Electricity is development

At the service of Ecuador.

CONELEC
CONSEJO NACIONAL DE ELECTRICIDAD

Environmental Regulation and Renewable Energies

ECUADOR

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Lima, Peru November 2013

ECUADOR

- In the northwest of South America
- 256,370 km^2
- 15 million inhabitants
- 4 natural regions: Coast, Highlands, Amazon, Galapagos
- 7 administrative regions and 2 metropolitan districts
- 24 provinces, 221 cantons and 1078 parishes

LEGAL FRAMEWORK

CONSTITUTION (2008)

International Conventions and Treaties

Kyoto Protocol	(1997)
Convention on Biological Diversity	(1992)
Cartagena Protocol on Biosafety of the Convention on Biological Diversity	(2000)

Laws

Electrical Sector Act	(1996)
Environmental Management Act	(1999)
Constitution of Taxes and Rights Act Related to Electrification Works	(1977)

Regulations

Environmental Regulation for the Power Sector	(2001)
Unified Text of Secondary Legislation of the Ministry of the Environment	(2003)

Ministerial Agreements

AM 131 General Policies Good Environmental Practices Public Agencies	(2010)

INSTITUTIONAL FRAMEWORK

Decentralised Environmental Management System

Central Government

National Environmental Authority (AAN)
Ministry of the Environment

Office for the Defence of the Environment and Nature
(state stewardship of the environment and citizen co-responsibility)

Environmental Implementation Supervision Authority (AAAr)
CONELEC is the only Sector-based AAAr in Ecuador

Co-operating Environmental Implementation Authority (AAAc)

CONSTITUTION 2008

SUMAK KAWSAY (Preamble, Arts. 14, 250, 275, 387 of the Constitution)

- Harmony among people and between people and nature to attain a good quality of life.

It recognises the right of the population to live in a healthy and ecologically balanced environment that guarantees sustainability and a good quality of life, sumak kawsay.

RIGHTS OF NATURE or PACHA MAMA (Preamble, Art. 71)

Nature or Pacha Mama, where life is reproduced and occurs, has the right to integral respect for its existence and for the maintenance and regeneration of its life cycles, structure, functions and evolutionary processes.

LEGAL FRAMEWORK

Constitution of the Republic of Ecuador (2008)

"Art. 66 The following rights of persons are recognised and guaranteed:… 27. The right to live in a healthy environment that is ecologically balanced, pollution-free and in harmony with nature..."

- Nature is considered a juridical person.
- The rights of nature are inalienable and not subject to a statute of limitations.
- The State shall apply preventive and restrictive measures on activities.
- All citizens can call upon public authorities to enforce the rights of nature.
- Individuals and communities that depend on affected natural systems have the right to be compensated.

LEGAL FRAMEWORK

Constitution of the Republic of Ecuador (2008)

- In the public sector, the State shall promote the use of environmentally clean technologies and low-impact, non-polluting alternative energies and energy efficiency at all levels.
- The State shall give incentives to natural persons, bodies corporate and communities to protect nature.
- It is the responsibility of people to produce, exchange and consume goods and services in a socially and environmentally responsible way.
- Environmental management policies shall be applied cutting across all sectors and dimensions.
- **The burden of proof regarding the absence of potential or real environmental damage shall lie with defendant.**

LEGAL FRAMEWORK

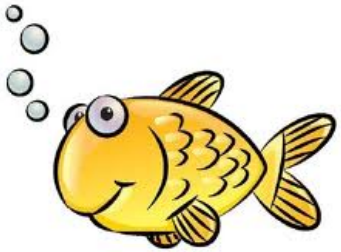
Ecological Flow

Constitution of the Republic of Ecuador (2008)

Art. 411.- The State shall guarantee: The State shall guarantee the conservation, recovery and integral management of water resources, watersheds and ecological flows.

It regulates all activities that can affect the quality and amount of water and the equilibrium of ecosystems.

The sustainability of ecosystems and human consumption shall be priorities in water use and development.



