

ENERGY DATABASE

RG-T2603

CERTIFICATION

I hereby certify that this operation was approved for financing under the Sustainable Energy and Climate Change Initiative (SECCI-SCI) through a communication dated May 21, 2015 and signed by Felipe Caicedo (ORP/GCM). Also, I certify that resources from said fund are available for up to **US\$500,000** in order to finance the activities described and budgeted in this document. This certification reserves resources for the referenced project for a period of four (4) calendar months counted from the date of eligibility from the funding source. If the project is not approved by the IDB within that period, the reserve of resources will be cancelled, except in the case a new certification is granted. The commitment and disbursement of these resources shall be made only by the Bank in US dollars. The same currency shall be used to stipulate the remuneration and payments to consultants, except in the case of local consultants working in their own borrowing member country who shall have their remuneration defined and paid in the currency of such country. No resources of the Fund shall be made available to cover amounts greater than the amount certified herein above for the implementation of this operation. Amounts greater than the certified amount may arise from commitments on contracts denominated in a currency other than the Fund currency, resulting in currency exchange rate differences, for which the Fund is not at risk.

Original Signed

07/22/2015

Sonia M. Rivera
Chief
Grants and Cofinancing Management Unit
ORP/GCM

Date

APPROVAL

Approved:

Original Signed

07/23/2015

Ariel Yepez
Division Chief
Energy Division
INE/ENE

Date

TC DOCUMENT

ENERGY DATABASE

RG-T2603

I. Basic Information

| | |
|--|--|
| ▪ Country/Region: | Regional |
| ▪ TC Name: | Energy Database |
| ▪ TC Number: | RG-T2603 |
| ▪ Team Leader/Members: | Ramón Espinasa, Team Leader (INE/ENE); members: Annette Hester (INE/ENE); Jorge Mercado (INE/ENE); Arturo Alarcón (INE/ENE); Jesús Tejeda (INE/ENE); Carlos Sucre (INE/ENE); Eduardo Rodríguez (INE/ENE); Betina Hennig (LEG/SGO); and Stephanie Suber (INE/ENE) |
| ▪ Indicate if: Operational Support, Client Support, or Research & Dissemination | Research and Dissemination |
| ▪ If Operational Support TC, give number and name of Operation Supported by the TC: | N/A |
| ▪ Date of TC Abstract authorization: | February 18, 2015 |
| ▪ Beneficiary: | Countries in Latin America and the Caribbean |
| ▪ Executing Agency: | Inter-American Development Bank, through the Energy Division (INE/ENE) |
| ▪ Donors providing funding: | SECCI |
| ▪ IDB Funding Requested: | US\$500,000 |
| ▪ Local counterpart funding, if any: | N/A |
| ▪ Disbursement period (which includes Execution period): | 18 months |
| ▪ Required start date: | July 25, 2015 |
| ▪ Types of consultants: | Firm and Individual Consultants |
| ▪ Prepared by Unit: | INE/ENE |
| ▪ Unit of Disbursement Responsibility: | INE/ENE |
| ▪ TC Included in Country Strategy (y/n): | No |
| ▪ TC included in CPD (y/n): | No |
| ▪ GCI-9 Sector Priority: | Ensuring Sustainable Development; Addressing Sustainable Energy and Climate Change; and Promoting regional Integration |

II. Objectives and Justification of the TC

- 2.1 The objective of this Technical Cooperation (TC) is to deepen and broaden the scope of the INE/ENE Energy Database by showcasing new research and knowledge products focused on Latin America and the Caribbean's most pressing energy challenges.
- 2.2 The Energy Database was originally developed by the "ENE Innovation Center" of the Energy Division, funded by RG-T1884 and RG-T2048 (US\$400,000.00 and US\$500,000.00 respectively). Additional support was provided by the Government of Alberta through a Project Specific Grant - RG-X1171 (Can\$1,000,000.00). Among

the objectives of the original funds were the creation and publication of an in depth analysis of the energy sector for each of the IDB's borrowing member countries. The results were published as a series titled "[Energy Dossiers](#)." The scope of the Energy Database, in part funded by RG-X1171, was to transform the information contained in the Energy Dossiers into readily accessible knowledge. Many lessons were learned along this process. Principal among them is that publishing research as an "interactive information system," in contrast to traditional formats: (i) significantly increases its reach; and (ii) facilitates updates.

