

XXI REUNION ANUAL DE REGULADORES DE ENERGIA

Propuestas de Colaboración ARIAE/CEPAL



NACIONES UNIDAS

CEPAL

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Acuerdo de Colaboración ARIAE/CEPAL

Convenio Marco, firmado en Enero 2015 por Presidente ARIAE y Secretaria Ejecutiva CEPAL.

Apunta a promover conjuntamente:

- 1) Acciones acordes con **Agenda Desarr. Sost. 2030**
- 2) **Mejores practicas** en regulación energética
- 3) **Desarrollo institucional** de los Reguladores
- 4) **Estudios/programas** en regulac. energética
- 5) Actividades de **capacitación e intercambio**
- 6) Organización de **sistemas de información**



Recomendaciones del “VII Dialogo Politico Regional en Eficiencia Energética”

4. Apoyar el establecimiento de un “Observatorio Regional sobre Energías Sostenibles”, el que se crearía en CEPAL³ y cuyo objetivo sería el de coordinar los esfuerzos de investigación y análisis de datos y de políticas en materia de acceso a la energía, renovables y eficiencia, sobre la base de la positiva experiencia del BIEE
5. Reforzar la coordinación de los países y de las agencias multilaterales en apoyo a la elaboración de los Informes del Global Tracking Framework (GTF) de la iniciativa SE4ALL, coordinado a nivel planetario por el Banco Mundial y, a nivel regional, por la CEPAL
6. Encomendar a CEPAL a coordinar acciones con ARIAE para establecer un diálogo sistemático sobre los desafíos de la Regulación en la promoción de medidas de eficiencia energética y de la integración de la generación descentralizada, a nivel nacional y regional.



ECOSUD project

Energy COmplementarity and SUstainable Dvelopment in South America



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Energy Complementarity: *the justification*

- The new non-conventional renewable sources enable diversifying the **current mix of South American countries** which is strongly based on hydroelectric generation and, therefore, **vulnerable to climatic phenomena** (El Niño/La Niña)
- In addition, the increasing **lack of clarity in the policies for granting permits** for the construction of new hydro, combined with the **increasing influence exerted by opposing groups**, has led to **delays** in the construction of these plants.
- **RES are smaller projects** which are geographically scattered, subject to **fewer barriers for obtaining environmental permits**, which enable the diversification of the energy mix

