the government, ensuring government ownership via:

- setting up technical theme-based groups involving staff from line ministries and the Planning Ministry (which has a special mandate for the Environment and Climate), and experts recruited by GGGI for training and modeling work.
- holding national workshops at different stages of the process, to encourage dialog and participation between various stakeholders.
- steering committees chaired by the Ministry of Planning.
- capacity-building support focused on modeling: the LEAP tool for the energy industry ; the EXACT and NEXT tools for the AFOLU sector ; and the GEM – *Green Economy Model* for macroeconomics incorporating adaptation. Gathering data and establishing and modeling BAU (business as usual) and mitigation scenarios were systematically co-built with national experts from the government ministries and numerous training sessions were held to ensure the tools would be subsequently appropriated and used.
- prioritizing investments based on a cost-benefit analysis of the actions identified for investment planning purposes.
- identifying potential sources of funding for implementing the LT-LEDS, including mobilizing climate finance.
- recommendations for setting up a system to monitor and evaluate the implementation of the LT-LEDS.
- support for drafting the long-term low-carbon strategy (LT-LEDS).

ASSOCIATED STAKEHOLDERS

This support was developed in partnership with various stakeholders, including:

- **Beneficiaries and local counterparts: the Ministry of Planning and Development in charge of overseeing the drafting of the LT-LEDS,** and the incorporation of climate actions into the planning of investment programs**; sectoral ministries** (agriculture and forestry, transportation, energy, industry, the Ministry of Planning's Environment Department) as part of working groups to build scenarios and model country's long-term pathways.
- **Representatives from regional ministries** also took part in some **national workshops.**
- **Technical partners: GGGI, *World Resources Institute* (WRI)**
- **Academia:** representatives of academia, research and think tanks were not sufficiently involved in the project.

EXPECTED IMPACT

What are the expected impacts of this support?

SUPPORTING COUNTRY'S CLIMATE GOVERNANCE BY SETTING LONG-TERM OBJECTIVES

- The support provided capitalized on previous work aimed at integrating climate into development strategies (CRGE, NDC, revised NDC), enabling GGGI to lead a technical discussion with the technical ministries involved and the Ministry of Planning (including the Environment) on long-term sectoral strategies for achieving Net0, based on long-term sectoral and macroeconomic modeling 2050 (horizon 2050). Depending on the actions implemented, the Net0 scenarios could be achieved by 2035 or 2050.

BUILDING STAKEHOLDER CAPACITY

- Support for drafting the LT-LEDS has strengthened the long-term modeling skills of teams from the sectoral ministries and the Ministry of Planning. In fact, the project was built by closely associating the technical teams of the ministries involved within theme-based groups, who were trained in the models used, in building by international experts recruited by GGGI. The ministry staff involved in this work especially appreciated being able to lead the modeling exercises, enabling them to master the tools, which is a change from previous exercises (CRGE, NDC...) carried out by consultants and mobilizing ministry experts mainly to provide data.
- In addition to involving technical experts from sectoral ministries, AFD has insisted on the need to broaden participation in training sessions on modeling tools and scenario building to include new sources of knowledge and decision-making levels (sub-national authorities, universities, think-tanks, research centers, private sector operators and civil society representatives). This approach contributes to the creation of multi-stakeholder platforms and encourages dialog between the various parties involved. It also reinforces the relevance of the assumptions, scenarios and actions decided upon, and their appropriation, by mobilizing other data and analyses enriched by multi-stakeholder discussions. This approach could only be touched upon during the course of the project.

SUPPORTING COUNTRY'S DECARBONIZATION AND RESILIENCE EFFORTS

- This work has enabled to draw up 3 pathways leading to Net0, which, depending on the measures adopted, could be achieved as early as 2035 (maximum ambition scenario) or in 2050 (scenario in line with the NDC, and late action scenario). The AFOLU sector, a major contributor to GHG emissions, is also the sector with the most carbon offset and capture actions to achieve net0. Other sectors (energy, transportation, waste, industry) will also contribute, but to a lesser extent.
- Adaptation has been integrated into the process of identifying sectoral mitigation actions.

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CAPITALIZATION REPORT

OVERVIEW OF A TYPICAL SUPPORT PROJECT

Analysis of the socio-economic impacts of climate change and adaptation strategies in Vietnam

To support thirty of the most carbon-emitting or vulnerable developing countries in their transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.

Vietnam

In Vietnam, AFD has supported the Department of Climate Change (DCC) of the Ministry of Natural Resources and Environment (MoNRE) and the Ministry of Planning and Investment to contribute to public policy dialog on the various socio-economic impacts of climate change and adaptation strategies for Vietnam up to 2050.

Special Report “Climate change in Vietnam – Impacts and adaptation”: Presented at COP26. Final Report “National Climate Change – Impacts and Adaptation”: Presented at COP27. Final Report “Mekong Delta Emergency”: Presented at COP27.

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BACKGROUND

Extreme vulnerability to climate change and the need to develop adaptation strategies

Vietnam is one of the world's most vulnerable countries to climate change. The Mekong Delta in the south of the country is particularly at risk from rising sea levels, but is also subject to significant local and regional anthropogenic pressures.

In this context, AFD has been committed for many years to supporting Vietnam in the design, development, and implementation of a long-term development strategy that reduces GHG emissions, conserves natural resources, and is climate-resilient to the adverse effects of climate change. In 2018, during the Vietnamese Communist Party Secretary General's official visit to the Elysée Palace, AFD and the Ministry of Natural Resources and Environment (MoNRE) signed a memorandum of understanding to agree on the roll out of support funded under the 2050 Facility.

We therefore propose using the Gemmes Vietnam macroeconomic modeling tool developed by AFD. The aim is to draw up a study on the various aspects of the socio-economic impacts of climate change and the adaptation strategies that could be implemented in the country, to help it build a climate-resilient development pathway.

KEY FIGURES

CLOSE TO
500,000 euros
IN GRANTS

AND A CONTRIBUTION OF
1 million euros
TO THE GEMMES PROGRAM

3 years: duration of the support

- **17 Vietnamese and European research institutes (French Research Institute for Sustainable Development, *Vietnam Institute of Meteorology, Hydrology and Climate Change*, Center for Hydro-Meteorological Technology Applications (Hymetec), *School of Industrial Engineering and Management* (IEM), *the Institute of Energy* (IE), *Institute of Labor, Science, and Social Affairs* (ILSSA), *Institute for Policy and Strategy for Agriculture and Rural Development* (IpSard), etc.)**
- **More than sixty researchers involved**

HOW THE SUPPORT WORKS

Modeling the socio-economic impacts of climate change and adaptation strategies in Vietnam

The 2050 Facility's support consisted of five main activities:

- **Implementation of a research program on climate change impacts and adaptation strategies in Vietnam**

  This activity is part of the GEMMES (GEneralized Monetary Macrodynamics for the Ecological Shift) applied research program, launched by AFD in 2015 and aimed at facilitating public policy dialog around climate-related issues and, more broadly, the green transition. The program is structured around two areas: participating in and contributing to the international climate debate (IPCC, COP, etc.), and building capacity to design, manage, and assess public climate policies in partner countries. The GEMMES Vietnam research program focused both on diagnosing the physical and macroeconomic impacts of climate change in Vietnam, in conjunction with other local anthropogenic pressures, particularly in the Mekong Delta, and on studying various adaptation strategies.

- **Integrating climate change into national socio-economic development plans at the Ministry of Planning between 2019 and 2022**

  This project, led by a team of European and Vietnamese experts under the aegis of SUEZ consulting, focused on integrating climate change issues into Vietnam's socio-economic strategy documents for 2021-2030, its development plan for 2021-2025, and its medium-term investment plan for 2021-2025. Sectors with significant integration potential for climate change adaptation and mitigation include industry and commerce, agriculture and forestry, construction, transportation, water resource management, and the environment.