LEGAL FRAMEWORK

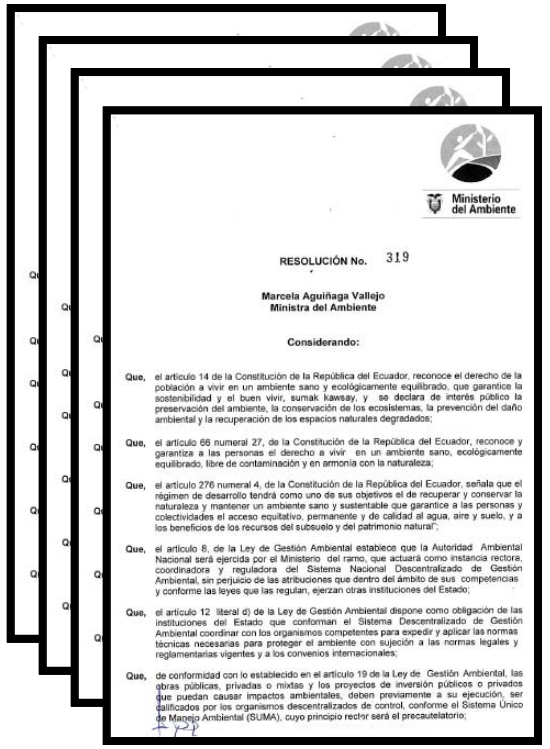
Ecological Flow Environmental Technical Standards for the Prevention and Control of Pollution in Infrastructure Sectors... Electrical Power.

Set of ecological flows that resemble the hydrologic conditions or circulating flows per hydrographic sector of the river...

The regulated flows in the case of hydropower plants must ensure the maintenance of the water flow or ecological flow that ensures conservation and maintenance of the ecosystems and biodiversity of the river environment.
(10% of the average annual flow).

CONELEC AS AN ENVIRONMENTAL AUTHORITY

- Accreditation as an AAAr in 2005.
- Accreditation renewed in 2011.
- Authorised at the national level to issue Environmental Licenses for electrical power projects and to exercise oversight of its regulated agents.
- It is in charge, through an Environmental Management Unit, of regulating, supervising and monitoring compliance of the National Power Sector with environmental obligations.



Ministerio del Ambiente

RESOLUCIÓN No. 319

Marcela Aguiñaga Vallejo
Ministra del Ambiente

Considerando:

Que, el artículo 14 de la Constitución de la República del Ecuador, reconoce el derecho de la población a vivir en un ambiente sano y ecológicamente equilibrado, que garantice la sostenibilidad y el buen vivir, sumak kawsay, y se declara de interés público la preservación del ambiente, la conservación de los ecosistemas, la prevención del daño ambiental y la recuperación de los espacios naturales degradados;

Que, el artículo 66 numeral 27, de la Constitución de la República del Ecuador, reconoce y garantiza a las personas el derecho a vivir en un ambiente sano, ecológicamente equilibrado, libre de contaminación y en armonía con la naturaleza;

Que, el artículo 276 numeral 4, de la Constitución de la República del Ecuador, señala que el régimen de desarrollo tendrá como uno de sus objetivos el de recuperar y conservar la naturaleza y mantener un ambiente sano y sustentable que garantice a las personas y colectividades el acceso equitativo, permanente y de calidad al agua, aire y suelo, y a los beneficios de los recursos del subsuelo y del patrimonio natural";

Que, el artículo 8, de la Ley de Gestión Ambiental establece que la Autoridad Ambiental Nacional será ejercida por el Ministerio del ramo, que actuará como instancia rectora, coordinadora y reguladora del Sistema Nacional Descentralizado de Gestión Ambiental, sin perjuicio de las atribuciones que dentro del ámbito de sus competencias y conforme las leyes que las regulan, ejerzan otras instituciones del Estado;