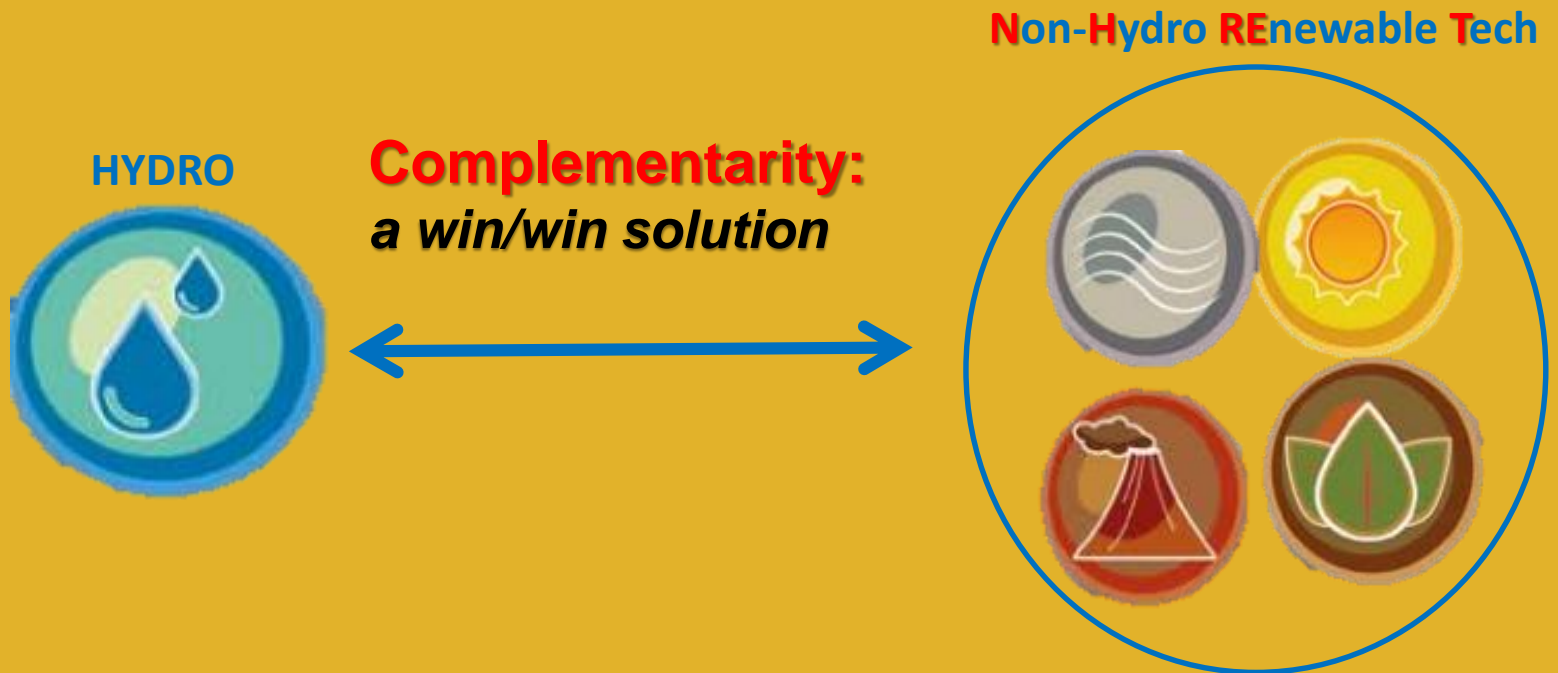


Energy Complementarity: *the justification*

- From an economic perspective - especially now, where **financing capacity at global level has significantly declined** - the smaller scale of the RES is a clear advantage.
- This is true, considering the **large capital investment involved in large hydroelectric** projects under construction in the region – e.g. Belo Monte plant (11,233 MW) in Brazil; Pescadero Ituango plant (2,400 MW) in Colombia; and potential projects like Aysén in Chile (2,000MW)
- For many countries in the region, the **output regime of RES can complement the hydroelectric output regime**, which enables the creation of invaluable synergies for the system.



HYDRO **vs** N.H.RE.T

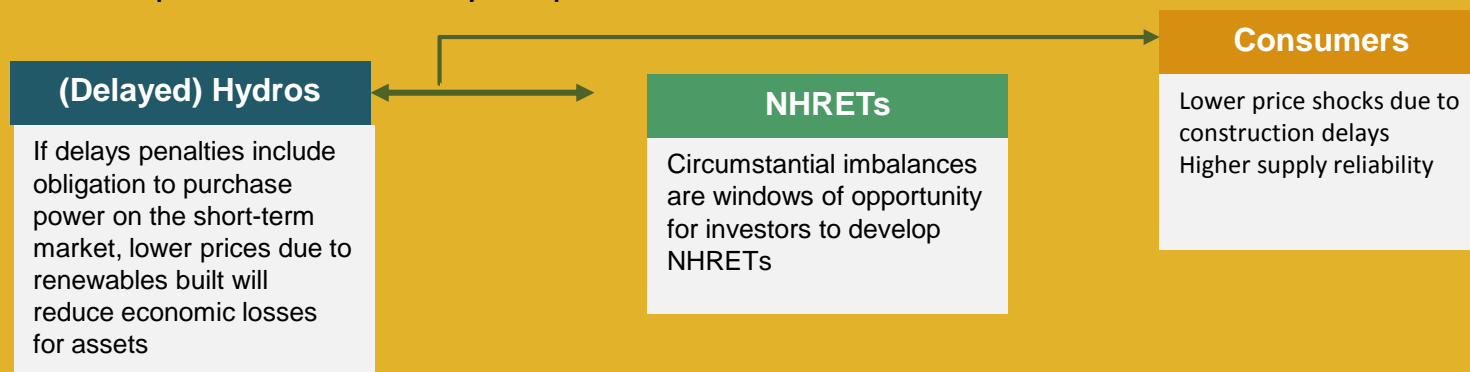


- Enhance economic performance of the power system
- Enhance reliability of supply

EXPANSION: *modularity*

- **Implementation of generation infrastructure**

- Modular **NHRETs with short construction times** can be built quickly to partially counteract circumstantial imbalances in supply/demand, especially if **delays** in implementation of hydro plants occur



