CLEAN ENERGY SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY
An Initiative of the Clean Energy Ministerial

CLEAN ENERGY MINISTERIAL
Advancing Clean Energy Together

Policy Programs and Their Impact to Increase the Deployment of Clean Energy Solutions in the Latin American Region

Presented in partnership with:

USAID FROM THE AMERICAN PEOPLE
NREL Transforming ENERGY
TETRA TECH
USEA United States Energy Association
CELA clean energy latin america
SDG7 YOUTH CONSTITUENCY YOUTH IN SUSTAINABLE ENERGY

March 9, 2023

Housekeeping - Zoom

- This webinar is **being recorded** and will be shared with attendees.
- You will be **automatically muted** upon joining and throughout the webinar.
- Please use the **chat feature** to add comments and share input.
- Please use the **Q&A function** in your toolbar to ask questions.

- If you have **technical issues**, please use the chat feature to message Emily Klos.
- You can adjust your audio through the **audio settings.** If you are having issues, you can also dial-in and listen by phone. Dial-in information can be found in your registration email.
- We will be launching a **survey** when the event ends. Your feedback is highly valuable to us!

CLEAN ENERGY SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY
An Initiative of the Clean Energy Ministerial

Overview of the Clean Energy Solutions Center

Presented by Rob Horner, U.S. Department of Energy

March 9th, 2023

The Clean Energy Solutions Center

CLEAN ENERGY SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY

CLEAN ENERGY MINISTERIAL
Advancing Clean Energy Together

OBJECTIVE

To accelerate the transition of clean energy markets and technologies.

RATIONALE

Many developing governments lack capacity to design and adopt policies and programs that support the deployment of clean energy technologies.

AMBITION/TARGET

Support governments in developing nations of the world in strengthening clean energy policies and finance measures

ACTORS

Leads:

Operating Agent:

NREL
Transforming ENERGY

Partners:

More than 40 partners, including UN-Energy, IRENA, IEA, IPEEC, REEEP, REN21, SE4All, IADB, ADB, AfDB, and other workstreams etc.

ACTIONS

- **Deliver** dynamic services that enable *expert assistance*, *learning, and peer-to-peer sharing of experiences. Services are offered at no-cost to users.*
- **Foster** dialogue on emerging policy issues and innovation across the globe.
- **Serve** as a first-stop clearinghouse of clean energy policy resources, including policy best practices, data, and analysis tools.

UPDATES

Website:
www.cleanenergyministerial.org/initiatives-campaigns/clean-energy-solutions-center

Factsheet:
www.nrel.gov/docs/fy22osti/83658.pdf

Requests: Now accepting Ask an Expert requests!

The Clean Energy Solutions Center

CLEAN ENERGY SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY

CLEAN ENERGY MINISTERIAL
Advancing Clean Energy Together

Ask an Expert Service

- Ask an Expert is designed to help policymakers in developing countries and emerging economies identify and implement ***clean energy policy*** and finance solutions.
- The Ask an Expert service features a network of more than **50** experts from over **15** countries.
- Responded to **300+** requests submitted by **90+** governments and regional organizations from developing nations since inception

Training and Capacity Building

- Delivered over **300** webinars training more than **20,000** public & private sector stakeholders.

Resource Library

- Over **1,500** curated reports, policy briefs, journal articles, etc.

For additional information and questions, reach out to Jal Desai, NREL, jal.desai@nrel.gov

CLEAN ENERGY SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY
An Initiative of the Clean Energy Ministerial

Webinar & Speaker Introductions

Presented by Sean Esterly, National Renewable Energy Laboratory

March 9th, 2023

Webinar Agenda

- **Crosscutting Opportunities for Policy Programs in Latin America and the Caribbean Region,** *Daniella Rough, NREL*
- **Activities in Colombia, Mexico, and Central America,** *Jairo Gutierrez*
- **Policy Programs and Impact in Brazil,** *Camila Ramos*
- **USEA Activities in Colombia and Honduras; Lessons Learned for Impacting Policy Decisions,** *Johanna Koolemans-Beynen*
- **Youth-Focused Policies in Clean Energy in the Latin America Region,** *Joyce Mendez*
- **Audience Question & Answer Session,** *All speakers*

Webinar Speakers

Sean Esterly

Project Manager, Integrated Application Center's Strategy, Policy, and Implementation Group; National Renewable Energy Laboratory (**NREL**)

Daniella Rough

International Project Manager, Accelerated Deployment and Decision Support Center; **NREL**

Jairo Gutierrez

Energy Sector Director, **Tetra Tech**

Johanna Koolemans-Beynen

Program Manager, United States Energy Association (**USEA**)

Camila Ramos

Managing Director and Founder, Clean Energy Latin America (**CELA**)

Joyce Mendez

Global Activist & Expert on the Just Energy Transition, International Renewable Energy Agency (**IRENA**) & **SDG7 Youth Constituency**

CLEAN ENERGY SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY
An Initiative of the Clean Energy Ministerial

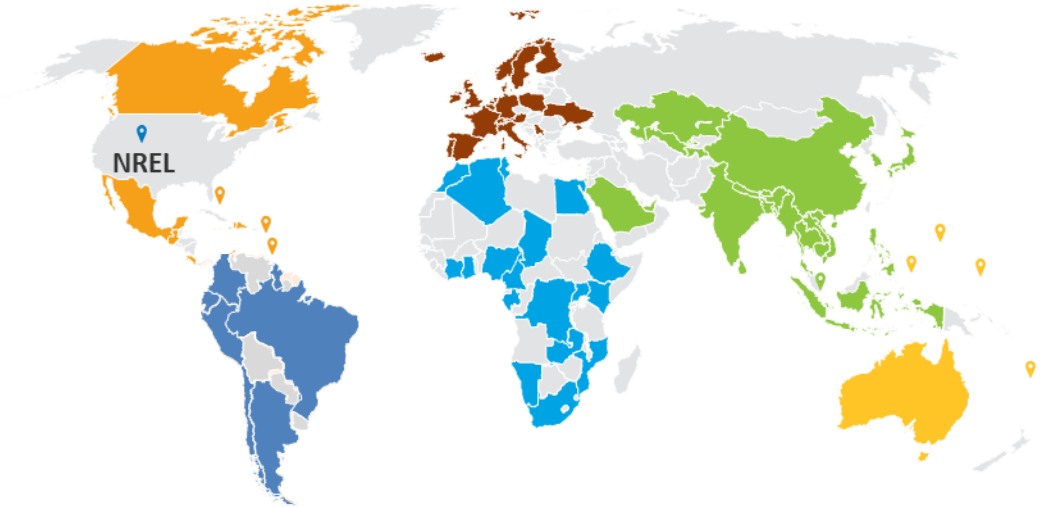
Crosscutting Opportunities for Policy Programs in Latin America and the Caribbean Region

Presented by Daniella Rough, National Renewable Energy Laboratory

March 9th, 2023

NREL Accelerates Global Transitions to Low Emission Advanced Energy Systems

We work with 80+ countries in all regions



NREL International Objectives

Accelerate progress towards energy transition targets with policy changes and enabling conditions

Speed transformations to low emission, socially inclusive energy systems

Accelerate R&D progress — reduce costs and improve performance for industry and consumers

Expand competitive markets & investment in advanced energy technologies and services

Strengthen energy system resiliency and security

Portfolio of Technical Toolkits

REexplorer MAPPING OUR ENERGY FUTURE

Greening the Grid

I-JEDI

Resilient Energy Platform

Transformative Global, Regional, and National Programs focused on:

- **Policy changes to support climate action and accelerate investment in clean energy**
- Advanced clean energy power systems
- Clean mini-grids and productive uses
- Energy resilience, equity and justice
- E-mobility & other sustainable transport
- High performance buildings and industry

Global Climate Action Partnership
regional leadership, global change

REGIONAL PLATFORM LEDS LAC
RESILIENT AND LOW EMISSION DEVELOPMENT STRATEGIES.

GLOBAL PST CONSORTIUM

RELAC
Renewable Energy in Latin America and the Caribbean

LOCAL2030 ISLANDS NETWORK

USAID FROM THE AMERICAN PEOPLE | NREL Transforming ENERGY
Partnership

NET ZERO WORLD INITIATIVE
Accelerating Global Energy System Decarbonization

INTEGRACIÓN EFICIENTE DE ENERGÍAS RENOVABLES VARIABLES AL SISTEMA COLOMBIANO

CLEAN ENERGY INVESTMENT ACCELERATOR

CLEAN ENERGY SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY

USAID-NREL Partnership Project in Colombia

USAID's Renewable Energy Programs to Support GOC and Key Communities in the Transition to Renewable Energy and in Achieving the Climate NDC Goals

Transforming Colombia's Energy Sector

The USAID-NREL Partnership in Colombia is supporting energy security in the country by helping the Government of Colombia diversify its energy mix, stabilize energy costs, and electrify rural areas in support of peace and development through capacity building and direct technical assistance.