- **Implementation of the Support Program for Response to Climate Change (SP-RCC) and recommendations for the development of the NDC-ISP**

  The 2050 Facility funded a study by the Institute for Strategy and Policy on Natural Resources and the Environment (Isponre) to assess all the climate change support programs (SP-RCC) produced between 2009 and 2020. The study resulted in recommendations on an effective roadmap, a mechanism for coordination, monitoring and reporting, and the mobilization of resources to support national climate targets.

- **Support for the development of a regional climate change adaptation strategy for the mountainous region of northern Vietnam**

  The 2050 Facility funded a study led by local experts to build the scientific terms supporting a climate change adaptation strategy for the mountainous region of northern Vietnam that will be released by the Vietnamese government. This involves rolling out national climate adaptation objectives at the regional level. The study should be completed by the end of 2023.

- **Support for the theme-based working groups of the National Steering Committee for implementing the COP26 net-zero commitments.**

  This initiative supports expert assessment work related to strategies, coordination, and monitoring of the implementation of economic decarbonization objectives initiated at COP26. This support will help to implement the long-term low-carbon development strategy in Vietnam. The project is also being coordinated with GIZ and JICA for the same area.

ASSOCIATED STAKEHOLDERS

Various **stakeholders** were involved in this support, including:

- **The National Steering Committee on the implementation of COP26 commitments** (COP26 steerco), mainly led by MONRE and including all ministries, notably the **Ministry of Planning and Investment and the Ministry of Agriculture and Rural Development**.
- **A scientific research community on climate change** in Vietnam, in cooperation with French research units from the **CNRS, INRA,** and **IRD** and **researchers from other countries** (over sixty researchers involved).

EXPECTED IMPACT

What are the expected impacts of this support?

CREATING AND LEADING A PUBLIC POLICY DIALOG ON CLIMATE CHANGE

- The Facility's support provided MONRE with data and analyses relating to the area of adaptation, and facilitated dialog with donors (UNDP, UK, Italy, Germany, and Japan) through various working groups and forums (energy, agriculture, transportation, and the Mekong Delta). The scientific output and results of the GEMMES study have been widely shared. Climate change could have significant impacts on a variety of sectors as diverse as health (increased mortality rate, higher incidence of infectious diseases), agriculture, energy, total factor productivity or labor productivity...the cumulative direct economic impact on these sectors represents an annual average of 1.8% of GDP in the event of a temperature rise of 1°C compared to the pre-industrial period 1851-1900. This loss becomes 3.1% for an increase of 1.5°C, 4.4% for an increase of 2°C and up to 8.1% for an increase of 3°C. In addition, through this support, AFD is assisting in the design and implementation of the country's public climate policies, through its collaboration with the DCC/MONRE and the Prime Minister's right-hand man on climate issues.

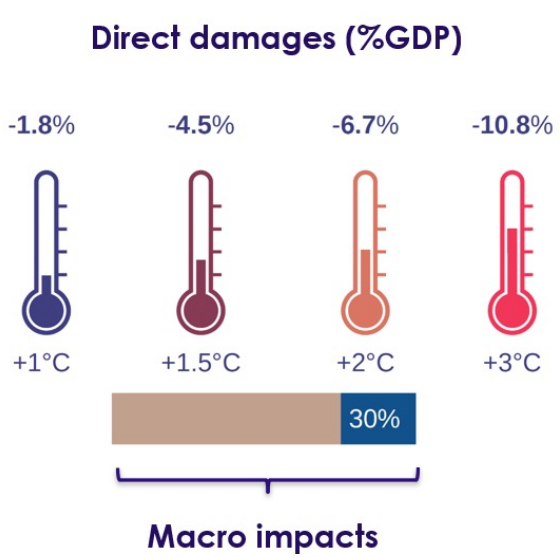
BUILDING STAKEHOLDER CAPACITY

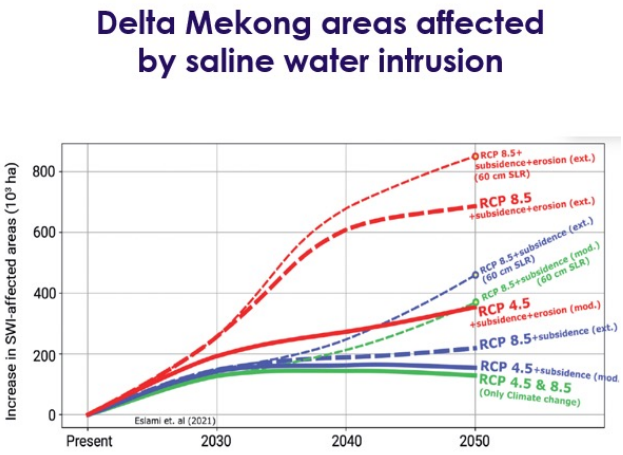
- Capacity-building in the field of research has led to the creation of a network of Franco-Vietnamese researchers (theses, post-docs, seminars, and training courses). Thirteen webinars were held between March and June 2022, attended by over 80 experts. Five additional webinars took place during for Q1 2023 to present the two final GEMMES reports.
- The support helped build interministerial dialog and collaborative, participatory work, integrated since the support's desinging phase. In fact, inter-ministerial workshops were held to include the various sectoral ministries. The macroeconomic model was rolled out to the ministries in 2022. These workshops were essential in organizing the transfer and sharing of knowledge on the various subjects included in the modeling.

SUPPORTING COUNTRY'S DECARBONIZATION AND RESILIENCE EFFORTS

- As part of this support, AFD took part in discussions on the country's Long-Term Strategies (LTS). Specifically, Vietnam announced a net-zero commitment at COP26 (2021). This commitment was confirmed by the publication of the National Climate Change Strategy for 2050 in July 2022 (Decision No. 896/QD-TTg).
- At COP27, French and Vietnamese researchers presented a final report outlining different socio-economic scenarios for Vietnam looking ahead to 2050 with regard to climate change, and proposing relevant solutions to support a climate-resilient economic development pathway for Vietnam.
- Finally, in December 2022, Vietnam also signed a JET-P (Just Energy Transition Partnership), which addresses net-zero commitments and resilience issues.

Main results





Vietnam GEMMES Project Presentation, AFD (COP26 - November 2021)

MORE INFO

- Overview of AFD GEMMES activities in Vietnam
- Mekong Delta Emergency
- Publication Climate Change in Vietnam - Impacts and adaptation: National Climate Change Impacts and Adaptation - Final Report | AFD - Agence Française de Développement
- Vietnam's Updated NDC
- JET-P Policy Statement

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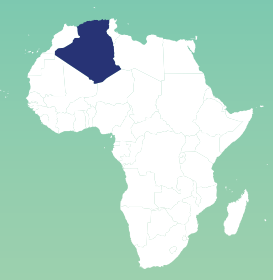
CAPITALIZATION REPORT

OVERVIEW OF A TYPICAL SUPPORT PROJECT

Developing energy/economy modeling in Algeria

To support thirty of the most carbon-emitting or vulnerable developing countries in their transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.

Algeria



Wishing to benefit from this tool, the Ministry of Mines and Energy submitted a request to AFD in 2018 to set up technical cooperation on modeling its energy transition and development pathway for 2050.

LONG-TERM STRATEGY: ONGOING

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BACKGROUND

A much-needed energy transition in Algeria

Algeria is one of the world's leading oil and gas exporters and its economic model is heavily dependent on hydrocarbons. Resources are dwindling and domestic energy demand has risen sharply since the early 2000s. In addition, the country has significant potential for developing alternative energy sources, whether non-conventional fossil fuels (which are more difficult to exploit) or renewable energy sources, and is faced with strategic choices regarding the allocation of these resources.