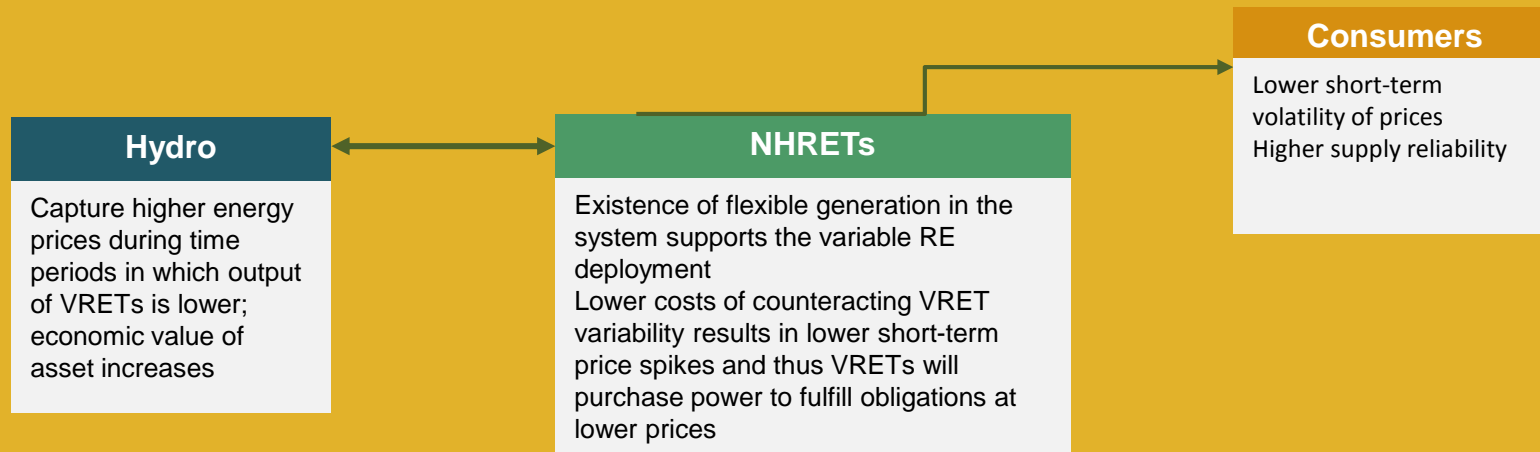
Implementation delays of hydropower projects in Latin America

- Large delays in hydro implementation allow implementation of small NHRETs

Project	Countries	Date	Capacity [MW]	Delay [months]
Bayano	Panama	1970	190	18
Sixth Power Project	Honduras	1973	40	42
Playas	Colombia	1981	200	30
Itaipu	Brazil, Paraguay	1991	12,600	116
Yacyreta	Argentina, Paraguay	1994	3,100	108
Baixo Iguaçu	Brazil	2016	350	39

OPERATION: *flexibility*

- **Hydropower's flexibility counteracts short-term variability of NHRETs**
 - Hydropower plants with reservoirs are flexible assets and the costs of using such existing plants to counteract the short-term variations in the VRETs' production is lower than that of other flexible generation technology

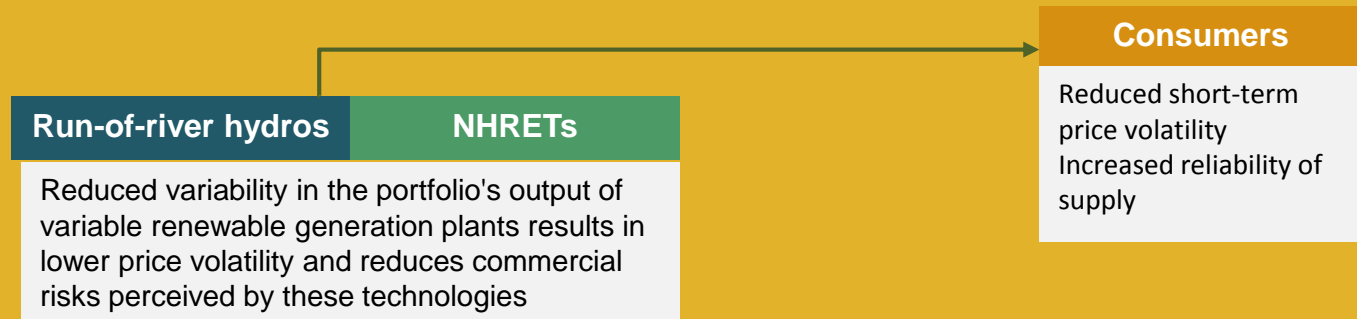


Hydro plants as cost effective providers of flexibility in Brazil

- The hydro plants in Brazil, with flexible generation at low costs, have been historically the sole provider of a large range of ancillary services, called secondary frequency control

OPERATION : *diversification*

- **Portfolio diversification of non-dispatchable renewable energy plants**
 - The production of a diversified renewable energy portfolio of non-dispatchable renewable energy plants, including run-of-river hydro plants, is less volatile in the short-term than that of each individual plants