- 2.3 To achieve the goals of this TC, this operation will: (i) fund the creation of new datasets, such as electricity prices at the country and regional levels, that are key to delivering projects that improve the sustainability of our borrowing member countries' energy matrix. To ensure the relevance of the new datasets for the Bank's operations, a survey of data/information priorities was conducted among the Energy Division's specialists and analysts (IDBDOCS#39678071); (ii) fund the creation of new visualizations that will best translate the datasets and implement them into the online Energy Database hosted in the Bank's website; and (iii) Disseminate and promote the updated Energy Database. Consultation will be sought with the Bank's member countries prior to the publication of any of the new visualizations to ensure that the data accurately depict the countries' energy matrix. Further, all visualizations and Bank generated datasets will be published using the Creative Commons licenses as mandated in the new Numbers for Development (N4D) Database [Data Protocol](#).
- 2.4 The Energy Database was designed following the most advanced web protocols (linked open data), and updates to the existing visualizations do not require outside web specialists. Insofar as the existing content, the International Energy Agency (IEA) updates the dataset once a year with a two year lag (i.e. data for 2013 will be published in the fall of 2015). Although this could be perceived as potential shortcoming of the database, energy balances change very little from year to year because incorporating new sources of energy and altering patterns of consumptions is a slow process that takes years to be clearly demonstrated in the balance data. Therefore, the lag from the IEA is neither an obstacle nor a weakness but an inexorable reality of database construction. Accordingly, the IEA Data dependent visualizations will be updated once a year. Incorporating the new data into the system requires approximately one week of full time work. Updates to the Institutional Frameworks dataset are required when new laws are enacted. New datasets will be designed to ensure rapid updates. Given the efficient design for upkeep of the existing database, the funds requested are almost entirely intended for the addition of new information and their visualization.
- 2.5 This product is intended to transform and visualize data collected by trusted parties in a way that is easily understood and digestible by specialized and non-specialized audiences in an appealing format. Although this product is called the IDB Energy Database, the name responds to the need to be recognized by Internet search engines, thus, increasing the traffic to the website. The current product available online is not a "database" but a visual way to transform open data into open knowledge. The IDB's unique expertise in the open knowledge space adds much needed value to the information required for the region's energy development. Furthermore, given that the IDB is the regional development bank par excellence it is responsible for generating, hosting and providing common knowledge products to all

its clients under a common methodological basis that ensures data quality, comparability and accessibility.

- 2.6 This product is proving to be a valuable resource to our borrowing member countries as the combination of the visualizations with time-series data allows them to see the evolution of their energy production and use it to plan for a sustainable future. The Energy Database is a unique tool to derive forward thinking policy prescriptions and analyze regulatory frameworks. It also assists the Bank's support of data-gathering efforts currently under way in the region, particularly those in the Caribbean, by contextualizing the energy sector of each country and region. In the case of countries where energy balance information is not available from sources that are cross-comparable, the data will be included and a note will be made regarding its singular data-gathering methodology.
- 2.7 The tool and its content have been used in the elaboration of the Energy Sector Framework Document, in particular, to help frame the requirements for a successful transition to a more sustainable energy matrix.
- 2.8 The tool is also valuable to the Bank as a whole and a multitude of stakeholders. In the first six months since going online mid-June last year, the Energy Database has become one of the Bank's most used databases. Up to April 2015, it counted with over 7,500 users from 142 countries. Almost 60 percent of users are returning visitors and their time at the site has increased steadily. The current average is 4:08 minutes. To date, almost half of the users are in the United States and Canada, stemming from IDB Headquarters and Donor location of use, while the other half is divided among Latin America and the Caribbean (LAC) with Brazil, Colombia, Mexico, and Argentina among the top users. To increase the use in our region, disseminating the Energy Database in LAC is the logical next step. The new funding will allow for the collection of detailed users' statistics. This information is valuable to help identify and reach specific audiences. Finally, the Energy Database was recognized in the President's Report to the Board of Executive Directors as one of 14 notable knowledge products of 2014.
- 2.9 A clear understanding of the region's energy landscape and needs is an important input for the development of appropriate strategies to support environmental sustainability. The Ninth General Increase in the Resources of the Inter-American Development Bank (GCI-9) mandates that the Bank improves its capacity to assist the region in: (i) reducing poverty and inequality; (ii) ensuring sustainable development; (iii) addressing sustainable energy and climate change; (iv) addressing the special needs of the poorest countries; (v) promoting regional integration; and (vi) fostering development through the private sector. The GCI-9 also defines sector priorities including to protect the environment, respond to climate change, promote renewable energy, and ensure food security. It follows that to achieve these multiple objectives it is necessary to aid the region transition to a green economy. To this end, the Energy Database provides trustworthy and well organized data that is a necessary input to both public and private investments.

