HUFS-ITBA
INTERNATIONAL CONFERENCE

CLIMATE CHANGE, RENEWABLE ENERGY AND CULTURAL COOPERATION

ITBA Postgraduate School,
25 de Mayo 444, Buenos Aires

2017 February 5~7th

GCC-KOLAC ITBA

HUFS-ITBA INTERNATIONAL CONFERENCE

CLIMATE CHANGE, RENEWABLE ENERGY AND CULTURAL COOPERATION

○ 일시: 2017 February 5~7th

○ 장소: ITBA Postgraduate School, 25 de Mayo 444, Buenos Aires

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Pre – Session	
16:00 – 20:00	Environmental Cooperation Detween Korea and Argentina: Issues and Methods Session Chair: Dr. Kyung-Won, Chung(HUFS) ■ Pre-meeting and Consulting about International Conference

2017 February 6th

HUFS-ITBA INTERNATIONAL CONFERENCE CLIMATE CHANGE, RENEWABLE ENERGY AND CULTURAL COOPERATION	
08:30 – 09:00	Registration Hall 3° Floor
09:00 – 09:40 Room 3001	Opening Address: Kyung-Won, Chung(Director of GCC-KOLAC, HUFS) Welcoming Address: Javier Valladares(ITBA) Welcoming Address: José Luis Roces(ITBA) Welcoming Address: Jong-Youn, Choo (Ambassador of Republic of Korea in Argentina)
09:40 – 09:50 Room 3001	MOU between ITBA and GCC-KOLAC/Photo
09:50 - 10:00	Coffee Break
10:00 – 11:50 Room 3001	Session 1: Climate Change Issue and International Cooperation Session Chair: Lic. Javier Valladares(ITBA) ■ Dr. Gilberto M. Jannuzzi(UNICAMP, Brazil) "Latin American Scene on Renewable Energy: Challenges and International Cooperation" ■ Dr. Si-Hong, Kim(HUFS) "EU Climate Action and International Cooperation"

	■ Ing. Luzuriaga Diego(ITBA) "ITBA commitment with research and management concerning renewable energies and environment"
11:50 – 12:00	Coffee break
12:00 – 13:00 Room 3001	Session 2: Culture and International Cooperation Between Korea and Latin America Session Chair: Dr. Kyung-Won, Chung(HUFS) ■ Dr. Man-Hee, Lee(HUFS) "La música en los autos sacramentales latinoamericanos: en torno a Sor Juana Inés de la Cruz" ■ Dr. Sel-Gie, Koh(HUFS) "La novelización coreana de la 'Guerra del Fútbol'" ■ Dr. Won-Dug, Han(HUFS) "Un estudio pedagógico sobre el sistema de inspección sanitaria de Corea"
13:00 – 15:15	Lunch Time
15:15 – 16:15 Room 3001	Session 3: Climate Change and Renewable Energy Session Chair: Dr. Si-Hong, Kim(HUFS) ■ Dr. Sang-Sub, Ha / Dr. Kyung-Won, Chung(HUFS) "Renewable Energy Development in Argentina: Policy Analysis and its Limitation" ■ Dr. Isaac Azuz(CETYS, Mexico) "Present state and opportunities to use renewable energy in Mexico" ■ Ing. Esteban van Dam(Aires Renewables) "The Renewable sector in Argentina: achievements and challenges"
15:15 – 16:15 Room 3004	Session 4: Environment and Renewable Energy Development in Argentina Session Chair: Dr. Daniel Ryan(ITBA) ■ Ing. Martín Fraguío(Asociación Maízy Sorgo Argentino) "Bioenergy in Argentina" ■ Dra. Silvia Barredo(ITBA, FIUBA) "Potential of the geothermal energy in Argentina" ■ Dr. Il-Soo, Park(HUFS) "The Analyses of Micro-meteorology in Buenos Aires, Argentina"
16:15 - 16:30	Coffee Break
16:30 – 17:30 Room 3001	Session 5: : Academic Study on Climate Change and Scientific Research Session Chair: Ing. Norberto Lerendegui(ITBA) ■ Dr. Yu-Woon, Jang(HUFS) "The improvement of air quality using green harvest of sugar cane in Bauru, Brazil"

	■ Dra. Gloria Lucia Camargo(UPTC, Colombia) "Co-composting of solid waste organic urban with sludge" ■ Dra. Cecilia Smoglie(ITBA) "Efficiency in hydrogen production, storage and combustion"
17:30 – 18:30 Room 3001	Session 6: International Cooperation Between Korea and Latin America: Korean Studies, Wave and Economy Session Chair: Dr. Won-Dug, Han(HUFS) ■ Dr. Gi-Woong, Jung(HUFS) "Korean Studies in Latin America: Current Scenario and Future Cooperation" ■ Dr. Eun-Young, Lee(HUFS) "Korean Wave and Entertainment Law" ■ Dr. Nam-Kwon, Mun(HUFS) "The Prospect of Mexican Economic Reform"
18:30 –	Closure

2017 February 6th

Round Table	
10:30 – 12:00 ITBA	Cooperation Plan Between Korea and Latin America Session Chair: Ing. Andrés Agres(ITBA)
12:00 - 12:30	Closing ceremony and Lunch

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CLIMATE CHANGE, RENEWABLE ENERGY AND CULTURAL COOPERATION

Session 1: Climate Change Issue and International Cooperation

Session Chair: Lic. Javier Valladares(ITBA)

■Dr. Gilberto M. Jannuzzi(UNICAMP, Brazil)
"Latin American Scene on Renewable Energy: Challenges and International Cooperation"

■Dr. Si-Hong, Kim(HUFS)
"EU Climate Action and International Cooperation"

■Ing. Luzuriaga Diego(ITBA)
"ITBA commitment with research and management concerning renewable energies and environment"

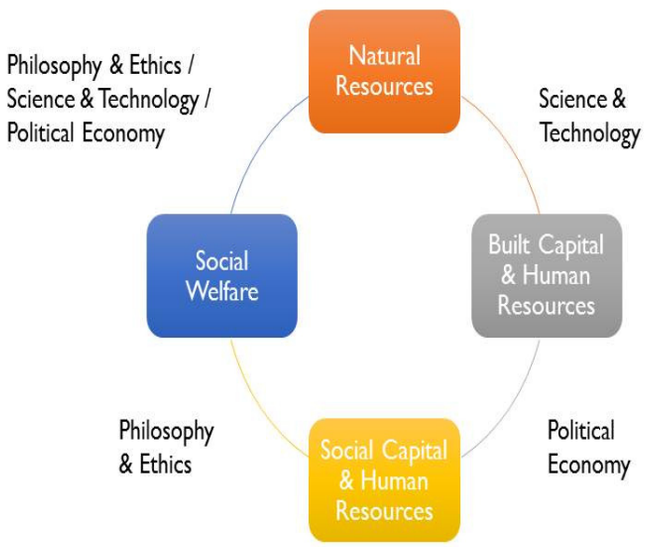
Latin American Scene on Renewable Energy: challenges and international cooperation

Gilberto M Jannuzzi
University of Campinas (UNICAMP), Brazil

Contents

1. Latin America and Climate Change
2. The structure of Energy Supply
3. The structure of Energy Demand
4. Energy and Climate change

1. Sustainable development & Climate change & Energy



Adapted from Meadows (1998)

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The structure of Energy Supply

Still based on fossil fuels, but changing.

Hydroelectricity, Biomass energy is important

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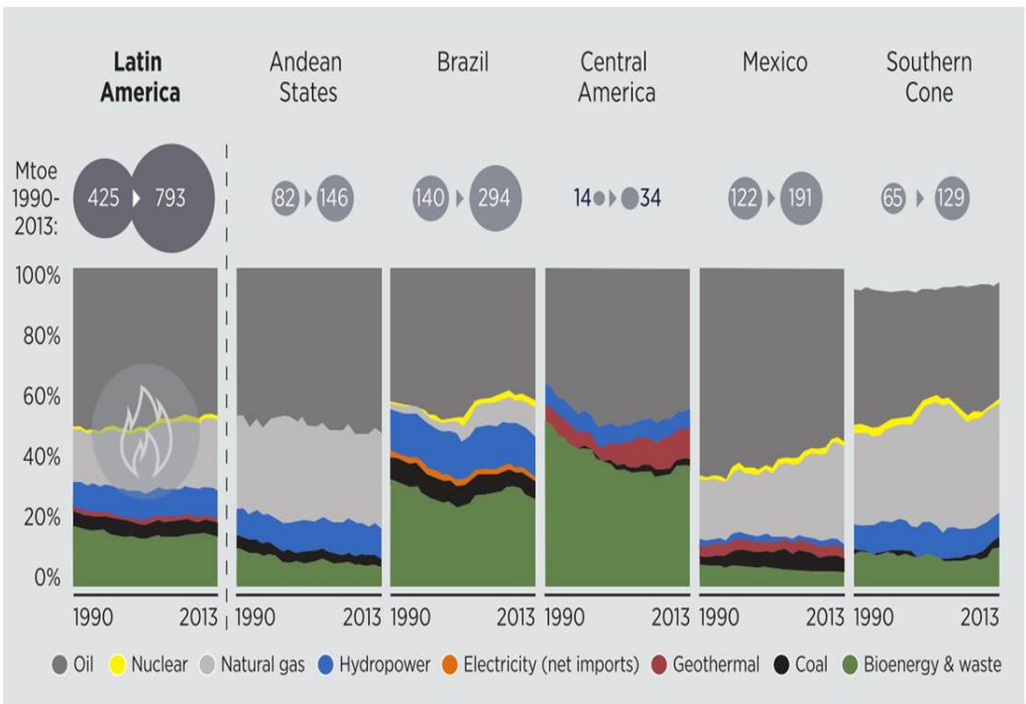

Primary energy supply in Latin America

Note: the values for the Southern Cone do not add up to 100% because of net exports of electricity from Paraguay to Brazil.
Source: IEA, 2015b

The structure of Energy Demand

Transport and industrial sectors are important.

Building energy consumption too.

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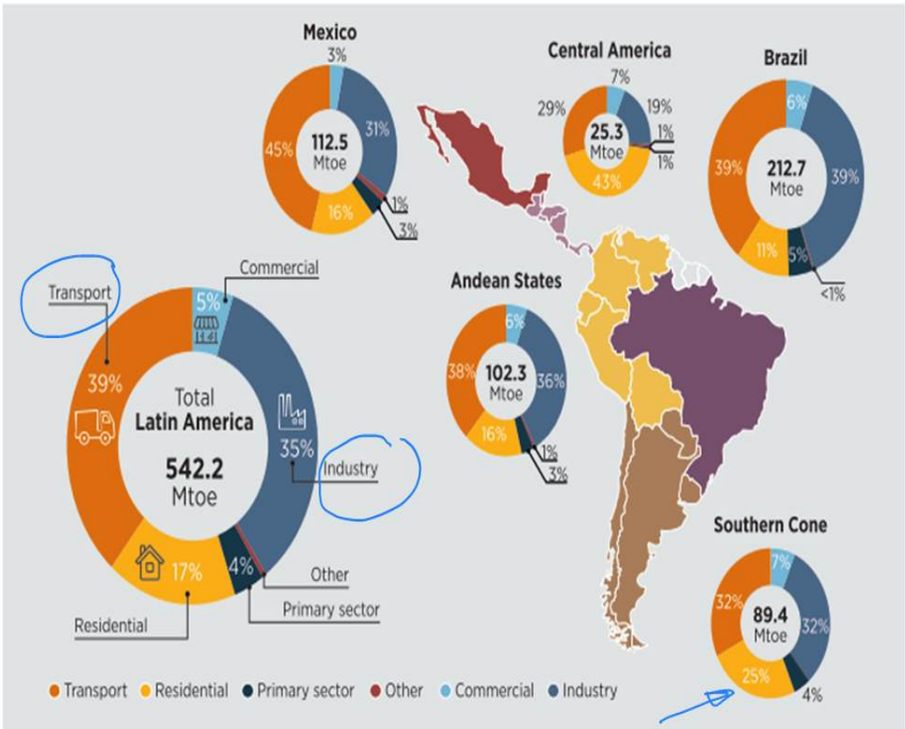
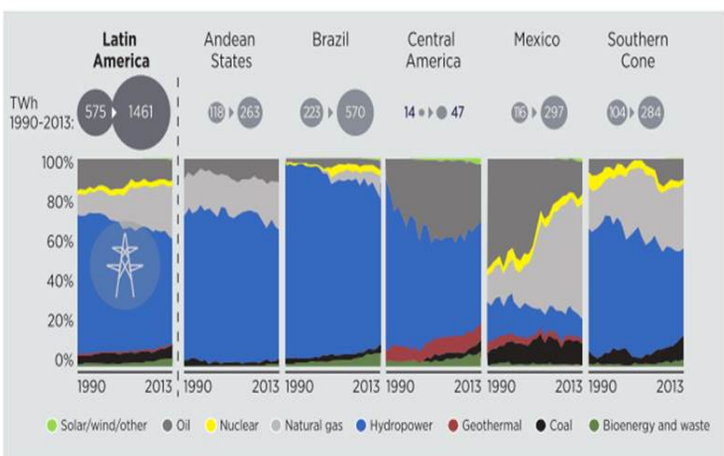
Total final energy consupmtion 2013



Note: "Primary sector" includes agriculture, fishing and forestry.
Source: IEA, 2015b

Power sector: 1990-2013

Figure 1.5 Electricity generation by energy source in Latin America and the sub-regions, 1990-2013



Source: IEA, 2015b

Hydro - Droughts 2012-14

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Energy and Climate Change: efforts to stabilize emissions

Transitions towards low-Carbon Economy

Energy transition: Low C fuels (Gas) + Energy Efficiency + Renewables

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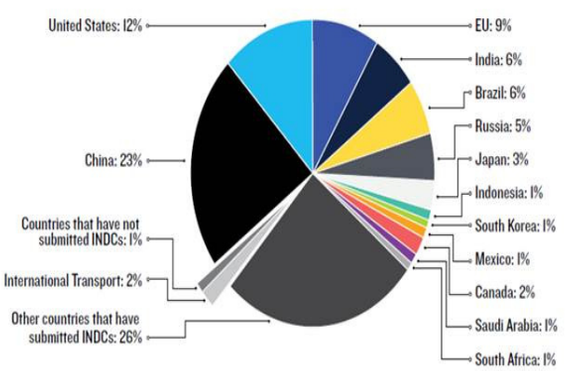
Share of GHG emissions by countries with Climate Targets



Source: Natural Resources Defense Council, as of December 15, 2015.

Countries' share of emissions was calculated as a share of the world total GHG emissions for 2012, as reported by EDGAR.

Countries that have not submitted targets are: Uzbekistan, North Korea, Libya, Syria, Nepal, Nicaragua, Panama, and Timor-Leste.

Emissions Database for Global Atmospheric Research, "GHG (CO_2, CH_4, N_2O, F-gases) emission time series 1990-2012 per region/country," European Commission Joint Research Centre, http://edgar.jrc.ec.europa.eu/overview.php?v=GHGts1990-2012. (Accessed December, 2015.)

Source: NRDC 2015

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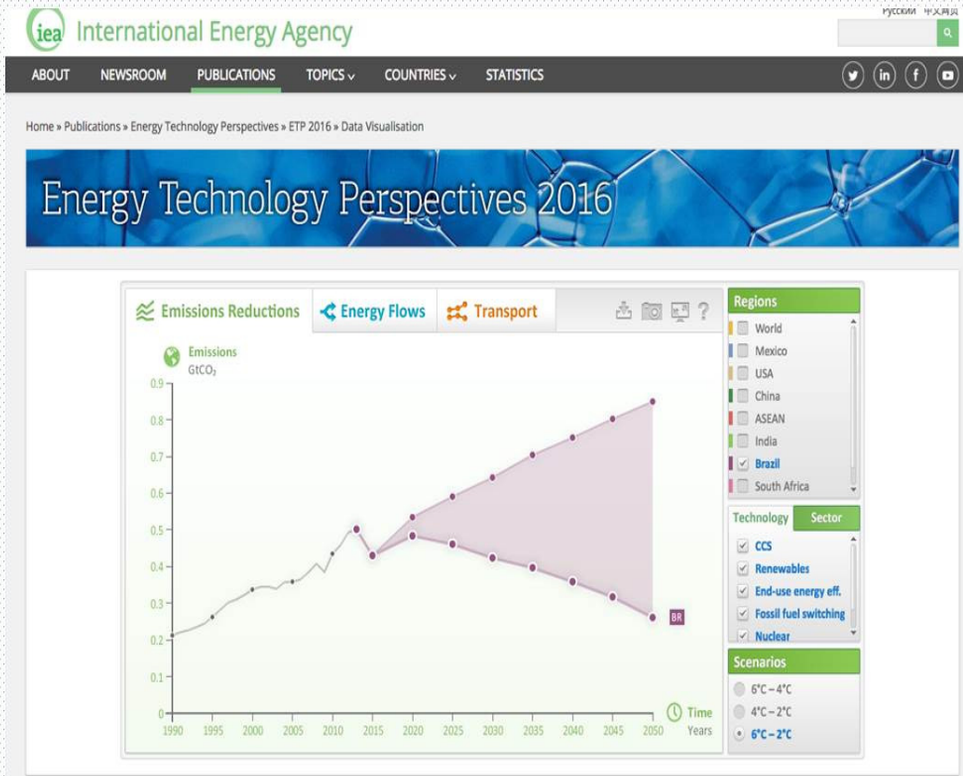
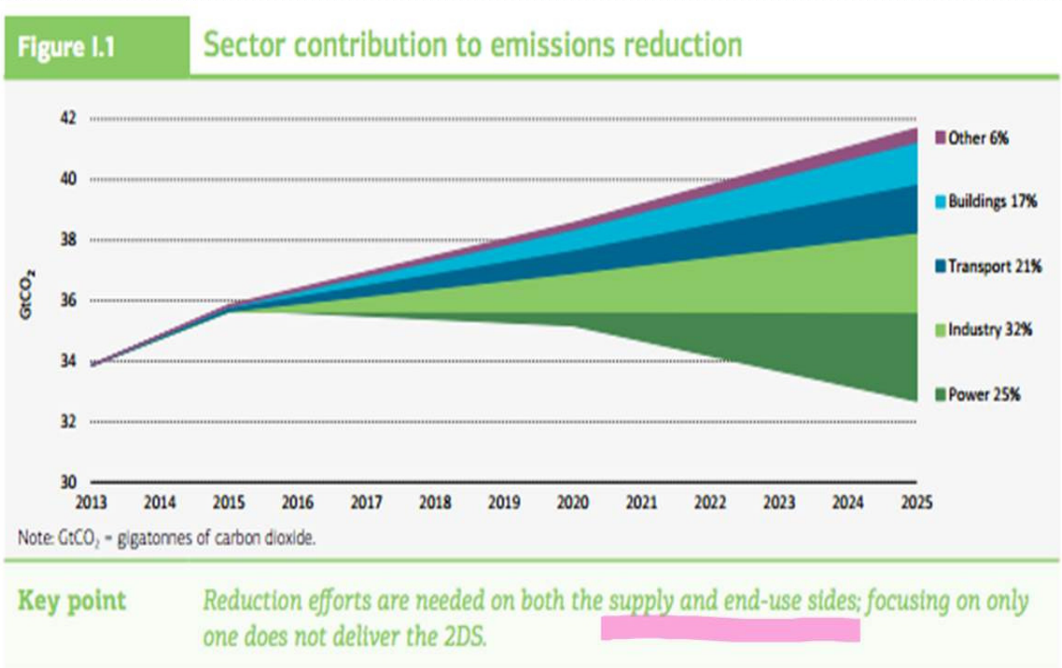


International Energy Agency. 2016. "Tracking Clean Energy Progress 2016". Paris.



International Energy Agency. 2016. "Tracking Clean Energy Progress 2016". Paris.