Key Design Objectives:

- Support the Colombian energy sector to efficiently plan for and manage the **integration of high volumes of variable renewable energy (VRE)**
- Promote efficient markets, regulations, institutions and market monitoring, in order for Colombia to **optimize the benefits of VRE**
- Increase access to **clean, reliable, and affordable power**
- Provide high-quality, timely, and holistic **capacity building and technical assistance** to the Government of Colombia and other energy sector stakeholders
- Promote the **participation and leadership of women** in these activities
- Enhance bilateral **U.S. - Colombia market opportunities**
- **Reduce greenhouse gas emissions** and promote system **resilience to climate change** and variability

Working with Our Country Partners

INFORMED DECISION MAKING

Providing future leaders with vital information to make informed decisions to accelerate efficient VRE integration

SCALABLE IMPACTS

Broadening impact as workforce trainees share knowledge and connections forged during the training to their respective organizations to amplify program reach

PROMOTING WOMEN

Promoting the participation and leadership of women in Colombia's energy sector.

PARTNERSHIP & RELATIONSHIP BUILDING

Bring together leading experts from the U.S. and around the world to support the Colombian energy sector to efficiently plan for and manage the integration of high volumes of VRE.

ACTIONABLE CONTENT

Training participants and providing the opportunity to discuss and apply the training content to their current work, integrating it directly and in real time to Colombia's energy transition

TECHNICAL ASSISTANCE & CAPACITY BUILDING

Provide high-quality, timely, and holistic capacity building and technical assistance to the Government of Colombia and other energy sector stakeholders.

SUPPORTING THE NEXT PHASE OF COLOMBIA'S CLEAN ENERGY TRANSITION

Technical Assistance for Action Plan Implementation:
Planning for the Efficient Integration of Distributed Energy Resources

As part of the Young Leaders Workforce Training Program, the initial cohort of participants were required to develop action plans, applying the content they received through the program to real-world energy questions they were facing in their respective organizations. The USAID-NREL Partnership in Colombia, in conjunction with SURE and USEA, selected four action plan teams to receive tailored NREL technical assistance to support plan implementation.

The four plans selected represent various aspects associated with planning for the efficient integration of distributed energy resources, including:

EBSA
ELECTRIC VEHICLE FLEET PLANNING

GEB
SMART CITY PLANNING FOR ELECTRIC MOBILITY

SER
DISTRIBUTED SOLAR PHOTOVOLTAIC GENERATION MODELING

CREG
REGULATORY CONSIDERATIONS FOR DER INTEGRATION

USAID and NREL are implementing a cohort approach to technical assistance—wherein each team will receive tailored assistance, but updates and results will be regularly shared across the action plan teams—to draw out important connections, leverage applicable resources (including research and analysis), foster more robust stakeholder involvement, and facilitate more coordinated development across related initiatives.

NET ZERO WORLD INITIATIVE

Accelerating Global Energy System Decarbonization

Net Zero World Initiative

USAID
FROM THE AMERICAN PEOPLE

U.S. DEPARTMENT OF ENERGY

USTDA
U.S. TRADE AND DEVELOPMENT AGENCY

DFC | U.S. International Development Finance Corporation

EXIM EXPORT-IMPORT BANK OF THE UNITED STATES

MILLENNIUM CHALLENGE CORPORATION
UNITED STATES OF AMERICA

TETRA TECH

Policy Programs to Increase the Deployment of Clean Energy in Colombia, Mexico and Central America

Jairo Gutierrez

Energy Sector Director

March 9, 2023

Agenda

- Colombia Clean Energy Program
- Scaling Up Renewable Energy Program (Colombia portion)
- Mexico Low Emissions Development Program
- Central America Regional Clean Energy Initiative

2023 Snapshot

TETRA TECH

TETRA TECH SNAPSHOT

WORKS IN
100+
COUNTRIES

7
CONTINENTS

Publicly traded on NASDAQ as
TTEK

$4.5 billion
ANNUAL REVENUE

WORKS ON
100,000
PROJECTS
ANNUALLY

550 OFFICES WORLDWIDE

ENR RANKINGS

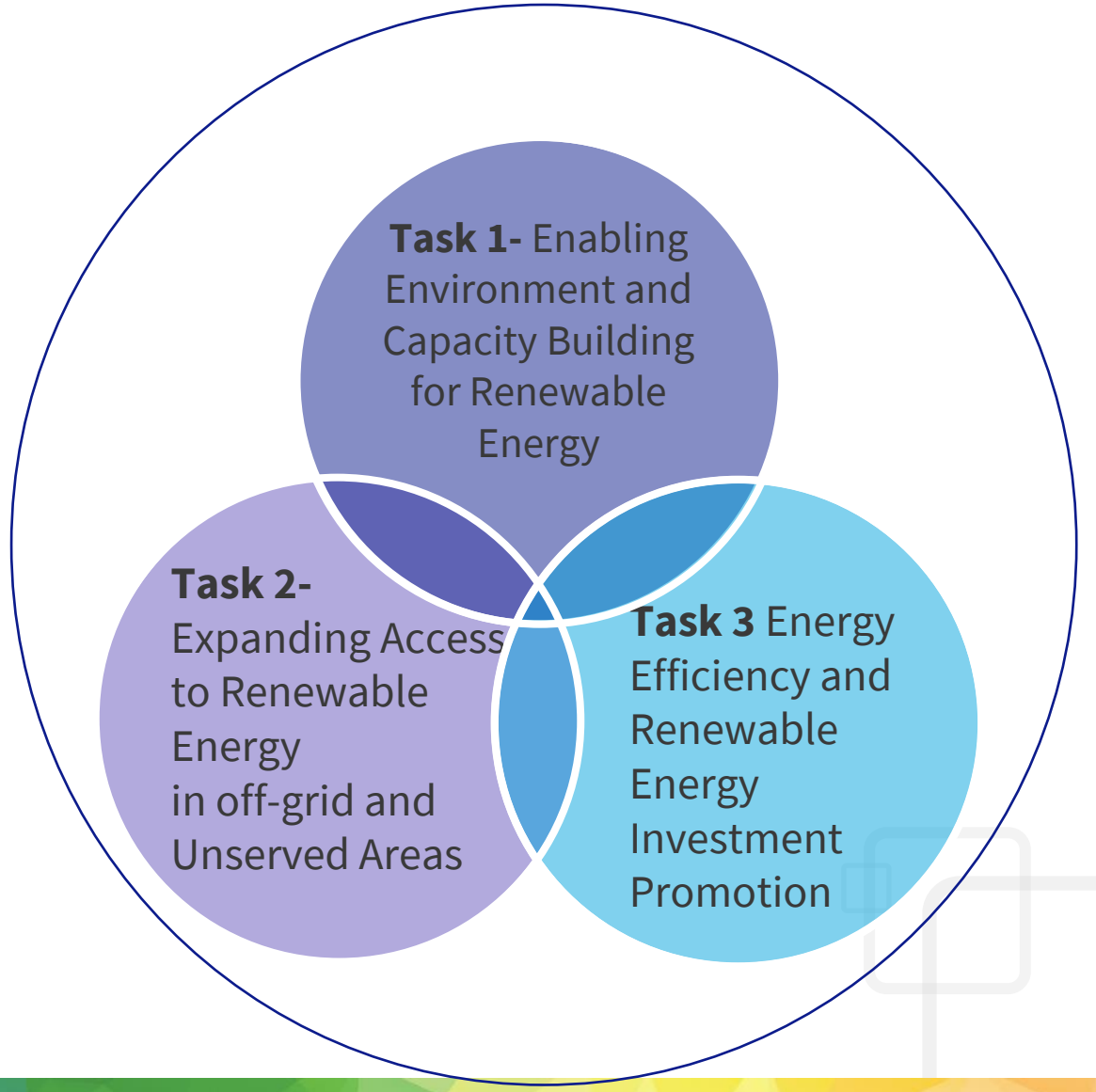
#1	Water
#1	Environmental Management
#1	Water Treatment/Desalination
#1	Hydro Plants
#8	Solar Power/Solar Generation
#10	Transmission & Distribution

22,000 CLIENTS

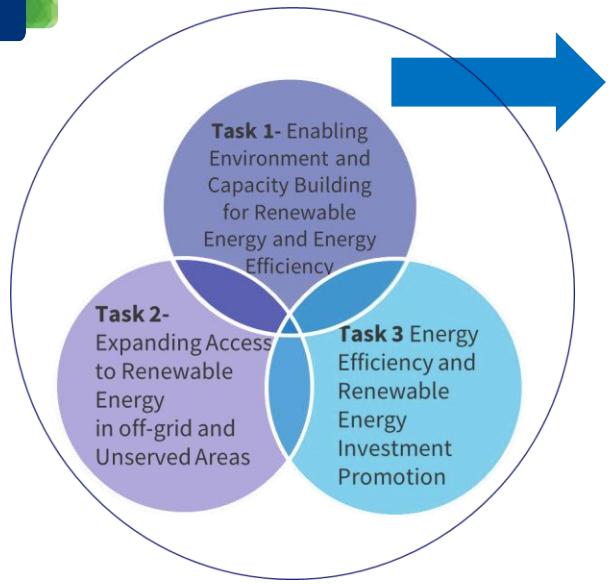
27,000

Colombia Clean Energy Program (USAID, CCEP, 2012-2017)