In order to improve its citizens' quality of life, Algeria faces a major challenge: increasing the quality of its energy services, while at the same time diversifying its energy mix and changing its economic model, which would enable it to strengthen its development while protecting the environment and meeting its international climate commitments.

It is in this context that the Ministry of Mines and Energy and AFD decided to kick off a technical cooperation project in 2018 that aims to explore long-term alternative energy futures for Algeria.

KEY FIGURES

1 million euro
AFD GRANT

2019 > 2024

5-YEAR SUPPORT
for the Ministry of Energy's teams, including energy sector stakeholders

- **Modeling 4 energy transition scenarios using the EnerNEO techno-economic model and transferring the model over to the Ministry.**
- **Development of an IMACLIM macro-economic model coupled with the EnerNEO model to refine energy transition scenarios**

HOW THE SUPPORT WORKS

What energy transition modeling tools are needed?

The main objective of this cooperation is to prepare and transfer a simulation model of the Algerian energy sector (EnerNEO-Algeria model) to the Directorate General of Studies and Forecasting (DGEP) of the Ministry of Energy. It also aims to use this model to conduct a long-term prospective energy/climate analysis by 2050,, based on four transition scenarios, and thus help identify the actions and measures to be implemented. The IMACLIM model, which was developed in conjunction with the Ministry and ENSSEA, was paired with the EnerNeo model.

1 *Reference*

A scenario based ***on current trends***

2 *Hydrocarbons option*

A scenario based mainly on ***the use of fossil fuels***

3 *Transition*

A scenario focused on energy efficiency and renewables. *It includes the key renewable energy development measures announced by the Government (Action Plan, February 2020).*

4 *Ambition 2°c*

A scenario whose objective is ***a pathway consistent with the spirit of the Paris Agreement****: around 1.6-1.7tCO2 per person by 2050.*

Support is provided in two main areas:

1. Techno-economic modeling of the energy transition

- This involves preparing and transferring a simulation model of the Algerian energy sector (EnerNEO-Algeria model) to the Ministry, and using this model to carry out a long-term energy/climate forecast analysis (2050), based on four transition scenarios.

2. Modeling the energy transition's macro-economic impacts

- This area aims to double the energy system modeling capacity provided by the EnerNEO model, with a macro-economic modeling capacity designed to be paired with it: the IMACLIM-DZA model. These operations are systematically designed as training courses for DGEP staff and include:
  - collecting and processing data to create a hybrid energy/economy grid guaranteeing the consistency of the EnerNEO and IMACLIM models.
  - collecting and processing macro-financial data to extend IMACLIM-DZA to a consistent stock-flow model (SFC).
  - processing of household survey data to break down the household category of the national accounts into interest groups.
  - co-development and familiarization with the precursor KLEM-DZA (two-sector aggregation) and then the complete multi-sector model IMACLIM-DZA, for exploring macroeconomic scenarios to frame the technical-economic scenarios generated by EnerNEO, through coupling with the latter model.

ASSOCIATED STAKEHOLDERS

This support was developed in partnership with various stakeholders.

- **The beneficiary: the Directorate General of Studies and Forecasting (DGEP) of the Ministry of Mines and Energy** is the main beneficiary of the support provided. The Ministry appointed a dedicated team of modelers to oversee the steering and implementation of the support.
- **The associated stakeholders:** several Algerian stakeholders were involved in co-building the modeling scenarios: **public companies involved in the energy sector (SONELGAZ, SONATRACH, and Naftal), the National Agency for the Promotion and Rationalization of Energy Use (APRUE), the Commission for the Regulation of Electricity and Gas (CREG),** and the ongoing development of the macroeconomic model **(CNESE, ONS, Central Bank, and Ministry of Finance).**.
- **University partners:** Academic and research partners are also collaborating to develop and monitor the models, including Algeria's **ENSSEA (National Higher School of Statistics and Applied Economics)**. In addition, an Algerian doctoral student and her thesis supervisor were involved in the project.
- **Technical service providers:** an economic consulting firm specialized in the energy and environment sector (Enerdata) as part of a joint research program including the International Center for Research on Environment and Development (CIRED UMR CNRS 8568), and the Society of Applied Mathematics and Human Sciences (SMASH), specifically involved in the 2nd area of support (macroeconomic modeling).

EXPECTED IMPACT

What are the expected impacts of this support?

CREATING AND LEADING A PUBLIC POLICY DIALOG ON CLIMATE CHANGE

- The support provided has made it possible to build a framework for public policy dialog on climate within the Ministry of Mines and Energy, and to encourage multi-stakeholder discussions on long-term transition issues. Specifically, this technical cooperation project involved a participative and collaborative approach between the DGEP and associated stakeholders (APRUE, CREG, public companies, Ministry of Finance, central bank, etc.). Two workshops to present the cooperation's interim results were attended by a wide range of technical and political stakeholders.

BUILDING STAKEHOLDER CAPACITY

- Capacity-building is the core focus of the support provided to the Directorate General of Studies and Forecasting (DGEP) to conduct forecasting exercises on the energy transition and development pathway by 2050. For each of these stages, departmental managers are involved in developing the models and are trained in their use. The monitoring and scenario-building role has been strengthened by training managers not only in the use of a technical model, but also in the pairing of sectoral (energy systems) and macro-economic models. In addition, this support has been developed over time, incorporating changes that have occurred as research and modeling work on energy transitions has progressed. As such, the Phase 2 research group included the Phase 1 technical partner to ensure that the models are properly coupled over time.
- Finally, a strong link has been established with the research community by mobilizing ENSSEA's CIRED (UMR CNRS). The involvement of French researchers has led to strong collaboration with Algerian academia. Capacity transfer was ensured by involving ENSSEA, where an Algerian doctoral student and her thesis supervisor were involved.

SUPPORTING COUNTRY'S DECARBONIZATION AND RESILIENCE EFFORTS

- The energy scenarios developed with the support of the EnerNeo and IMACLIM models are intended to provide food for thought on Algeria's energy future and to help the country formulate ambitious energy transition scenarios. Specifically, the "2°C Ambition" scenario was developed using a *backcasting* approach targeting CO_2-energy emissions of around 1.7 tCO_2/cap, in line with a global reduction pathway leading to a temperature rise limited to 2°C by the end of the century. This scenario is therefore highly ambitious in terms of the deployment of renewable, low-carbon energy sources and the implementation of policy mixes (optimal combinations of economic policy instruments) mobilizing various public policy levers (investment, pricing and taxation policy, standards and regulations). This scenario specifically provides Algeria with the tools it needs to set up a framework to encourage high-performance energy technologies, developing renewable energies, and zero-emission greenhouse gas equipment.
- The macro-economic modeling resulting from the 2nd phase will produce the framework for the energy scenarios developed during the 1st phase, and specifically estimate their impact in terms of growth and major macro-economic balances (balance of goods and services, public deficit, unemployment rate, average household purchasing power), as well as structural change (sectoral composition of business) and income and consumption distribution (household class modeling). These results are part of the structuring tools needed to establish an ambitious yet realistic national pathway towards a low-carbon future. By funding this project, AFD aims to provide the Algerian government with the keys it needs to build an ambitious strategy for 2050.

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UN OUTIL AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

CAPITALIZATION REPORT

OVERVIEW OF A TYPICAL SUPPORT PROJECT

Support for E2050, Colombia's long-term climate strategy

To support thirty of the most carbon-emitting or vulnerable developing countries in their transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.

Colombia

In Colombia, AFD supported the development and implementation of the E2050 strategy through 3 projects consolidating Colombia's ambitious positioning for 2050 and exploring the risks and opportunities of a low-carbon transition for the Colombian economy and financial system.