Efforts in Latin America

- Good RE resource base
- Shared resources: specially hydro resources
- Already experience in policy instruments
- Contribution of RE and Energy Efficience still modest
- Grid integration (?)
- Industrial base and market integration of energy technologies
- Joint R&D programs

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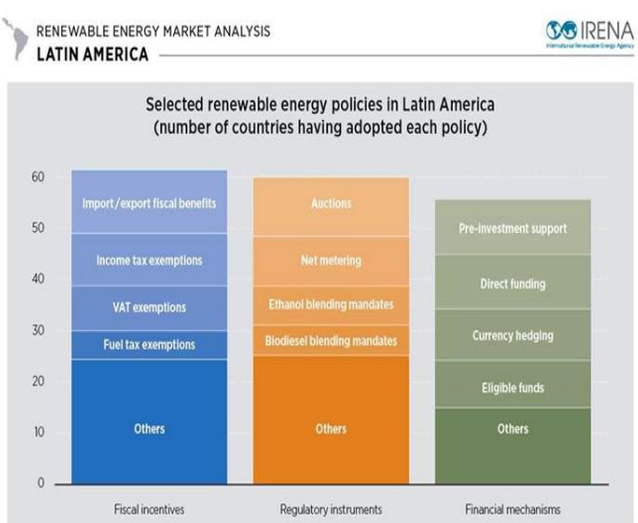
RE policies in Latin America



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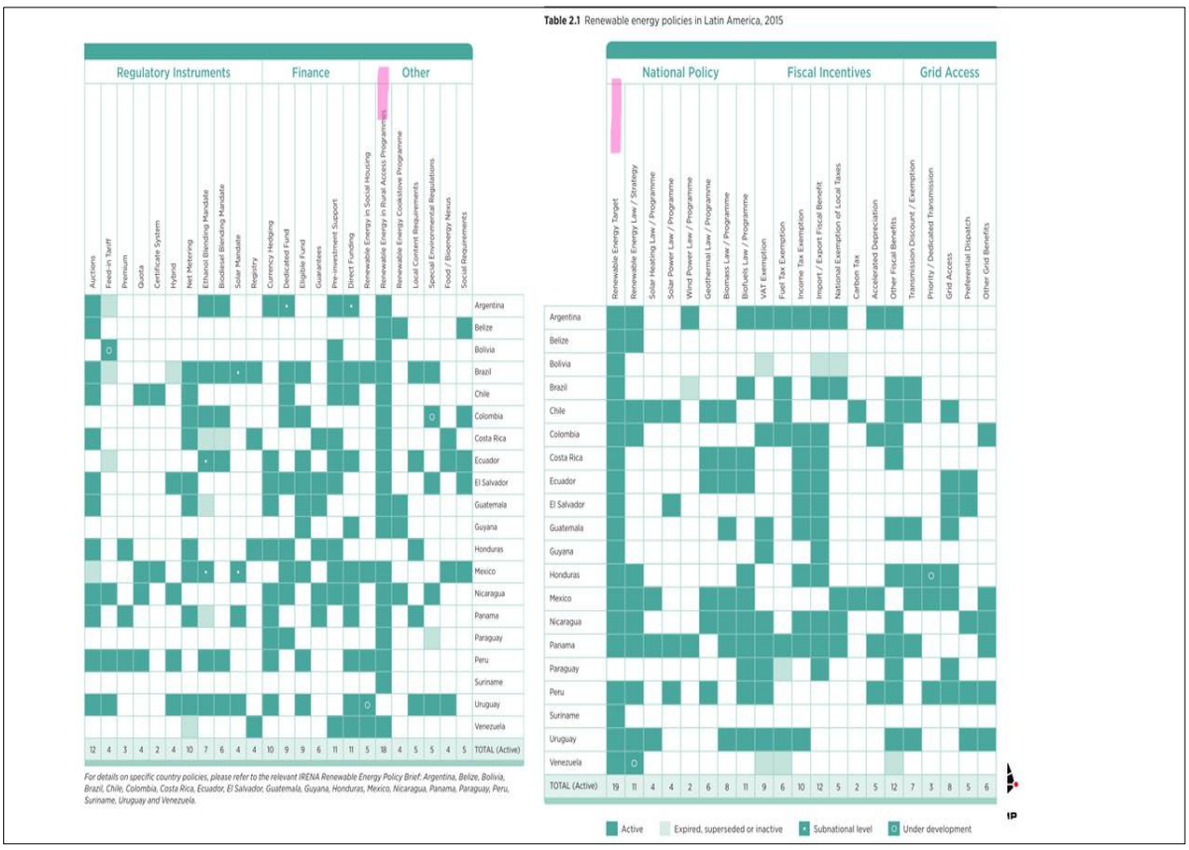


Table 2.1 Renewable energy policies in Latin America, 2015
Regulatory Instruments
Finance
Other
National Policy
Fiscal Incentives
Grid Access
Auctions
Fixed-in Tariff
Premium
Quota
Certificate System
Hybrid
Net Metering
Ethanol Blending Mandate
Biodiesel Blending Mandate
Solar Mandate
Registry
Currency Hedging
Dedicated Fund
Eligible Fund
Guarantees
Pre-investment Support
Direct Funding
Renewable Energy in Social Housing
Renewable Energy in Rural Access Programme
Renewable Energy Cookstove Programme
Local Content Requirements
Special Environmental Regulations
Food / Bioenergy Nexus
Social Requirements
Renewable Energy Target
Renewable Energy Law / Strategy
Solar Heating Law / Programme
Solar Power Law / Programme
Wind Power Law / Programme
Geothermal Law / Programme
Biomass Law / Programme
Biofuels Law / Programme
VAT Exemption
Fuel Tax Exemption
Income Tax Exemption
Import / Export Fiscal Benefit
National Exemption of Local Taxes
Carbon Tax
Accelerated Depreciation
Other Fiscal Benefits
Transmission Discount / Exemption
Priority / Dedicated Transmission
Grid Access
Preferential Dispatch
Other Grid Benefits
Argentina
Belize
Bolivia
Brazil
Chile
Colombia
Costa Rica
Ecuador
El Salvador
Guatemala
Guyana
Honduras
Mexico
Nicaragua
Panama
Paraguay
Peru
Suriname
Uruguay
Venezuela
TOTAL (Active)
For details on specific country policies, please refer to the relevant IRENA Renewable Energy Policy Brief: Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela.
Active
Expired, superseded or inactive
Subnational level
Under development

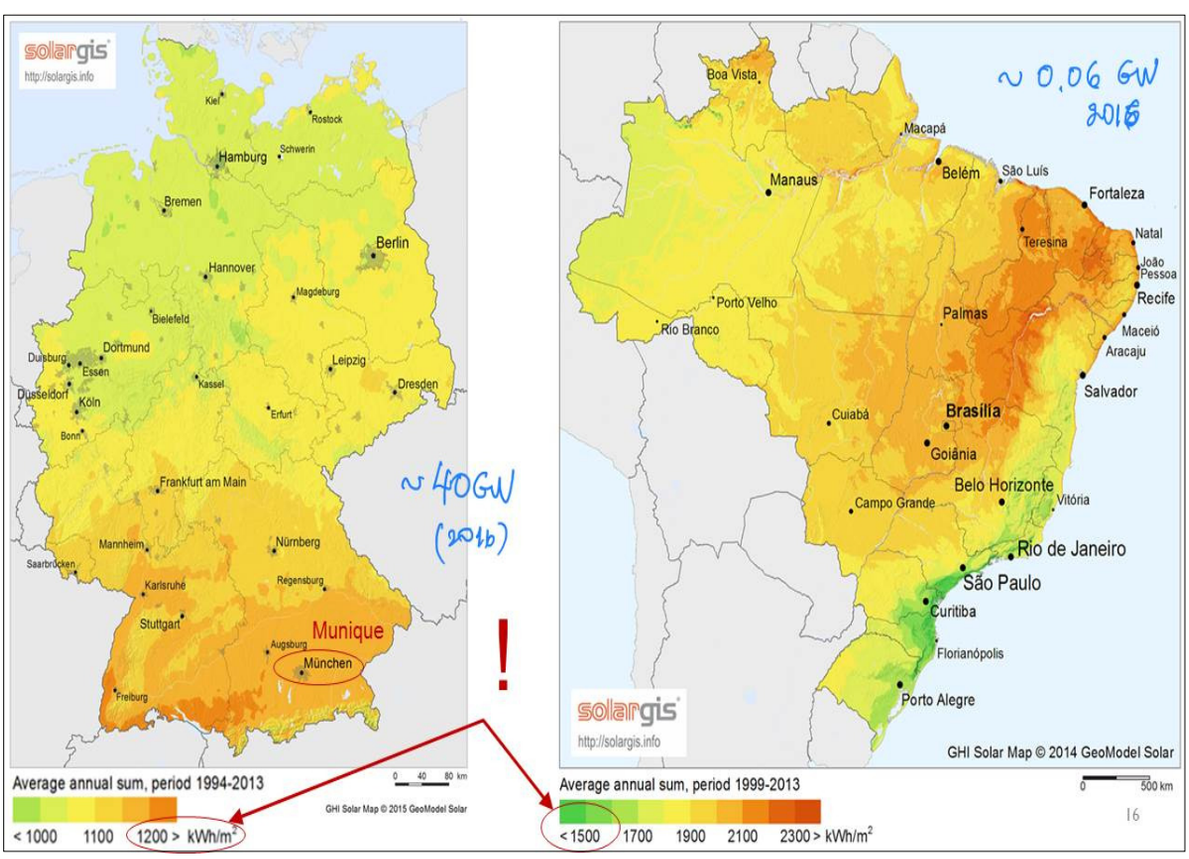
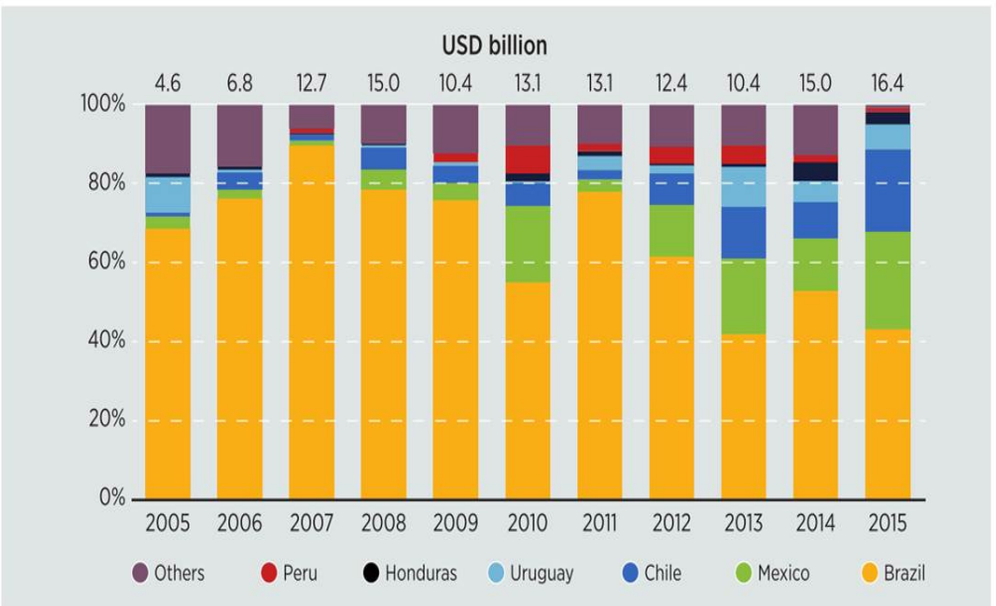
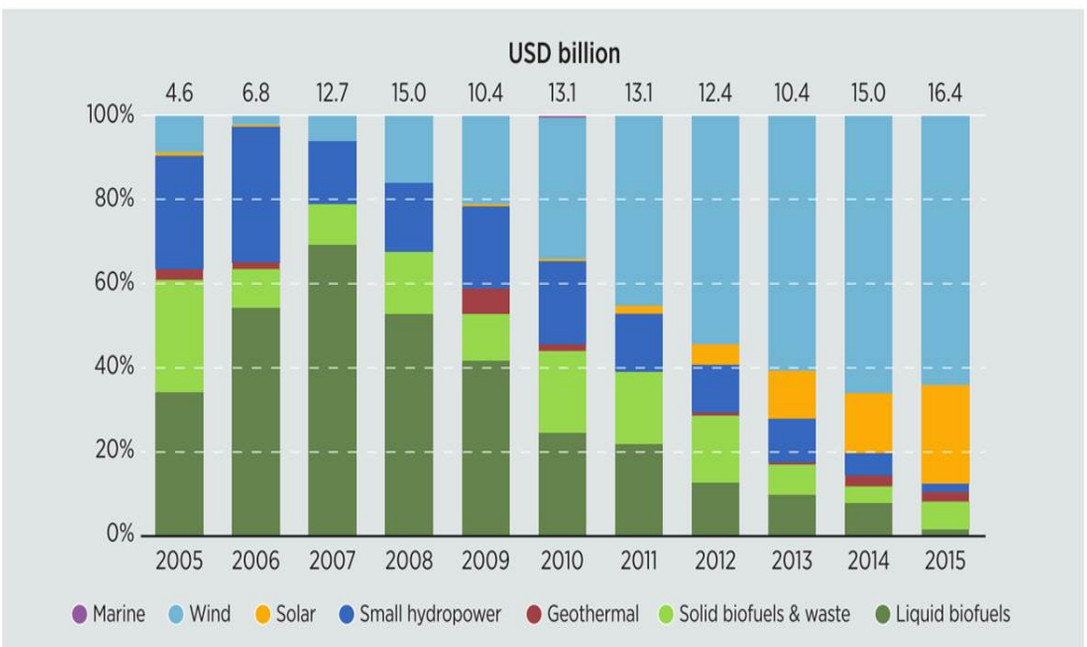

solargis
http://solargis.info
Kiel
Rostock
Hamburg
Schwerin
Bremen
Berlin
Hannover
Magdeburg
Bielefeld
Dortmund
Duisburg
Essen
Leipzig
Kassel
Dresden
Düsseldorf
Köln
Erfurt
Bonn
Frankfurt am Main
~ 40GW
(2016)
Mannheim
Nürnberg
Saarbrücken
Karlsruhe
Regensburg
Stuttgart
Munique
Augsburg
München
Freiburg
!
0 40 80 km
Average annual sum, period 1994-2013
GHI Solar Map © 2015 GeoModel Solar
< 1000 1100 1200 > kWh/m²
~ 0,06 GW
2016
Boa Vista
Macapá
Manaus
Belém
São Luís
Fortaleza
Natal
Teresina
João Pessoa
Recife
Porto Velho
Palmas
Rio Branco
Maceió
Aracaju
Salvador
Cuiabá
Brasília
Goiânia
Belo Horizonte
Campo Grande
Vitória
Rio de Janeiro
São Paulo
Curitiba
Florianópolis
Porto Alegre
solargis
http://solargis.info
GHI Solar Map © 2014 GeoModel Solar
0 500 km
Average annual sum, period 1999-2013
< 1500 1700 1900 2100 2300 > kWh/m²
16

Figure 4.1 Investment in renewable energy by country in Latin America, 2005-2015



Source: BNEF, 2016

Figure 4.2 Investment in renewable energy by technology in Latin America, 2005-2015



Source: BNEF, 2016

Table 2.3 Biofuel blending mandates in Latin America, 2015

	Argentina	Brazil	Colombia	Costa Rica[1]	Ecuador[2]	Guatemala[3]	Mexico[4]	Panama[5]	Paraguay	Peru	Uruguay
Ethanol	10%	27%	8-10%	0-8%	5%	5%	6%	5%	25%	7.8%	5%
Biodiesel	10%	7%	10%	0-5%	5%				1%	5%	5%

1. Currently 0% until regulated; 2. Ethanol blend only in Guayaquil; 3. Not implemented; 4. Only in Guadalajara, Monterrey and Mexico D.F.; 5. Temporarily suspended.
Source: IRENA, 2015b

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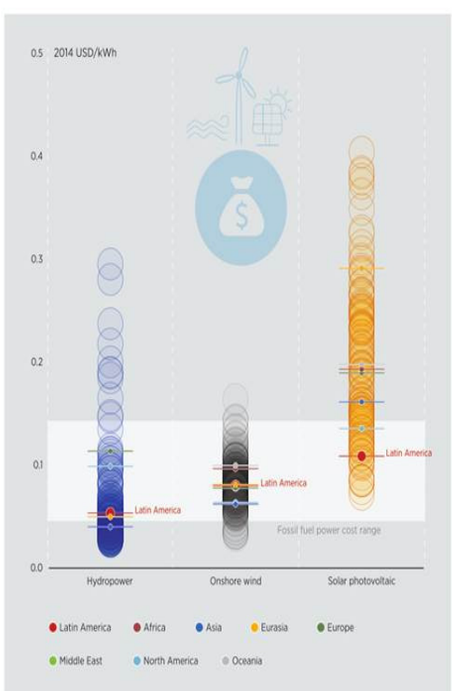
Figure 3.1 Typical levelised cost of electricity and regional weighted averages by technology, projects commissioned in 2014



Note: Each circle identifies a project independent of its geographical origin. The centre of each circle is the value for the cost (LCOE) of each project on the y-axis. The coloured bars represent the weighted average LCOE for an individual region. Real weighted average cost of capital is 7.5% in OECD countries and China, and 10% in the rest of the world. The date is for planned commissioning; sometimes projects are delayed.
Source: IRENA, 2016c

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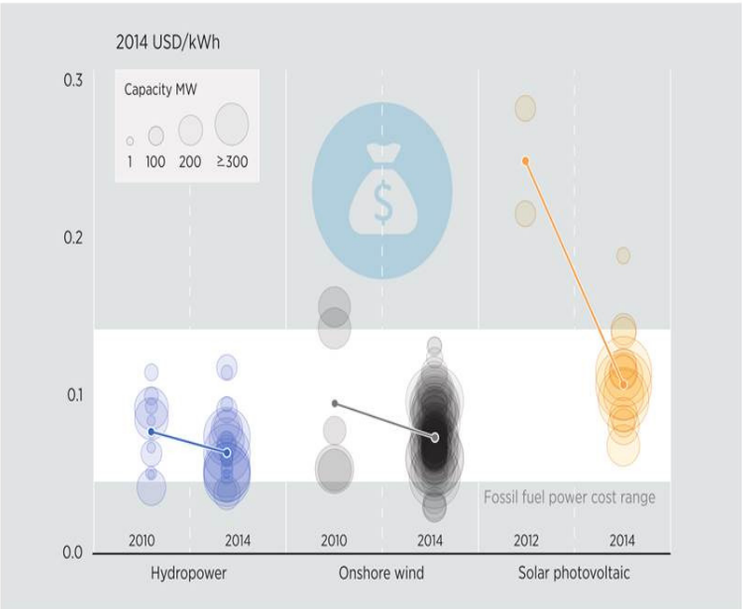
Figure 3.2 Levelised cost of electricity from utility-scale renewable energy technologies in Latin America



Note: Size of diameter of the circle represents the size of the project. The centre of each circle is the value for the cost of each project on the y-axis. Real weighted average cost of capital is 7.5% in OECD countries and China, 10% in the rest of the world. The date is for planned commissioning; sometimes projects are delayed.

Source: IRENA, 2016c

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Resultados de los programas gubernamentales

Energy Efficiency! more attention

Tabla C – Resultados anuales de la conservación de energía

País	Motores Eléctricos	Refrigeradores	Acondicionadores de Aire	Calentadores Solares
	GWh/año	GWh/año	GWh/año	
Argentina	16,2	59,4	26,0	-
Brasil	1.213,5	580,8	120,1	166,3 GWh/año
Chile	11,7	16,2	6,6	2321,0 (toneladas de GN)
Colombia	29,4	42,6	8,8	-
México	723,2	374,9	68,9	16885,0 (toneladas de GN)
Perú	9,4	17,8	1,3	2343,0 (Toneladas de GN)

Total 6.653 GWh/año

Fuente/País	Chile	
	GWh	%
Carbon	15.286	27,1%
Petróleo	13.598	24,1%
Gas	2.938	5,2%

Carbon 43%
Petróleo 49%

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Resultados: CO_2

Tabla D – Resultados de la mitigación de CO_2: tecnologías de uso final de la energía (toneladas de CO_2/año)

País	Motores Eléctricos	Refrigeradores	Acondicionadores de Aire	Calentadores Solares	Total
Argentina	5.983	21.901	9.585	-	37.468
Brasil	114.714	54.904	11.349	15.723	196.690
Chile	4.147	5.730	2.353	7.043	19.273
Colombia	4.870	7.055	1.453	-	13.379
México	430.213	222.993	40.987	51.237	745.430
Perú	1.975	3.760	264	7.110	13.110
Total	561.902	316.344	65.992	81.113	1.025.350

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Investments in Energy R&D and Energy Efficiency, Industrial base and Markets

- Brazilian Regulation: 1% of electricity revevues and Oil&Gas royalties
- Climate Funds
- TNAs: Technology Needs Assessments http://unfccc.int/ttclear/tna

INTERNATIONAL COOPERATION (LA-LA, S-S, N-S)

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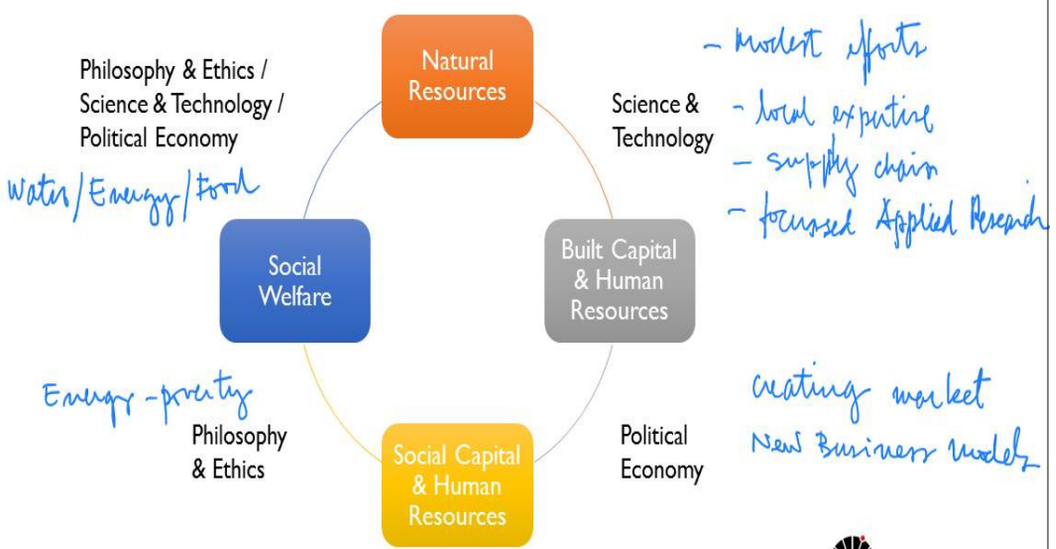
1. Sustainable development & Climate change & Energy



Adapted from Meadows (1998)

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OBRIGADO!
THANK YOU!