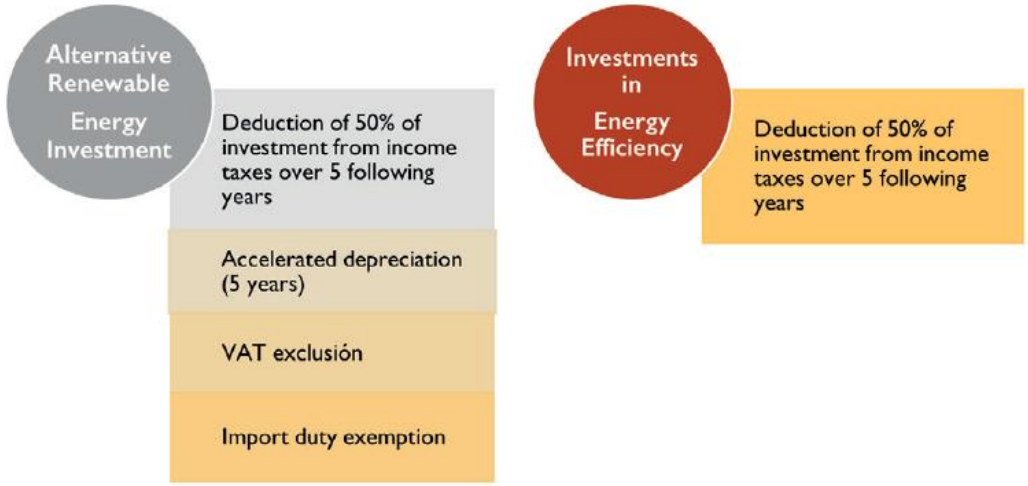
- Program financed by United States Agency for International Development (USAID)
- Conceived as USAID's Colombia's **flagship clean energy activity**
- Objective: To **increase access to renewable energy sources and energy efficient practices** in Colombia through a combination of project development support, technical assistance and **enabling environment reforms.**



Most relevant policy activities by CCEP

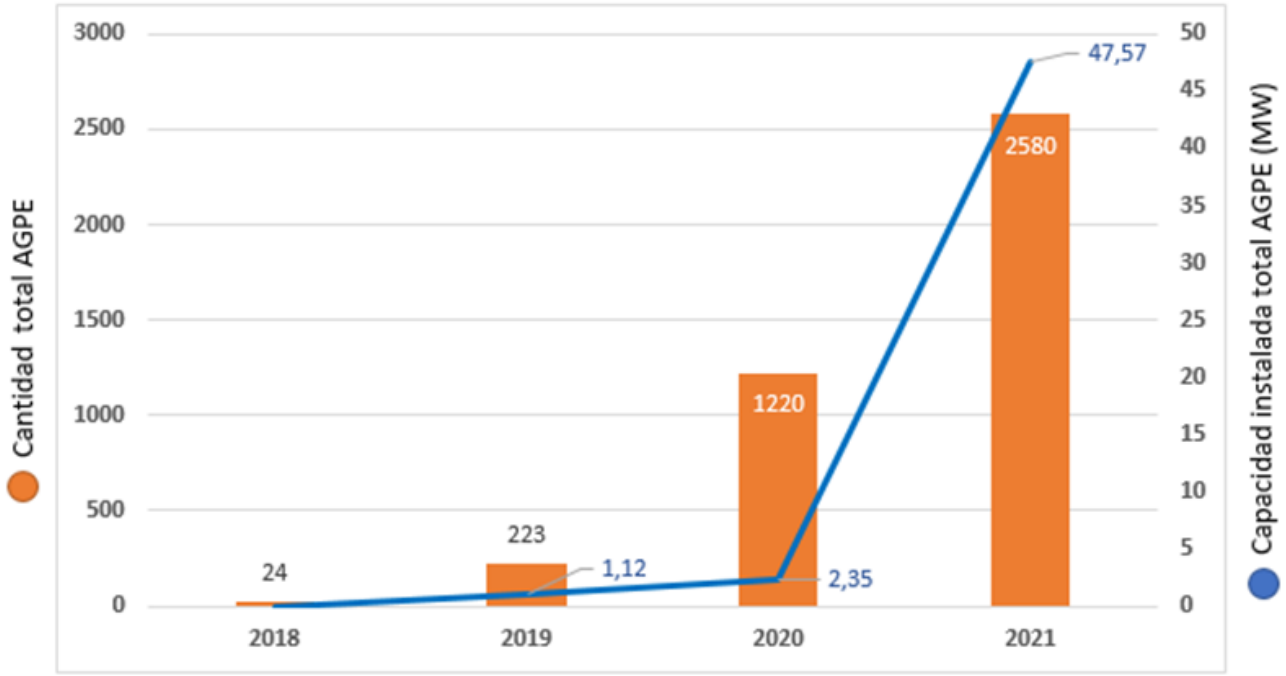


- Supported GoC with regulations associated with the Renewable Energy Incentives Law 1715 (2014)
- Designed & drafted technical regulations to allow the sale of surplus power from self-generation, co-generation and distributed generation
- Supported tax authorities + Ministry of Energy rolling-out Law 1715 tax incentives:
- Nearly 5,000 people attended live and video stream workshops hosted by CCEP with GoC to present guidelines, procedures, and eligibility of clean energy projects to apply for and receive these tax incentives.



Impacts policy actions

- Disruptive growth of distributed energy generation (mostly less than 100 kW)
- About 48MW in over 2500 projects
- Distribution companies are processing increasing number of applications causing delays and complaints in some cases
- Large scale deployment od DER (1 MW- 5 MW) are also under development



Source XM December 2021

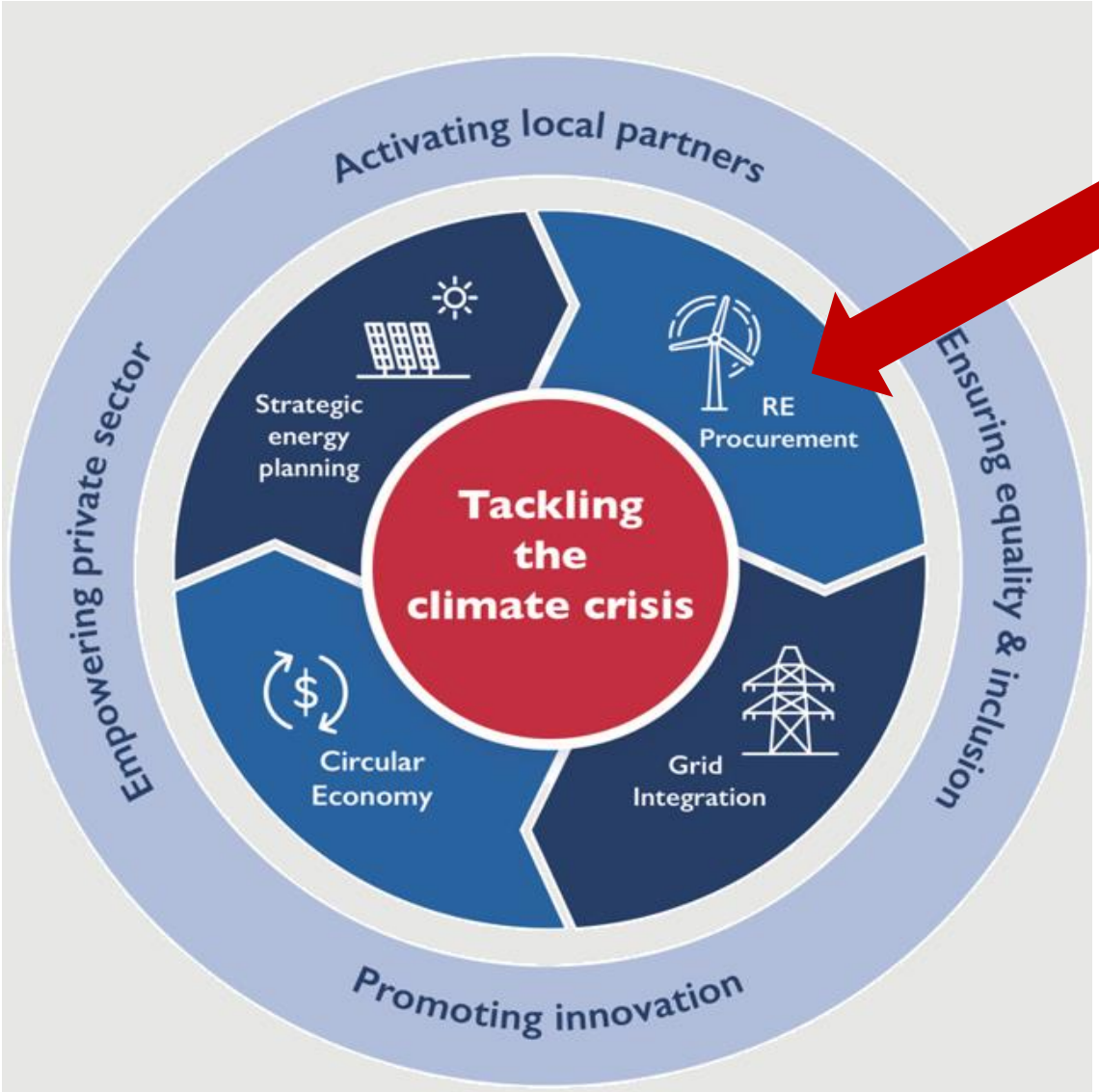
Scaling Up Renewable Energy Program (USAID, SURE, 2017-2025)