LONG-TERM STRATEGY: SUBMITTED TO THE UNFCCC IN 2021

#MondeEnCommun

BACKGROUND

A participatory approach to a strong commitment to combating climate change

Between 2019 and 2021, the E2050 strategy development process was led by the Ministry of the Environment and Sustainable Development (MADS), the National Planning Department (DNP) and the Ministry of Foreign Affairs (Cancilleria), with the support of a team recruited by Expertise France as part of the support funded by AFD via the 2050 Facility. The various activities resulted in the long-term strategy being published and submitted to the UNFCCC in 2021. This open, participatory process followed the methodological approach defined in the roadmap approved by the Intersectoral Commission on Climate Change (ICCC) in September 2019. It also involved the IADB, UNDP and WRI, which were involved in steering the process and also contributed expertise and financial resources to the project.

AFD supported Colombia through 3 successive grants between 2020 and 2022, for a total subsidy of €1.8 million. The three support grants are shown below:

	1. SUPPORT FOR DEVELOPING THE E2050 STRATEGY	2. CONDUCTING A "TRANSITION RISKS" STUDY	3. SUPPORT FOR E2050 STRATEGY IMPLEMENTATION
Signing an MoU	July 2020	01/21/2021	01/27/2022
Duration	1 year	6 months	1 year
Funding	€900 k	€550 k	€400 k

HOW THE SUPPORT WORKS

1.Support for developing the E2050 strategy

The funding for the first project, aimed at developing Colombia's long-term strategy as defined in Article 4.19 of the Paris Agreement, was part of a cooperation program linked to a territorial development funding from the French to Colombian government. to the Colombian government. The various initiatives undertaken as part of this first support program funded by the 2050 Facility were divided into four components:

- identifying and assessing transformative actions (investments, changes to the legal system, economic instruments, social projects, etc.) contributing to climate-resilient, low-carbon development in Colombia.
- detailed characterization and modeling of adoption and deployment pathways for prioritized actions.
- additional studies (mainly to analyze the economic and financial impacts of the recommended actions and pathways).
- drafting a technical document consolidating and integrating the identified actions and pathways, as well as the results of the consultation process, and drafting a more political summary document corresponding to Strategy 2050.

The E2050 Strategy is made up of 48 transformation options and 195 ambition references (quantitative indicators), divided into 9 themes (referred to as "bets for the future").

KEY FIGURES ON PARTICIPATION:

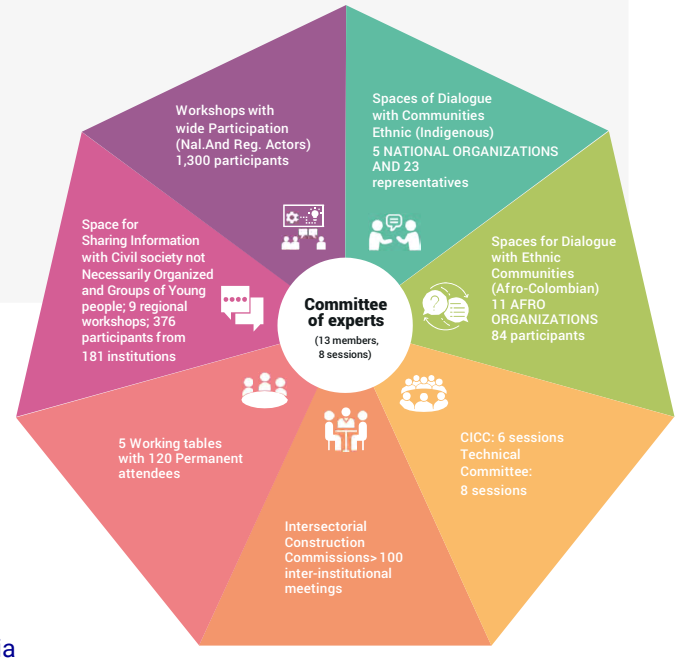
Over the 22 months of work, the participative process for developing E2050 involved a large number of meetings with a wide variety of stakeholders from government, the private sector, academia, local authorities, and civil society:

More than 2,100 people from 500 institutions (public, private, civil society, ethnic communities) were involved in over 300 working meetings (workshops, bilateral meetings, debates, commissions, etc.).

- **More than 1,300 people** took part in disclosure meetings held in Bogotá and the surrounding region.
- **Discussions** were held with 23 representatives of 5 organizations representing ethnic communities (indigenous peoples).
- Dialog sessions were set up with 84 representatives of 11 ethnic community organizations (Afro-Colombians and indigenous communities).
- Dialog spaces with representatives of civil society and young people were also held (9 regional workshops attended by 376 participants from 181 institutions).

The process also led to several inter-ministerial coordination forums:

- **5 inter-ministerial forums** were held with over 120 participants.
- 8 technical committee sessions of the Intersectoral Commission on Climate Change (ICCC) and 3 ICCC sessions at the ministerial level (including approval of the E2050 document).
- Several bilateral working meetings between Expertise France and AFD at the Minister and Vice-Minister level (of the Environment) and at the Presidential level.
- The creation of a committee of experts, the driving force behind a genuine cross-disciplinary dialog between various stakeholders and sectors.



Communication and mobilization efforts ensured strong media coverage in national media and via social networks, as well as at the E2050 launch event at CoP26 in Glasgow (more than 53 publications in national and international media). An Actúa E2050 Colombia competition was held to encourage innovative regional initiatives to counter the effects of climate change. Finally, communication tools for the general public were deployed, including the creation of a Youtube channel and some twenty podcasts, and the publication of a book for young people entitled "vientos de cambio - una historia de carbono neutralidad" (meaning "winds of change - a carbon neutrality story").

2. Conducting a "transition risks" study

In addition to the initial support, a specific study was funded to provide an innovative microeconomic analysis and quantify the transition risks and impact on the Colombian economy of a significant drop in coal and oil mining activities, which today account for 60% of the country's exports. The study, conducted by Willis Tower Watson and the "Regional Center for Sustainable Finance - CFS" of the University of Los Andes, highlighted the effects on the stability of the financial system, the balance of public finances, and the impact on workers, local governments, businesses and territories particularly at risk. It also offers a series of recommendations for mitigating these risks and the impacts of the low-carbon transition.

3. Support for implementation

Finally, a third area of support was provided for implementing E2050 through capacity-building (public and private sectors) and raising public awareness. The implementation of the first measures, notably concerning the sectoral policies to be modified, was accompanied by work with the National Planning Department to draw up a summary document of the long-term climate challenges, which will provide the technical basis for preparing the next National Development Plan (after the presidential elections in 2022). Methodological guides for drawing up Integrated Sectoral or Territorial Climate Change Management Plans have been produced with MADS and UNDP.

EXPECTED IMPACT

What are the expected impacts of this support?

CREATING AND LEADING A PUBLIC POLICY DIALOG ON CLIMATE CHANGE

- Since 2015, AFD has positioned itself as a strategic partner of the Colombian government for developing public policies linked to the environmental and climate transition, with six public policy loans (2015, 2016, 2018, 2020, 2021 and 2022) directly linked to defining and implementing policies and reforms that include climate co-benefits. These loans, accompanied by grant-funded technical cooperation programs, have demonstrated their impact in terms of supporting reforms and strengthening the country's strategic and regulatory framework.
- Support from the 2050 Facility has also helped to strengthen the public policy dialog between AFD, DNP, the Ministry of Finance, and line ministries involved (Environment, Mines and Energy, etc.), not only in terms of budgetary funding, but more generally, positioning AFD as an innovative, high-quality stakeholder in transition risk issues.
- Over the course of the various support programs, public policy dialog has been built up and facilitated at different levels of governance, through a truly collaborative effort involving a wide range of stakeholders in the country's low-carbon strategy.
- For the elaboration of the strategy, many institutions were involved in the project's elaboration: the Interministerial Commission on Climate Change, involving 15 ministries; an E2050 Project Steering Committee, involving the Ministry of the Environment, the Ministry of Planning (DNP), AFD and Expertise France; a Project Technical Committee; and, finally, consultation groups involving public, private, academic, and civil society stakeholders. The participatory process made it possible to build a shared vision of the future, which achieved a high level of acceptance at different territorial and sectoral levels. Although the establishment of an interministerial working group is not directly linked to the initiation of AFD's support, but to a pre-existing national framework, the fact remains that AFD's support has made it possible to structure and support the steering of this organization, through a dedicated steering team of 10 people recruited by Expertise France and funded directly by the 2050 Facility.