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gilberto@iei-brasil.org

EU Climate Action and International Cooperation*

KIM, Si Hong(HUFS)

I. Introduction

Environmental concern with global dimension was firstly raised by Club of Rome when it published a series of reports entitled with *The Limits to Growth* and *Mankind at the Turning Point* back in early 1970s. Problematique at the time was long term perspective and future of the earth. The original version of the first report presented a model based on five variables: world population, industrialization, pollution, food production and resource depletion. These variables are considered to grow exponentially, while the ability of technology to increase resources availability is only linear. According to this report, if mankind does not prepare necessary solutions, that is, an equilibrium rather than growth, this planet will face the doomsday prospect in the future.[1]

But it was only early 1990s at a time when the issue of environment was seriously discussed among nations and it was United Nations Conference on Environment and Development (UNCED), Rio de Janeiro in 1992, so called the Earth Summit. Several documents and declarations were met to win over the menace of the world, but it also caused discrepancies between the developed and the developing worlds, in particular way as to the ozone depletion. Main cause was freon gas which is used for refrigerators and air conditioners and should be replaced by clean alternative one, new refrigerant. Problem was that it was too expensive for the developing countries. So they demanded to the developed ones to provide it free or with low cost, but there failed to come up with any agreement over that issue.

Nonetheless, international efforts to solve the environmental problems which have started with Rio and UNFCCC have been a robust frame of reference for the subsequent gatherings such as Conference of Parties (COP). Every year, COP was held and significant development has been made through Kyoto Protocol and others. In doing so, the European Union (EU) has been committed and fervent actor who

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* Draft Not For Citation.

[1] Donella H. Meadows et al., *The Limits to Growth*, Signet, 1972, pp. 192-6.

has been coined as a *Lediator* (leader + mediator).[2] In particular way, COP 21 in Paris marked a quantum shift in that most of the countries were willing to present a reduction target to minimize the temperature increase of the planet.

This paper first of all is going to present the efforts of the EU on the climate change policies during the past two decades. Recently Energy Union is widely used in that twin goals for it are fighting climate change and at the same time boosting energy security. Second, to meet the necessary and meaningful results, global cooperation is indispensable. EU has been eager to discuss with partners in diverse levels, UN, bi-regional, bilateral and any other international actors who are engaged in climate change issues. Here emphasis will be given to cooperation between the EU and CELAC and possibly between the EU and Argentina. In conclusion this paper will present a way ahead, particularly with the advent of Trump aministration and its implication to the climate diplomacy.

II. EU Climate Action

1. Basic lineaments

The international community agreed that the average global temperature should not rise more than 2°C above the pre-industrial level to maintain climate change below critical levels. The EUhas been continuously endulging to decrease member states' emission level, encourage other major polluters to take effective action and address the inevitalbe impacts of climate change. It is believed that confronting climate change might save human and economic costs in the longer run. Growing demand for clean technologies also offers opportunities to modernize Europe's economy, creating green growth and jobs.

EU's 2020 Strategy was prepared to meet the above context. The EU proposed binding climate and energy criteria designed to cut EU greenhouse gas emissions to at least 20% below 1990 levels, increase to 20% the share of EU energy consumption coming from renewable sources, improve energy efficiency to reduce the amount of primary energy used by 20% compared with projected levels. The EU has offered to scale up its emissions cut from 20% to 30% by 2020 if other major economies commit themselves to taking their fair share of global reduction efforts.[3]

The Emissions Trading Scheme (ETS) - the cornerstone of the EU's climate change strategy since 2005 - is gradually bringing down emissions from industry at least cost. The cap on emissions from energy-intensive industries, e.g. power generation, steel, cement is lowered annually. Companies

[2] Sebastian Oberthur and Lisanne Groen, "The European Union and the Paris Agreement: leader, mediator or bystander ?", *Climate Change*, 2017 (8-1): 6.
[3] https://europa.eu/european-union/topics/climate-action_en Retrieved on Jan 16 2017.

surrender allowances for each tone of CO2 they emit - a permanent incentive to minimize emissions. There are sectors that receive some allowances free of charge, but increasingly firms must buy them at auction or on the carbon market.

Even though all emissions stopped right now, those already in the atmosphere would continue changing the climate for decades to come. The world has no choice but to adapt to climatechange. The action needed includes modifying building regulations to take account of future climate conditions, building flood defenses and developing drought-tolerant crops.

2. Recent developments

The UNFCCC is a framework treaty with 195 Parties – a near universal membership of states. The UNFCCC sets a long-term, science-based objective which calls for the stabilization of greenhouse gas concentrations in the atmosphere at safe levels. The Parties have since clarified that this will mean limiting a rise in the global average temperature to less than 2°C as compared to pre-industrial levels. The UNFCCC also sets out principles, establishes bodies and procedures to guide future international negotiations towards this objective. Recognizing the shortcomings of the Copenhagen/Cancun/ approach and the failure of the Kyoto Protocol to attract more Parties, the UNFCCC agreed in 2011 in Durban to start negotiations on a new international agreement to be completed by the end of 2015 and to apply from 2020 onwards.

The EU worked closely with progressive allies to agree the Durban mandate for these negotiations that is designed to ensure a result that, unlike the Kyoto Protocol, will be applicable to all Parties and that, unlike the voluntary Copenhagen/Cancun pledges, will be set out in a Protocol or another form of international agreement with binding legal force.

Since 2011, the negotiators returned to the challenge of how to set emission reduction targets, applicable to all Parties, that are both ambitious and fair. It became quickly apparent that Parties would be unable to agree an approach that sets a global emissions budget for a specific timeframe, or to allocate that budget on the basis of agreed criteria – in the way, for example, the EU negotiates its effort sharing for emissions outside the ETS. It also became clear that Parties were unwilling to agree to a single commitment type, such as the economy-wide emission reduction targets that are part of the Kyoto Protocol.

Parties of the UNFCCC began to map out the third model of international climate policy – a hybrid approach between the top-down aspects of the Kyoto Protocol and the bottom-up approach of the Cancun/Copenhagen pledges. In Warsaw, in 2013, and in Lima, in 2014, Parties agreed to come

forward in the run up to Paris, with Intended Nationally Determined Contributions (INDCs) that served as the basis for their commitments in the 2015 Agreement.[4]

The INDC process has generated some promising results. In preparation for Paris, the EU Heads of State and Government announced their INDC in October 2014. Shortly thereafter, the US and China made a joint announcement setting out the basic elements of their targets. And many other countries followed the process of preparing their commitment in Paris. The challenge that remains is materializing these commitments, and the commitments of as many countries as possible in a legally binding 2015 Agreement framework that supports their implementation, irrespective of the advent of Trump administration.

3. 2030 Framework and 2050 Roadmap

The 2030 climate and energy framework sets three key targets for the year 2030: at least 40% cuts in greenhouse gas emissions from 1990 levels; at least 27% share for renewable energy; at least 27% improvement in energy efficiency. It built on the 2020 climate and energy package. It is also in line with the longer term perspective set out in the Roadmap for moving to acompetitive low carbon economy in 2050, the Energy Roadmap 2050 and the Transport WhitePaper.[5]

The framework contains a binding target to cut emissions in EU territory by at least 40% below 1990 levels by 2030. This will enable the EU to take cost-effective steps towards its long-term objective of cutting emissions by 80-95% by 2050 in the context of necessary reductions by developed countries as a group and to make a fair and ambitious contribution to the new international climate agreement, to take effect in 2020.[6]

To achieve the at least 40% target, ETS sectors would have to cut emissions by 43% as compared to 2005 – to this end, the ETS is to be reformed and strengthened. Non-ETS sectors would need to cut emissions by 30% as compared to 2005 – this needs to be translated into individual binding targets for Member States.

The framework sets a binding target at EU level to boost the share of renewables to at least 27% of EU energy consumption by 2030. And on the basis of the Energy Efficiency Directive, the European Council has endorsed an indicative energy savings target of 27% by 2030. This target will be reviewed in 2020 having in mind a 30% target.

A transparent and dynamic governance process will be further developed to help deliver the Energy Union, including the 2030 climate and energy targets, in an efficient and coherent manner. A joined-up approach for the period up to 2030 helps ensure regulatory certainty for investors and coordinate EU

[4] http://unfccc.int/focus/indc_portal/items/8766.php Retrieved on Jan 20 2017.
[5] http://www.roadmap2050.eu/ Retrieved on Jan 15 2017,
[6] https://ec.europa.eu/clima/policies/strategies/2030_en Retrieved on Jan 16 2017.

countries' efforts. The framework helps drive progress towards a low-carbon economy and build an energy system that ensures affordable energy for all consumers, increases the security of the EU's energy supplies, reduces dependence on energy imports and creates new opportunities for growth and jobs.

By 2050, the EU aims to cut its emissions substantially - by 80-95 compared to 1990 levels as part of the efforts required by developed countries as a group. The Roadmap suggests that, by 2050, the EU should cut its emissions to 80% below 1990 levels through domestic reduction alone. It sets out milestones which form a cost-effective pathway to this goal - reductions of the order of 40% by 2030 and 60% by 2040.[7]

Under these arrangements, up to 1.5 million additional jobs could be created by 2020 if governments used revenues from CO2 taxes and from auctioning of emission allowances to reduce the labor costs. On average, the EU could save € 175-320 billion annually in fuel costs over the next 40 years. Fewer people would suffer asthma and other respiratory diseases and considerably less money would need to be spent on health care and on equipment to contol air pollution. By 2050 the EU could save up to € 88 billion a year in these areas.

4. Paris Agreement

All countries that are members of the UNFCCC – 195 nations, plus the EU – have agreed to adopt a new global climate agreement in Paris (COP21) in December 2015 which will take effect in 2020. The EU has set out its vision for the new agreement, which aims to limit the rise in global average surface temperature to below 2°C compared to pre-industrial times to avoid the most dangerous impacts of climate change.

The Paris Agreement is a bridge between today's policies and climate-neutrality before the end of the century. In terms of mitigation which is reducing emissions, governments agreed a long-term goal of keeping the increase in global average temperature to well below 2°C above pre-industrial levels; to aim to limit the increase to 1.5°C, since this would significantly reduce risks and the impacts of climate change; on the need for global emissions to peak as soon as possible, recognizing that this will take longer for developing countries; to undertake rapid reductions thereafter in accordance with the best available science. Before and during the Paris conference, countries submitted comprehensive national climate action plans (INDCs). These are not yet enough to keep global warming below 2°C, but the agreement traces the way to achieving this target.

As to transparency, governments agreed to come together every 5 years to set more ambitious targets as required by science; report to each other and the public on how well they are doing to implement

[7] https://ec.europa.eu/clima/policies/strategies/2050_en Retrieved on Jan 16 2017.

their targets; track progress towards the long-term goal through a robust transparency and accountability system. In terms of adaptation, parties agreed to strengthen societies' ability to deal with the impacts of climate change; provide continued and enhanced international support for adaptation to developing countries.

As far as role of cities, regions and local authorities are concerned, the agreement recognizes the role of non-Party stakeholders in addressing climate change, including cities, other subnational authorities, civil society, the private sector and others. They are invited to scale up their efforts and support actions to reduce emissions; build resilience and decrease vulnerability to the adverse effects of climate change; uphold and promote regional and international cooperation.

The EU will continue to support climate action to reduce emissions and build resilience to climate change impacts in developing countries. Other countries are encouraged to provide or continue to provide such support voluntarily. Developed countries intend to continue their existing collective goal to mobilize USD 100 billion per year by 2020 and extend this until 2025. A new and higher goal will be set for after this period.

The EU has been at the forefront of international efforts towards a global climate deal. Following limited participation in the Kyoto Protocol and the lack of agreement in Copenhagen in 2009, the EU has been building a broad coalition of developed and developing countries in favor of high ambition that shaped the successful outcome of the Paris conference. The EU was the first major economy to submit its intended contribution to the new agreement in March 2015. It is already taking steps to implement its target to reduce emissions by at least 40% by 2030.

The EU is already taking action to curb greenhouse gas emissions in all areas of its activity. This means more efficient use of less polluting energy, cleaner and more balanced transport options, more environmentally-friendly land-use and agriculture, more sustainable and resilient cities, fewer emissions from all sectors of economy, and financing for climate action. To enter into force of Paris Agreement, at least 55 countries representing at least 55% of global emissions had to deposit their instruments of ratification. On 5 October, the EU formally ratified the Agreement, thus enabling its entry into force on 4 November 2016.[8]

[8] http://ec.europa.eu/clima/policies/international/negotiations/paris_en Retrieved on Jan 16 2017.

III. EU's International Cooperation on Climate Change

1. *Raison d'etre* of Global Cooperation

Since the 1990s, the EU has played a leading role in the development of international climate change policy. This policy has, over the past twenty years, shaped the EU's domestic climate change policy. The dynamics of leadership and learning reflects the EU's strong commitment to a multilateral response to climate change. It also reflects the EU's understanding that it cannot successfully combat climate change on its own. It is therefore necessary to encourage others and build partnerships with other countries. Ambitious European climate policy will increasingly depend upon the rest of the world acting collectively, and with comparable ambition, to reduce greenhouse gas emissions.[9]

Throughout two decades of negotiations, the EU has, together with other progressive countries, called for international agreements that are: ambitious and inclusive, by ensuring that all countries play a role in reducing greenhouse gas emissions in line with what science indicates is necessary; fair, by taking into account the common but different responsibilities, capabilities and vulnerabilities of countries at different levels of economic development; and robust, by providing a strong legal basis for holding all countries accountable for the commitments that they make.

Climate change is an integral part of the EU's internal and foreign policy agendas. This is because it has the potential to influence almost every aspect of EU citizen's daily lives and the lives of people in other countries. For this reason, the EU has sought to mainstream climate change across the board of domestic and external policy areas.

There are several strategic objectives with which the EU aims to achieve in cooperating with external partners about climate change. Building political will and trust are necessary. The EU is convinced that the way to achieve the 2ºC objective is through a global and comprehensive agreement and that this agreement must be founded in the UNFCCC. In order to ensure that this process is inclusive, it is necessary to convince partners that climate actions make economic and environmental sense and that this action is entirely compatible with national policy objectives, e.g. development, health, energy security or foreign policy objectives.

Building capacity is another target to achieve. In order to attain the EU's objective of limiting global climate temperature to 2ºC, the EU needs to ensure that European partners are able to tackle the problem. This means, *inter alia*, ensuring that the most vulnerable countries are able to adapt to the inevitable impacts of climate change, and that the greatest emitters are in a practical and administrative position to reduce their greenhouse gas emissions.

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[9] http://ec.europa.eu/clima/policies/international_en Retrieved on Jan 10 2017.

It is also relevant to consider aid effectiveness and the Millennium Development Goals (MDGs), and more recently SDGs. In the case of developing countries, the EU has signed up to the MDGs and is committed to ensuring the effectiveness of its development aid spending. Climate change impacts have the potential to undermine policies and projects aimed at poverty eradication and economic development, and it therefore makes sense to ensure that donor and recipient implementation of aid and development policies consider climate change impacts at every stage. Furthermore, it is part of the EU's humanitarian role to ensure that the EU assists the most vulnerable on this planet, including when it comes to coping with the impacts of climate change.

2. EU-CELAC bi-regional cooperation

The EU, Latin America and the Caribbean announced in 1999 the launch of their Bi-regional Strategic partnership. This partnership has been maintained through the shared principles and objectives. The EU consists of 28 Member States. In over 60 years of history of integration and enlargement it has developed a single market with free movement for goods, services, capital and people. With few exceptions, there are no border controls between EU countries and 19 of them share a common currency, the euro. The Community of Latin American and Caribbean States (CELAC) comprises 33 Member States from Latin America and the Caribbean. Together, the EU and the CELAC count 61 countries with almost a third of the members of the United Nations, eight seats at the G20, and over one billion people, approximately 15.5% of the world population.

More recently, 1st EU-CELAC Meeting was held in Santiago, Chile in 2013. And in the 2nd Meeting in Brussels, Belgium, important consensus were met with Action Plan, Brussel and Political Declarations. In Action Plan, issues of sustainable development, environment, climate change, biodiversity and energy was treated in the following.[10] Main objectives in this area for ensuring environmental sustainability taking into account the principle of common but differentiated responsibilities are: to promote the sustainable development of all countries and to support the achievement of the MDG and the other international agreements on these issues; to ensure the effective implementation of the UNFCCC and the Kyoto Protocol, recognizing the scientific views regarding the limit for the increase in the global temperature; to develop policies and instruments for adaptation and mitigation, to address the adverse effects of climate change and enhance long-term cooperation initiatives and to reduce the vulnerability to natural disasters; to support activities oriented to reduce intensity of greenhouse gas emissions in consumption and production activities in our countries, according to existing international commitments; to facilitate access to and exchange of information related to best environmental practices and technologies; to ensure and support the full implementation

[10] http://www.consilium.europa.eu/en/press/press-releases/2015/06/11-eu-celac-summit-brussels-declaration/ Retrieved on Jan 10 2017.

of the three objectives of the Convention on Biological Diversity; to improve energy efficiency and saving as well as accessibility; to develop and to deploy renewable energies and to promote energy interconnection networks, ensuring the diversification and complementarity of the energy matrix.

Between the EU and CELAC, key areas of cooperation might be arranged in the following.[11] First, the challenges and opportunities presented by climate change offer the potential to rejuvenate relations between the EU and the CELAC. Second, the EU-CELAC Strategic Partnership considers climate change and sustainable developtment to be central pillars of their relationship, and activities on climate change are extensive, offering an important alternative to Latin America and the Caribbean's relations with other countries and regions. Third, EU-LAC countries can together promote a new climate narrative calling for ambitious collective action by all countries, based on the principle of common but differentiated responsibility. This supports the notion that cooperation is possible between developing and developed countries and that climate protection and economic growth can be complementary goals. There are a number of opportunities for the EU and LAC countries to enhance climate diplomacy between both regions and within Latin America and the Caribbean, particularly to build consensus on ambition and equity.