100% Renewable portfolio target in Costa Rica

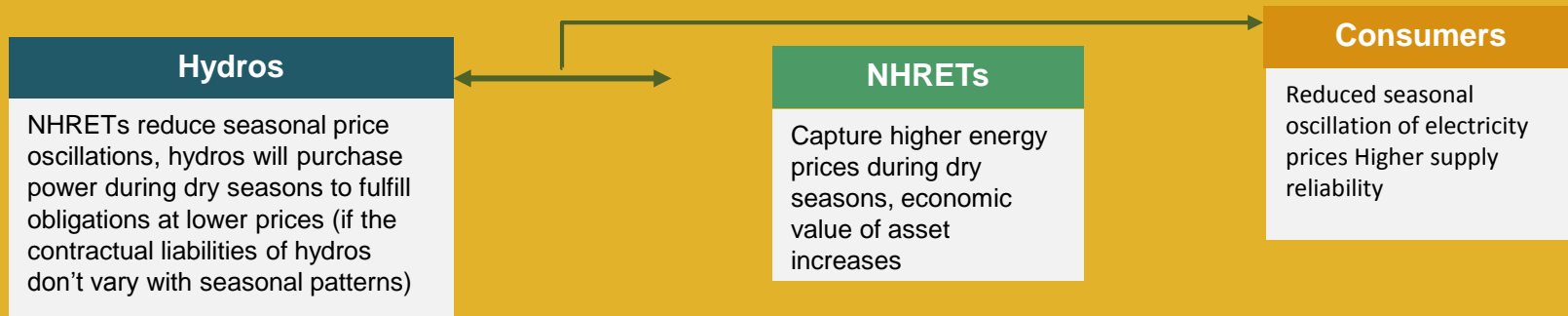
- Costa Rica aims at supplying 100% of its electricity need with renewable energy
- The diversified renewable portfolio (hydro, wind, geothermal and solar projects) managed in supplying for 75 consecutive days in the beginning of 2015, without any fossil fuels dispatch



OPERATION: *complementarity*

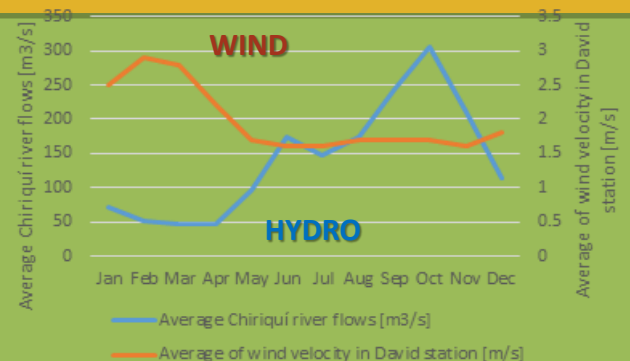
- **Seasonal climatic complementarity**

- Generation of **hydro plants is lower during drier seasons** but the generation of some NHRETs is not reduced or even increases during these periods
- What **benefits** does this mechanism bring?