III. Description of Activities

3.1 **Component 1 – Creation of New Datasets:** This component includes the research, generation and compilation of datasets that are relevant to the work of the Bank.

- a. **Electricity prices:** This activity will finance the collection and organization of electricity prices – tariffs at the country and regional levels and by consuming sector (industrial, residential, commercial). The collection of electricity prices will be done via official data by working with regional agencies or knowledge organizations, including universities. In cases when official data is not available, external organizations will be engaged to provide data and this data will be verified with country authorities.
- b. **Disaggregation of biomass data:** This activity finances the adaptation of disaggregated biomass, biofuels, and waste data to the visualization environment. The current energy balance data from the IEA combines biomass, wood and waste as a single primary source of energy. However, this limits the information that can be extracted from the data because the three components differ greatly from one another. Sustainable biofuels are an important component in some countries' transportation and electricity sectors, while new technological development has open the potential to convert waste to energy. On the other hand, wood burning is a hazard to the environment, contributes to climate change, and is extremely detrimental to health, particularly that of women and children. Hence, presenting this information separately facilitates the formulation of future policy and potentially a number of projects ranging from converting household waste to energy, to cooking fuel substitution. This data on biofuels – advanced and traditional – is sometimes available on a disaggregated level from regional and national energy agencies. This information would be gathered from national and regional sources, compiled into a single database, and worked to ensure that the data is comparable across time and country.

3.2 **Component 2 – Creation of New Visualizations:** This component focuses on the design and implementation of new visualizations that translate the new datasets to an interactive web environment.

- a. **Web-based, interactive visualizations for the new datasets created by Component 1.** To this end, current visualization and web-development teams, who have been part of this TC from inception, and consequently, have amassed considerable expertise on this subject and on the Bank's IT environment, will be tasked with visualizing the new data gathered in Component 1 for prices, consumption by income bracket and disaggregated biomass data.
- b. **Comparative chart of electricity by source over time:** This activity finances the creation of a visualization that shows the generation of electricity by source in a given country in comparison to another, over time. Currently, the Energy Database allows the user to view electricity by source for an individual country. However, an overlapping comparison of several countries or regions provides a broader view of the evolution of the use of specific fuels in electricity generation. In turn, this information allows our specialists, analysts,

policy makers and stakeholders to examine the impact of these changes to the electricity matrix over time.

- c. **Energy intensity:** The addition of options of ratios in the visualization to allow for the calculation of energy intensity as a percentage of Gross Domestic Product or population. This data allows a normative investigation into a country's use of energy and is a development indicator (or depending on the ratio, an efficiency indicator).
- d. **Energy trade between countries:** This activity will finance the visualization of energy trade data collected with funding from RG-T2386. This funding covered energy import and export data for each country. From an integration perspective, the addition of visualizations of energy trade would allow for easy understanding of energy integration. Stakeholders would benefit from a visualization that shows how much energy is traded regionally, and how much internationally. This is an important insight into the reliance on external factors for meeting energy demand and/or the generation of income for producing nations.