Fourth, during the second phase, EUROCLIMA has a number of opportunities to improve EU-LAC cooperation on climate change, such as working with CELAC to establish climate change and sustainable development on CELAC's agenda.[12] Fifth, the scale of EU-LAC trade and investment in heavily polluting and carbon-intensive sectors represents a key challenge for EU-CELAC relations in mainstreaming sustainability and climate change into the partnership. The EU and LAC countries with a focus on carbon intensive sectors should limit potential risks from a new climate change agreement by encouraging their limits to actively invest in renewable energy, low carbon growth and environmental protection. Lastly, EU-LAC countries alongside their partners in the Cartagena Dialogue should increase their own levels of participation and bring more countries from other regions to enhance cooperation and develop strategies to improve dialogue and consensus building efforts for a high ambition agenda.[13]

3. EU-Argentina cooperation on climate action

Argentina was the first Latin American country to formalize relations with the EU. The Framework Agreement for Trade and Economic Co-operation between the EU and Argentina[14] entered into force

[11] Guy Edwards and J. Timmons Roberts, *The EU and Latin America and the Caribbean: Paving the road towards a new global climate change agreement in 2015 ?*, EU-LAC Forum on Global Governance, 2013, p. 10.
[12] http://www.euroclima.org/en/euroclima/what-is-euroclima Retrieved on Jan 5 2017.
[13] https://www.iiss.org/en/events/cartagena-s-dialogue Retrieved on Jan 10 2017.
[14] http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:21990A1026(01) Retrieved on Jan. 15 2017.

in 1990 and includes two recurrent principles of their cooperation: the strengthening of democracy and human rights, as well as regional integration. An EU-Argentina Joint Commission has also been established. A number of sectoral agreements were materialized throughout the 1990s. The main focuses of bilateral cooperation have been education and training; economic competitiveness; capacity‐building in the public and academic sector.

Both the EU and Argentina have been eager and serious actors, globaly and regionaly, when it comes to climate change. In fact, Buenos Aires hosted twice COP 4 and 5 meetings in 1998 and 2004 respectively.[15] In terms of INDC, as unconditional goal, Argentina is to reduce GHG emissions by 15% in 2030 with respect to projected BAU emissions for that year. The goal includes, *inter alia*, actions linked to: the promotion of sustainable forest management, energy efficiency, biofuels, nuclear power, renewable energy, and transport modal shift. The criteria for selecting the actions include the potential for reducing and capturing GHG emissions, and associate co-benefits, as well as the possibility of applying nationally developed technologies.

While with conditional goal, Argentina could increase its reduction goal under the following conditions: adequate and predictable international financing; support for transfer, innovation and technology development; support for capacity building. In this case, a reduction of 30% GHG emissions could be achieved by 2030 compared to projected BAU emissions in the same year. The goal contemplates both the increase of the scope of measures in progress, as well as the implementation of new measures. In most cases, the costs and benefits of the measures have been analyzed.

Argentina also has been fast runner and intiator in the process of Paris Agreement, with date of signature April 22 2016, with date of deposit of instruments of ratification or accession September 21 2016 and finally with date of enforcement November 4 2016. The fact that Argentina will chair G20 in the year of 2018 is another positive aspect in terms of global leadership as to the climate change issue.

When the President of the Argentine Republic Mr Mauricio Macri visited the EU 2016, significant accordance was met between the two parties. In their Joint Press Release, it is firmly espressed that the EU and Argentina are facing up to global challenges like climate change and the refugee crisis in the Middle East and have been strengthening their cooperation in the United Nations and other multinational fora like the G20 on these and many other issues.[16] Acknowledging 2015 EU-CELAC Summit, the EU committed to further enforcing the bi-regional partnership with the Community of Latin America and Caribbean States.

The EU and Argentina recently confirmed their intention to use and further expand the excellent results of Argentine participation in projects under the Horizon 2020 Science and Technology research

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[15] http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx Retrieved on Jan. 18 2017. ARGENTINE REPUBLIC. INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

[16] https://eeas.europa.eu/headquarters/headquarters-homepage_en/7184/Joint%20Press%20Release%20on%20Visit%20of%20the%20President%20of%20the%20Argentine%20Republic%20to%20the%20EU%20Institutions Retrieved on Jan 15 2017.

programme which demonstrates the high level of innovation and technological development of scientific and academic institutions. This includes a commitment to reinforce the Bilateral Agreement on Science and Technology Cooperation in Strategic Priorities, such as bio-economy, marine research, climate, renewable energies and information and communication technologies. The bilateral agreement signed in 2015 will allow Argentine researchers to participate in European Research Council initiatives. The European Commission is committed to also further strengthen regional science and technology cooperation, recognizing the key role Argentina can play in moving towards an EU-CELAC Common Research Area.

The EU and Argentina also reaffirm their interest to continue engaging in dialogues and cooperation activities in a number of other areas, such as biotechnology applied to agriculture, sanitary issues and animal welfare, employment, labour and social protection issues, environment and sustainable development, climate change and energy efficiency.

IV. Summary and Discussions

1. Summary

EU has been lediator in the area of climate action. With step-by-step and learning -by-doing, the EU could build an internal consensus to win over the threat caused by global warming.[17] This method is also applied to international cooperation and Paris Agreement was an accomplishment of such an endeavor. In fact flexibility and fairness which are applied to adaptation and mitigation made possible a great number of countries willing to join the agreement through INDC measures.

As climate governance has become polycentric, there requires careful prioritization as well as further enhanced coordination of climate diplomacy across the EU and through international cooperation. The EU's position in climate geopolitics will not least depend on the development of its internal climate and energy policy framework for 2030 and beyond. Advancing decarbonization and fostering low-carbon innovation towards the new climate economy in the EU will help enhance the EU's power base and role in future climate geopolitics.[18] In this sense, it is highly recommedable to enhance the cooperation in diverse levels, global, bi-regional, bilateral and with any other internationall and local actors around the planet.

Bi-regional cooperation between the EU and CELAC demostrated significant deveopments and most countries in the Latin America and Caribbean regions provided realistic target as to the nationally

[17] Jos Delbeke and Peter Vis (Eds)., *EU Climate Policy Exlained*, Routlede, 2016, pp. 111-2.
[18] Sebastian Oberthur, "Where to go from Paris ? The European Union in climate geopolitics", *Global Affairs*, 2016, p. 1.

determined contributions. Leaders in both regions expressed deep concern over this issue by way of summit declarations. Capital cities of Latin American region hosted several Conference of Parties meetings as with major European cities.

Bilateral cooperation between the EU and Argentina also demonstrated a reference as far as climate change is concerned. Buenos Aires hosted twice COPs and throughout the summit meeting between the two parties, both leaders acknowledged the relevance of the global challenges like climate change and reaffirmed their interest to continue engaging in dialogues and cooperation activities in areas, such as biotechnology, environment, sustainable development, climate change and energy efficiency.

2. Discussions

Paris Agreement is considered as one of the great achievements of the international society ever made after the post-cold war era. EU has been a fervent actor for that mission. But the advent of Trump is now causing perplexity and bewilderment. During his campaign for presidency, Trump argued incessantly that climate action is a kind of hoax and detrimental to US economy. In fact, just after his inaguaration ceremony, website of climate action of the White House is vanished which means a strong will of the new president. His policy area of 'An America First Energy Plan' clearly denotes that lower costs for hardworking Americans and maximize the use of American resources, freeing from dependence on foreign oil. This plan also contends that for too long the US has been held back by burdensome regulations on energy industry.[19] Trump is commited to eliminating harmful and unnecessary policies such as the Climate Action Plan. He believes that lifting these restrictions will greatly help American workers, increasing wages by more than $30 billion over the next 7 years. For him, boosting domestic energy production is in America's security interest and coal industry should be revived. While not dismissing the importance of environment, protecting clean air and water, it seems that his policy guidelines are directly contrary to the spirit of the Paris Agreement.

There is an opinion that though the presence of Trump might be a disaster to climate policy, there will be no great damage to the Agreement for reason that it has flexibility and institutional arrangements. First of all, the Paris system's flexibility makes it resilient in ways more traditional international regimes. If he wants to withdraw from Paris System, Trump has to wait at least 4 years, which means the withdrawal is not possible within his term. Or one year to leave the overarching UN climate convention which seems to be unrealistic and that will eventually make the US no seat in the international climate policy meeting.[20]

[19] http://www.climatechangenews.com/2016/11/09/the-paris-agreement-will-survive-president-trump/ Retrieved on Jan 13 2017.

[20] https://thinkprogress.org/trump-paris-agreement-speed-up-cancel-ceb106ff9661#.8hr2hx1qs Retrived on Jan. 21 2017.

Second, Paris gave us 189 other climate plans. Because these pledges are based upon national priorities and interests, they are more likely to be implemented than a more traditional agreement that would require reciprocal concessions. Nothing about Trump's election reduces China's or India's need to clean up their air and build new industries based on next-generation technology.

Third, Trump's election will not slow the groundswell of climate action as seen from cities, states and provinces, businesses, civil society groups, and other actors whose decisions are not governed by the electoral college. For instance, Suzanne McCarron, Vice President of Public and Government Affairs at Exxon Mobil Corporation, recently expressed that the company fully supports remaining in the Paris agreement.

Lastly, the Paris Agreement has accelerated a number of background drivers that fundamentally change the costs and benefits of climate action in the real economy. Renewables are at parity with fossil fuels across much of the world, and dropping even further in price. Disclosure of climate risk is being mainstreamed by some of the largest institutional investors, hitting corporate directors in their share prices. Such economic transformations can re-write the conventional political wisdom. Indeed, renewables are expanding quickly in many US states where Trump won.

Given the universal and cross-cutting nature of the climate challenge, there need priorities that might shape foreign policy action on climate issues in the decades ahead.[21] It will be crucial for the EU to develop a concreate comprehensive and ambitious climate diplomacy action plan for the post-COP21 era. Build a strategic vision for implementation of the Paris Agreement is utmost. It is also necessary to provide support for developing countries to implement INDCs and decarbonize. Developing countries that may lack economic or governance capacities will require international support to shape and implement more ambitious climate policy. Identify and support ambitious alliances are another job to do in the years to come. Cooperating with different partners and expanding alliances should never be underestimated. The G20 could be an ideal forum for this, given that its important role in global economic discussions and the participation of major emitters. For the EU, facilitating delegations would be effective way of cooperating with partners in the world as to improve climate diplomacy capacities.

[21] Stephan Wolters et al., "Climate Change and European Foreign Policy after COP21", *Climate D1plomacy Brief*, 2016, p. 1.

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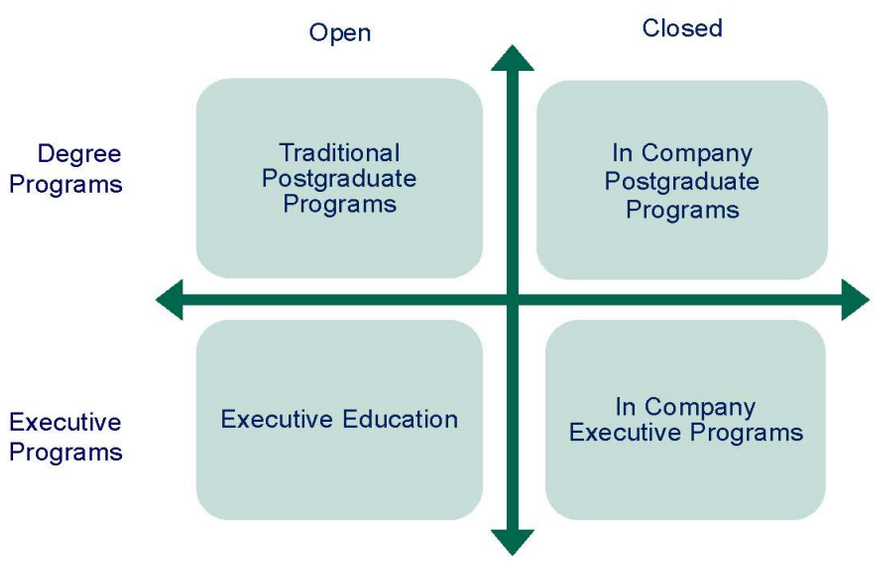

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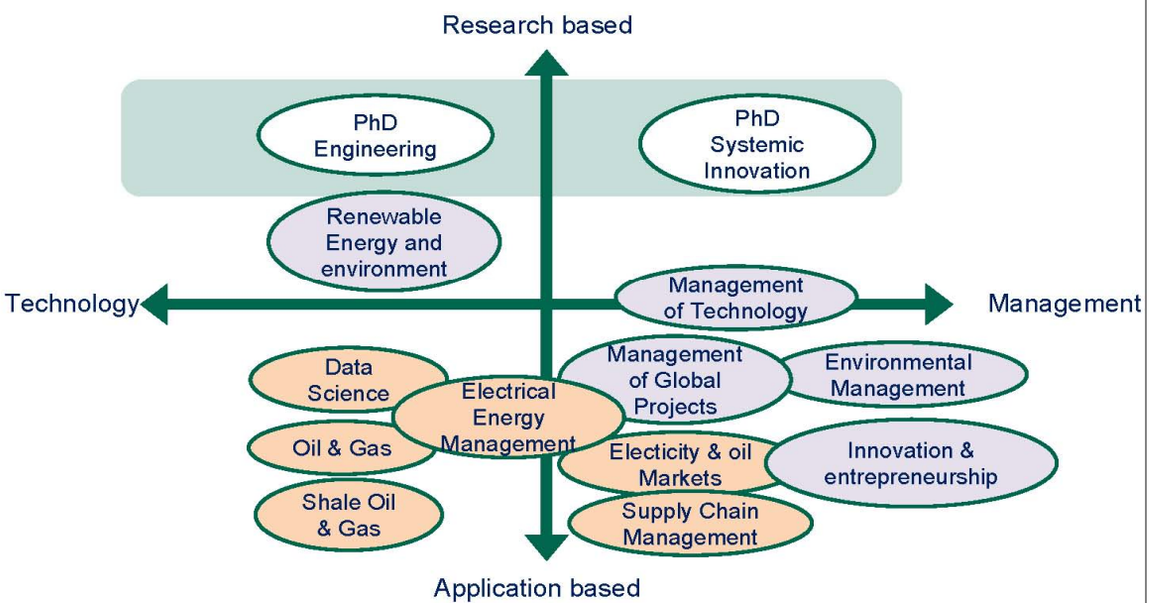

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CLIMATE CHANGE, RENEWABLE ENERGY AND CULTURAL COOPERATION

Session 2: Culture and International Cooperation Between Korea and Latin America

Session Chair: Dr. Kyung-Won, Chung(HUFS)

■Dr. Man-Hee, Lee(HUFS)
"La música en los autos sacramentales latinoamericanos: en torno a Sor Juana Inés de la Cruz"

■Dr. Sel-Gie, Koh(HUFS)
"La novelización coreana de la 'Guerra del Fútbol'"

■Dr. Won-Dug, Han(HUFS)
"Un estudio pedagógico sobre el sistema de inspección sanitaria de Corea"

La música en los autos sacramentales latinoamericanos
- en torno a Sor Juana Inés de la Cruz -

LEE, Manhee(Hankuk University of Foreign Studies)

I. Introducción

Sor Juana Inés de la Cruz (México, 1649 o 1651-1695) es una de los dos dramaturgos mexicanos que comparten honores con los grandes autores dramáticos españoles de los Siglos de Oro junto con Juan Ruiz de Alarcón. Sor Juana destaca en el género del teatro y así escribió piezas profanas y religiosas de gran ascendencia calderoniana.[1] La autora escribió tres autos sacramentales: *El divino Narciso* (1688), *El mártir del Sacramento, San Hermenegildo* (1692) y *El cetro de José* (1692). Sor Juana toma sabiamente de la Biblia las tramas de sus autos, de la mitología griega y de la historia de la Edad Media bajo el reinado de la dinastía goda. En cada caso la elección obedece no sólo a gustos particulares afines al carácter dramático, sino también a que los temas permiten mejor que otros sondear en el misterio de la Eucaristía.[2]

El auto sacramental es una pieza teatral religiosa alegórica de un solo acto y de tema preferentemente eucarístico que se representaba el día del *Corpus Christi* entre los siglos XVI y XVIII.[3] Este género dramático alcanzó su auge en las obras del dramaturgo Pedro Calderón de la Barca y, asimismo, sus elementos musicales se utilizaron de forma más intensa que nunca. Alfonso Méndez Plancarte dice comentando sobre *El divino Narciso* de Sor Juana que su auto posee una "excelsa hermosura de sus varias 'canciones' parafrásticas de la Biblia".[4] El presente estudio se enfoca, precisamente, en el papel de la música en los autos sacramentales de Sor Juana Inés de la Cruz, en comparación con los coros de los antiguos dramas griegos.

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1) Marina Gálvez Acero, El teatro hispanoamericano, p. 40.
2) Sergio Fernández, “Prólogo” en *Autos Sacramentales de Sor Juana Inés de la Cruz*, p. xii.
3) Ignacio Arellano, *Historia del teatro español del siglo XVII*, p. 687.
4) Alfonso Méndez Plancarte, “Estudio liminar” en Obras completas de Sor Juana Inés de la Cruz III: Autos y loas, p. lxxiv.

II. La música y los coros

Se percibe que la música en estas piezas heredó la tradición del coro en la antigua tragedia griega. Comentando sobre el auto de Sor Juana *El mártir del Sacramento, San Hermenegildo*, Alfonso Méndez Plancarte reconoció que el auto lleva "la más bella función que tuvo el 'Coro' en la Tragedia Griega."[5] Como es sabido, el coro es un elemento esencial e imprescindible en el drama griego. En este tenor, los dramaturgos griegos querían educar y propagar los valores de la democracia a sus ciudadanos atenienses a través de las tragedias. Con la finalidad de conseguir dicho objetivo, se usó como medio el coro.

A través del coro el dramaturgo podía expresar sus ideas a la audiencia de manera eficiente según las particularidades que enmarcaban la época. El coro presentó el contexto y resumió las situaciones de la escena para ayudar al público a seguir los sucesos, haciendo comentarios referentes a los temas principales de la obra.

Sófocles utilizó dos coros para sus tragedias. Por ejemplo en el *Edipo Rey*, los coros se sitúan separados por la escena: un coro de la derecha, el otro de la izquierda.[6] En esta línea, Sor Juana usa, en sus autos, los mismos términos griegos "el coro 1, el coro 2" y los diseña intencionalmente para ejecutar similares funciones a las de los coros griegos. Por ejemplo, en la escena I de *El divino Narciso* aparecen los músicos con el nombre de “Coro 1, Coro 2”.

Sinagoga: ¡Alabad al Señor todos los hombres!
Coro 1: ¡Alabad al Señor todos los hombres!
Gentilidad: ¡Aplaudid a Narciso, fuentes y flores!
Y pues su beldad divina,
sin igualdad peregrina,
es sobre toda hermosura,
que se vio en otra criatura,
y en todas inspira amores,
Coro 2: ¡Alabad a Narciso, fuentes y flores![7]

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5) Ibid., p. lxxviii.
6) Sófocles, “Edipo rey” en *Tragedias completas*, p. 226.
7) Sor Juana Inés de la Cruz, “El divino Narciso” en *Autos Sacramentales de Sor Juana Inés de la Cruz*, pp. 3-4.

III. La música y los personajes

Mientras que en los dramas de Sófocles se dividieron claramente las maneras de expresión del coro y los personajes, en los autos de Sor Juana sus personajes se expresaban cantando como un músico. En la escena VII de *El divino Narciso*, la Gracia canta aparte de los coros.

Gracia: Debido obsequio es, y así
yo te ayudaré a invocarla.
Canta la Gracia: ¡Oh, siempre cristalina,
clara y hermosa fuente:
tente, tente;
reparen mi rüina
tus ondas presurosas,
claras, limpias, vivíficas, lustrosas![8)]

En la escena XXIV de *El cetro de José*, la Profecía también canta sola.

(*Ábrese un Carro, y aparece* Jacob *en una cama;* José *a su lado, y todos sus* Hijos; *y la* Profecía*, en lo alto, cantando:*)
Profecía: ¡Venid, venid, Mortales,
en el acento mío,
a escuchar los Misterios
del venidero siglo!
¡Atened, escuchad los prodigios!
En Boca de Jacob,
soy yo quien profetizo
al Mundo su remedio,
su fortuna a los Tribus.
¡Atened, escuchad el prodigio![9)]

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8) Ibid., p. 39.

9) Sor Juana Inés de la Cruz, "El cetro de José" en *Obras completas de Sor Juana Inés de la Crus III: Autos y loas*, pp. 248-249.

Como se ve, no sólo cantan los coros, sino también casi todos los personajes de los autos. De esta manera, los autos de Sor Juana llegaron a crear una dinámica escena musical a lo largo de todo el drama.

IV. La música y los consejeros

Al principio de *Filoctetes* de Sófocles, Ulises y Neoptólemo llegan a Lemnos donde fue abandonado Filoctetes por haber sido mordido por una serpiente venenosa. Los dos comisionados del ejército griego que combaten en Troya intentan llevar a Filoctetes y su arco a Troya. Lo anterior es debido a que, según el adivino troyano Héleno, que había sido hecho prisionero por Ulises, sólo por la simple presencia de Neoptólemo y de Filoctetes y su arco caería Troya. Finalmente, Ulises consiguió el arco de Filoctetes, pero éste se vengaría de él. En este momento, un coro formado por marineros le aconseja cantando la siguiente letra:

Coro: ¡En nombre de los dioses, si tienes algún miramiento para con un amigo
extranjero, acércate
a quien se acerca a ti con la mejor intención!
Sin embargo, reconoce, reconoce claramente que en tus manos está
escapar a esta desgracia.
pues triste es de alimentar e indisciplinada
para soportar la infinita carga que cohabita con él.[10)]

En esta escena el coro está aconsejando a Filoctetes a no vengarse. De ese modo el coro da un mensaje educativo a los atenienses que están escuchando sus canciones.