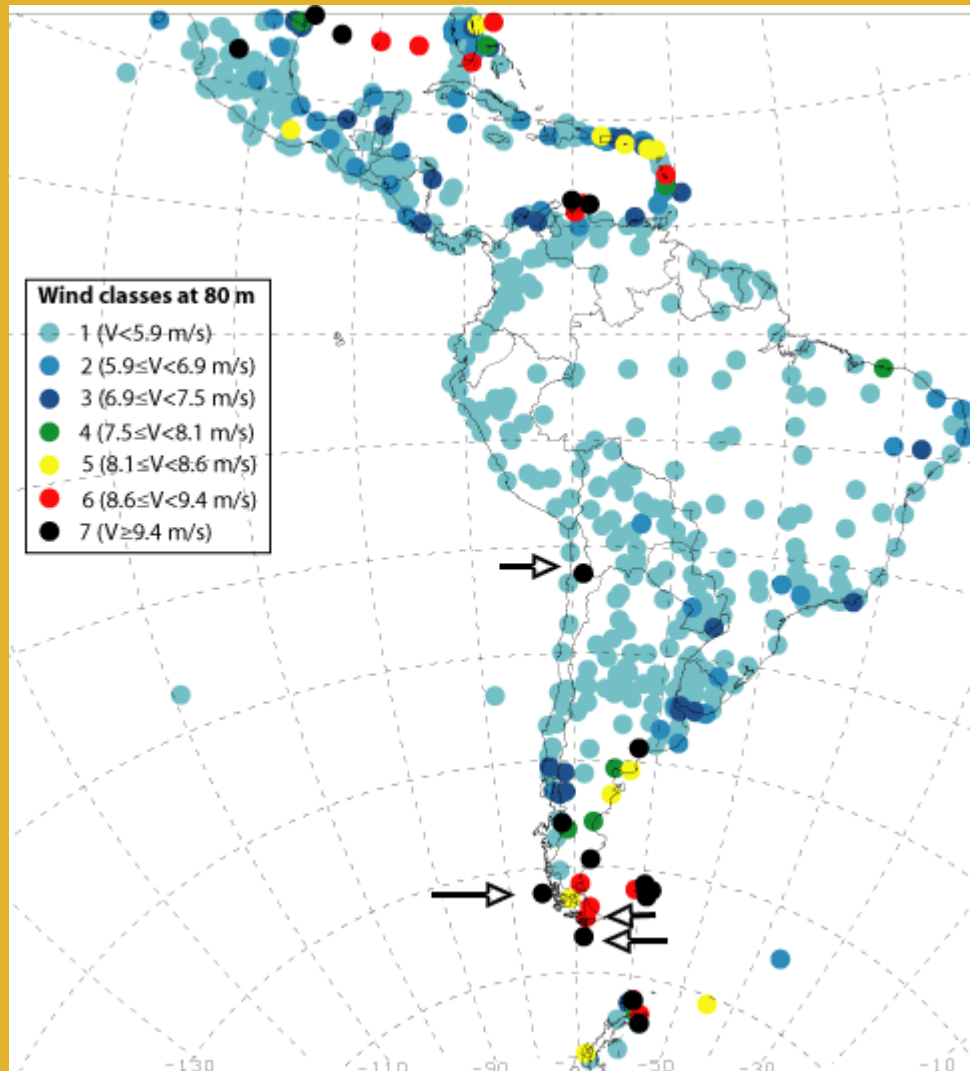


Seasonal complementarities in Panama

Observed complementarity between wind velocities and water flows of the same district, in the Pacific Coast of Panama