TETRA TECH

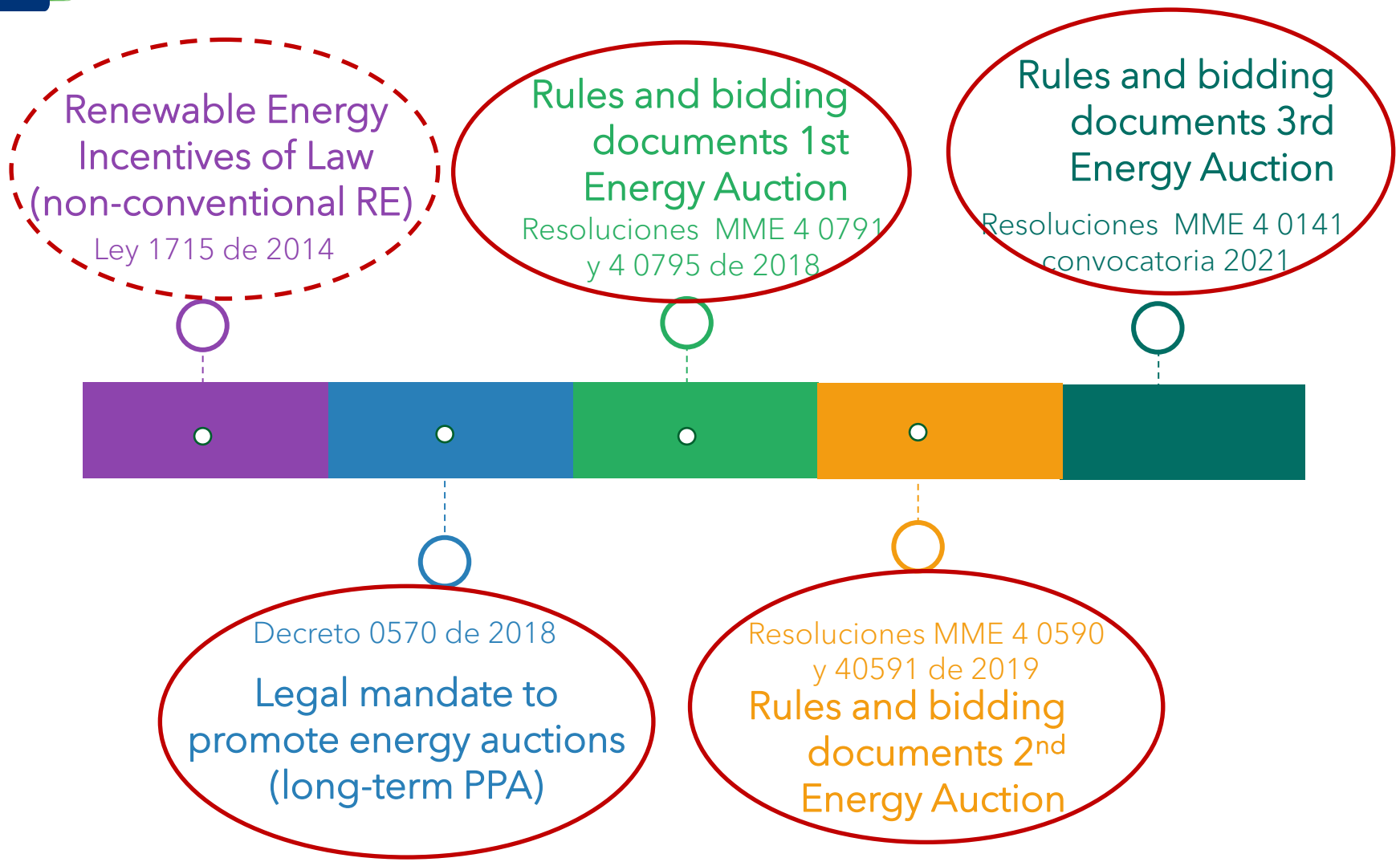
SURE Objective:

Assist USAID partner countries to **integrate renewable energy (RE)**

Fostering an enabling environment for scaling up RE and advanced energy technology using methods **that enhance self-reliance** while helping respond to energy sector challenges, opportunities and priorities



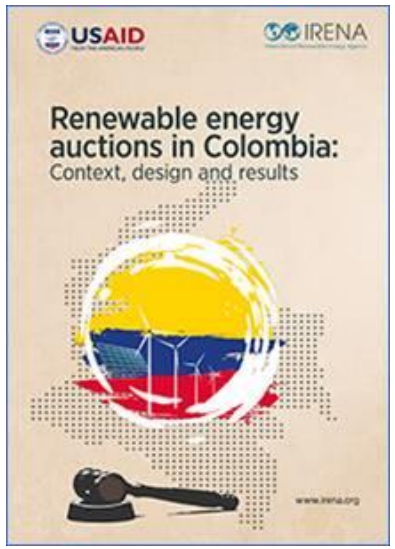
SURE Colombia impact of policy design and implementation



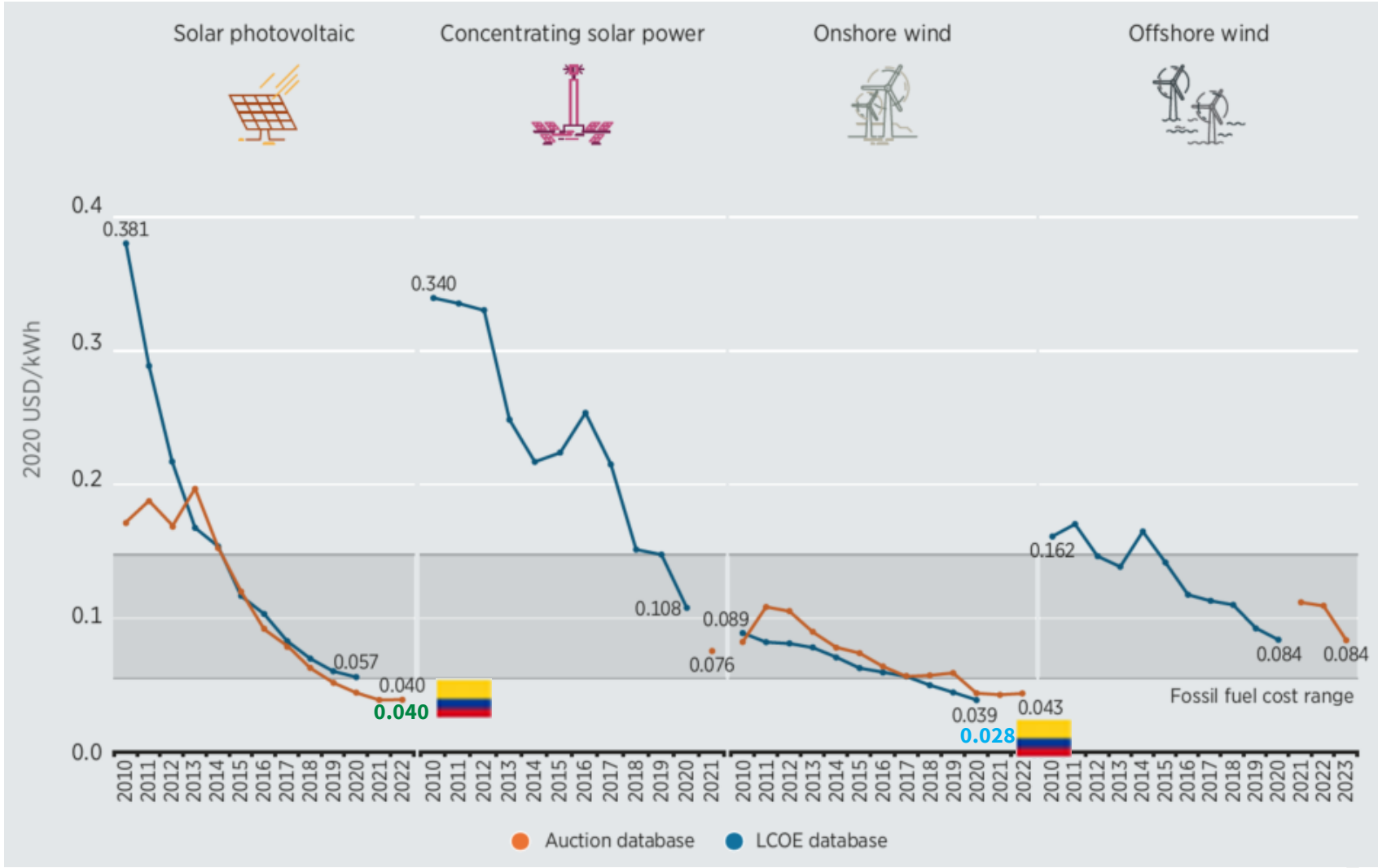
- Helped Colombia draft energy auction policies and regulations tailored to the country's context and policy vision.
- Supported **Colombia's first renewable energy auction in February 2019**, by assessing the energy sector, drafting regulatory instruments, and tailoring the auction design to Colombia's unique needs.

Impacts energy auction policy

- The Colombian auction process resulted in very competitive prices globally
- Awarded contracts for about **2170 MW** mostly wind



Renewable Energy Auctions in Colombia: Context, design and results.