BUILDING STAKEHOLDER CAPACITY

- The high level of participation in E2050 development has contributed to capacity building. The E2050 strategy coordination team recruited by Expertise France has helped coordinate E2050 with the various projects and academic, public, and private initiatives contributing to the decarbonization of Colombia.
- Capacity building for model mastery also benefits from interaction with an AFD research project (2018-2022) with the National University (UNAL), the DNP, and the Ministry of Finance for setting up and using a GEMMES Colombia model (not funded by the 2050 Facility). In September 2022, the DNP published an economic report using the GEMMES* model, as well as other analysis documents.

SUPPORTING COUNTRY'S DECARBONIZATION AND RESILIENCE EFFORTS

- AFD and Expertise France's support the DNP and the Ministry of the Environment led to the passing of law no. 2169, the "Climate Action Law" in December 2021, which enshrined the objectives of the NDC in law (with a much higher level of ambition in 2020), as well as the goal of carbon neutrality by 2050 and the adoption of sectoral "carbon budgets" for the period 2020 to 2030 by 2023 at the latest.
- Finally, work on developing E2050 was aligned and coordinated with the Colombian NDC process. Building the E2050 was based on the pathway that has been established technically, but above all politically, by the NDC, with the goal of achieving the -51% target by 2030.
- The E2050 strategy is now the roadmap for the country's transition to a low-carbon economy, while incorporating the challenges of climate change adaptation and disaster risk management. It will need to influence all development plans (drawn up every 4 years), NDC updates, and planning policies and instruments (sectoral and territorial) impacting country's climate resilience and carbon neutrality objectives by 2050.

MORE INFO

- e2050colombia.com
- LTS available on the UNFCCC's website
- Film
- An Approach To Decarbonization Using The GEMMES Model, Economic Studies Office, National Planning Department, n547, September 2022.

GEMMES (GEneralized Monetary Macrodynamics for the Ecological Shift) is an applied research program launched by AFD in 2015 that aims to facilitate public policy dialog around climate-related issues and, more broadly, the green transition.

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CAPITALIZATION REPORT

OVERVIEW OF A TYPICAL SUPPORT PROJECT

Support for implementing Costa Rica's 2050 National Decarbonization Plan

To support thirty of the most carbon-emitting or vulnerable developing countries in their transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.

Costa Rica

↘ **In Costa Rica, AFD is helping to implement the strategy of one of the leading countries in combating climate change.**

↘ **LONG-TERM STRATEGY**: SUBMITTED TO THE UNFCCC IN DECEMBER 2019

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BACKGROUND

A strong commitment to decarbonization

Costa Rica is a member of the V20 group, which includes 20 countries that are highly vulnerable to climate change. Also proactive on of biodiversity and forests, the "Champion of the Earth" award presented by UN Environment in September 2019 had praised Costa Rica's skills in sustainable development and highlighted the urgent need to find solutions for climate change.

In fact, on February 24, 2019, President Carlos Alvarado's government presented its National Decarbonization Plan (NDP). This was a bold, real-world plan, which aims to make Costa Rica a carbon-free country by 2050. The NDP was communicated to the UNFCCC on 12/12/2019 as a long-term strategy under the Paris Agreement.

At the same time, AFD granted Costa Rica $150 million in public policy budgetary funding (BF-PP) to support the government in implementing the NDP, co-financed ($230 million) with the Inter-American Development Bank (IDB). AFD and IDB therefore initiated a dialog with the Costa Rican government on the priority areas of the NDP (transportation, AFOLU sector), as well as on cross-cutting issues such as the institutional, regulatory, and financial framework for implementing the NDP. A second "Decarbonization" BF-PP was signed in October 2022, as a continuation of the first BF-PP (based on medium-term indicators already defined at the start of the first BF-PP).

Other grants via the FAPS project preparation fund (€750,000) and FEXTE technical expertise (€695,000) have also been used for "climate" issues. Costa Rica was also part of the DDP LAC (Deep Decarbonization Pathways Project in Latin America), led by IDDRI and supported by IDB and AFD, which contributed directly to the NDP.

KEY FIGURES

735,000 euros
AFD GRANT

2021
START OF THE SUPPORT

HOW THE SUPPORT WORKS

How can we support the implementation of an ambitious strategy?

The grant awarded by the 2050 Facility has provided essential support to help institutions structure themselves and put in place the tools needed to implement the NDP over the long term: organizational support for the Ministry of the Environment and Energy (MINAE), and particularly for the unit in charge of combating climate change, consolidation of the Measure/Notify/Verify (MNV) mechanism created in September 2019 to support sector-wide implementation of the NDP and its SINAMECC platform, development of a mechanism for monitoring the results of the NDP, capacity-building and support for the climate change unit of the Ministry of Agriculture and Livestock (MAG).

The activities funded are declined into 3 main categories:

- 1. Organizational support for the Ministries of Environment and Energy (MINAE) and Transportation and Public Works (MOPT) to implement the NDP.
- 2. Support to improve the quality and transparency of the MNV system and monitor NDP results.
- 3. Capacity-building within the MAG unit in charge of combating climate change, including consolidation and planning of climate actions in the agricultural sector and coordinated monitoring of all NAMAs* implemented in the agricultural sector, i.e. the existing coffee and livestock NAMAs and 3 additional NAMAs being prepared: rice, sugarcane, and plantain.

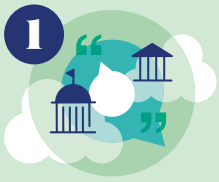
ASSOCIATED STAKEHOLDERS

The main stakeholders involved in this project are:

- **The beneficiaries: MINAE/DCC, MAG, MINSALUD, MOPT**
- **Technical partners:** support was mainly implemented under AFD project management with delegation to a local organization, the NGO Costa Rica Por Siempre, recruited by AFD in March 2021.

EXPECTED IMPACT

What are the expected impacts of this support?



STRENGTHENING CLIMATE GOVERNANCE THROUGH INSTITUTIONAL AND TECHNICAL SUPPORT FOR IMPLEMENTING THE NATIONAL DECARBONIZATION PLAN

- AFD's proposal to fund organizational support and the MNV mechanism was a major contribution to the public policy dialog initiated with this first BF-PP funding (150 million USD) in Costa Rica, and AFD proposed to include these themes in the public policy matrix of its loan, jointly with the IADB. Joint management of the public policy matrix with the IADB was a source of leverage in the strategic dialog and enabled to reach the desired level of participants.
- Technical and strategic discussions were regular and fruitful with MINAE and MAG, but more difficult with the Ministry of Transportation (MOPT). However, more technical studies have been published to reinforce actions taken in the transportation sector: Development of a roadmap for managing electric vehicle batteries (beneficiaries: MINSALUD and DCC/MINAE), Reinforcement of the "MRV" system for GHG emissions from the transportation sector (beneficiary: DCC/MINAE), long-term monitoring and integration into the SINAMECC platform, air quality aspects (beneficiary: MINSALUD, MINAE)
- AFD's support has contributed to a number of official documents: the study on the job potential of decarbonization in Costa Rica, financed via the F2050 DDPLAC, was used to draw up the 2050 National Strategic Plan (PSN) for implementing the NDP, and the revised National Adaptation Plan was published in 2022.
- However, not all the proposals for reform made by the technical assistance team were acted upon, such as creating the Energy and Environmental Transition Planning Office (SEPTEA), which failed to come to fruition after the change of government in May 2022 (in a break with the policy directions set by the previous government in the climate sector).