Que, el artículo 12 literal d) de la Ley de Gestión Ambiental dispone como obligación de las instituciones del Estado que conforman el Sistema Descentralizado de Gestión Ambiental coordinar con los organismos competentes para expedir y aplicar las normas técnicas necesarias para proteger el ambiente con sujeción a las normas legales y reglamentarias vigentes y a los convenios internacionales;

Que, de conformidad con lo establecido en el artículo 19 de la Ley de Gestión Ambiental, las obras públicas, privadas o mixtas y los proyectos de inversión públicos o privados que puedan causar impactos ambientales, deben previamente a su ejecución, ser calificados por los organismos descentralizados de control, conforme el Sistema Único de Manejo Ambiental (SUMA), cuyo principio rector será el precautelatorio;

PRODUCTS / SERVICES

- Review and approval of Environmental Impact Studies (physical, biotic and socio-cultural).
- Review and approval of Environmental Audits (compliance with approved Management Plans and Action Plans))
- Leadership of Social Participation Processes
- Granting of Environmental Licences, except in protected areas.
- Imposition of Easements.
- Support in resolving social conflicts.

CONELEC

LICENCIA AMBIENTAL No. 001/11

CONSEJO NACIONAL DE ELECTRICIDAD, CONELEC

LICENCIA AMBIENTAL PARA LA CONSTRUCCION Y OPERACION DEL PROYECTO DE DE LINEA DE SUBTRANSMISION A 69 kV Y 1.1 km, DESDE LA SUBESTACIÓN EL PACHE HASTA LA SUBESTACIÓN SVETLANA CON UNA CAPACIDAD DE 7.5 MVA

El Consejo Nacional de Electricidad, CONELEC, en su calidad de Autoridad Ambiental de Aplicación responsable, AAAr, otorgada mediante Resolución del Ministerio del Ambiente No. 0173, publicada en el Registro Oficial No. 552 de 28 de marzo de 2005 y en cumplimiento de sus responsabilidades establecidas en la Constitución, la Ley de Gestión Ambiental y la Ley de Régimen del Sector Eléctrico, para precautelar el interés público en lo referente a la preservación del ambiente, la prevención de la contaminación ambiental y la garantía del desarrollo sustentable, confiere la presente Licencia Ambiental para la construcción y operación del Proyecto Linea de Subtransmisión a 69 kV y 1.1 km, desde la Subestación El Pache hasta la Subestación Svetlana con una capacidad de 7.5 MVA; a ubicarse entre los sitios de El Pache y sector oeste de El Osorio, en el sector industrial minero de El Pache (sector paralelo al río Calera), cantón Portovelo, provincia de El Oro, que desarrollará CNEL Regional El Oro, representada legalmente por su Gerente Regional y Representante Legal, Ing. Rodrigo Polo Urdiales, en sujeción estricta al Estudio de Impacto Ambiental Definitivo, APROBADO.

En virtud de lo expuesto, CNEL Regional El Oro, se obliga a:

1.- Cumplir estrictamente con el Plan de Manejo Ambiental aprobado.

2.- Utilizar en las actividades inherentes a la construcción y operación del Proyecto Linea de Subtransmisión a 69 kV y 1.1 km, desde la Subestación El Pache hasta la Subestación Svetlana con una capacidad de 7.5 MVA, tecnologías y métodos que prevengan, mitiguen y/o remedien, los impactos negativos al ambiente y atender los requerimientos del CONELEC al respecto.

3.- Presentar al CONELEC las Auditorías Ambientales correspondientes, conforme con lo previsto en el Reglamento Ambiental para Actividades Eléctricas, artículos 26 a 29 y la Auditoría Ambiental de cierre a la finalización de la construcción del Proyecto Línea de Subtransmisión a 69 kV y 1.1 km, desde la Subestación El Pache hasta la Subestación Svetlana con una capacidad de 7.5 MVA.

4.- Apoyar al Equipo Técnico del CONELEC, o a terceros delegados por el mismo, para facilitar los procesos de monitoreo y control del cumplimiento del Plan de Manejo Ambiental respectivo, materia de esta Licencia Ambiental.