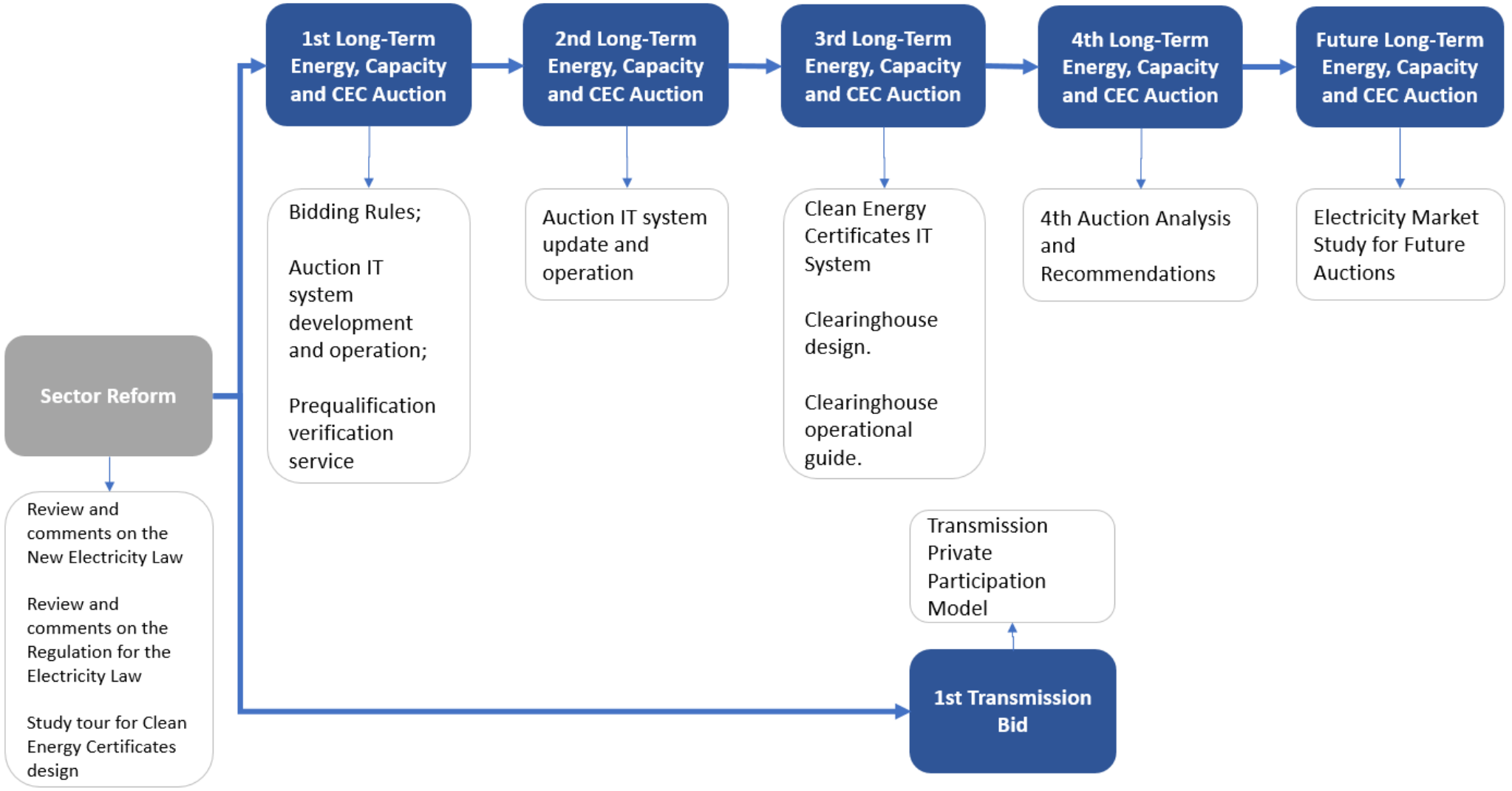
Source: IRENA Power Generation Cost 2020, published June 2021

Mexico Low Emissions Development Program (USAID, MLED 2012-2018)

Objectives:

- Support development and implementation of a **National Low Emissions Development Strategy and Subnational Climate Change Action Plans**
- Strengthening Mexico's systems for **monitoring, reporting, and verifying GHG emissions**
- **Increase the deployment of renewable energy**, strengthening the regulatory and policy environment, developing regulations and policies for clean energy, providing support for the liberalization of the energy market.
- Technical assistance during the 2013 constitutional **reform that liberalized the energy market**
- Support Mexico's three long term clean energy auctions
- **Capacity building** for the adoption of **project financing** instruments such as **carbon markets and clean energy certificates**.
- Develop and deploy several **IT tools for GHG inventories, MRV** and compliance for the energy and industrial sectors.

Overview of USAID MLED auction support



Impact policy actions

	1st AUCTION	2nd AUCTION	3rd AUCTION
	Companies **18** winning offers from **11 companies** participating in 7 Mexican states	**Companies** **56** winning offers from **23 companies** participating in 8 Mexican states	**Companies** **16** winning offers from **8 companies** participating in 8 additional Mexican states
	Investment **2.6** billion USD (in 3 years)	**Investment** **4** billion USD (in 3 years)	**Investment** **2.4** billion USD (in 3 years)
	Energy **2,085 MW** of installed capacity awarded	**Energy** **2,871 MW** of installed capacity awarded	**Energy** **2,180 MW** of installed capacity awarded
	CELs **5.4** million of clean energy certificates (CELs) awarded	**CELs** **9.3** million of clean energy certificates (CELs) awarded	**CELs** **6.1** million of clean energy certificates (CELs) awarded
	Power Not allocated	**Power** **1,187 MW** per year	**Power** **550 MW** per year
	March 31, 2016	*September 23, 2016*	*November 22, 2017*
	AVERAGE PRICE 47.78 USD	AVERAGE PRICE 33.47 USD	AVERAGE PRICE 20.57 USD

About **USD$9 billion** in investments for renewable projects

Awarded contracts with over **7100 MW of installed capacity**

Regional Clean Energy Initiative (USAID, RCEI 2012-2017)

- RCEI was a **regional project across six countries (El Salvador, Guatemala, Honduras, Costa Rica, Nicaragua, and Panama) to expand renewable energy and distributed generation** and introduce energy efficient solutions within national and regional markets.
- Tetra Tech worked with **local and regional policymakers, regulatory agencies, power market administrators and investors to advance the development of the Regional Electricity Market** (MER) in Central America and enhance economic growth.

RCEI Objectives:

- Contribute to **increased public and private investment in renewable energy** in Central America by improving the **enabling environment and institutional capacity.**
- Reduce energy consumption by **promoting rational energy use at the national and regional levels**.
- Improve quality of life and citizen **security in the Northern Triangle to reduce immigration**.

RCEI relevant policy regulation design and implementation

Activities to improve the investment climate for renewable energy development in Central America included two streams of work:

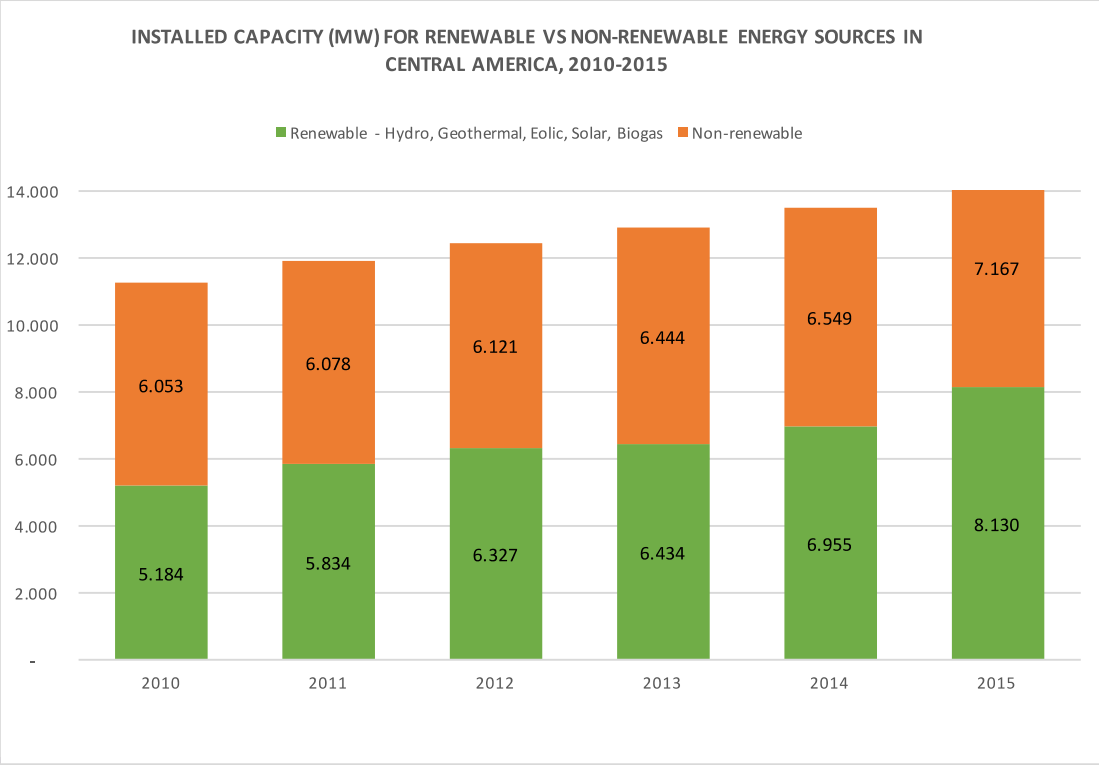
- **Strengthening of governance and regulation of the Regional Electricity Market** aimed at facilitating the increase of market transactions, the opening of national markets and attracting investments.
- **Supporting renewable energy auctions and monitoring of the implementation of the awarded projects**, as well as the technical and regulatory adaptation of the grid for the integration of new renewable technologies.