* Nationally Appropriate Mitigation Actions. See also https://nama-facility.org/projects/

BUILDING STAKEHOLDER CAPACITY

- A series of consultations helped improve i) data visualization for the National Greenhouse Gas Inventory (INGEI) published online on the SINAMECC website, ii) analysis and integration of INGEI data, "Carbon Neutral Country Program" (CNCP) data and waste sector data from 1990 to 2020.
- The DDP LAC's support (besides of dedicated 2050 Facility funding) and the participation of the University of Costa Rica are helping to build capacity in modeling and the national roll out with Sweden's KTH Institute of the OSeMOSYS (Open Source energy Modeling System) tool.
- French expertise (CIRAD, I4CE, CITEPA, etc.) was mobilized through technical support and peer-to-peer exchanges (green budget, MRV systems).
- A seminar led by Expertise France provided training on how to draw up and implement a "green budget" to identify public spending on climate and biodiversity (I4CE study, June 2021).
- CIRAD and the Costa Rican Tropical Agricultural Research and Higher Education Center (Catie) were responsible for technical assistance on two components of the project:

  > reinforcing the national system for monitoring land use and ecosystems (Simocute) and ensuring its ownership by institutional partners.

  > developing a tool to assess the ecosystem services rendered by regions benefiting from payment for environmental services (PES) funded by the French National Forestry Financing Fund (Fonafifo).

SUPPORTING THE COUNTRY'S DECARBONIZATION AND RESILIENCE EFFORTS

- Costa Rica submitted its revised NDC in December 2020, with a consistent target in the National Decarbonization Plan to achieve carbon neutrality by 2050 and with the 1.5°C pathway.
- In terms of adaptation, the NDC aims to strengthen the country's social, economic, and environmental resilience to the effects of climate change through capacity building and information for decision-making, the inclusion of adaptation criteria in funding and planning instruments, the adaptation of public services, production systems and infrastructures, and the implementation of nature-based solutions.

MORE INFO

- Getting to Net-Zero Emissions - Lessons from Latin America and the Caribbean, IDB
- PNA
- Link to a study on green jobs, AFD and University

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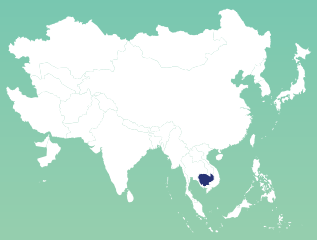
CAPITALIZATION REPORT

OVERVIEW OF A TYPICAL SUPPORT PROJECT

Modeling Cambodia's energy sector for 2050

To support thirty of the most carbon-emitting or vulnerable developing countries in their transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.

Cambodia



In Cambodia, AFD is supporting the General Department of Public Policy of the Ministry of Economy and Finance (MEF) to develop a long-term energy pathway modeling tool, to provide input for public policy dialog in the energy sector.

LONG-TERM STRATEGY: SUBMITTED TO THE UNFCCC IN 2021

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BACKGROUND

Plenty of challenges, but a strong commitment to combating climate change

The Kingdom of Cambodia is facing a number of challenges in the energy sector: meeting the needs generated by the various industrial sectors driving the kingdom's economic growth, ensuring access to electricity for everyone as well as energy security, and diversifying the sources of energy currently derived mainly from biomass combustion. The growth trajectory of the energy sector is a major challenge for the Kingdom and must anticipate various climate change impacts in a particularly vulnerable country.

In terms of combating climate change, Cambodia has been making commitments since 2013 with the drafting of the *Cambodia Climate Change Strategic Plan 2014-2023* and is striving to systematically integrate climate change into planning documents.

A signatory to the Paris Agreement, the Kingdom of Cambodia ratified an initial Nationally Determined Contribution (NDC) in 2016, then published an updated version in 2020. The NDC sets out ambitious targets for reducing GHG emissions, as well as a strategy for adapting the country's national policies and strategies in this respect, including those relating to energy.

At the *United Nations Climate Ambition Summit* in 2020, the Prime Minister also commissioned a multi-sector *Long Term Strategy For Carbon Neutrality (LTS4CN)*. The exercise was led by Cambodia's National Council for Sustainable Development to propose an ambitious pathway for development goals and carbon neutrality by 2050. To date (January 2023), Cambodia is one of 57 countries to have submitted its long-term strategy to the UNFCCC. It is the third LDC (after Benin and Nepal) to do so and the second LDC (after Nepal) to submit a strategy with clear carbon neutrality objectives. Emissions from the energy sector are set to rise significantly between now and 2050, making it a key sector for the carbon neutrality strategy. The LTS4CN mentions the need to improve energy efficiency in industry and buildings, to transition energy sources in various sectors (industry, transportation, electricity, etc.), and to increase the share of renewable energies.

In this context, AFD signed a memorandum of understanding with the Ministry of Economy and Finance in 2020 to support Cambodia in structuring ambitious pathways, especially where energy is concerned.

KEY FIGURES

300,000 euro
AFD GRANT

2 years
DURATION OF THE SUPPORT

- **Modeling of 4 energy sector scenarios**
- **5 key players in a technical coordination group**

HOW THE SUPPORT WORKS

Modeling the energy sector for 2050

The aim is to develop a long-term energy pathway modeling tool, to spark and foster multi-stakeholder policy dialog in the energy sector. There are three specific objectives to this support:

- To develop a robust, accessible, and easy-to-use Excel-based modeling tool capable of aggregating input data* and existing studies to model the supply and demand dynamics of the main energy types for at least 10 end-use sectors.
- To design and model four long-term energy transition scenarios leading up to 2050:
  - *Business as Usual* (benchmark scenario before a change in public policy).
  - Current policies (projection of the impact of policies currently being implemented or most likely to be implemented).
  - Sustainable Development 1 (SD1), to achieve the NDC objective through diversified generation and highly ambitious energy efficiency.
  - Sustainable Development 2 (SD2), to achieve the NDC objective via an energy shift to electrification and increased deployment of renewable energies.
- Support stakeholders in mobilizing the modeling and scenario analysis tool, in decision-making processes and in political dialog, by offering technical and capacity-building training courses, as well as organizing consultative working groups.

This support is divided into two distinct phases:

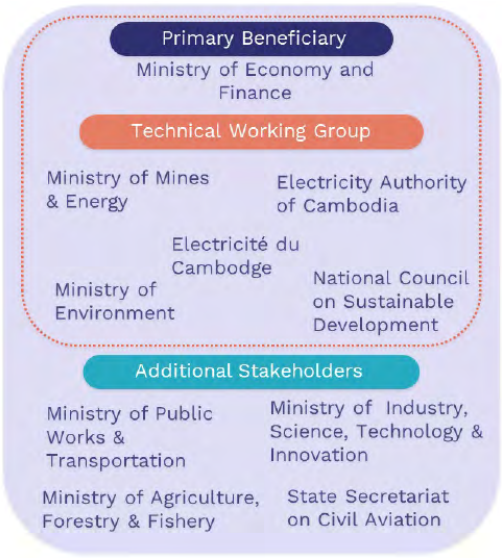
- 1. Technical and economic modeling of the energy sector as a whole, and building energy transition scenarios.
- 2. Developing a macroeconomic model to assess the macroeconomic impacts, funding options and potential positive and negative externalities (air pollution, innovation, etc.) of the scenarios defined in phase 1.

ASSOCIATED STAKEHOLDERS

Various **stakeholders** were involved in this support, including:

- **General Department of Public Policy Ministry of Economy and Finance, project** beneficiary.
- The consortium is made up of **IED** and **Artelys**, **the support** service providers.
- A technical working group was set up, including the **Ministry of Energy, the Ministry of the Environment, the electricity operator and the electricity regulator**.