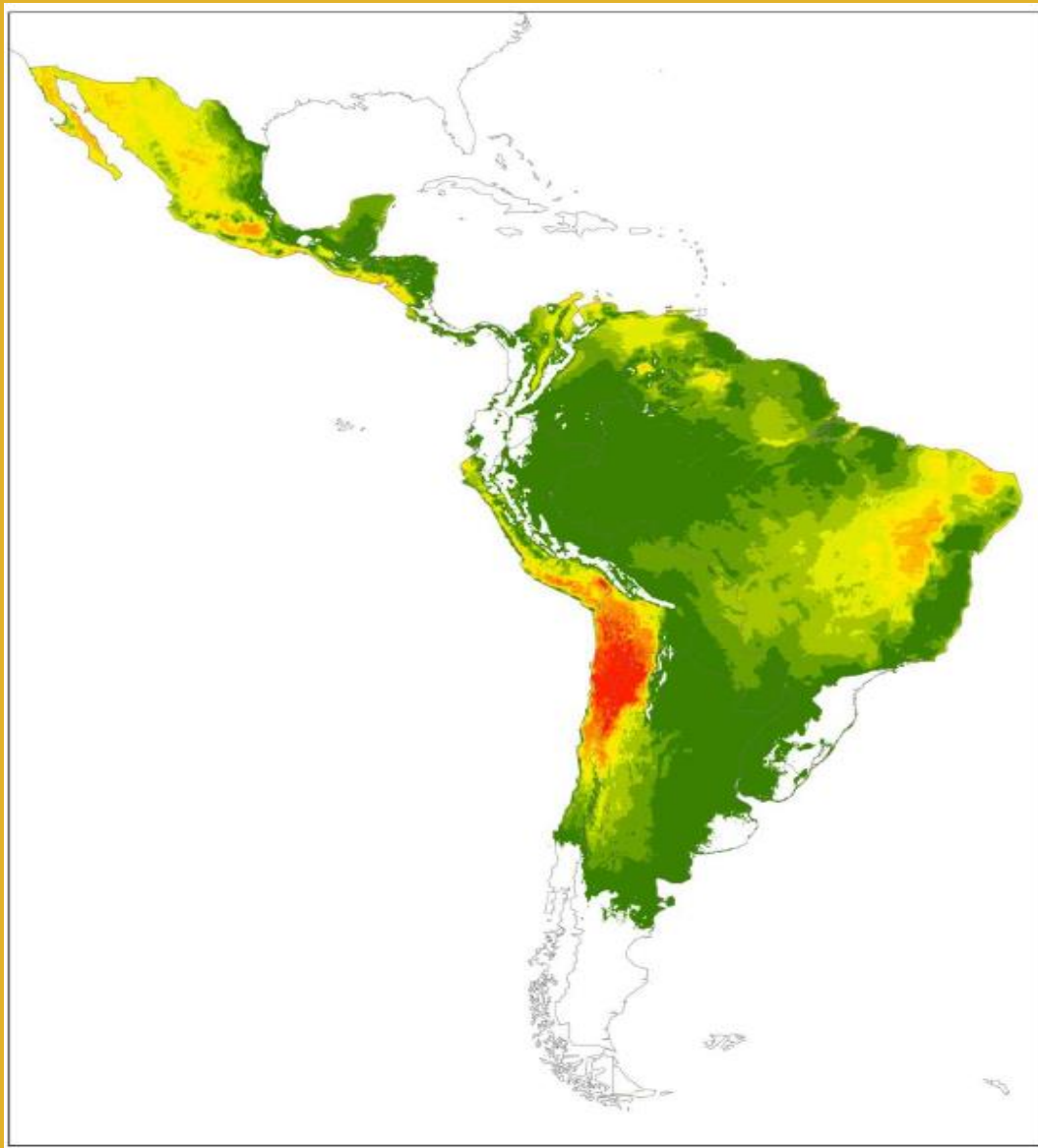


ECOSUD project: *the "Assets"*



The wind
resource

ECOSUD project: *the "Assets"*



**The sun
resource**

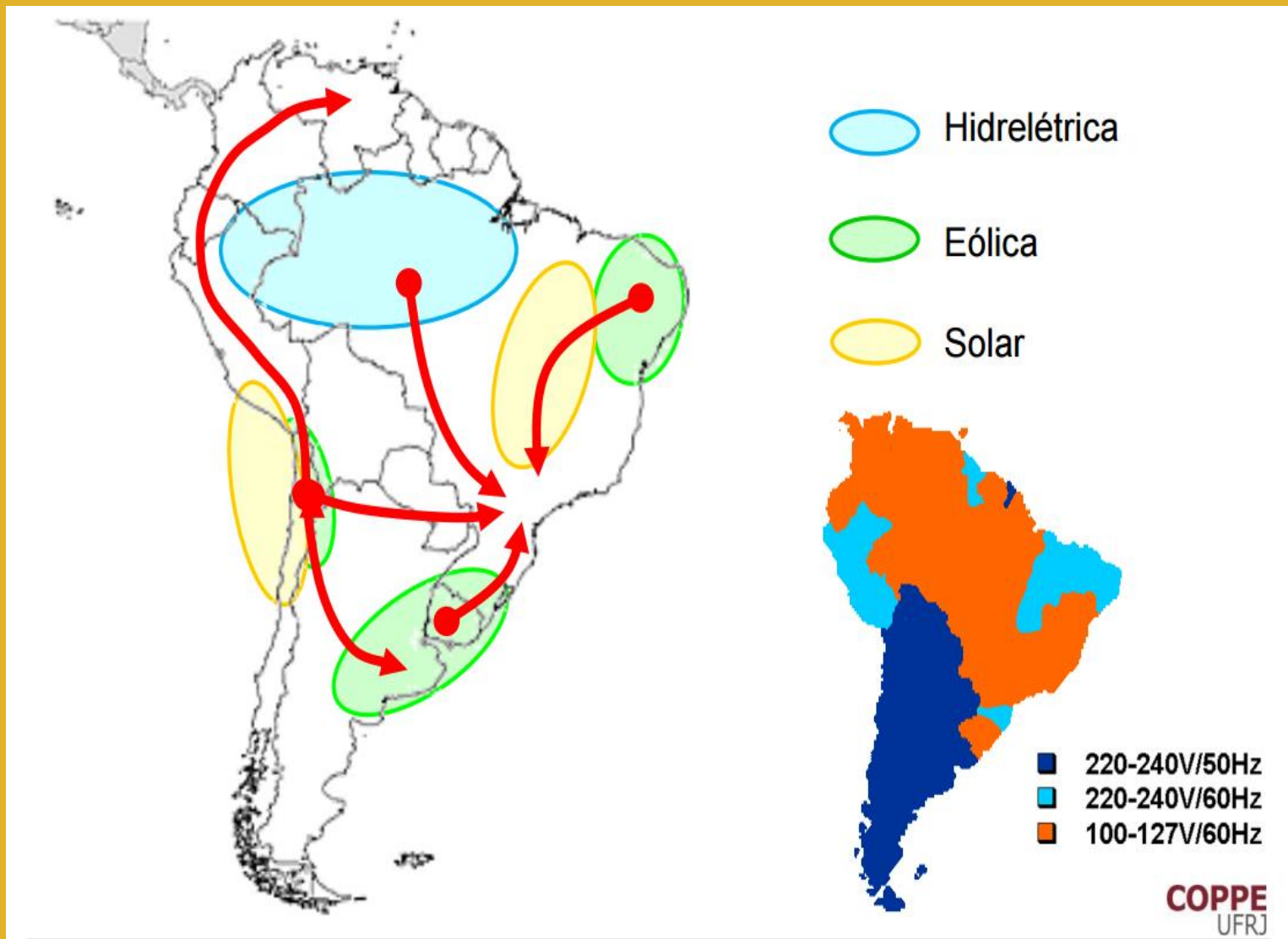
Fuente: Grid of the
Future, 2016 – J.R.
Paredes, IADB