5.- Facilitar el acceso a la información necesaria, para que se lleven a cabo las Auditorías Ambientales practicadas directamente por el CONELEC o a través de terceros delegados.

6.- Presentar la información y documentación que sea requerida por el CONELEC y/o por el Ministerio del Ambiente.

7.- Promover reuniones con la comunidad, en las cuales se les informe sobre el monitoreo ambiental del Proyecto Linea de Subtransmisión a 69 kV y 1.1 km, desde la Subestación El

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Apartado: 17-17-817 • E-mail: coneleoc@conelec.gov.ec • www.conelec.gov.ec • Quito - Ecuador.

DESIGN / ALTERNATIVES

CONSTRUCTION

Toachi Pilaton Hydropower Project

PHASES

OPERATION

Machala Power Thermal Power Plant

DECOMMISSIONING

High-Voltage Tower

Social Participation Processes

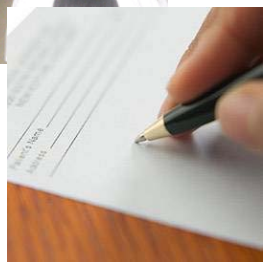
Implementation Regulation for Social Participation Mechanisms established in Environmental Management Law No. 1040, of May 2008

I. PLANNING

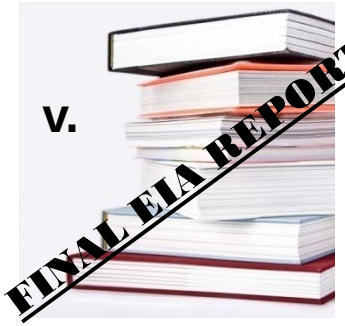
II. OUTREACH

III. INFORMATION AND PUBLIC COMMENT CENTRE

IV. PUBLIC HEARING



V.



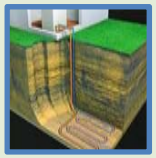
CONELEC
CONSEJO NACIONAL DE ELECTRICIDAD

REGULATION OF NON-CONVENTIONAL RENEWABLE ENERGIES - NCRE

National Regulation Coordinator

Purpose of the Regulation

To establish the basic requirements and preferential conditions for the participation of non-conventional renewable energy generators in the Ecuadorian power sector.



CHANGE IN THE ENERGY MATRIX

Harnessing the great hydropower potential of the Amazon watershed, without neglecting projects that can be developed in the Pacific watershed.

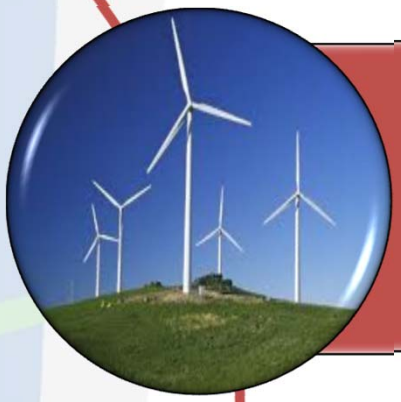
Incorporating low-cost thermal generation, which is required to ensure internal supply conditions (demand + reserve).

Replacing the use of liquid fossil fuels, especially imports, with other fuels such as natural gas and locally produced wastes, which would make it possible to reduce generation costs and minimise environmental impact.

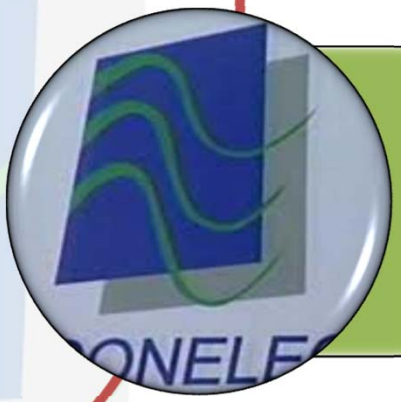
Fostering the development of generation based on renewable resources such as: geothermal, wind, biomass and biogas.

Achieving energy self-sufficiency in the electrical power sector in the shortest possible time, with the capacity to export surpluses regionally.