Renewable energy promoted at the national level by:

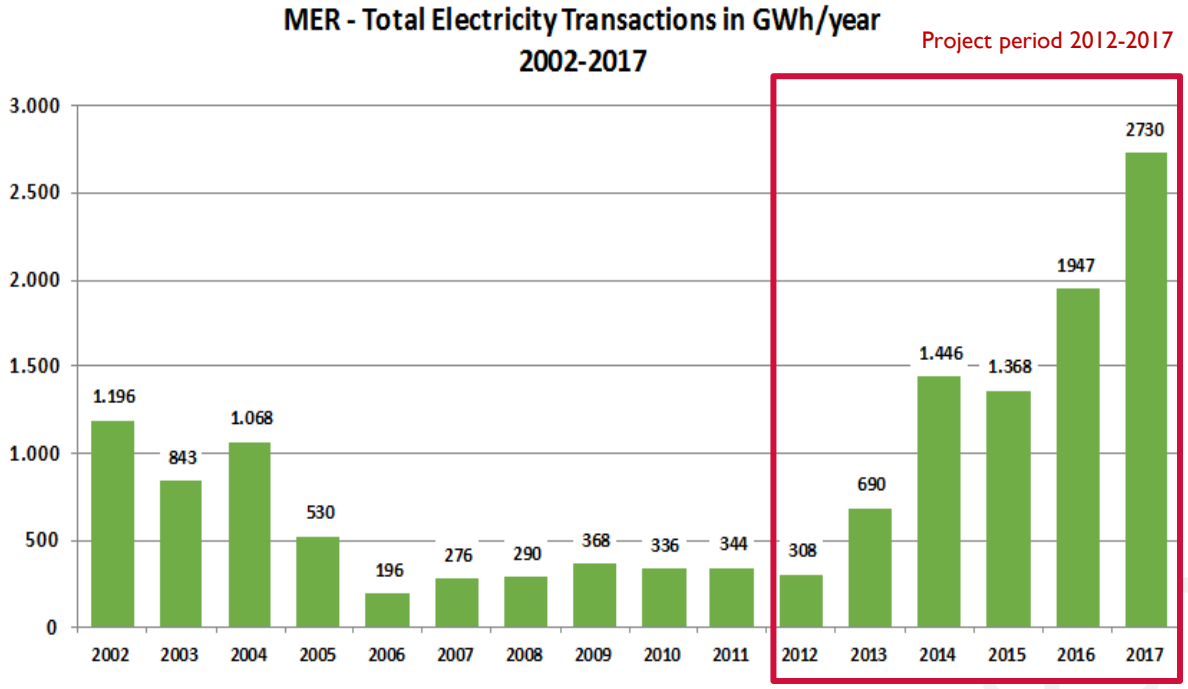
- **Supporting renewable energy auctions** that resulted in the awarding of 276 MW of new generation capacity in El Salvador
- Monitoring progress of 574 MW of projects awarded in auctions in Guatemala.
- Carrying out **renewable energy penetration studies** and participating in the processes of **developing and updating Guatemala's and El Salvador's regulations.**

Impacts

- Regional installed renewable energy from 2011-2015 grew rapidly – directly contributing to economic growth and job creation.



Regional energy transactions increased from 308 GWh in 2013 to about 2730 GWh in 2017



Key take-aways

- **Tax incentive policies, laws and regulations** increased deployment of large scale RE and DER
- **Competitive procurement policies such as auctions** have increased deployment of RE and can enable a competitive price setting, mobilize private sector investment and increase the transparency of public procurement.
- Broad consensus that **RE auctions are global best practice for procuring renewable energy** plants and **allow countries to capture reductions in technology prices** and achieve lower rates for utilities and consumers.
- RE policies such us auction design and implementation process must be tailored to the national policy objectives, market conditions and institutional capacities.
- The **integration of increasing shares of variable renewable energy creates system challenges**. System integration interventions include **improved system operations, market design, and network management.**

Reference materials

- USAID SURE partnered with IRENA to publish a case study, *Renewable Energy Auctions in Colombia: Context, design and results*.
- USAID SURE also developed a case study on how USAID and Colombia partnered with the private sector and published additional resources on the Colombia on USAID.gov.

TETRA TECH

CONTACT:

Jairo Gutierrez
Energy Sector Director
Tetra Tech ES, Inc.
Email: Llyr.Rowlands@tetratech.com

National Lab Cooperation to Support Net Zero Transitions

Energy System Wide – Development of technical and investment plans for holistic energy transitions to net zero energy systems and support for design and implementation of integrated energy system measures

Transportation

Policies for public-fleet procurement; low-carbon fuel standards to drive deployment of zero-emissions vehicles; joint RD&D to lower costs of battery electric and hydrogen fuel cell vehicles; modeling and analysis to optimize grid integration of charging infrastructure

Industry

Policies and standards for material efficiency; joint RD&D and testing for H2 for heat and as feedstock production; modeling and analysis to determine electrification opportunities

Buildings

Policies for finance availability; codes and standards for appliances and buildings performance; demonstration of technologies at building/ stock/community-level; workforce development for operators of net-zero buildings at scale

Carbon Capture and Geologic Storage

Policy support and Integrated assessment modeling to identify economic pathways to emissions reductions; tools and best practices for management, monitoring, validation, and accounting; technical and market development to create value from CO_2

Storage

Policies and regulations for business model and market development; analysis and road mapping to evaluate technologies for different power-sector applications; workforce development to facilitate knowledge-sharing and best practices around emerging technologies

Power

Policies and best practices for grid planning and system operation; grid modernization infrastructure and operational tools, modeling and analysis for grid integration and electricity market design; deployment of renewables and solutions for driving higher penetrations

Global Climate Action Partnership

regional leadership, global change

A Decade of GCAP

Over the last 10 years, the GCAP advanced LEDS/NDC implementation and ambition through its network of climate leaders and topical regional communities of practice. Since its launch in 2011 the LEDS GP has become a vibrant platform for peer learning and collaboration for over more than 4000 members across 120 countries.

275
Adopted and Strengthened POLICIES and MEASURES

+120 COUNTRIES
collaborating to implement and raise ambition of NDC and LTS

+19,000
Cases of improved knowledge & capabilities

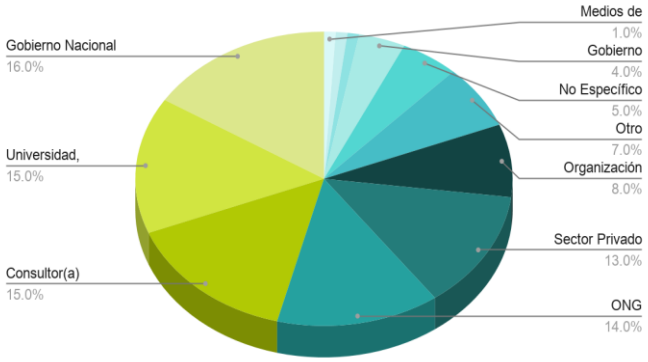
4735
MEMBERS WORLWIDE

The GCAP enabled **LEDS and NDC implementation partnerships** between private and public sectors, national and local governments, sectoral ministries and international support programs via regional and global communities.

LEDS LAC Community

Registered members (to April 2021)

Total (%male/%female): **+2.400 (55/45)**



Social network followers

3,372 followers in Facebook

1,213 followers in Twitter

879 followers in Linkedin

Communities of practice, working groups and special projects

- Bioenergy CoP
- Electric mobility CoP
- Sustainable logistics CoP
- M&E of climate policies
- ArticuLAC
- Transport WG
- Resource Efficiency WG
- Transparency in LAC
- Mining and climate
- Innovation
- LEDSinLAC

GCAP Approach to Achieve Policy Outcomes

Goal: Accelerate and coordinate the implementation of ambitious climate action in Latin America and the Caribbean, particularly through country level Nationally Determined Contributions (NDCs) and Long-Term Climate Strategies (LTS).