ECOSUD project: *the "Assets"*



The geo
resource

ECOSUD project : *the Assets flow...*

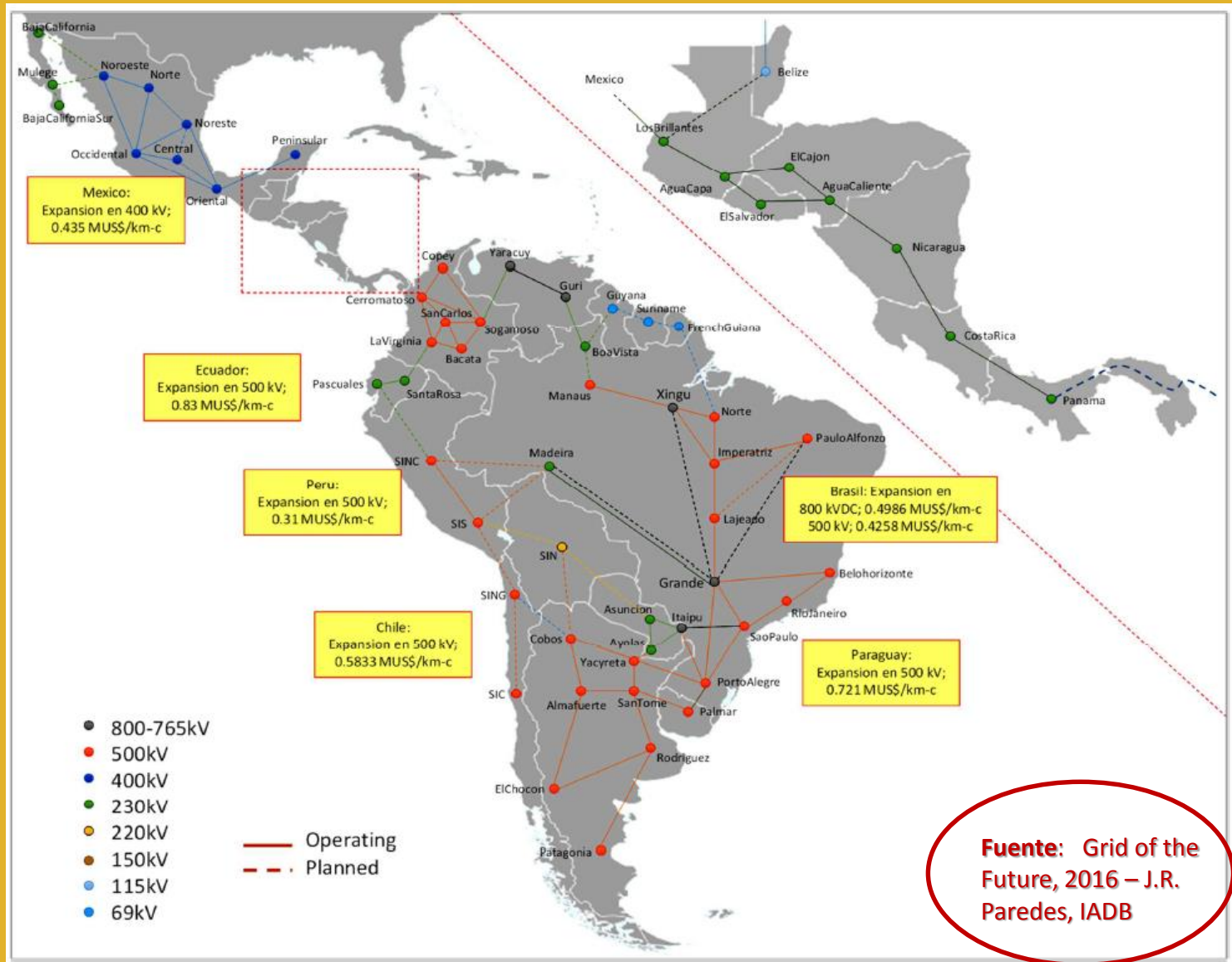


ECOSUD project : *the grid scenarios*



Fuente: CIER, 20015

ECOSUD project : *the grid scenarios*



Fuente: Grid of the Future, 2016 – J.R. Paredes, IADB

ECOSUD project : *the objectives*

- The key objective of ECOSUD project is to assess the **future impact of a significant deployment of RES** in the operation and expansion planning of the power systems in South America
- Given the spatially-dependent nature of these resources, the analysis will include an **assessment of the transmission and storage capacity requirements** that would accompany these renewables.
- The project will use **power system modeling tools** to examine what combination of additional power generation - including **Distributed Energy Resources (DER)** and **transmission assets** - will be required in the region to meet future electricity demand.