Promotion

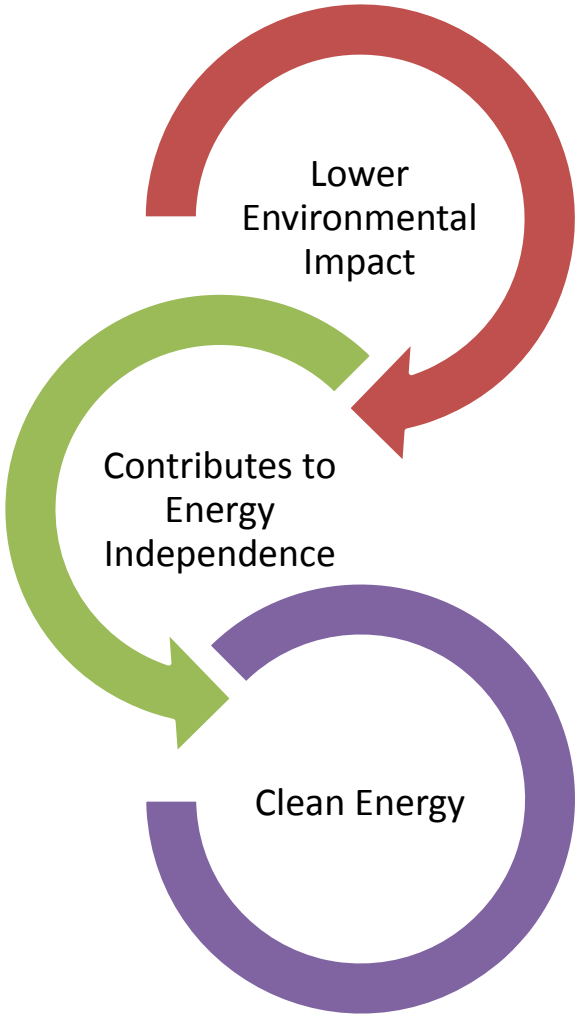


Promotion refers to a mode of government intervention that uses various techniques to boost power production with renewable resources.



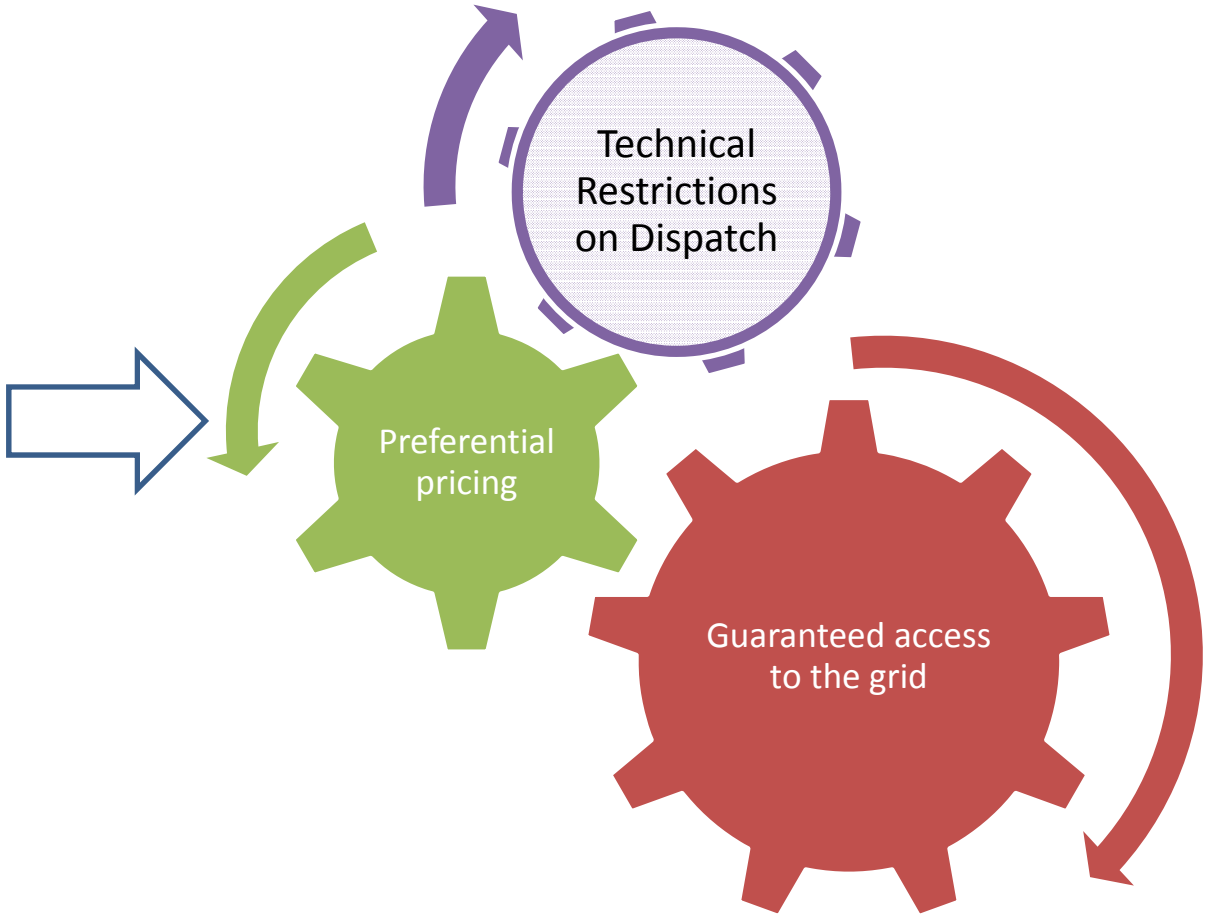
The regulatory frameworks usually provide a consistent framework for promotion.