Particularmente, la Música de los autos de Sor Juana también aconseja al protagonista con autoridad tal y como ocurría en la tragedia griega. En la escena XXIV de *El mártir del Sacramento, San Hermenegildo*, la Fe canta esta canción de consejo a Hermenegildo a quien estaba tentando la Apostasía:

Fe: ¡Cuidado, Hermenegildo;
atiende, escucha atento,

10) Sófocles, “Filoctetes” en *Tragedias completas*, p. 335.

que en traje de vïanda
se disfraza el veneno!
¡Atienede, escucha, oye
mis interiores ecos![11)]

La canción de la Fe aconseja tanto al protagonista en la escena como a la audiencia tomar una adecuada decisión que agrade a Dios.

V. La música y los adversarios

Mientras que el coro de Sófocles, generalmente, simpatizaba con el protagonista, los autos de Sor Juana llevaba no sólo la música simpatizante, sino también la música hostil al protagonista como la música del bien y la del mal. El auto tenía que dramatizar las doctrinas teológicas del catolicismo que fueron: la elección entre el bien y el mal, la salvación y el juicio, Cristo y el demonio.

En la escena XIII de *El divino Narciso*, la Música se entristece por la muerte de Narciso, quien es uno de los protagonistas de la obra.

(*Retíranse a un lado; y sale la* Naturaleza *llorando y todas las* Ninfas *y* Pastoras*, y*
Música *triste.*)
Naturaleza Humana: Ninfas habitadoras
de estos campos silvestres,
unas en claras ondas
y otras en troncos verdes;
Pastores que vagando
estos prados alegres,
guardáis con el ganado
rústicas sencilleces:
de mi bellos Narciso,
gloria de vuestro albergue,

11) Sor Juana Inés de la Cruz, “El mártir del Sacramento, San Hermenegildo” en *Autos Sacramentales de Sor Juana Inés de la Cruz*, p. 181

las dos divinas lumbres
cerró temprana muerte:
¡sentid, sentid mis ansias;
llorad, llorad su muerte!
Música: ¡Llorad, llorad su muerte![12)]

La Música repite este verso nueve veces en esta escena expresando su tristeza profunda por la muerte de Narciso. Pero en otras escenas podemos ver que la Música canta a favor del antagonista de la obra. Por ejemplo, en la escena XI de *El divino Narciso*, Eco se convierte en muda, por eso sólo puede repetir las últimas palabras de la Soberbia y el Amor Propio. Sor Juana indica que la Música cante las palabras de Eco quien es la alegoría de Satanás. En esta escena, Eco iba a suicidarse, pero la Soberbia y el Amor Propio la detienen.

Soberbia: Tente, pues que yo te tengo.
Eco: *Tengo.*
Amor Propio: Refiere tu ansiosa pena.
Eco: *Pena.*
Soberbia: Di la causa de tu rabia.
Eco: *Rabia.*
(*Dentro, repite la* Música*, con tono triste, los ecos.*)
Amor Propio: Pues eres tan sabia,
¿dinos qué accidentes
tienes, o qué sientes?
Eco: *Tengo pena, rabia...*[13)]

En la misma escena, la Música sigue cantando la copla de Eco.

Eco: Tengo pena, rabia,
de ver que Narciso
a un ser quebradizo
quiere, a mí me agravia.

12) Sor Juana Inés de la Cruz, “El divino Narciso”, pp. 69-70.
13) Ibid., pp. 50-51.

(*Repite la música toda la copla.*)[14)]

Más adelante, la Música canta junto con Eco en dúo, simpatizándose con esta ninfa malvada.

Eco y Música: Eco quejosa responde,
viendo que quiera tu amor
Amar un ser inferior;
y así, a tus ojos se esconde.[15)]

VI. La música y los alabadores

En la escena X de *El cetro de José*, la Música ofrece alabanza al Faraón de Egipto. El Faraón no es el protagonista de la obra, ni el antagonista, sino uno de los personajes neutrales. Pero cuando el rey egipcio aparece en la escena, Sor Juana indica a la Música cantar una elogía para él.

Música (*Cantan*): ¡Viva el magno Faraón,
en que enlazadas se miran
a los timbres herdados
las hazañas adquiridas;
en quien se cifran
los blasones, los timbres, las glorias
que Egipto admira!
¡Viva, viva![16)]

Esta vez la Música no tiene una función especial sino solamente como ceremonia de recepción. En la escena I de *El divino Narciso*, la Música se dedica a alabar a Dios.

Naturaleza Humana: […] Y pues en edad ninguna
ha faltado quien abogue

14) Ibid., p. 54.
15) Ibid., p. 64.
16) Sor Juana Inés de la Cruz, “El cetro de José” p. 219.

por mí, vamos a buscar
la fuente en que mis borrones
se han de lavar, sin dejar
las dulces repeticiones
de la música, diciendo
entre lágrimas y voces.
Coro 1: ¡Alabad al Señor todos los hombres!
Coro 2: ¡Aplaudid a Narciso, fuentes y flores![17)]

En la escena XVI, todos los personajes de la obra cantan juntos alabando la Eucaristía que es el tema principal del auto.

Naturaleza Humana: Sólo falta que, rendidos,
las debidas gracias demos;
y así, en concertados himnos
sus alabanzas cantad
diciendo todos conmigo:
(*Cantan*): ¡Canta, lengua, del cuerpo glorioso
el alto misterio, que por precio digno
del mundo se nos dio, siendo fruto
real, generoso del vientre más limpio!
Veneremos tan gran sacramento,
y al nuevo misterio cedan los antiguos,
supliendo de la fe los afectos
todos los defectos que hay en los sentidos.[18)]

VII. La música y la voz de Dios

En *Electra* de Sófocles, el coro canta como profeta de dios cuando Electra demuestra su espíritu vengativo hacia su madre y su padrastro.

17) Sor Juana Inés de la Cruz, “El divino Narciso”, p. 14.
18) Ibid., pp. 83-84.

Coro: Si no he resultado ser estúpida adivina
y falta de sabia intuición
se pondrá en camino la profética
Justicia con la intención de alcanzar por sus dos brazos el triunfo justiciero.
Atacará, hija, dentro de no demasiado tiempo. […][19)]

En los autos de Sor Juana, la música domina el drama, en muchas veces, siendo la voz de Dios, y de esa forma influye fuertemente tanto en los actores como en los espectadores. En la escena IV de *El divino Narciso*, uno de los músicos canta como el ángel quien transmite la voz de Dios.

(*Pasa* Abraham, *como lo pintan, y canta* el Ángel:)
Ángel: ¡Para herir al niño
la mano no extiendas,
que basta haber visto
cuánto al Señor temas![20)]

En la escena V de *El cetro de José*, la Música canta como la voz de Dios. La escena muestra la conversación entre Jacob y Dios.

Música [voz de Dios]: Yo soy el Dios verdadero
de Abraham, tu padre, y de Isaac,
que aquesta tierra en que duermes
toda te tengo de dar.
Excederá tu progenie
a las arenas del mar;
y en ti y tu Semen, benditas
todas las Gentes serán.[21)]

Las canciones de los ángeles forman otro tipo del coro y dominan el drama representando la

19) Sófocles, “Electra” en *Tragedias completas*, p. 259.
20) Sor Juana Inés de la Cruz, “El divino Narciso”, p. 23.
21) Sor Juana Inés de la Cruz, “El cetro de José”, p. 208.

voz de Dios.

VIII. La música y los mensajeros

El coro del drama griego expresa de forma directa a los espectadores un mensaje de carácter educativo que quiere transmitir el dramaturgo. El coro griego dio al público la suprema sabiduría de la vida de los griegos de aquel entonces. En la última escena de *Antígona* de Sófocles, el coro canta a Creonte de esta forma:

Creonte: Si aceptarais mis súplicas llevarías lejos de aquí a un hombre estúpido que, hijo,
sin ser su voluntad te mató, y también a ti, ésta de aquí, ¡ay infeliz de mí!, y no sé cómo ni a cuál de las dos cosas prestar atención, pues todo los que cae en mis manos se desmorona, y, por otro lado, se abatió sobre mi cabeza una desgracia insoportable.

Coro: La sensatez resulta con mucho lo primero y principal de la felicidad, y también conviene no cometer impiedad alguna, al menos en lo tocante a los dioses. Pues los razonamientos inmoderados de los arrogantes, al sufrir como castigo golpes inmoderados, les enseñan con la vejez la sensatez.[22)]

La música de los autos de Sor Juana también tomaba esta función del coro del drama griego, porque este género religioso buscaba la formación moral del pueblo por parte de la Iglesia católica, o sea, la difusión de la doctrina de la Contrarreforma. Debido a lo anterior, fue necesario la Música que cantara repetidas veces el tema de la obra e interviniera sin cesar en las escenas como si fuera un mensajero de Dios para de este modo educar a la audiencia adecuadamente.

En la escena VII de *El divino Narciso*, la Música repite el último verso de las canciones de los actores para dar énfasis en el mensaje religioso.

Gracia: Albricias, mundo: albricias,
Naturaleza Humana,

22) Sófocles, “Antígona” en *Tragedias completas*, p. 175.

pues con dar esos pasos
te acercas a la Gracia:
¡dichosa el alma
que merece tenerme en su morada!
Venturosa es mil veces
quien me ve tan cercana;
que está muy cerca el sol
cuando parece el alba:
¡dichosa el alma
que merece hospedarme en su morada!
(*Repite la Música este último verso, y llégase la Naturaleza a ella.*)[23)]

Más adelante, la Naturaleza Humana y la Gracia cantan juntos y después el Coro repite la última parte de su canción. Se pueden ver las escenas en que los actores cantan de modo distinto. Sor Juana les indica a los músicos que vuelvan a cantar las letras de los demás actores como si fueran los estribillos de sus canciones.

Las Dos: Albricias, mundo: albricias,
Naturaleza Humana,
pues con dar esos pasos
te acercas a la Gracia:
Coro: ¡dichosa el alma
que merece hospedarme en su morada![24)]

En la escena VIII, Sor Juana indica que Narciso cante el último verso de cada estrofa para demostrar su amor hacia la Naturaleza Humana de forma sensorial.

(*[...] y sale por otra parte* Narciso*, con una honda como pastor, y canta el último verso de [cada una de] las coplas, y lo demás representa.*)
Narciso: Ovejuela perdida,
de tu dueño olvidada,

23) Sor Juana Inés de la Cruz, “El divino Narciso”, pp. 34-35.
24) Ibid., p. 35.

¿adónde vas errada?
Mira que dividida
(*Canta*): de mí, también te apartas de tu vida.
Narciso: Por las cisternas viejas
bebiendo turbias aguas,
tu necia sed enjuagas;
y con sordas orejas,
(*Canta*): de las aguas vivíficas te alejas.[25)]

En la escena XII, la Música y Narciso cantan en dúo transmitiendo a los espectadores el mensaje esencial de la obra, la salvación de Cristo.

Música y Él: Tormento paso insufrible;
pues mi hermosura cabal
el amor hizo mortal,
sujeta, humana, pasible.[26)]

Música y Él: El Amor, que puede herir,
en mí mostró su pujanza;
y amando a mi semejanza,
del cielo vine a morir.[27)]

En la última escena de *El cetro de José*, los dos Coros cantan repitiendo después de que la Profecía canta sola.

(*Canta la* Profecía *sola, y repiten los* Coros:)
pues es el Misterio de los Misterios
y es el Prodigio de los Prodigios!
Pues si el Maná tuvo
sabores distintos,

25) Ibid., p. 41.
26) Ibid., p. 58.
27) Ibid., p. 61.

Éste un sabor tiene,
pero es infinito,
(*Cantan*): ¡porque es el Misterio de los Misterios
y es el Prodigio de los Prodigios![28)]

Llegando al final del drama, la Música repite las variaciones de la Eucaristía que cantan los personajes de la escena para dar énfasis en el mensaje principal del dramaturgo y transmitirlo a los espectadores de forma intensa. En la escena XXIV de *El mártir del Sacramento, San Hermenegildo*, Sor Juana indica a la Música que cante elogios a la Eucaristía de la siguiente manera.

Paz: Y aladas jerarquías
a venerar el cuerpo
del mártir, y a adorar
tan alto sacramento,
de las esferas bajen,
todos diciendo
que éste es el mártir solo
del Sacramento.
(*Repiten los* Coros): ¡Que éste es el mártir solo
del Sacramento!
¡Llore, llore la tierra,
y cante, cante el cielo,
que éste es el mártir solo del Sacramento![29)]

Mientras que los coros de la tragedia griega transmiten el tema de la obra con letras largas, los de nuestra dramaturga cantan repetitivamente letras cortas como si fueran estribillos de una canción para dar fuerte énfasis al mensaje religioso de la Iglesia contrarreformista.

28) Sor Juana Inés de la Cruz, “El cetro de José”, p. 257.
29) Sor Juana Inés de la Cruz, “El mártir del Sacramento, San Hermenegildo”, p. 188.

IX. Conclusión

En suma, evidente e indiscutiblemente, la música de Sor Juana Inés de la Cruz fue un elemento muy útil para transmitir, eficazmente, la esencia del Santísimo Sacramento (*Corpus Christi*), tal como ella misma la concebía, a la audiencia receptora mexicana de ese entonces. De esta forma, la maestra aplicó el coro griego a sus autos para difundir los dogmas de la Iglesia postridentina a los espectadores de la época.

Sor Juana Inés de la Cruz desarrolló los elementos musicales en sus autos más que otros autores de este género del teatro. Mientras que el coro del drama griego manifestaba el mensaje del autor a través de varias letras de canciones, la música de sus autos lo expresaban de forma simple y repetitiva como estribillos de canción para destacar el mensaje religioso de la Iglesia católica en la Nueva España.

La dramaturga utilizó la música en conjunto para mostrar la festividad y relgiosidad de la época barroca latinoamericana. Los autos sacramentales de Sor Juana Inés de la Cruz y su literatura criolla en su tiempo heredaron de forma fiel y sincera las tradiciones de los grandes maestros españoles como Pedro Calderón de la Barca. Además, sus obras abrieron la puerta para que el auto se convirtiera en un drama esencialmente musical a fines del siglo XVII en México.

[Sor Juana Inés de la Cruz/ Auto sacramental/ Coro griego/ Teatro mexicano]

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La novelización coreana de la ‘Guerra del Fútbol’

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I. Prefacio

La ‘Guerra del Fútbol’ es un suceso en el que el fútbol llevó a la guerra después de los partidos eliminatorios de la Copa Mundial de México en 1970 entre los países vecinos de Honduras y El Salvador. El fútbol no fue la única causa, pero por éste explotaron los rencores acumulados hasta entonces entre los dos países.

Después de 32 años, en 2002 se celebró la Copa Mundial de fútbol en Corea y Japón. Eso nos muestra que hasta entonces el nivel y la afición de fútbol asiático iba creciendo poco a poco y por fin consiguió celebrarlo por primera vez fuera de Europa y América, los dos poderosos continentes del fútbol.

Para celebrar ese evento una autora coreana empezó a escribir una novela sobre el fútbol y llegó a completar y publicar 100 días antes de la inauguración. Efectivamente esta novela trata de la “Guerra del fútbol”. En este artículo indagamos cómo se ha desarrollado y novelado ese suceso en Corea, un país todavía muy lejos geográfica y políticamente de América Latina.

II. La Guerra del fútbol (1969): El proceso y resultado

A fines de la década de los sesenta, la mayor parte de las tierras de El Salvador estaban en manos de unos pocos hacendados, por lo que los campesinos salvadoreños no tenían tierras suficientes para ganarse la vida y se instalaron en Honduras, una tierra mucho más espaciosa que El Salvador. Pero la reforma agraria que ejecutaba el gobierno hondureño causaba la expropiación y la expulsión de los salvadoreños. Por eso miles de salvadoreños tuvieron que regresar a su patria. Esta fue la principal razón de la “Guerra del fútbol”

Pero sin duda la causa que prendió la mecha fue el fútbol. El 8 de julio de 1969 Honduras recibió a El Salvador en el partido de ida de la eliminatoria del Mundial de México de 1970. Para los dos países era la única oportunidad, porque el poderoso México ya estaba clasificado por ser el país anfitrión. La afición local no dejó dormir al equipo salvadoreño la noche antes del encuentro. El partido del día siguiente se decidió a falta de un minuto con el gol de Honduras que le dio la victoria por 1-0. Por consecuencia del resultado, en El Salvador se suicidó una joven de 18 años, supuestamente desesperada. Y la muerte de la joven fue mediatizada en El Salvador y pensaron vengarse.

El partido de vuelta se celebró el 15 de julio, y la hinchada salvadoreña armada con el intento de la venganza puso ratas muertas y huevos podridos en el hotel donde hospedaba la selección contraria. Los jugadores hondureños pudieron dormir poco y consecuentemente perdieron por goleada 3-0.

Después del partido el equipo hondureño escapó como pudo pero cientos de salvadoreños persiguieron al microbús de la plantilla hasta la frontera. En cuanto supo el maltrato sufrido de los jugadores hondureños, los habitantes de ese país comenzaron a agredir a cualquier salvadoreño que tuvieran cerca, linchando y matando a algunos inocentes.

Para evitar algún tipo de favoritismo, el partido del desempate se llevó a cabo en el Estadio Azteca el 27 de julio. Ese mismo día, El Salvador decidió romper formalmente las relaciones diplomáticas con Honduras. Y al final El Salvador ganó 3-2 y se clasificó para la final de las Eliminatorias de la Concacaf. Después del partido, como se había pronosticado, hubo violencia y asesinatos incluso lejos del estadio.

Aunque los partidos se había terminado, el 14 de julio de 1969 un pelotón del ejército hondureño ametralló la guarnición militar fronteriza de “El Poy” en Chalatenago, y con ello el ejército salvadoreño (más numeroso que el hondureño) lanzó un ataque contra suelo de Honduras y su aviación bombardeó el aeropuerto de Toncontín en Tegucigalpa, inmovilizando el 80% de la flota aérea hondureña. Ganado el dominio de los cielos, el ejército salvadoreño avanzó en el territorio de Honduras (con más tropas y mejor equipado), invadiendo la población de Nuevo Ocotepeque, y penetrando hasta ocho kilómetros más allá de la frontera la tarde del 15 de julio, acercándose peligrosamente a la propia capital, Tegucigalpa. Al día siguiente las tropas hondureñas se lanzaron a la contraofensiva pero sin éxito, aunque su aviación logró interrumpir la cadena de suministros y logística de sus enemigos.

No estuvo nada claro qué bando comenzó las hostilidades. Pero lo cierto es que durante los cuatro días del conflicto bélico hubo entre 4.000 y 6.000 bajas civiles. La guerra no ocurrió por estos tres partidos de fútbol, pero lo que sucedió en los partidos fue la chispa necesaria para que dos naciones hermanas llegaran a una guerra sin sentido, como todas lo son.

En estos tiempos parece que quedan pocos rencores y recuerdos de esa tragedia, y los dos países se llevan bien al parecer. El fútbol también fue el protagonista de la reconciliación. Doce años después de la guerra, los dos países se encontraron de nuevo en los partidos eliminatorios del mundial 1982. Al

final empataron 0-0. Pero la emoción ocurrió en el partido siguiente. Honduras que ya está clasificado hizo lo mejor que pudo en el partido contra México y consiguió el empate 0-0, ayudando a El Salvador a clasificarse. Así, los dos equipos fueron al Mundial de España. En el Mundial, mientras El Salvador perdió los tres partidos, Honduras consiguió empatar dos partidos contra España e Irlanda del Norte. De este modo, el equipo hondureño emocionó al mundo y, por supuesto, a los salvadoreños.

III. La novela *Guerra del fútbol* de Kim Byeol-ah

III.1. Antecedentes

Esta novela se publicó antes de la Copa Mundial de fútbol 2002, celebrada en Corea y Japón. La autora es Kim Byeol-Ah, es una aficionada de fútbol que quería celebrarla a su propia manera, es decir escribiendo una novela. Y decidió usar la 'Guerra del fútbol' que ocurrió en 1969. Pero ella contó en la entrevista que fue muy difícil ya que Honduras y el año 1969 resultan muy lejanos y desconocidos para Corea y para la autora.[1] Además, como esta novela está protagonizada por un niño adolescente que vive en un suburbio de Tegucigalpa, la autora tendría que documentarse y estudiar, para luego trabajar intensamente.