ECOSUD project : *the objectives*

- Currently, the scale of **regional interconnection** along the South American region **is limited**.
- Efforts support the idea of opening up greater links in the region, including the **creation of a Regional Power Market**.
- A comparative analysis of contemporary regulation in the region's different countries will be carried out in order to assess their differences and provide guidance on **how regional and national regulation can be optimized**.
- The study will **analyze how complementarity/integration** developments – e.g. **SINEA** initiative - might aid in helping the region meet its growing electricity needs, in order to **systemically leverages the region's energy resources**, particularly RES that have not yet been developed

ECOSUD project: *Model Design*

TARGET: to design a model capable to properly simulate the future performance of the power systems in the region

Will take as **base-case 1 country** of interest. First base-case country: **Brasil**

Two parallel studies: 1) **modelling and assessing the future** performance of the energy system under the scenarios considered; ii) analyzing **the regulatory design changes** that would be required

Prior to facing country analysis, it will be required to develop a sufficiently consistent and limited set of scenarios. This **power system development scenario analysis** will be **coordinated with the economic modeling scenarios** in order to assess how the system would evolve under those **demand** growth and **regulatory** conditions

The **first case might require a larger effort**, as during the process significant modelling redesigns will be needed. Extending these sort of analyses to the other countries (and later, to the Region) should not require such an effort.

ECOSUD project : *Regulation*

TARGET : develop a comprehensive analysis that addresses relevant regulatory challenges, to deal with two main elements:

a) interaction of Distributed Energy Resources (DER) at Wholesale level:

- Will new DER agents be admitted to **all the segments** of the market or they will be allowed to offer just **reliability services**?
- Which segments of the wholesale market should be open to the participation of DER and how to improve their **integration**?
- Should DER be entitled some **advantages** or should they receive the same treatment as dispatchable technologies?
- What about the **storage**, both at resources and electricity level ? Which will/should be the role in this of the **large hydropower** capacity found in Southamerica ?

b) interaction of DER and Transmission System-Operation (TSO) services:

- Which roles the TSOs have to play and how to delimit their **competencies**?
- How to improve the **coordination between TSO and DSO** for an efficient contribution of DER to system operation?

ECOSUD project : *the Partners*

ECLAC, is Leader of ECOSUD initiative, which consolidated the support of the German Cooperation for the period December 2016-Aug 2018. ECLAC also counts on limited financial support from the Government of France during '17.

WUPPERTAL INSTITUTE/Germany, **CIREN**/France and **Univ, Fed. Rio de Janeiro, UFRJ**/Brasil are mainly playing the role of technical advisors and contributors all along the project, specifically in the **modelling** effort.

IADB would accompany the project, based on: i) the previous studies and experience of the Bank on the matter, like is the case of the “*Red del Futuro*” study, ii) the interest of IADB in identifying bankable, sustainable energy complementarity projects in the region; iii) the chance of framing this project as a **SE4ALL-Americas** (the initiative leaded by IADB, with ECLAC as regional, strategic partner)

IRENA (International Renewable Energy Agency) joined the consortium as Observer, in its role of global SE4ALL partner.

ARIAE hosted the 1st inception meeting of ECOSUD (Jan '17) and will play a relevant role in following-up and assessing the **regulatory** effort



Propuesta de Colaboración ARIAE/CEPAL

Aprovechando del proyecto ECOSUD como articulador e “enabler” de la cooperación, realizar las siguientes acciones entre Abril 2017 y Diciembre 2018:

- a) Estudio comparativo Europa/America Latina **“Desafíos Regulatorios de la Generación Distribuida”**
- b) Participación activa de las Entidades Reguladoras de Energía en **actividades y estudios de ECOSUD** en materia regulatoria (ANEEL y CNE/Chile ya involucradas)
- c) Realización de actividades de difusión y/o capacity building de la futura **“Escuela Iberoamericana de Regulación”** en la sede de CEPAL en Santiago de Chile



Propuesta de Cierre.....

?? Constituir un **nuevo Grupo de Trabajo** de **ARIAE** sobre **“Redes del Futuro”**, como punto de referencia para coordinar – entre otras acciones - este Plan de Cooperación con CEPAL ??



Gracias por su atención



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