Expected benefits



Scheme: Feed-In Tariffs

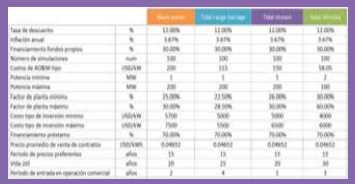
This is a policy developed internationally to encourage the adoption of renewable energy sources in the countries where it is being applied



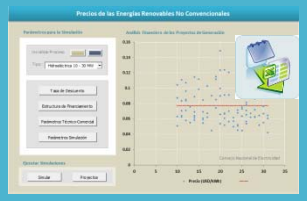
Methodology - Preferential Pricing

Input

- Financing structure for projects,
- Service life of projects,
- Installed power,
- Load factor,
- Investment costs,
- AO&M costs,
- Preferential period proposed in the Regulation,
- Terms of licence,
- Average Price of the Regulated Contracts,
- Number of simulations,



Processing

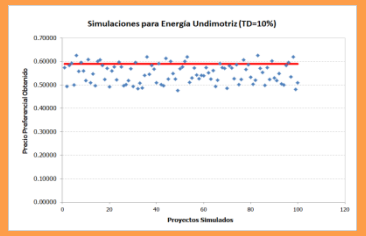


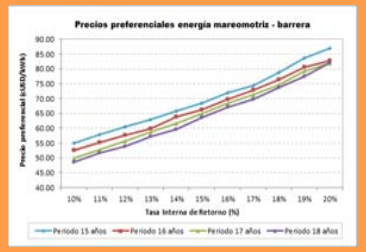
Price=f(IRR, DT)

An iterative process is used to obtain the preferential price; the process determines the price that meets the DT=IRR condition

Output

100 generation projects were simulated for each type of technology.