3.3 **Component 3 – Seminars and Dissemination:** This component focuses on: (i) the exchange of ideas and information on all aspects of energy data gathering and publishing at the country, regional and international levels; and (ii) the information and promotion of the use of the updated Energy Database.

- a. **Seminars:** This activity will finance seminars on the importance of data collecting, reporting issues as well as issues pertaining to open data and improvement of data visualization. The seminars will take place in our borrowing member countries and to a targeted audience of government officials, policy makers, experts, and when judged appropriate, the private sector. In addition, to maximize funds, whenever possible, partnership with local or regional organizations and/or other existing events (conferences or seminars) will be sought.
- b. **Consultation:** This activity will ensure that consultation is carried out with member countries prior to publication to make sure that the dataset accurately reflects their energy matrix.
- c. **Marketing:** This activity will devise and implement a strategic marketing plan that uses both traditional and innovative methodologies. The plan will leverage and be coherent with existing Bank platforms and programs.

Indicative Results Matrix

| Activity | | Output | Result | Means of Verification |
|-------------|---|--|--|--|
| Component 1 | Research and collection of energy data for the Bank's member countries, generation of tables/reports for each country, and compilation of the information into country or region Specific datasets | Two new datasets, including: (i) electricity prices at the country and regional level; (ii) Disaggregation of biomass data | Enhance and deepen the information provided by the Energy Database to better inform the strategic planning of project execution by the Bank and other investors, as well as better inform policy makers | Survey of the use of the datasets in project/loan preparation Use of the visualizations by different audiences (reports from Google Analytics) |
| Component 2 | Work with the visualization and web development teams to translate the new datasets (as well as other data) into new interactive visualizations. This includes bringing the team together once every six months to ensure the project is proceeding apace. | Design of visualizations for the datasets created in Component 1 as well as 3 additional visualizations that are relevant to the Bank's operations. Publish the new visualizations in the Energy Database website | Publicly accessible, country or region specific data in a format that is easy to read and understand, to be used by the member countries as well as the Bank in preparation for loans, projects, sector development and public policy. The information will also facilitate knowledge exchange | Consultation will be sought from the member countries prior to publication (see Component 3). Use of the visualization by internal and external audiences analyzed from reports produced by Google Analytics –views to increase by 20 percent Requests to use the database and technical assistance on the subject by other governments and organizations – at least 3 countries |
| Component 3 | Host seminars to disseminate the Energy Database and encourage its use by internal and external audiences. Share the lessons learned and experience acquired in the collection, reporting, and development of the visualizations with internal and external audiences. | At least one workshops that increase awareness of the Energy Database conducted in a combination of regions and individual countries in Latin America and the Caribbean. Work with energy partner organizations to leverage their events to promote the Energy Database Work with other multilaterals responsible for energy data to ensure non duplication of efforts and the creation of economies of scale for increase efficiency in all matters related to energy data. | Increased visibility and usage of the Energy Database for a broader policy dialogue and greater visibility of the energy challenges facing LAC. This awareness will open a host of opportunities for improvements in the energy sector at the regional and national levels. Increase use of the Energy Database in the preparation of projects and loans by multilateral institutions and the private sector. | High level attendance and positive feedback from seminars Increase traffic to the Energy Database including increased page views (increase by 20 percent), increase time spent for each session (by .30 seconds), and increase on downloaded content |

3.4 The distribution of expenses by Components is presented in the following table¹.

| Budget * | | | |
|---|-------------------|------------------------|---------------------|
| Component | IDB (US\$) | Subtotal (US\$) | Total (US\$) |
| Component I. Creation of New Datasets | 270,000 | 270,000 | 270,000 |
| Component II. Creation of New Visualizations | 180,000 | 180,000 | 180,000 |
| Component III. Seminars and Dissemination | 50,000 | 50,000 | 50,000 |
| Total | 500,000 | 500,000 | 500,000 |
| * Given that dissemination is part and parcel of the work to be conducted, consultant travel is permitted for Seminars and Dissemination. | | | |