Inmediatamente antes de dicha publicación, con el mismo motivo, un autor llamado Koh Won-Jung publicó una novela con el título de *Los últimos quince minutos,* también basada en fútbol. Pero el lugar y el tiempo de ambientación de su novela era Corea en el 2002. Ahí narra que el equipo coreano avanzaba a los cuartos de final (cosa que ocurrió de verdad, al vencer el equipo coreano al equipo español). Comparado con la novela de Koh, sin duda Kim Byeol-Ah hizo un trabajo más difícil por haber escogido un tema más desconocido.

III.2. La trama de la *Guerra del fútbol*

Pepe es un chico de trece años que vive en un suburbio de Tegucigalpa. Él vive con su madre, su hermano mayor Alfonso y unas hermanas. Y trabaja en un puesto de limpiabotas de Juan, el marido de su hermana mayor, así que no va a la escuela y su única diversión es jugar al fútbol. Su hermano Alfonso, que es un miembro de Mara[2], era muy buen jugador y jugaba de delantero en un equipo local que se llamaba 'Estrella'. Su novia, Isabel, es la más guapa del barrio y luego provocará a Pepe la adoración y el odio. Entre tanto, Pepe conoce a Nacom, un viejo misterioso. El viejo parece que lo sabe todo acerca del fútbol y la vida en general. El encuentro no fue agradable pero cada vez que ve al

[1] Curiosamente la autora nació en el año 1969 en el que ocurrió la 'Guerra del fútbol'.
[2] Mara es una organización internacional de pandillas criminales asociadas.

viejo Pepe recibe algunas lecciones y ayudas. Por ejemplo, mientras Pepe jugaba al fútbol con sus amigos, se lesionó, y Nacom le alivió la pierna lesionada con unas hierbas.

Conforme se aproximaba la fecha del partido de ida de la eliminatoria con El Salvador, los hondureños se pusieron frenéticos. Mientras tanto, Alfonso cometió un gran error, ya que intentó engañar al otro grupo de Mara pero eso se supo. Para evitar la batalla grave entre las dos Maras, Servando, el jefe de Alfonso, dejó que él solucionara ese error. Y Alfonso, sin otro remedio, acepta un duelo con el hombre más fuerte de la banda contraria. Y delante de Pepe, Alfonso murió por una cuchillada del oponente.

Unos días después por fin se celebró el partido de ida, y al final ganó el combinado hondureño. Hubo violencia durante el partido y después también. Además una chica de San Salvador se suicidó poco después del partido. Y los rumores que la chica se suicidó con la desesperación por el partido perdido de su equipo se difundieron y provocaron la ira general de El Salvador.

Por su parte, Pepe celebró el funeral de Alfonso con familiares y amigos. Cuando Pepe y su madre lloraban, Isabel, la novia de Alfonso, ya había caído en los brazos de otro hombre. Su poseedor era Servando, el que había empujado a la muerte a Alfonso. Era natural que Pepe se enfadara por su comportamiento, además la vio prostituirse con los turistas. Y ella, además de eso le devolvió la camiseta de Alfonso, la que él mismo había regalado después de golazo de un partido importante. Pepe vio en ella la imagen de Santa María y prostituta en el mismo tiempo, como había visto en ella la adoración y el desprecio.

Por otra parte, el partido de vuelta tuvo lugar en San Salvador. Y esta vez los jugadores hondureños sufrieron por los ruidos y lanzamientos a su hotel. Como consecuencia de eso, perdió el equipo visitante por 3-0. Todavía quedaba lo peor, ya que después del partido, los salvadoreños atacaron a los jugadores y aficionados hondureños. Fue un milagro regresar a casa sin ninguna baja . Y también en Honduras la gente enfadada cazaron a los salvadoreños y murieron decenas. Y antes del tercer y definitivo partido en México, la mayoría de los salvadoreños en Honduras regresaron a su país para evitar el asesinato y la violencia previsible y ambos países rompieron las relaciones diplomáticas. La guerra se visualizó con los bombardeos a cuatro ciudades por la parte de aviación salvadoreña el 14 de julio. Ellos descansaron un rato para ver la llegada del hombre a la Luna por parte de Estados Unidos. Y luego, en un bar, Pepe vio a Isabel, borracha en los brazos de Servando. Ella confunde a Pepe como Alfonso y pretexta que no podía ir a ver el duelo porque Servando le hizo tomar droga y quedó inconsciente. Pero Pepe la rechaza tirándole 30 dólares con los que puede comprarla en una hora.

Y al final, esa guerra absurda terminó y se termina la novela con la descripción de que Pepe siguió jugando al fútbol.

III.3. Los puntos destacados

Aunque la autora no conoce Honduras, la describe vivamente como si hubiera estado ahí. El siguiente párrafo es un descripción de un bar después de la época de la lluvia:

La gente estaba todo en un bar donde la lluvia suena el tejado de zinc. Cada vez que entra el aire, olfateando la aroma de caprifoliáceo estaban embriagados de la interpretación de violín del ciego Murato.[3] (pp. 12-13)

Y he aquí otra descripción de una situación en medio de la guerra:

Recorrían por las calles los vehículos cargados de los soldados cuyas caras parecían resueltas como si tuviera los enemigos enfrente. Aunque no era la policía o los militares, cualquiera que tuviera las luces advertencia o la sirena, las llevaban en su coche y recorrían resonándolas. (p. 146)

Y en cada rincón de la novela podemos encontrar los mitos mayas, lo cual muestra la afición y delicadeza de la autora. A principios de la novela ella narra la historia del nacimiento del sol y a finales, el mito del hombre de maíz. Y también el párrafo sobre Malinche (p. 103) y la meditación sobre el proceso de la mezcla de la cultura indígena y cristiana (p. 107) son destacables.

Y la autora también tiene ojo de detallar el fútbol y la vida. Como se sabe, la vida y el fútbol tiene mucho en común, y la autora lo menciona en su obra con las palabras de Nacom. Exactamente en la vida o en el partido de fúbol, tenemos que aguantar la soledad:

(En el partido) Los jugadores en general lleva el balón solo 3 ó 4 minutos, y otros 86 ó 87 minutos es el tiempo de moverse sin balón. Los que se mueven sin cesar con algo de propósito son buenos jugadores. Por ejemplo, la soledad de 86 ó 87 minutos, ellos tienen que aguantarlo así como está. (p. 149)

También tenemos que entregar lo nuestro en un momento definitivo sin apego. Nacom dice a Pepe:

Pero el jugador que conoce la belleza, no se apega a tener balón. Si es necesario volver a pasar el balón. A la dirección exacta con la velocidad exacta y en un momento exacto, entrega el balón con mucho gusto. En ese momento sorprendentemente, lo que lo enseña no es la cabeza, sino el corazón. Es un corazón cruelmente frío y inbordablemente caliente. (p. 151)

Y por último en este párrafo compara el estadio con la vida. Explica que “El que no arriesga, no gana:

El área de defensa no es segura sino siempre peligrosa. Es que es una zona más lejos de la portería contra pero cerca de la nuestra. La ocasión empieza en el centro del campo. Y por fin cuando estamos en el área contraria se necesita un ataque arriesgada. El peligro está toda la parte. Ningún lugar es seguro. (p. 152)

[3] Todas las traducciones son mías.

También tiene carácter de ‘Bildungsroman’ la novela de formación, porque se describe el proceso de crecimiento de un niño. La novela se extiende entre el año 1967 y 1970 cuando el protagonista Pepe tiene entre 12 y 15 años. En ese período Pepe sufre la muerte de su adorable hermano Alfonso, siente amor a Isabel, la novia de Alfonso, y se masturba por primera vez.

IV. Conclusión

En esta novela el acontecimiento histórico de la ‘Guerra del fútbol’ no actúa tan fuertemente, aunque tiene el título de ese mismo acontecimiento. Y la relación entre el protagonista y el fútbol no parece algo inseparable. En este sentido la misma autora y algunos críticos mencionan que es una pena que no estén tan bien entretejidos ambos elementos. Pero la historia de la Latinoamerica está proyectada adecuada y correctamente por los ojos del niño Pepe y su familia, y la palabras del viejo sabio Nacom. A pesar de poca relación entre Corea y los países de Latinoamérica, en este caso Mesoamérica, la autora consiguió crear la vida de Honduras en los años 1970 con el método bastante correcto tratando el pasado y el futuro de Latinoamérica. Además consideramos que esta obra ha contribuido a la extensión del género, por la fusión de la literatura y el deporte.

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Un estudio pedagógico sobre el sistema de inspección sanitaria de Corea

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1. Introducción

Las relaciones diplomáticas entre la República Argentina y la República de Corea se establecieron en el año 1962. Hasta hoy día los dos países han profundizado sus vínculos en diferentes áreas de interés mutuo. Sobre todo, destaca la cooperación en temas medioambientales y energías renovables. Sin embargo, el volumen comercial bilateral en materia de alimentos tiene gran potencial de crecimiento puesto que Corea posee más de 50 millones de consumidores de frutas frescas, carne bobina, porcina , aviar, entre otros, mientras que la Argentina, como proveedor importante de alimentos al mercado internacional, es capaz de ampliar la gama de opciones para los gastrónomos coreanos. Lamentablemente las frutas frescas y las carnes argentinas no tienen presencia todavía en el mercado nacional de Corea debido a algunas regulaciones que estipulan la prohibición de la importación de productos argentinos.

Recientemente un grupo de inspectores de Corea ha visitado la Argentina para estudiar si este país puede exportar sus carnes a Corea. Además, el gobierno argentino ha presentado la solicitud a las autoridades competentes de Corea, reclamando su estatus de país limpio. Una vez que el gobierno de Corea permite el ingreso de los productos ganaderos argentinos, es inevitable que algunos intérpretes o traductores actúen en el terreno de inspección sanitaria. Pero, en realidad, la mayoría de los intérpretes y los traductores coreanos no tienen mucha noción de los procedimientos de importación de los alimentos porque se trata de un área inexplorada para ellos, y en particular para quienes han hecho la carrera de filología hispánica. El presente trabajo tiene como propósito presentar los conocimientos que ellos deben aprender y dominar para facilitar su labor para la inspección sanitaria de la carne bobina argentina.

En Corea la enseñanza de interpretación entre el castellano y el coreano a nivel profesional comenzó formalmente en el año 1979 cuando se estableció el departamento de interpretación castellano – coreano en la Escuela Pos-grado de Interpretación y Traducción de la Universidad Hankuk de Estudios Extranjeros. Sin embargo, la comprensión sobre los procedimientos de la importación de la carne bobina extranjera por parte de los intérpretes coreanos no es tan profunda que se cree necesario introducir en el currículo los elementos educativos necesarios para cubrir sus carencias y la demanda

de interpretación que se pueda generar en el futuro, teniendo en cuenta que estos días se acelera la deliberación del ingreso de la carne bobina argentina que comenzó en el año 2004 cuando se presentó la solicitud a la Agencia de Inspección Sanitaria y Fitosanitaria de Corea y que actualmente dicha debliberación se encuentra en la fase 4 de las 8 que forman parte de los procedimientos de autorización de la importación:

1) Analizar la posibilidad de importación.
2) Enviar el cuestionario al país solicitante
3) Examinar el cuestionario contestado.
4) Inspección del cumplimiento de los requisitos higiénicos de las vacas locales.
5) Autorizar o rechazar la importación.
6) Negociar los requisitos higiénicos.
7) Legislar los requisitos higiénicas
8) Aprobar las plantas de faena para la exportación
y consultar sobre el formato del certificado sanitario.

2. El volumen comercial entre la Argentina y Corea

El volumen comercial bilateral batió su récord en el año 2013 registrando más de 2 mil millones de dólares. El saldo comercial fue favorable para la Argentina, pero en los últimos dos años, la situación ha cambiado. Corea ha registrado 252 millones de dólares y 348 millones en superávit en los años 2014 y 2015 respectivamente.

Volumen Comercial(mil dólares)

	2012	2013	2014	2015
Exportación	973,000	1,075,000	754,000	1,047,000
Importación	1,427,000	1,195,000	502,000	699.000
Saldo	-454,000	-120,000	252,000	348,000

Sin embargo estas cifras dejan mucho que desear a la luz de las capacidades económicas de las dos naciones. Desde la puesta en vigencia del TLC entre Corea y Chile en 2004, el intercambio comercial se ha cuadruplicado registrando 6 mil 200 millones de dólares en el año 2015. Según los datos publicados en el 2016 por el Fondo Monetario Internacional, el Producto Interior Bruto de la Argentina fue de 542 mil millones de dólares y el de Corea 1,404 mil millones mientras que el de Chile registró 235 mil millones de dólares, lo cual nos permite suponer que la relación comercial entre la Argentina y Corea tiene grandes posibilidades de desarrollo.

En este sentido, la exportación de la carne bobina argentina puede ser una de las partidas óptimas para fortalecer la presencia de los principales ítems comerciales argentinos en el mercado de Corea tal como el vino chileno que entró en él como una partida insignia y aportó mucho a que los consumidores coreanos tuvieran una impresión positiva no solo del vino chileno sino también de los

productos chilenos en general. Según las estadísticas de Korea Customs Service, Lotte Mart, uno de los distribuidores de alimentos más importantes ha venido incrementando el 10% cada año su volumen de importación de alimentos frescos desde Chile, Perú y Ecuador, y en particular la importación de arándanos chilenos por el mismo conglomerado empresarial aumentó diez veces en el año 2014 y cinco veces en el año 2015.

3. Sistema de cuarentena e inspección de Corea

1) Instituciones

- Sección de Inspección Sanitaria
del Departamento de Control de Enfermedades Animales y Cuarentena
dependiente de la Agencia de Cuarentena Sanitaria y Fitosanitaria
(Animal and Plant Quarantine Agency)

Esta agencia se puso en marcha el 23 de marzo del 2013. En el pasado, sus servicios estaban dispersos entre varias instituciones tales como el Servicio Nacional de Cuarentena Sanitaria que se estableció en 1962, el Instituto Nacional de Estudios Veterinarios en 1994 y el Servicio Nacional de Inspección de la Calidad de Productos Pesqueros en 2001. Estas tres instituciones se incorporaron y se transformaron en junio del 2011 en la Agencia de Cuarentena e Inspección Sanitaria, Fitosanitaria y Productos Pesqueros: el predecesor de la actual Agencia de Cuarentena Sanitaria y Fitosanitaria.

- División de Políticas de Cuarentena
del Buró de Cooperacion Internacional
dependiente del Ministerio de Asuntos Agrícolas, Alimenticios y Rurales
(Ministry of Agriculture, Food and Rural Affairs:MAFRA)

- División de Medidas Sanitarias de Productos Ganaderos
del Buró de Seguridad de Productos Agropecuarios y Pesqueros
dependiente del Ministerio de Seguridad de Alimentos y Medicamentos
(Ministry of Food and Drug Safety:MFDS)

2) Inspección sanitaria

Colección de materiales importados (Empresa Naviera, Aerolínea)
- Inspección a bordo(Oficial de cuarentena)
- Inspección in situ(Oficial de cuarentena)
- Transporte
- Depósito en las facilidades de cuarentena

- Cuarentena(Entrega de solicitud de inspección por el o la importador(a)

● Estudio epidemiológico

Inspección de documentos y el etiquetado de los alimentos

● Inspeccion clínica u órganoléptica

Contacto visual y de tacto con el producto

● Análisis de laboratiorio

Pruebas físicas, químicas y microbiológicas de los alimentos

Después del cumplimiento de los requisitos establecidos, se expide un certificado de importación para su liberación. De lo contrario, los productos pueden ser devueltos al lugar de oriden.

3) Regulaciones ejecutivas de la ley especial sobre la gestión de la seguridad de alimentos importados(en vigor a partir del 4 de febrero del año 2016)

● Evaluación de las condiciones higiénicas de los productos ganaderos. Los productos de importación tienen que pasar el análisis de riesgo y la evaluación del estado higiénico que efectúan MAFRA y MFDS respectivamente.

Procedimientos de la evaluación

a. Petición de la autorización de importación por parte del país exportador
b. Envío del cuestionario al país exportador
c. Presentación del cuestionario contestado
d. Estudio del cuestionario contestado
e. Inspección in situ
f. Autorización de la importación o rechazo a la petición
g. Consultas sobre los requisitos higiénicos y los documentos necesarios

● Aprobación de establecimientos de faena e inspección in situ

El país exportador debe inscribir los establecimientos de faena de la carne y notificarlos a las autoridades de Corea. La exportación es viable solo cuando la inscripción y la aprobación de los establecimientos se hayan efectuado. Si se descubren violaciones de esta regulación, Corea puede exigir al gobierno del país exportador correciones o la suspensión de la exportación.

● Presentación del certificado sanitario por el país exportador para la declaración de la importación

A partir del día 4 de febrero del 2016, el o la exportador(a) debe presentar a la Agencia Nacional de Cuarentena e Inspección el certificado sanitario para la exportación y el certificado sanitario de no infección de la Encefalopatía Espongiforme Bobina.

● El texto de los requisitos higiénicos

4) Mercado Nacional de Corea

Actualmente en Corea tienen presencia las carnes bobinas de 7 países tales como Australia, Nueva Zelandia, Canadá, Uruguay, Estados Unidos, México y Chile.

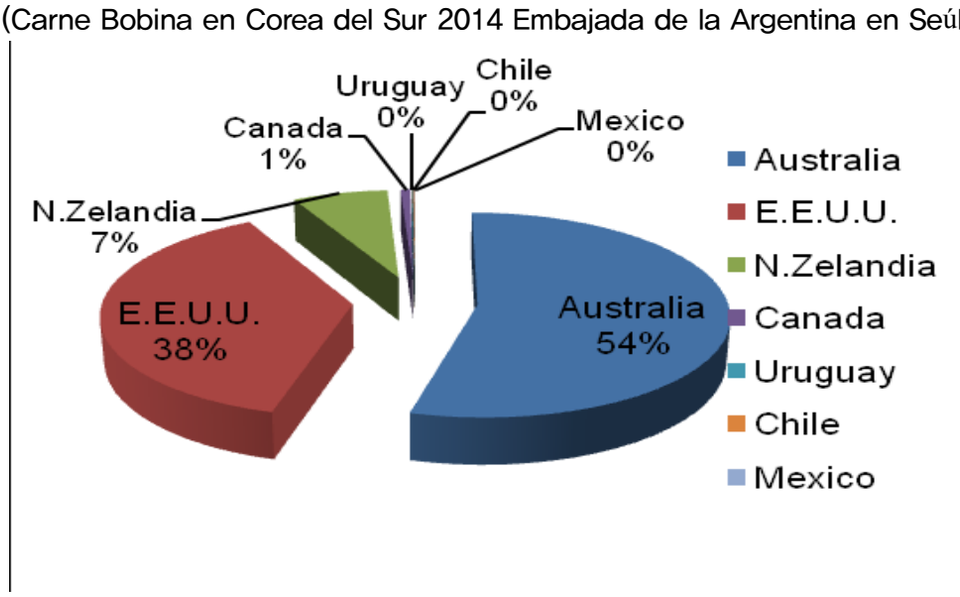
Consumo de carnes en Corea(Korea Meat Trade Association 2016)
(Toneladas)

Año	Consumo Total			Consumo per cápita		
	bobina	porcina	pollo	bobina	porcina	pollo
2013	519,002	1,049,300	579,944	10,34	20,89	11,55
2014	542,312	1,118,865	647,077	10,76	21,80	12,83
2015	553,767	1,166.407	675,755	10,96	22,80	13,40

Importación de carne bobina(Korea Meat Trade Association)
(Toneladas)

Año	EE.UU	Australia	Canadá	Nueva Zelanda	México
2013	89,239	142,797	1,492	22,297	109
2014	104,953	150,882	2,739	20,964	118
2015	112,431	128,706	800	18,169	171
2016	153,181	177,530	5,556	20,294	194

Participación en el Mercado de Corea
(Carne Bobina en Corea del Sur 2014 Embajada de la Argentina en Seúl)



Importación e inspección de la carne bobina 2016(APQA)

País	Casos	Kilos
Australia	13,657	178,130,976.8

Estados Unidos	9,347	153,194,486.2
Nueva Zelanda	2,534	20,969,139.5
Canadá	287	5,596,521.2
Uruguay	139	2,964,895.9
México	112	1,400,176
Chile	89	666.229
Total	26,165	362,922,424.6

La mayoría de los productos de importación pasaron la inspección sin experimentar problemas serios. Solo Nueva Zelanda y Estados Unidos han sido los países cuyos productos fueron descalificados en algunas inspecciones por las siguientes razones.