In addition, there was coordination with the NDC planning and implementation working group.



Input data was obtained from the following sources: MEF, Ministry of Mines and Energy (MME), Electricité du Cambodge (EDC) and National Electricity Authority (ANE), Ministry of Environment (MoE) and National Council for Sustainable Development (NCSD), Ministry of Industry, Science and Innovation, Ministry of Urban Development and Construction.

EXPECTED IMPACT

What are the expected impacts of this support?

It is important to remember that this support is still ongoing and that these results are drawn solely from the activities carried out.

STRUCTURING THE COUNTRY'S CLIMATE GOVERNANCE

- This support has contributed to public policy dialog on climate in Cambodia's energy sector. The creation of a technical working group has facilitated exchanges between the various industry stakeholders and structured inter-ministerial work on the energy sector and the development of pathway scenarios. The working group brought together the Ministry of the Economy and Finance, the Ministry of the Environment and the Ministry of Energy, as well as the national electricity operator and the regulator, for working sessions and training courses on how to use the model created.
- This work resulted in the development of a modeling tool tailored to the Cambodian situation (CEPIA Cambodia) for the energy sector.
- In addition, this support was complementary to national climate-related policies and strategies, making it possible to take part in a national dialog on the subject.

BUILDING THE CAPACITY OF LOCAL STAKEHOLDERS

- Capacity building for local stakeholders is a core element of this support. Numerous training courses were held, both in person and remotely (due to the Covid crisis), including with the technical working group. In addition, a high level of interest in the transportation, AFOLU, and energy sectors was observed in these training courses. The model was developed using Excel in order to facilitate its appropriation by the stakeholders involved.
- The project team is still trying to find the right organization to bring the CEPIA model to life (ministry, university, etc.). Phase II could contribute to this, especially through the potential involvement of academia in the project.

SUPPORTING THE COUNTRY'S DECARBONIZATION AND RESILIENCE AMBITIONS

- This support is part of Cambodia's ambitious decarbonization and resilience strategy. Several inter-ministerial meetings, as well as consultations with development partners, enabled the government to set up the various support programs in the country.
- The results of our support have directly contributed to LTS4CN in the energy sector. For example, AFD, alongside a number of partners, funded and supported the upstream modeling work that led to the development of the LTS4CN long-term strategy, notably through the Business as Usual scenario.

MORE INFO

- Supporting Cambodia in modeling energy transition scenarios for 2050 | AFD - Agence Française de Développement
- Cambodia's Long-Term Strategy for Carbon Neutrality (unfccc.int)

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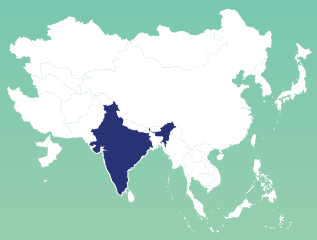
CAPITALIZATION REPORT

OVERVIEW OF A TYPICAL SUPPORT PROJECT

Support for modeling long-term energy transition scenarios in India

To support thirty of the most carbon-emitting or vulnerable developing countries in their transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.

India



In India, AFD is participating in drawing up energy transition scenarios to contribute to the national strategic vision for 2047 (100 years after the country's independence) and the Long-Term Strategy 2050.

LONG-TERM STRATEGY: SUBMITTED TO THE UNFCCC IN NOVEMBER 2022

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BACKGROUND

Ambitious yet low-carbon development

The scale of India's economic, demographic, and urban growth means that infrastructure and energy requirements will increase rapidly and substantially. In this context, the Indian government has committed itself to an ambitious yet sustainable development program, following a low-carbon development pathway. This commitment was formulated not only as part of the country's Nationally Determined Contribution (NDC), but also as part of its long-term strategy communicated in november 2022 to the UNFCCC.

With the support of local partners, including the *Center for Study of Science, Technology and Policy* (CSTEP), a renowned Indian research organization, AFD wanted to help the Indian government formulate energy transition scenarios that were both ambitious and low or even zero emission. The model aims to reconcile the objectives defined both in the country's NDC and also in the SDGs, in order to put in place strategic planning that enables India to disconnect the achievement of development goals from its dependence on fossil fuels. Thus, the scenarios developed must answer the question: what would be the implications in terms of energy and emissions if India were to achieve the desired standard of living for everyone?

Launched in 2020 at the request of the Ministry of the Environment, Forests and Climate Change (MoEFCC), the project has received two successive rounds of funding:

Phase 1
Defining and quantifying development objectives
FUNDING:
European Climate Foundation

Phase 2
Estimating the annual demand for materials and energy to achieve the specified objectives.
FUNDING:
European Climate Foundation

Phase 3
Scenario for optimizing the energy mix and the contribution of fossil fuels
FUNDING:
AFD (2050 Facility)

Phase 4
Developing a platform for calculating and viewing results
FUNDING:
AFD (2050 Facility)

KEY FIGURES

260,000 euro
AFD GRANT

2 years
DURATION OF THE SUPPORT

- **Development of 1 dynamic simulation model dedicated to the Indian context - *Sustainable Alternative Futures for India* (SAFARI)**

HOW THE SUPPORT WORKS

How can we support the development of a climate-resilient, low-carbon strategy?

The aim of the study is to develop an energy model and planning tool that enables decision-makers to create and test their policies before implementing them. As part of the task entrusted to CSTEP, the SAFARI (Sustainable Alternative Futures for India) tool was used as an interactive simulation model of energy supply and demand in India for 2050, in order to produce ambitious scenarios in terms of low-carbon development. More specifically, the model developed proposes to calculate the level of annual demand for materials and energy required to enable India to ensure the desired level of quality of life for all its citizens.

Support was provided in several stages:

1. Data collection and analysis
   - a. Data collection on energy sources and energy-consuming technologies (capacity, energy efficiency, costs and emissions)
   - b. Literature research on public policies relating to energy production and national objectives
2. Creating the model
   - a. Estimating energy resources for all types of capacity, especially decarbonized capacity
   - b. Validating results (ideal energy mix, required investment, emissions)

Reference Scenario
Development gaps are filled
Not much consideration to environmental indicators, energy, or emissions.

Sustainable Development A
Development gaps are filled
Technology and efficiency improvements reduce carbon footprints

Sustainable Development B
Climate and development are given equal urgency.
Behavioural shifts in addition to technology and efficiency

Overconsumption
India aspires for living standards and consumption patterns of OECD countries.

3. Developing scenarios
4. Validating and sharing the model to ensure its appropriation by public decision-makers
5. Incorporating the model into the DARPAN tool (decision support tool developed by CSTEP)
6. Tool training course for public decision-makers

ASSOCIATED STAKEHOLDERS

Various **stakeholders** were involved in this support, including:

- **The direct beneficiary of the support: the Ministry of the Environment, Forests and Climate Change (MoEFCC)**
- **Service provider:** The ***Center for Study of Science, Technology and Policy*** **(CSTEP)** is in charge of this study. **CSTEP** is an Indian non-profit research organization. Regarded as one of the most influential think tanks in South Asia, CSTEP has become a multi-disciplinary policy research organization in the fields of energy, infrastructure, security studies, materials, climate studies and governance.
- **Other associated stakeholders: NITI Aayog** (former Planning Commission), **Ministry of Power** (MoP), **Ministry of New and Renewable Energy** (MNRE), various planning regulatory bodies, parliamentarians, state government planning and regulatory bodies and development funding organizations interested in strategic planning.

EXPECTED IMPACT

What are the expected impacts of this support?