International References

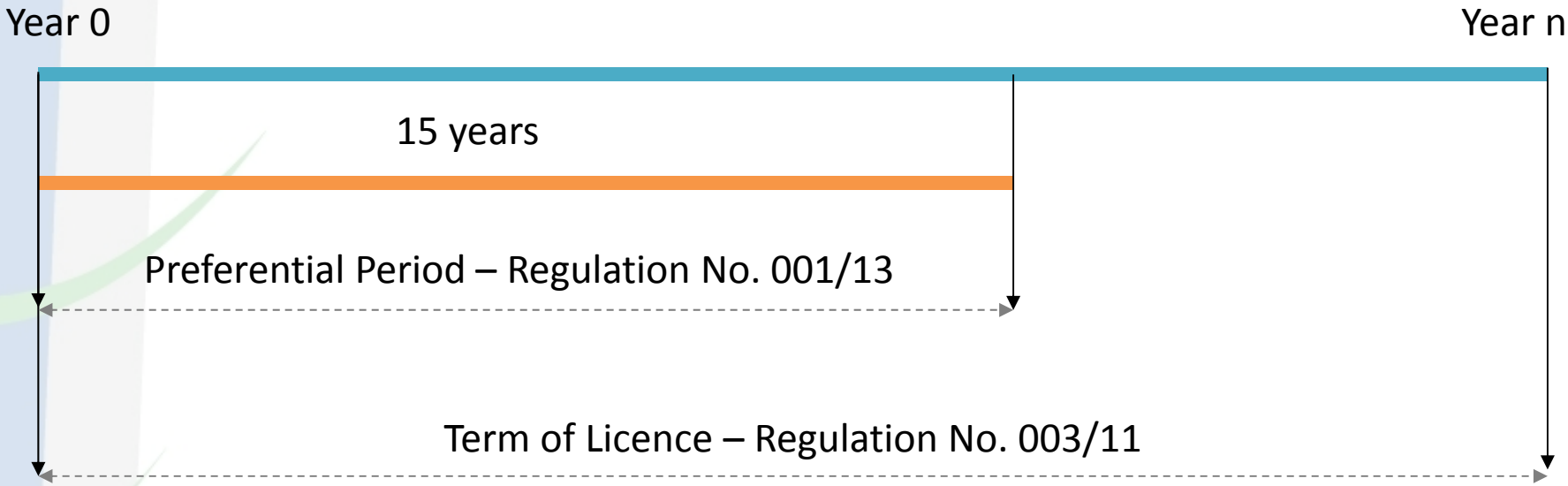
Preferential Conditions

Preferential Pricing.-

Centrales	Territorio Continental	Territorio Insular de Galápagos
Eólicas	11,74	12,91
Solar termoeléctrica	25,77	28,34
Corrientes marinas	32,43	35,67
Biomasa y Biogás	11,08	12,19
Geotermia	13,81	15,19

Centrales	Capacidad (MW)	Territorio Continental
Hidroeléctricas	$C \leq 10$	7,81
	$10 < C \leq 30$	6,86
	$30 < C \leq 50$	6,51

Preferential Period and Dispatch



All the energy is dispatched preferentially to the electricity market

It is subject to the same economic conditions for dispatch as any conventional generator

Final considerations: Implementation of the Regulation

Implementation of the Regulation is an economic signal aimed at boosting investment in generation projects.

There will be a new version with updated preferential prices EVERY TWO YEARS.

Conclusions

Promotion of NCRE has reasonable justification and support at this time, considering technical, economic and environmental factors.

Design of the regime in each country and the opportunity to implement it will depend on the country's institutional framework, economic and social situation and the characteristics of its power sector, as well as available energy resources.

Ecuador implemented the promotion scheme in 2000 through the Regulation (Feed-In Tariffs) and has obtained interesting results.