Nueva Zelanda

Razones	Casos	Cabezas
Tránsito por regiones prohibidas	1	14,000
Violación a los requisitos sanitarios	2	37
La no coincidencia entre el producto y el certificado sanitario	3	64

Estados Unidos

Razones	Casos	Cabezas
Ausencia del certificado sanitario	3	1,719
Violación a los requisitos sanitarios	4	21,951
Alteración de la calidad del producto	5	5,471
La no coincidencia entre el producto y el certificado sanitario	33	19,825
Empaque defectuoso	4	68
Descongelación del producto	1	50

Antes de enviar el producto a Corea, hay que verificar principalmente si la carne bobina no va a pasar por un país o una región prohibida por las regulaciones de Corea y también si su certificado sanitario está correctamente elaborado y sus contendios coinciden con las especificaciones de la carne de exportación en cuestión.

La Agencia de Cuarentena e Inspección de Corea dispone de 6 oficinas regionales y 22 oficinas distritales, y la mayoría de la carne bobina proveniente del exterior se somete a la inspección en la de la ciudad de Yong In al sur de la capital surcoreana Seúl y en la de la segunda ciudad de Corea Busan.

En muchos casos las carnes de importación se introducen a Corea a través del Puerto de Busan, pero se estima que es más económico transportar los contenedores a los centros distribución más importantes sin depositarlos en las instalaciones portuarias de Busan, y a los puntos más ventajosos para su rápido suministro a los consumidores coreanos, ya que por naturaleza de las carnes, cuanto más corto el tiempo de distribución tanto mejor para los distribuidores, los vendedores y los consumidores. Las 6 oficinas regionales son las de Incheon International Airport, Yeongnam, Jungbu, Seoul, Honam y Jeju.

Consumo de la carne bobina por cortes

Segundo semestre de 2013

KMTA (Toneladas)

Costillar (Tenderloin)	2,771	Morcillo (Neck)	743
Bife ancho (Ribeye roll)	1,662	Culata de contra (Shank)	720
Rabillo de cadera (Bottom round)	1,576	Bife angosto (Striploin)	413
Falda (Brisket)	1,312	Lomo (Tenderloin)	303
Espadilla (Shoulder clod)	1,139	Otros	4949
Cadera (Top round)	979	Total	16,567

Según los resultados del trabajo de investigación realizado por la Embajada de la Argentina en Corea en el año 2014, Mercado Majang es el mercado más importante de Seúl. Allí es donde se pueden comprar diversos cortes de carne bovina y porcina al mayor y al menor. Tiene una extensión de 116.150m² y 3.000 locales. Dos millones de personas lo visitan al año y trabajan en ella 12 mil personas. Se transaccionan las carnes nacionales traídas de todo el país y también las carnes importadas. Las carnes puestas a la venta están etiquetadas con los precios y los lugares de origen, costando de un 20 a un 30% menos que en los supermercados. Para llamar la atención y ofrecer servicios de calidad a los gastrónomos seulitas, los propietarios de los locales mantienen una taquilla de atención a clientes. En este espacio se hacen reembolsos o cambios de los productos adquiridos. Además, en un sector del mercado los visitantes pueden saborear carnes de buen sabor a precios muy económicos. ttp://www.mjmm.co.kr/

Mercado Doksan es especialista en carnes en Seúl. Se inauguró hace 40 años cerca del matadero. Actualmente este matadero ha desaparecido, pero su función como mercado de carnes subsiste ofreciendo al cliente carnes de calidad a buen precio.

Cada metrópolis tales como Daegu, Incheon, Gwangju y Anyang dispone de mercados mayoristas de carnes, aunque su volumen de ventas no alcanza el de aquellos mercados de Seúl

HUFS-ITBA INTERNATIONAL CONFERENCE

CLIMATE CHANGE, RENEWABLE ENERGY AND CULTURAL COOPERATION

Session 3: Climate Change and Renewable Energy

Session Chair: Dr. Si-Hong, Kim(HUFS)

■Dr. Sang-Sub, Ha / Dr. Kyung-Won, Chung(HUFS)
"Renewable Energy Development in Argentina: Policy Analysis and its Limitation"

■Dr. Isaac Azuz(CETYS, Mexico)
"Present state and opportunities to use renewable energy in Mexico"

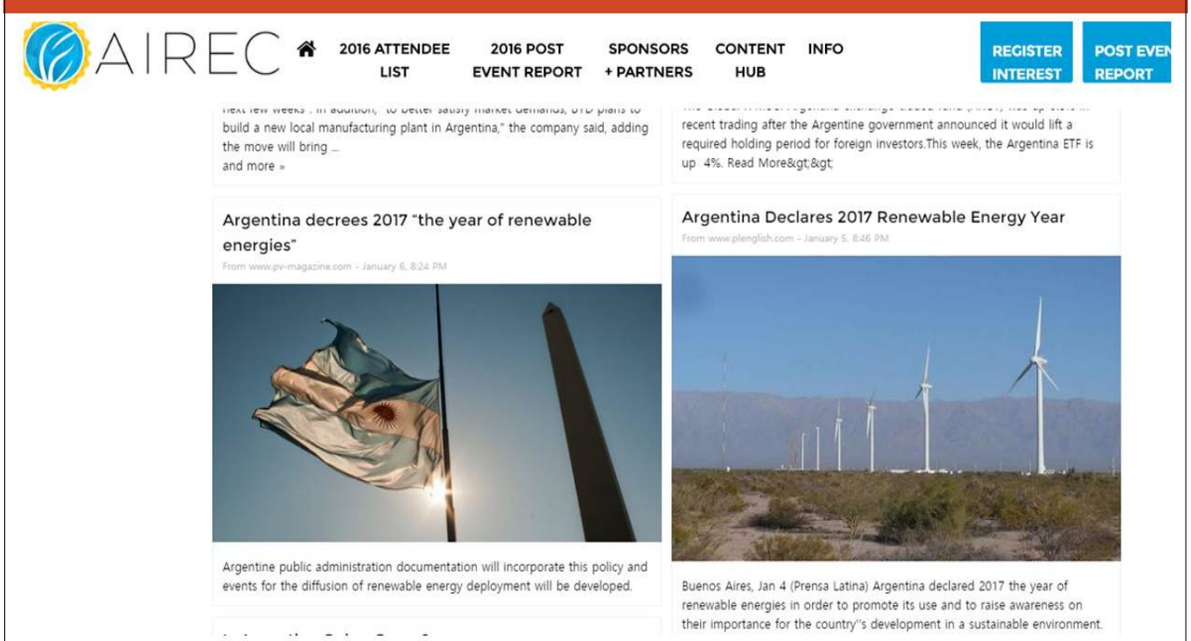
■Ing. Esteban van Dam(Aires Renewables)
"The Renewable sector in Argentina: achievements and challenges"

Renewable Energy Development in Argentina: Policy and its Limitation

GCC-KOLAC, HUFS

Dr. Sang Sub, Ha / Dr. Kyung Won, Chung

New Opportunities in Argentina's Renewable Energy Development(RED)?



Source: http://www.aireccongress.com/NewsZone

New Opportunities in Argentina's Renewable Energy Development(RED)?

ARGENTINA'S NEW GOVERNMENT IS SEEKING TO DEVELOP ITS ENERGY SECTOR

ARGENTINA

Government	Presidential Republic
President	Mauricio Macri
Population	43.4 million
GDP 2015	585.6 BUSD
GDP per capita	13 500 USD
Energy generation capacity	32 GW
Energy generation market	72% private (fragmented)
Energy transmission market	100% private (Transener)
Energy distribution market	75% private (Edesur, Edenor, Edelpap)

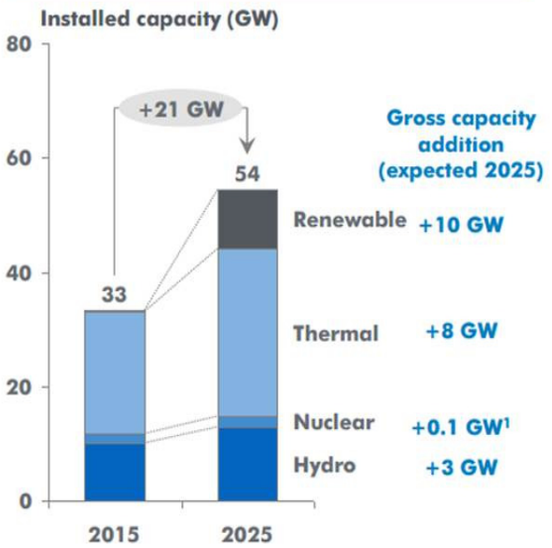
BACKGROUND

- Argentina's new government has been ambitious in establishing a reform plan to attract foreign investment to the country, simultaneously abolishing various protectionist barriers such as exchange controls, restrictions on withdrawals of earned income and dividends, as well as restrictions on the imports of capital goods
- President Mauricio Macri is turning to foreign investors in order to develop the Argentinian infrastructure
- In the energy sector there is the need for investment in order to decrease the reliance on fossil fuels for generation (67%), increase energy supply and reduce energy tariffs. Renewable sources represent only 2% of Argentina's matrix*
- The government has increased the goal for the share of renewable energy in total capacity from 2% to 8% by December 2017 and to 20% by December 2025
- Ministry of Energy and Mining's (MINEM) program RenovAr has recently announced tenders to increase generation by 1 000 MW from sources such as wind and solar

Source: http://www.business-sweden.se/contentassets/5060248bb36f40f99f89a93964c8ad73/get-on-the-grid-with-renewable-energy-opportunities-in-chile--argentina.pdf, p.4 cited here.

RENEWABLE ENERGY WILL LEAD GROWTH IN POWER GENERATION CAPACITY

Power matrix expected to increase 21 GW by 2025



Renewables will represent ~48% of growth in installed capacity

Significant development of renewables
- 3 GW expected to be added by 2018
- 10 GW expected to be added by 2025

Installed capacity of conventional technologies will also increase to cover power demand growth
- Thermal: 8 GW by 2025
- Hydroelectric: 3 GW through national and binational projects

Nuclear capacity will continue to grow after 2025
- 1.8 GW to be added from 4th and 5th nuclear plants

Aging power generation facilities will require **phase-out** or **technological modernization**

Source: https://www.argentinaforum2016.com/sites/default/files/file_media_coverage/DAY%201-%20Session%203-Power%20Renewable%20Energy.pdf

GOVERNMENT EXPECTS INVESTMENTS OF 5 BUSD IN RENEWABLE ENERGY BY 2025

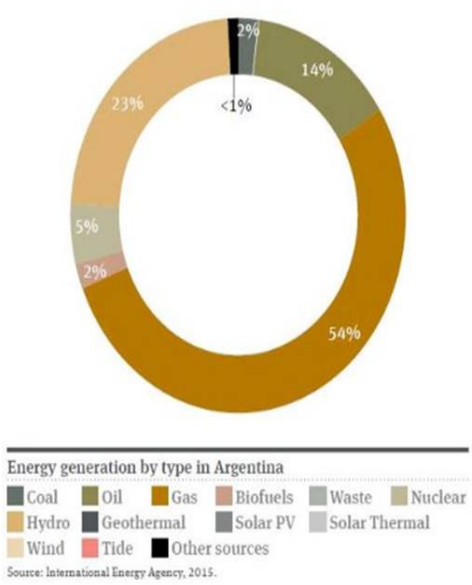
Source	In Operation (MW)	RenovAr Tender (MW)
Wind	215	600
Solar	8	300
Biomass	720	65
Small Hydro	400	20
Biogas	15	15
Total	1 358	1 000

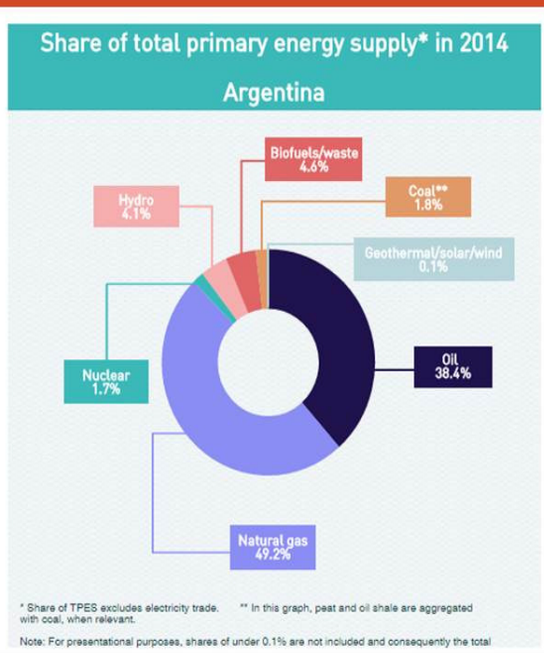
- Law 27.191 establishes a goal that 8% of energy capacity needs to come from renewable sources by December 2017. Currently, the share of renewable energy in the matrix is around 2%
- The RenovAr Program will raise renewable energy share to approximately 3% by adding 1 000 MW of renewable energy to the generation capacity. The government expects this will require an investment of around 1.7 BUSD
- RenovAr will be supported by public fund Foder (Fondo Fiduciario para el Desarrollo de Energias Renovables) of approximately 400 Million USD to finance renewable energy projects
- For the goal of 20% in renewable sources by 2025, the government expects investments of 5 BUSD in new capacity
- Another key aspect of Law 27.191 is the legal requirement for heavy energy consumers (more than 300 kW) to contribute on an individual basis with the renewable energy targets by having a share of their consumption from renewable energy. Although it is not clear how those consumers should comply, they will be investing in renewable generation

Source: http://www.business-sweden.se/contentassets/5060248bb36f40f99f89a93964c8ad73/get-on-the-grid-with-renewable-energy-opportunities-in-chile--argentina.pdf, p.6 cited here.

Argentina and energy matrix: generation and supply share

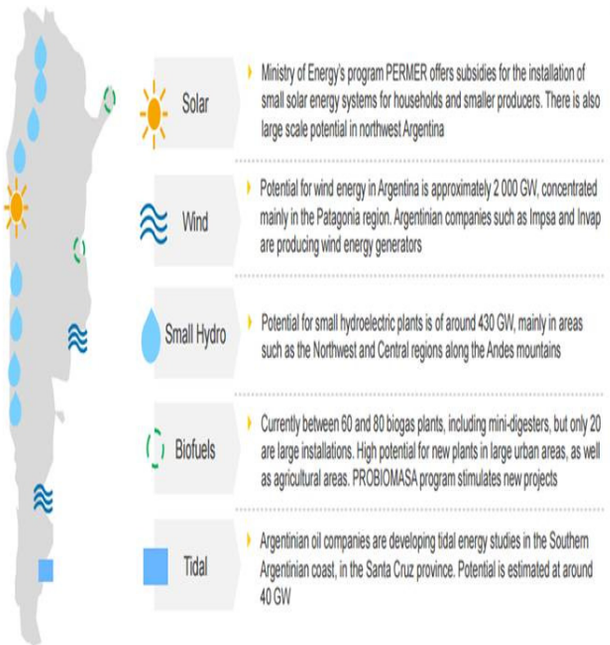
The opportunity





http://www.mondaq.com/Argentina/x/494910/Renewables/Renewable+Energy+In+Latin+America

HIGH POTENTIAL FOR DIFFERENT RENEWABLE ENERGY SOURCES IN ARGENTINA



Argentina is ripe for exploitation of wind, solar and biomass with exceptional resources in relation to wind energy.

Global experience indicates that with average winds of 5m/s or higher it is feasible to deliver good returns in wind power generation.

About 70 per cent of Argentina's territory enjoys winds with an average speed of 6m/s or more, while in areas of Patagonia they can exceed 9m/s. Argentina has the foundation to become a regional leader in the use of this technology(p.6).

Source: http://www.nortonrosefulbright.com/files/renewable-energy-in-latin-america-134675.pdf

New Opportunities in Argentina's Renewable Energy Development(RED)?

Argentina's diverse landscape and natural conditions are ready to provide and produce wind and solar energy as mentioned above.

A high density of various types of alternative energy plants through Patagonia, Neuquén and Rio Negro and Buenos Aires as well.

CADER(Cámara Argentina de Energias Renovables): Argentina is capable to sustain a high density of wind energy farms. 70% of Argentina's territory has suitable wind energy conditions with an annual average wind speed of 6 m/s (measured at 50-meter height).

Patagonia and the Southern part of the country offer the best locations for these farms with wind speeds reach values of 9 m/s and 12 m/s respectively. Likewise, Northern Argentina's desert terrain is perfect harness a consistent amount of high concentrations of solar radiation.

In practice and currently RED plans related with foreign direct investment is expected to spur close to a gigawatt (enough energy to support about 700,000 homes) in clean electricity, while future investments over the next several years will aim to bring in an additional 10 gigawatts of clean electricity.

This RED projects and plans could lead to a much rise of employment(green job) for local areas and bring about economic development via investment opportunity that could not only benefit foreign investors financially, but also contribute to the betterment of the environment and the Argentine society in near future.

Source: https://www.linkedin.com/pulse/new-investment-opportunities-argentinas-renewable-energy-allonca

New Opportunities in Argentina's Renewable Energy Development(RED)?

Argentina has set ambitious objectives

Argentina signed an unconditional commitment to reduce CO_2 emissions 15% by 2030

The target could be incremented to 30%, conditional to foreign direct investment

Two main drivers to accomplish the goal

1. Renewable energy generation
2. Increasing energy efficiency

Future investment: Argentina has announced that it is looking to develop US$5 billion in renewable energy by 2018.

Mauricio Macri government promises and make a great development plan with more ambitious RED program building as below:

1) RE, as a share of power consumption, must rise to 8% by 2017 (from 1.8% currently).

2) Growth of this capacity requires between 2,000 and 3,000 MW of development.

3) Argentina has set a target to increase its total RE share to 20% by 2025 (approximately 10,000 MW and between US$15-20 billion of investment, based on Argentina INDCs to UNFCCC): for a long term, this is a mitigation strategy with climate change regime as well.

Source: https://www.argentinaforum2016.com/sites/default/files/file_media_coverage/DAY%201-%20Session%203-Power%20Renewable%20Energy.pdf

Institutional reform: "Promotion of Renewable Sources of Energy for Electricity Production" (26.190, effective 2007)

9/10/13 ENERGIA ELECTRICA

ENERGIA ELECTRICA

Ley 26.190

Regimen de Fomento Nacional para el uso de fuentes renovables de energía destinada a la producción de energía eléctrica. Objeto. Alcance. Ambito de aplicación. Autoridad de aplicación. Políticas. Régimen de inversiones. Beneficiarios. Beneficios. Sanciones. Fondo Fiduciario de Energías Renovables.

Sancionada: Diciembre 6 de 2006.

Promulgada de Hecho: Diciembre 27 de 2006.

El Senado y Cámara de Diputados

de la Nación Argentina reunidos en Congreso,

etc.

sancionan con fuerza de

Ley:

REGIMEN DE FOMENTO NACIONAL PARA EL USO DE FUENTES RENOVABLES DE ENERGIA DESTINADA A LA PRODUCCION DE ENERGIA ELECTRICA

Source: https://www.iea.org/policiesandmeasures/pams/argentina/name-23911-en.php

Institutional reform: "Program to Promote the Use of Renewable Energy in Electricity Generation" (Dec. 531; Law 27.191, effective 2016)

Program to Promote the Use of Renewable Energy in Electricity Generation (Dec. 531; Law 27.191)

Country:	Argentina
Year:	2016
Policy status:	In Force
Jurisdiction:	National
Date Effective:	2016
Policy Type:	Economic Instruments>Market-based instruments, Policy Support>Institutional creation
Renewable Energy Policy Targets:	Multiple RE Sources
Policy Sector:	Electricity
Size of Plant Targeted:	Small and Large
URL:	https://www.boletinoficial.gob.ar/#!DetalleNorma/142860/20160331
URL:	http://www.energiaestrategica.com/wp-content/uploads/2016/04/Renewable-Energy-in-Argentina-Market-Update-2016-NYC-WDC-Roadshow-vFinal.pptx.
Legal References:	Dec. 531; Law 27.191

Source: https://www.iea.org/policiesandmeasures/pams/argentina/name-158841-en.php

Institutional reform: "Program to Promote the Use of Renewable Energy in Electricity Generation" (Dec. 531; Law 27.191, effective 2016)

The Decree and Law introduce fiscal incentives to independent power producers, including:

- **Exception of Import Duties for all project starting construction prior to 12/31/2107**
- **Accelerated fiscal depreciation of applicable assets**
- **Anticipated Refund of VAT paid on pre-COD purchases**
- **Exception of Minimum Deemed Income Tax and Dividend Tax (subject to re-investment)**
- **Extension of Income Tax Loss Credits to 10 years (standard is 5)**
- **Tax deduction of all financial expenses**

The Decree and Law describe the power purchase agreements (PPAs) under renewable energy auctions:

PPA costs will be transferred to all consumers.
Pre-qualified projects awarded at tender will have automatic access to tax benefits and FODER project financing and guarantees.
Selection rules will be set based on price and non-price criteria including local content integration, time to delivery and amount of FODER financing requested.
PPA will be awarded for 15+ years.
Large unbundled power users (> 300 kW) may opt-out of roll out of tendered PPAs and source RE directly from IPPs, utilities, traders or self-consumption projects.