IV. Executing Agency and Execution Structure

- 4.1 This is a Bank-originated TC, aimed at expanding the Energy Database so it can deliver the information and knowledge necessary to fulfill the Bank's objectives and by association, its mandate. In particular the commitment to support mitigation and adaptation efforts of borrowing members. The benefits are not limited to the borrowing members. Given the wide coverage of the database, the benefits are regional and global.
- 4.2 The execution of this TC leverages the knowledge generated by the Bank with the design and implementation of the Energy Database. The entire web-based product was designed to run in the Bank's system and several solutions and visualizations depend on solutions provided by the Bank, such as data access, IDBDocs, translators, designers, and short URLs. In addition, we are currently gathering all the material necessary to conform to the N4D Data Platform. Once the protocol requirements are fulfilled the Energy Database will also be uploaded to N4D. Coherence and coordination with N4D will be sought in all future developments of the Energy Database. To fulfill these objectives, a high degree of coordination is necessary to ensure that all pieces are functioning and that integration of the data, software, optimization, and other elements is optimized. Hence, Bank-execution translates into a significant cost advantage relative to external organizations.
- 4.3 Moreover, the development of the tool by the bank as the executing agency deposits in the Bank itself knowledge that is sought after internally and externally. This will allow the Bank to expand its support to borrowing member countries by providing a useful tool to understand energy issues. As mentioned above, the Energy Database will always seek coherence of design and content with N4D, VPS' designated platform of choice. There is an intangible benefit that it is well understood and

¹ The total amount of Bank's resources available for purposes of this TC will be US\$500,000.00 to be financed through the Sustainable Energy and Climate Change IDB Special Program (SECCI). The Bank's financing may be increased up to an additional amount of US\$370,000.00 provided that, such amount is needed for purposes of complementing the activities identified in this operation, resources are available and the criteria provided by ORP/GCM in the [SECCI Eligibility and Strategic Committee Minutes](#) for this operation have been fulfilled. The process and approval of such increase will follow Bank's applicable policies and procedures, including the use of the [Incremental Funding Appendix](#).

mandated by VPS in internalizing knowledge such as the one generated by the internal execution of this TC. Consequently, it is critical that this TC be Bank-executed.

- 4.4 **Procurement.** The Bank will contract individual consultants, consulting firms and non-consulting services in accordance with current Bank procurement policies and procedures.

V. Issues

- 5.1 The main risks identified for the implementation of this TC is the lack of interest from the beneficiaries in using the Energy Database for their knowledge gap. To mediate this risk, the member countries are being consulted at every step of the dataset production. So far, however, there is wide-ranging interest in the tool from the private sector, member countries and various divisions within the Bank.
- 5.2 A secondary risk is the challenge of securing, on a long term basis, comparable data for all our borrowing member countries, particularly those countries in the Caribbean region. This risk would be mitigated by parallel efforts to capacitate these countries to produce energy data regularly and using international agreed standards.
- 5.3 Another risk is the sustainability of the Energy Database on a long term basis. Although, as explained in the document (see ¶3.4), adding new years to existing visualizations does not involve extra funding, adding new visualizations and new datasets does. Although the costs are always linked to the ambition of the TC, it is envisioned that partnerships that include funding of approximately \$1 million, such as was obtained from the Government of Alberta, will be sought in the future. The sustainability of the database is enhanced by the fact that this product is judged as “the gold standard” of energy databases by several of our member countries, other multilateral organizations, and top tier universities, who are seeking partnerships with us. Potential partners range from the Massachusetts Institute of Technology (MIT) to OLADE and the IEA. In addition, other projects of the Energy Division, such as the Sustainable Energy Rating and Sustainable Energy For All Community of Practice, also adds to the long term viability of this TC, as they are generating datasets that need to be accessible by the Bank’s specialists, governments, and the public.

VI. Exceptions to Bank policy

- 6.1 No exceptions to Bank policy are foreseen.

VII. Environmental and Social Strategy

- 7.1 According to the ESG toolkit, the classification of this TC is “C”, meaning no environmental or social risks are expected. See [Safeguard Policy Filter Report \(SPF\)](#) and [Safeguard Screening Form \(SSF\)](#).

Required Annexes

- Annex I: [Terms of Reference](#)
- Annex II: [Procurement Plan](#)