Outcome 1: Increasing climate ambition, such as updating 2025 country-specific NDC targets, 2030 NDC targets, and long-term strategies (LTS)

Outcome 2: Adoption of new or improved regulatory framework that support increased climate ambition (e.g. policies, laws, technical standards, and strategic programming)

Outcome 3: Pipeline developed of bankable, replicable, and scalable projects aligned with country NDC / LTS and regional priorities

Outcome 4: Investment mobilized and partnerships formed to implement project pipelines

Renewable Energy in Latin America and the Caribbean

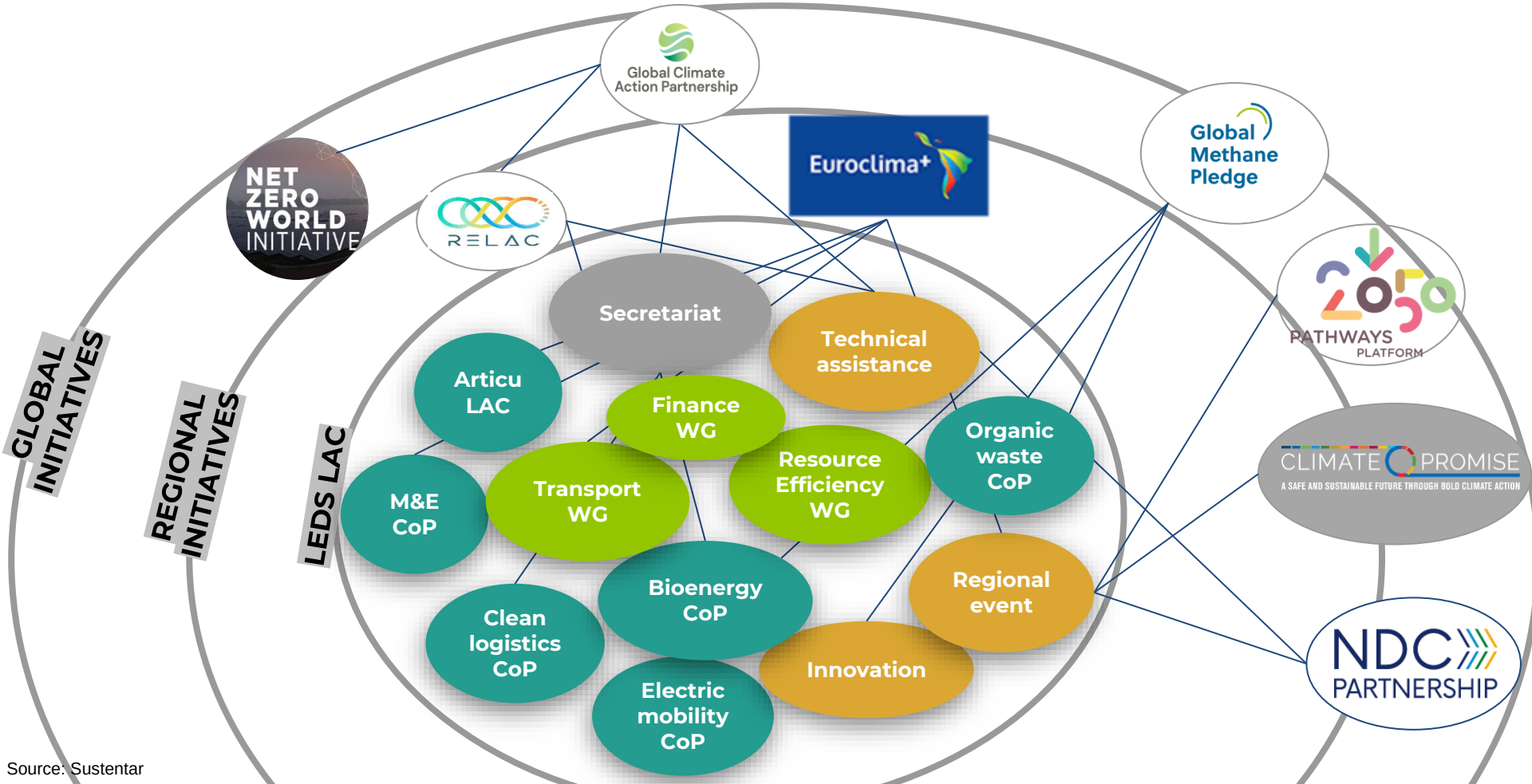
Achieving a regional target of 70% RE by 2030

Maximizing the impact of NREL's Technical Assistance:

- **Analysis and technical assistance on policies, incentives, regulatory frameworks, procurement and financing actions to achieve RELAC goals**
- **Technical support for national power system operators (through Global Power System Transformation Consortium)**
- **Development of Public-Private Coalitions to mobilize investment in clean energy**
- **Analytical Support of pathways and social, economic and environmental benefits of achieving RELAC's goals**
- **Peer learning and dissemination of good practices across LAC countries and worldwide (via GCAP network and communities of practice)**

https://hubenergia.org/index.php/en/relac

LEDS LAC Ecosystem



Source: Sustentar

CLEAN ENERGY SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY
An Initiative of the Clean Energy Ministerial

Thank you!

Daniella Rough, daniella.rough@nrel.gov

Policy Programs and Impact in Brazil

Clean Energy Solutions Center Webinar

Camila Ramos

March 9th, 2023

CELA
clean energy latin america

CELA is a strategic consultancy and financial advisory firm specializing in renewable energy, working with relevant and diverse set of clients

Consulting

- Strategic Planning
- Business plan
- Advisory services for participation in energy auctions
- Financial due diligence of projects
- Energy sectorial studies
- Financial modeling
- Modeling for H2V projects

Transactions

- Fundraising with investors
- Structuring of project financing
- Advisory services for buying and selling companies and projects (M&A)

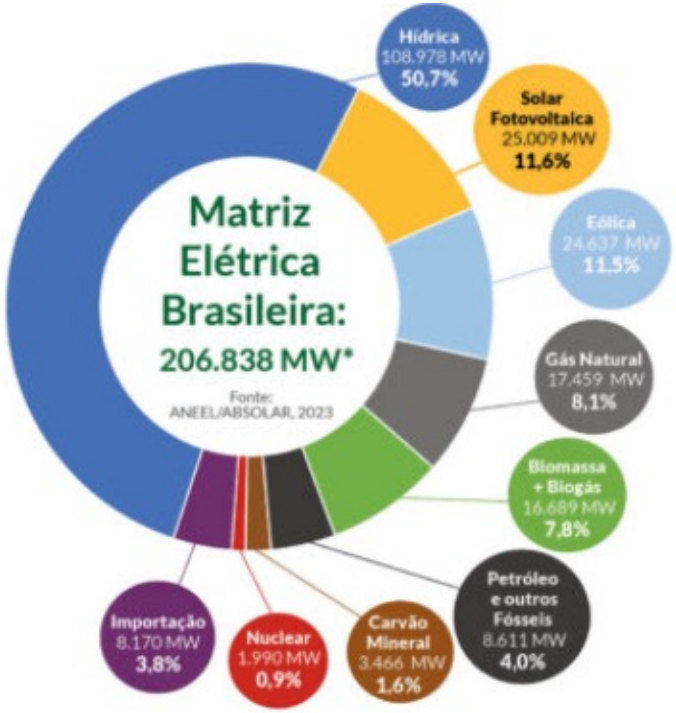
CELA's clients

acciona, aes Brasil, Atiaia Energia, AVINA, auren, BV banco, btg pactual, CanadianSolar
casadosventos energia para um novo mundo, CITYBELL, CPFL ENERGIA, dinamica, ecori, ecos, ecosolar Energia Inteligente, edp
edp renováveis, ENGIE, ERB, EÓLICA WIND | SOLAR, Grupo equatorial ENERGIA, equinor, GCL, greenyellow smart energy solutions, Grupo Casino GPA
helexia, IDB, IFC International Finance Corporation World Bank Group Creating Markets, Creating Opportunities, LDC. Louis Dreyfus Company, MARTIFER GROUP, NEOENERGIA, NREL National Renewable Energy Laboratory, ODEBRECHT Energia
R20 Regions of Climate Action, REN21 Renewables Now, Renobrax Energias Renováveis, REVOLUSOLAR, SEBRAE, ser energia, SIEMENS, SOLATIO ENERGIA LIVRE
Soliker, steag energy services, SUNCO. CAPITAL, SunEdison, TOTAL eren, Trinasolar, TRINERGY A TRITEC-INTERVENTO COMPANY, TSK
VIGNIS, voltalia, weg

CELA
clean energy latin america

The Brazilian power matrix is dominated by hydro power, and is increasingly being diversified with other renewables and natural gas

Brazilian power installed capacity



Source: ABSOLAR, based on ANEEL

- The Brazilian power matrix has historically been dominated by **hydro** power, which represents **51%** of the total installed capacity;
- **Solar and Wind (both utility-scale + DG)** are expanding their participation, and today each represent **11%** of the Brazilian power matrix;
- **Natural gas** is also expanding its participation, and now represents **8%** of total installed capacity – and will continue to grow (mandate of 8GW of new projects).