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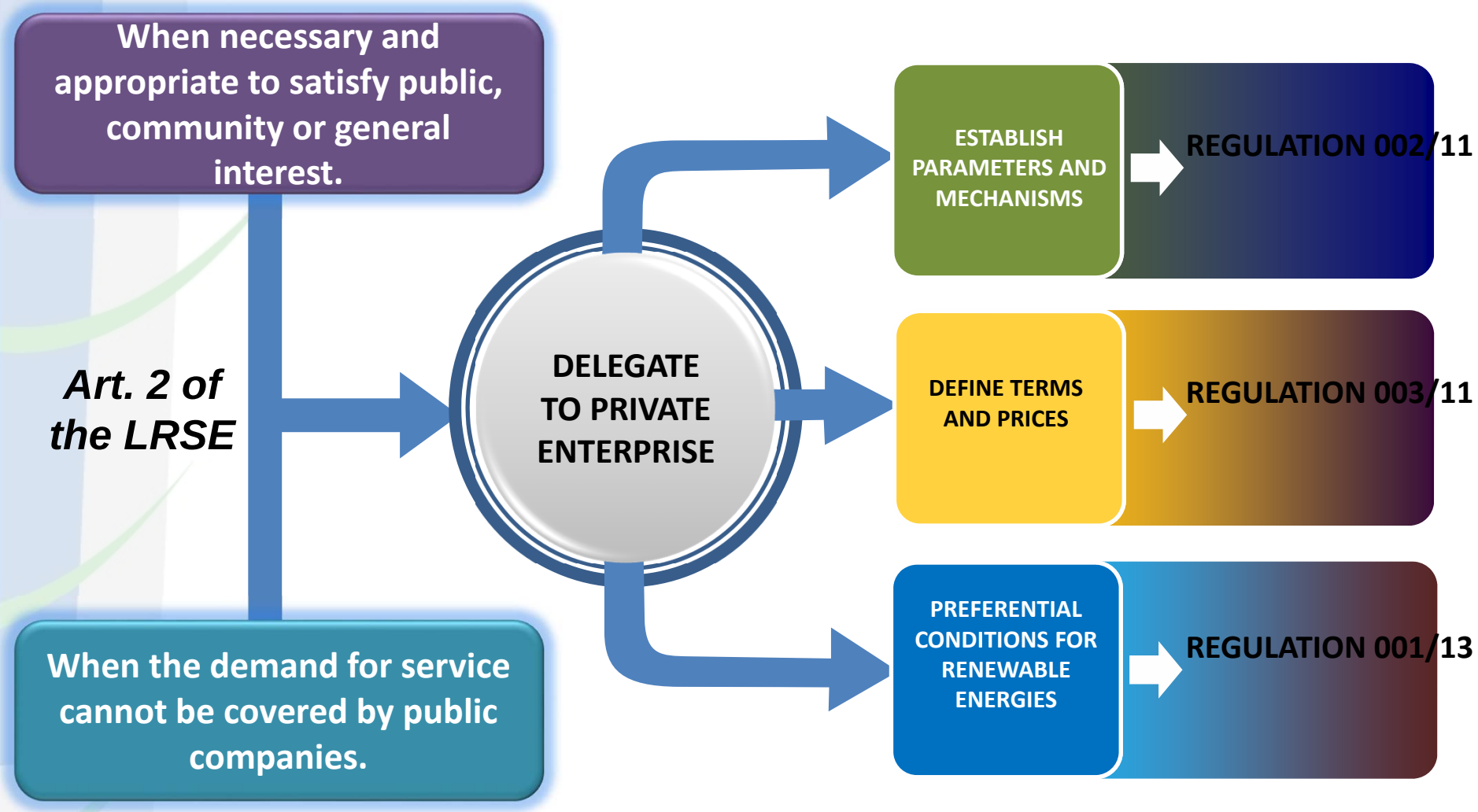
THANK YOU

General Scheme



Terms of Licence (years)

Technology type and power range	Private enterprise generation projects	Non-conventional Renewable Energies
• Steam	30	
• ICE < 514 rpm	20	
• ICE 514–900 rpm	15	
• ICE < 900 rpm	7	
• Industrial gas	20	
• Gas jet	7	
• Wind	25	25
• Photovoltaic	20	20
• Biomass - Biogas	15	15
• Geothermal	30	30
• Hydro 0–0.5 MW		20
• Hydro 0.5–0.5 MW	20–30	30
• Hydro 5–0.5 MW	23–40	40
• Hydro 10–50 MW	28–40	40
• Hydro > 50 MW	30–50	