CREATING AND LEADING A PUBLIC POLICY DIALOG ON CLIMATE CHANGE

- The model developed as part of this support is designed to help public decision-makers define and implement low-carbon strategies for specific sectors. Through C-STEP, this study has fueled Franco-Indian dialog on climate issues and India's low-carbon pathways, and has enabled AFD to maintain an active presence in the energy sector in terms of both operations and research. C-STEP's involvement in the implementation of this support has been a real driver for dialog with stakeholders within the ministries.

BUILDING THE CAPACITY OF LOCAL STAKEHOLDERS

- The model's design and incorporation into the decision-support tool developed by C-STEP was the subject of numerous workshops with the project's various stakeholders. In particular, the aim was to train these stakeholders in the challenges of building and using models to build development scenarios and pathway models. In addition, this support resulted in numerous publications to disseminate and popularize the results of using the tool that was created. By way of example, urban development scenarios were analyzed from an energy consumption and energy pathway perspective on a national scale.

SUPPORTING THE COUNTRY'S DECARBONIZATION AND RESILIENCE AMBITIONS

- The work carried out as part of this support has contributed to developing ambitious national strategies, notably through building the national strategy for 2047, but also for the 2020-2025 roadmap on integrating ethanol into the energy mix, a roadmap built by the Ministry of Petroleum and Natural Gas (MoPNG) and by the NITI Aayog (planning commission).

MORE INFO

- Energy and Emissions Implications for a Desired Quality of Life in India (cstep.in)
- SAFARI_briefing note_11.09.2020.pdf (cstep.in)
- (PDF) Sustainable Alternative Futures for urban India: the resource, energy, and emissions implications of urban form scenarios (researchgate.net)

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

FACILITÉ 2050

UN OUTIL AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

CAPITALIZATION REPORT

OVERVIEW OF A TYPICAL SUPPORT PROJECT

Energy transition pathways in China

To support thirty of the most carbon-emitting or vulnerable developing countries in their transition to a low-carbon and climate-resilient development model, AFD created a dedicated grant tool in 2018 called the 2050 Facility.

China

In 2019, AFD and the International Energy Agency (IEA) signed a partnership to collaborate as part of the IEA's Clean Energy Transition Program (CETP), implemented in various countries, including China. The purpose of this collaboration was to foster public policy dialog to accelerate China's energy transition strategies.

LONG-TERM STRATEGY: SUBMITTED TO THE UNFCCC IN OCTOBER 2021

#MondeEnCommun

BACKGROUND

China, a major player in the energy transition

With China's economy booming, energy demand has risen sharply in recent decades. This growth raises a number of environmental issues. The government has adopted a **very ambitious policy on energy transition** with, for example, a target of sharply reducing coal-fired power generation to less than 50% of China's energy mix by 2040.

China is also positioning itself as a pivotal player in promoting renewable energies on a global scale.

So in 2019, AFD and the IEA joined forces to foster public policy dialog to accelerate China's energy transition strategies.

KEY FIGURES

1.4 million euro
AFD GRANT

2019 > 2020
Support implementation period

- **More than 650,000 people took part in the virtual launch of the "An energy sector roadmap to carbon neutrality in China" report.**

HOW THE SUPPORT WORKS

A partnership with the IEA to implement public policy dialog

The IEA and China have formed a partnership as part of the IEA's Clean Energy Transition Program. This partnership is structured around the following three business components:

1. **Supporting the creation of the carbon market,** especially the new ETS (*Emissions Trading Scheme*) in order to make it easier to understand, and to improve pricing so as to encourage the reduction of greenhouse gas emissions.
2. **Providing support for new technologies** through exchanges of best practices between European experts and leading Chinese stakeholders involved in optimizing the energy value chain and transforming and decarbonizing the power grid.
3. **Providing support for modeling long-term low-carbon energy transition pathways** in keeping with China's 14th Five-Year Plan and its commitments under the Paris Agreement.

This project's implementation is based on several *Memoranda of Understanding (MoUs)* signed between the IEA and Chinese public organizations. Various initiatives were implemented:

- Consulting on the design of the national emissions trading scheme (customized analyses; exchanges with the Ministry of Ecology and Environment (MEE) and Chinese experts).
- High-level exchanges between the IEA Executive Director and Chinese officials (including Special Envoy on Climate Change Xie Zhenhua and Minister of Ecology and Environment Huang Runqiu) concerning cooperation on climate change.
- Insights into public policies and technological innovations to facilitate the transition of China's power generation industry towards carbon neutrality by 2060.
- Advising grid operators and regulators on how to design electricity markets to increase the market penetration of renewables.
- Advising the National Energy Administration on preparing the 14th Five-Year Energy Plan and setting targets for the sector's rapid decarbonization.
- Improving China-specific analyses in the World Energy Outlook and developing analyses on low-carbon hydrogen, industry, electricity and energy employment.

The analysis work conducted by the IEA led to holding several workshops with various Chinese institutions, as well as producing a number of publications.

EXPECTED IMPACT

What are the expected impacts of this support?

CREATING AND LEADING A PUBLIC POLICY DIALOG ON CLIMATE CHANGE

- Various technical exchanges and workshops were held as part of this support. These events enabled various Chinese and international experts to share their knowledge and experience on topics related to the country's energy transition pathways. Among the participants were the *China Renewable Energy Center* (CNREC), the *New Energy & Statistics Department*, *State Grid Energy Research Institute* (SGERI), *Electric Power Planning & Engineering Institute* (EPPEI), the *Tsinghua 3E Institute*, etc.
- In addition, the IEA worked with numerous organizations such as universities, research institutes, and national institutions to develop studies on innovative topics. The IEA's recommendations and commitment have helped move policies towards more ambitious targets in terms of emissions allowance allocation criteria.

BUILDING THE CAPACITY OF LOCAL STAKEHOLDERS

- The various components of this support provided several opportunities for exchanges between Chinese and international experts. In particular, seven Chinese experts from various institutions (ANE, EPPEI, ACCA21, China Energy Investment Corporation, CNPC ETRI, Tsinghua University) were given the opportunity to work in different IEA departments and reinforce their skills in low-carbon energy pathways.
- In addition, staff from China's statistics bureau attended a training course in data and statistics analysis organized by the IEA. While the health context hampered the implementation of certain initiatives, it led to developing an online training course that reached more Chinese stakeholders than initially planned.

SUPPORTING THE COUNTRY'S DECARBONIZATION AND RESILIENCE AMBITIONS

- The reports produced as part of this support have received a great deal of attention, both in China and internationally. For example, the An *Energy Sector Roadmap to Carbon Neutrality in China* report, the first report by an international organization to propose a carbon-neutral pathway for China, has been featured in many widely read publications such as *China Energy News*, Caixin, Xinhua News, *S&P Global headlines* and many leading energy publications. Specifically, this report explores the ways in which carbon neutrality is in line with China's development objectives. The report's launch event attracted 650,000 people online and sparked discussions on ways to accelerate decarbonization efforts in the country. In addition, the results of this support were presented at international events such as COP26.

MORE INFO

- China's Emissions Trading Scheme: Designing efficient allowance allocation (June 2020)
- The Role of China's ETS in Power Sector Decarbonization (April 2021)
- An Energy Sector Roadmap to Carbon Neutrality in China (September 2021)

Towards a common world

Agence Française de Développement (AFD) is responsible for implementing the French government's development and international solidarity policy. AFD funds, supports and accelerates the transition to a fairer and more climate-resilient world through its public sector and NGO financing activities, its research and publications (Éditions AFD), its sustainable development training programs (AFD Campus) and its awareness raising initiatives in France.

We are working with our partners to develop common solutions, with and for communities in the Global South. Our teams are actively involved in more than 4,000 projects in the field, in France's overseas departments, in 115 countries and in territories in crisis, working for the common good and focusing on climate change, biodiversity, peace-building, gender equality, education and health. In this way, we contribute to the commitment of France and French people to support Sustainable Development Goals (SDGs). Towards a common world.

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