CELA
clean energy latin america

Renewable energy (wind and solar) represent more than 78% of all new capacity added in the Brazilian power matrix

Newly added installed power capacity per source (MW)

Source	New capacity added 2021 (MW)	% of new capacity added in 2021
Solar DG	3,921	34%
Wind	3,664	32%
Thermoelectric	2,444	21%
Solar Utility-Scale	1,290	11%
Small Hydro	114	1%

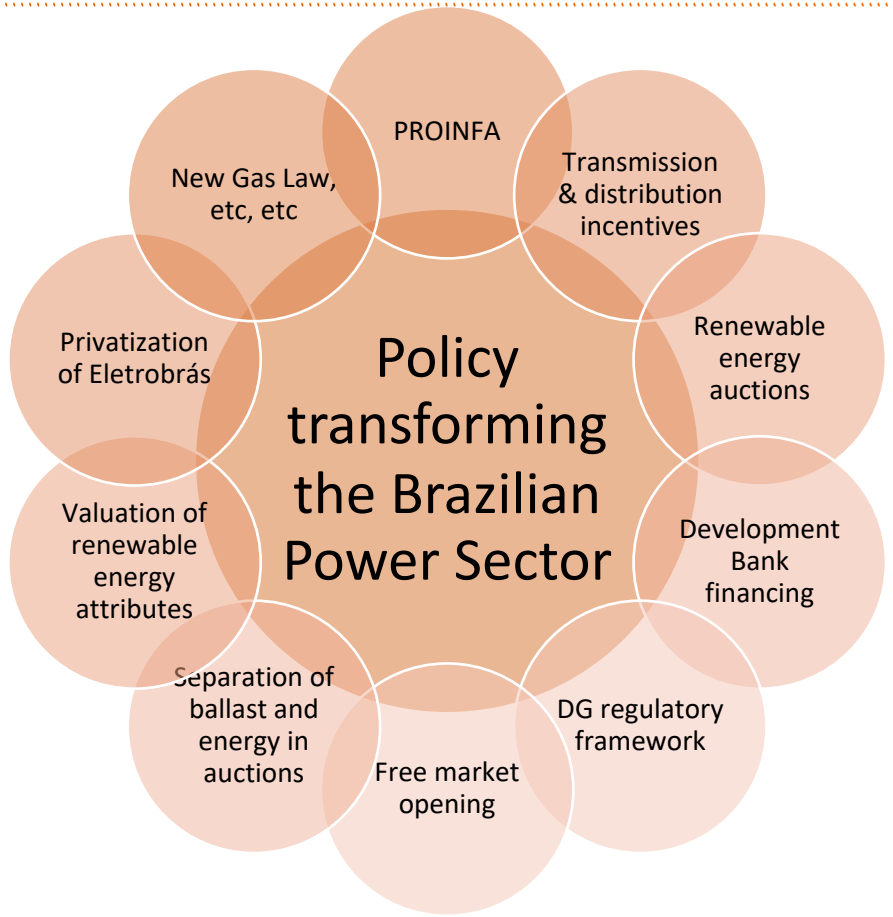
Source: ANEEL, table elaborated by CELA – Clean Energy Latin America.

- **Solar** (utility-scale + DG) represented **almost 1/2** of new added installed capacity in 2021;
- **Wind** represented almost **1/3**;
- **Thermoelectric gas plants** represented another **1/5** of new added capacity.

Source: ABSOLAR, based on ANEEL

Policy is at the core of the growth and competitiveness of renewable energy in Brazil

Main policies that have impact and will impact renewables



CELA
clean energy latin america

contacts

CELA – Clean Energy Latin America
info@cela.com.br
https://www.cela.com.br/

CELA
clean energy latin america

USAID
FROM THE AMERICAN PEOPLE

USEA
United States Energy Association

EUPP POLICY PROGRAMS AND THEIR IMPACT ON CLEAN ENERGY POLICIES IN THE LATIN AMERICAN REGION

Johanna Koolemans-Beynen
Program Manager

COLOMBIA

Resolution 60 of 2019, by which temporary modifications and additions are made to the Operation Regulations to allow the connection and operation of solar photovoltaic and wind plants in the SIN and other provisions are issued.

GRID WORK WITH XM

REVERSE AUCTIONS

Resolution 4-0791 of 2018 structures the implementing mechanism for Decree 570 of 2018, which established the criteria for introducing an energy auction in Colombia for the first time.

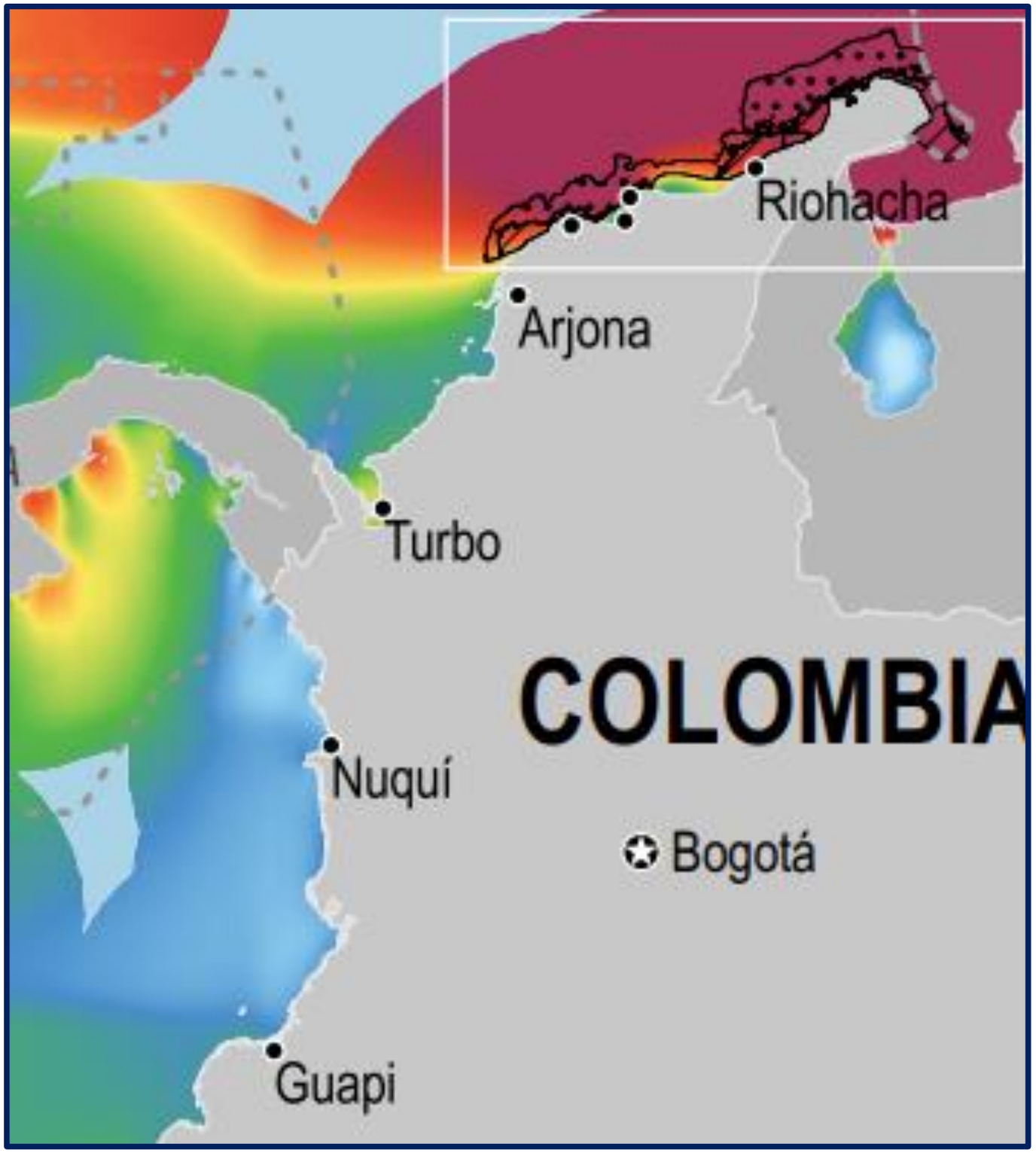
GEOTERMAL ENERGY

Decree 1318 of July 27, 2022, by which Decree 1073 of 2015, the Sole Regulatory Decree of the Administrative Sector of Mines and Energy is modified in order to regulate the articles 21 and 21-1 of Law 1715 of 2014 in relation to the development of activities oriented to the generation of electrical energy through **geothermal**

Decree 40302 of August 5, 2022, by which the technical requirements that will govern the Geothermal Registry and the Permits for exploration and exploitation of the Geothermal Resource for electric power generation purposes are established.

GREEN HYDROGEN

- **Decree 1476** of August 2, 2022 By which articles 21 and 23 of Law 2099 of 2021 are regulated and which adds Title VII to Part 2 of Book 2 of Decree 1073 of 2015 to adopt provisions aimed at promoting innovation, research, production, storage, distribution and use of **hydrogen**



OFFSHORE WIND

Resolution No.40284 of August 3, 2022, which defines the process by which those interested in developing offshore wind energy projects can obtain temporary permits on the maritime areas to be used by such projects and calls for the first round of allocations.

Factors of success:

- *Working in Colombia since 2017*
- *Working closely with NREL and Tetra Tech*
- *Extensive stakeholder consultations prior to starting a new project*
- *Working in a country with strong institutions,*
- *The existence of a high degree of consensus among government stakeholders*
- *Always working with a clear, policy-focused goal in mind*
- *Strong support from U.S. government*
- *Strong support from Ministry of Mines and Energy*

USAID
FROM THE AMERICAN PEOPLE

USEA
United States Energy Association

THANK YOU

JKOOLEMANS-BEYNEN@USEA.ORG

Connect With Us Online

- **Clean Energy Solutions Center (CESC)**
  - Check out our website
  - LinkedIn
  - CESC updates and event invitations

- **Clean Energy Ministerial (CEM)**
  - Check out our website
  - LinkedIn
  - Subscribe to the CEM newsletter!

CLEAN ENERGY SOLUTIONS CENTER
ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY
An Initiative of the Clean Energy Ministerial

Thank You!