The Decree and Law introduce important market and financial incentives for local supply chain building, including:

Sector specific development credit lines will be provided through FODER for local suppliers and manufacturers.
Import duty exemption for equipment, parts and supplies for local suppliers and manufacturers.
20% Tax Credit on locally supplied CAPEX for independent power producers that integrate 30% of local component in electromechanical installations (excluding civil works, cost of transport and assembly of equipment).
Priority Access to FODER project financing for independent power producers with significant integration of local content.

Many why question about 'this is a new opportunity' in Argentina's RED?

Failed Policy and Investment: However, considering about RED policies, there has failed experiences in the past and faced a new challenge as well for long-term investment in the future, Argentina lags significantly behind other neighbor countries in Latin America (Brazil, Uruguay, Chile, Mexico) particular in terms of development and penetration of renewable energy technologies as well.

Lack of Capacity: Until 2015, there were only about 200MW (out of over 32GW of installed capacity) of wind and solar generation capacity, with very little financed by private capital in the form of long-term project.

Weak Energy Development Governance: The lack of political will, Weak Regulatory Frameworks as well.

These kind of disadvantages was maintained throughout the 1990 in the convertibility period(a peso=a dollar regime), due to low prices in dollar for thermal energy generation and was solidified in the post-convertibility era with the freezing of energy prices and high subsidies given to the energy sector(Marina Yesica Recalde et al., 2015: 16)

The RED and its sustainability thus must consider overall 'macroeconomic' variables (e.g. inflation, budget) and 'political'(energy security, strong present of a long term energy policy and planning) and 'institutional' factors(legal security, regulation, decision making process, etc.)

Why questions for RED in Argentina(Literature Review)

Why question school for RED: one or mixed(multi) reason under new concept of 'sustainable development' as below:

1) Economic reasons: new economy development model for energy market, technology development via innovation and transfer, new job creation, attractive field for Foreign Direct Investment(FDI) and International Development Cooperation(IDC).

2) Energy security reasons: (beyond traditional fossil fuel supply), toward diversification of energy sources, alternative for reducing volume of hydrocarbon as clean energy supply.

3) Environmental reasons: reduction of carbon emission(and pollution), protection of 'medio ambiente' in itself.

4) Climate Change and international cooperation within the UNFCCC regime(INDCs in Argentina): mitigation promise with targeted % and achievement methods with energy efficiency strategy as well in Argentina

5) Other reasons, such as technology innovation in the field of Scientific Research Development, etc.

Why Renewable Energy Development in Argentina? Economic Investment Opportunity

Marcelo Mindlin, CEO of Pampa Energy, who presented an investment proposal close to $400 million dollars in a bid in May 2016 said,

"We want to be a key player in renewables. It's a hot sector".

"This is one of the major moves Argentina has recently made under the new administration in an attempt to increase foreign investments. They cut gas and electricity subsidies to let utilities rise with the help of the World Bank, who plans to produce a $500 million special warrant combined with a sovereign warrant provided by Argentina. The government is also providing tax credits and duty-free imports for projects that begin before 2018.

Institutional reform has put forth a national goal to have 8% of the countries electricity be derived from alternative energy by 2017 and 20% by 2025. To achieve these marks Argentina will ultimately need to spend $15 billion in total investments

How questions for Renewable Energy Development(RED) in Argentina

How question school explains about renewable energy policy(domestically institutional development) and its operation efficiently, capacity for further development via reducing much existing barriers such as technology, financing and human capital, external conditions are also important factors or variables for making renewable energy boom, such as increased oil prices in international markets and peso values in exchange rate regime, many tariff and interest(dollar) regime as well.

1) Institution reason: providing economic incentives, related energy law reform and regulation tool for improving renewable energy sector.

2) Policy implementation and its efficiency through democratic governance, especially in the decision making process: building more transparency, responsibility in the process of policy operation + and policy making process with the 3R (Recognition, Representation and Redistribution among public and private actors who involved energy developer and consumers) and currently debated with Natural Resource Governance(NRG) school.

3) Other factors such as environmental costs, ecological costs and another 'opportunity costs' such as 'recognition of clean energy use' and green images compared with the traditional energy use of oil, natural gas, how renewable energy is new vales and alternative for making more sustainable development model?

RED in Argentina and Policy effectiveness and Limitation

DIVERSIFY POWER GENERATION MATRIX THROUGH RENEWABLE ENERGY SOURCES

✓ Completed ✓ In progress ■ Projected

Set ambitious goals for renewable energy		■ **Satisfy 20% of electricity demand with renewables by 2025** + Add 3 GW by 2018 + Add 10 GW by 2025
Leverage regulatory framework		✓ **Regulation of Law 27,191** for renewables that establishes clear objectives and path to achieve them ✓ **1st tender for 1 GW in progress** + 2nd tender during 2017
Promote private sector participation		✓ **Plan RenovAr** offers **open tenders** and **incentives** + Fiscal **incentives**, tax **exemptions** & import **permits** + **FODER** fund: **AR$12 B** for guarantees and loans + Support for projects with relevant share of **national inputs**
Materialize regional integration		✓ **Trade electric power** with **neighboring countries** ■ Supply of **1,000 MW** through new high voltage line from Bolivia - under analysis

Source: https://www.argentinaforum2016.com/sites/default/files/file_media_coverage/DAY%201-%20Session%203-Power%20Renewable%20Energy.pdf

RED in Argentina and Policy effectiveness and Limitation: actors

72% OF ENERGY GENERATION CURRENTLY DONE BY PRIVATE COMPANIES IN ARGENTINA

PUBLIC POLICY	REGULATION	ENERGY GENERATORS
Federal Council of Electric Energy – CFEE	Electricity National Regulator Body – ENRE	Public generation (28%)
▸ Assists the government regarding energy public policy	▸ Regulates and monitors the energy sector together with provincial bodies	▸ Binational hydro plants ▸ Nuclear plants ▸ Provincial/municipal plants ▸ Enarsa (public oil company)
Energy Secretariat – SENER	Administrator of the Wholesale Electric Market – CAMMESA	Private generation (72%)
▸ Responsible for implementing public policy	▸ Operates the private energy system ▸ Manages commercial operations and calculates prices	▸ Main companies (fragmented market): ▸ Endesa ▸ AES ▸ Others (less than 15% share each) ▸ Ageera - Association of Energy Producers

Source: https://www.argentinaforum2016.com/sites/default/files/file_media_coverage/DAY%201-%20Session%203-Power%20Renewable%20Energy.pdf

RED in Argentina and Policy effectiveness and Limitation: Institutions

DIFFERENT ARGENTINIAN INSTITUTIONS INFLUENCE THE AREA OF RENEWABLE ENERGIES

Secretariat of Environment and Sustainable Development - SAyDS	Responsible for the implementation and management of environmental policies
National Directory of Promotion – DNPROM (SENER)	Within the Federal Energy Secretariat (SENER), the DNPROM is a directory responsible for the design of programs and actions concerning the development of renewable energy and energy efficiency initiatives
Argentinian Network of Municipalities Against Climate Change - RAMCC	Network for coordination of local public policies against climate change. Also offers technical support to local governments for solutions of sustainable development
Argentinian Chamber of Renewable Energy - CADER	A non-profit association of companies within the segment of renewable energy. It facilitates dialogue between public and private segments for the development of renewable energy projects
Argentinian Association of Renewable Energy and Environment - Asades	Association of universities, labs, NGOs and companies that push for the implementation and use of renewable energy. It was created on 1974, with a primary focus on solar energy

Source: https://www.argentinaforum2016.com/sites/default/files/file_media_coverage/DAY%201-%20Session%203-Power%20Renewable%20Energy.pdf

RED in Argentina and Policy effectiveness and Limitation: Institutions

ARGENTINA'S POWER & RENEWABLE ENERGY SECTOR FACES THREE MAIN CHALLENGES

1.  **Distorted price signals as a result of widespread subsidies**
2.  **Bottlenecks in power generation, transmission and distribution networks**
3.  **Legal and institutional disorder**

https://www.argentinaforum2016.com/sites/default/files/file_media_coverage/DAY%201-%20Session%203-Power%20Renewable%20Energy.pdf

RED in Argentina and Policy effectiveness and Limitation: still focusing on traditional energy development/investment policy and social tension?

"Some analysts argue that even the RE is the most interesting investment opportunity in Argentina, would offset disappointment at the pace of new investments into the huge Vaca Muerta shale gas development in Patagonia. Although it boasts some of the largest reserves of shale oil and gas in the world, Vaca Muerta has so far failed to take off due to low oil prices and high drilling costs" and currently the newly development of Nestor Kirchner and Jorge Cepernic hydropower plant(even the Supreme Court of Argentina has suspended work on these mega projects, with some reasons of **lack of environmental effects evaluation as mandatory studies and consultations.**

"Argentina has a lot of catching up to do in the renewables sector, after minimal investment in recent years due to poor business climate. It would be a huge missed opportunity given the resources available and today's prices if Argentina missed that boat."

With social tensions mounting as Argentines endure austerity measures(with ending of power subsidies) including six-fold rises in electricity tariffs that had been frozen for more than a decade with left government, the government's chances of consolidating power in important midterm elections next year could be in jeopardy if the economy fails to rebound in time"

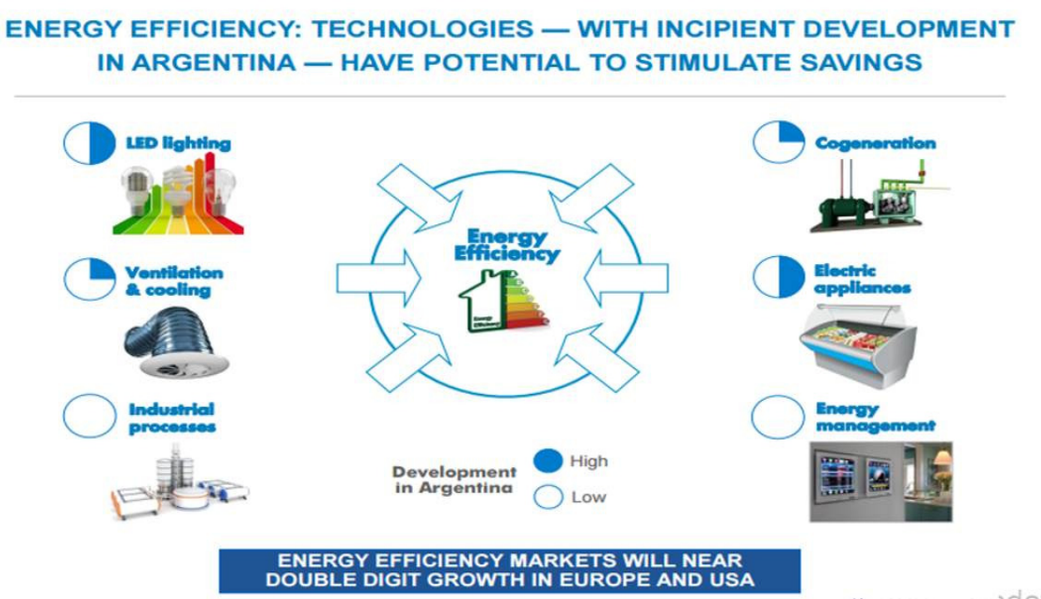
Source: https://www.ft.com/content/c6e58576-2da1-11e6-bf8d-26294ad519fc

Minister Aranguren said the target was reducing subsidies by US$4 billion this year as part of a drive to reduce a gaping deficit that widened sharply

"The subsidies for the generation of electricity in 2015 was around US$10 billion, which is just under 2 points of GDP" Aranguren told a news conference.

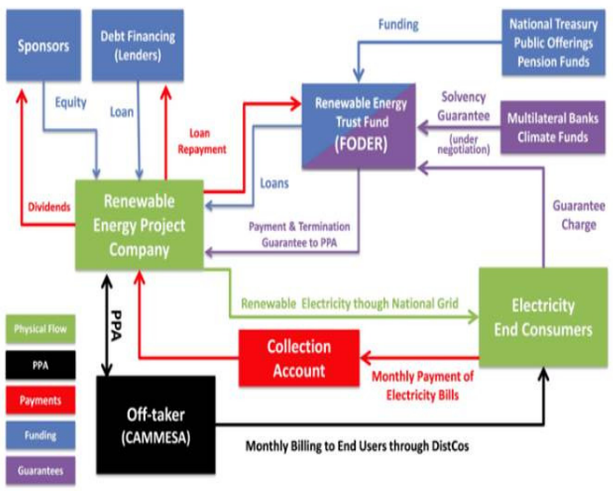
As of Monday a household in the capital which consumed 180 KW per month would see its bill rise to 150 pesos from 25 pesos "roughly as a cup of coffee".

RED in Argentina and Policy effectiveness and Limitation: energy efficiency sector policy?



RED in Argentina and Policy effectiveness and Limitation: financing and profit earning system

Tendered PPAs - Cash Flows Diagram



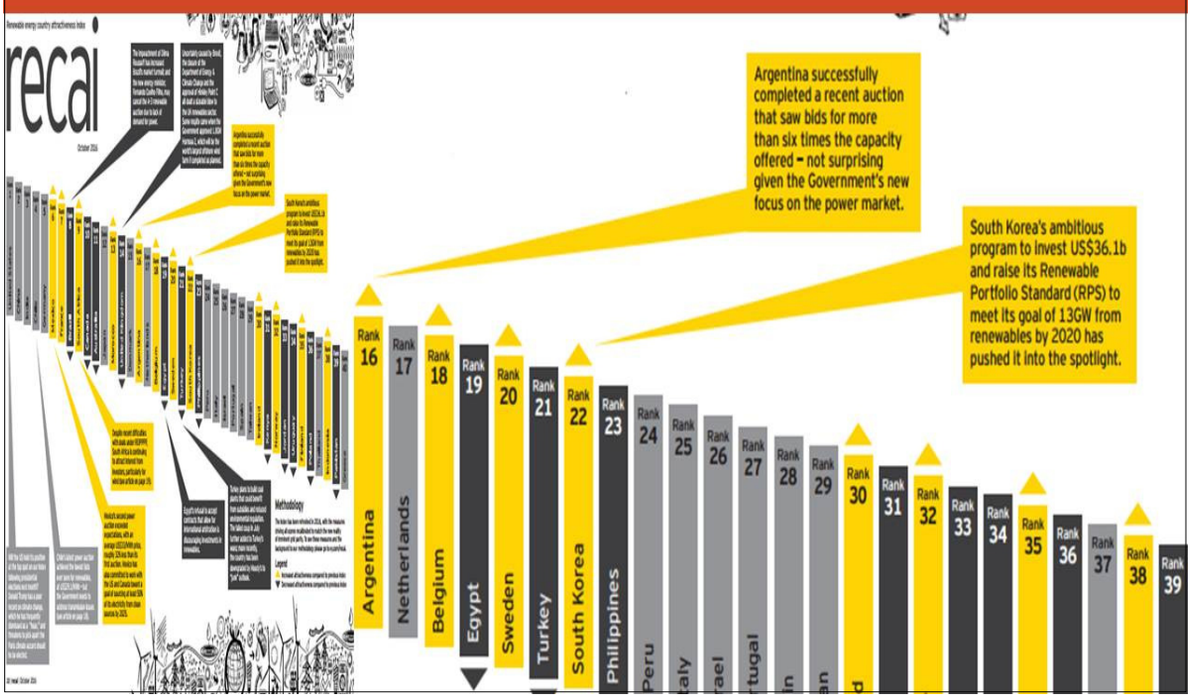
Source: MINEM, 2016

"The current market design has many actors (see figure) with many contracts that so far have not been vetted by international investors. The most important contract is the PPA, which has not been tested. Although government representatives assure that the PPA is based on international standards, there is a risk that investors and project developers will not be satisfied with it. This could lead to significant delays and multiple rounds of negotiation — neither of them desirable outcomes for the Argentine government. The only sure winners under this scenario are lawyers involved on both sides of the equation."

Source: https://www.greenbiz.com/article/argentinas-renewables-reboot-good-bad-and-unknown

International cooperation within RED in Argentina? Technology, financing and energy partnership

International cooperation within RED in Argentina? Technology, financing and energy partnership



Conclusion remarks: now thinking over 'integrated policy making practice in RED in Argentina...

- New policy ?: Triangular relationship and integration model building among financing, technology and human resources for more RED
- New governance?: it needs to satisfied between developers and consumers
- New recognition?: Government must think what the RE is? Is this private goods or public goods?, if agree and regard the meaning of 'renewable energy as from the nature in itself In near future, environmental aspects and knowledge argument must bring into the RED policy as new sustainable development model
- Beyond economic reason of development argument, further 3R concepts must be embedded in the policy-making process of RED and others as well.

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https://www.greenclimate.fund/documents/20182/490910/GCF_B.15_13_Add.03_-Funding_proposal_summary_package_for_FP030.pdf/9b90161e-6e1e-483b-b028-8a5a3a4708f5

HUFS-ITBA INTERNATIONAL CONFERENCE

Climate Change, Renewable Energy and Cultural Cooperation

Buenos Aires, Argentina, 5-7 Febrero 2017

Estado Actual y Oportunidades de Uso de las Energías Renovables en México

Isaac Azuz Adeath

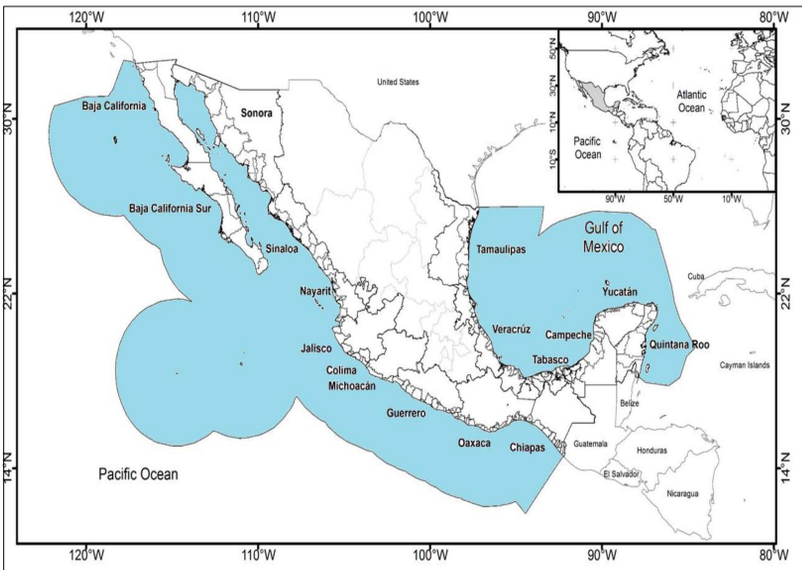
Centro de Excelencia en Innovación y Diseño en Ingeniería

Centro de Enseñanza Técnica y Superior

CETYS Universidad (México)

Contenido

- Contexto general
- Detonantes de la transición energética
- Estado actual del uso de energías renovables
- Potencial de aprovechamiento de fuentes renovables



Superficie Continental 1.9 Millones Km^2
Zona Económica Exclusiva 2.9 Millones Km^2

Población Total 2015:
121 Millones
Viviendas con Energía Eléctrica 2015:
30 Millones
Población Total con Acceso a la Energía Eléctrica 2015:
98.53%
Generación de Energía Eléctrica 2015:
310,000 GW/hora
NORTE: Industrializado, Competitivo pero con Poca agua y recursos Energéticos.
SUR: Marginado, con Amplios recursos y agua.

Contexto General

CEID CENTRO DE INNOVACIÓN Y DISEÑO

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2 Grandes Monopolios Estatales:

En 1937 se crea la Comisión Federal de Electricidad (CFE).

En 1938 se crea Petróleos Mexicanos (PEMEX).

PEMEX

Contexto General

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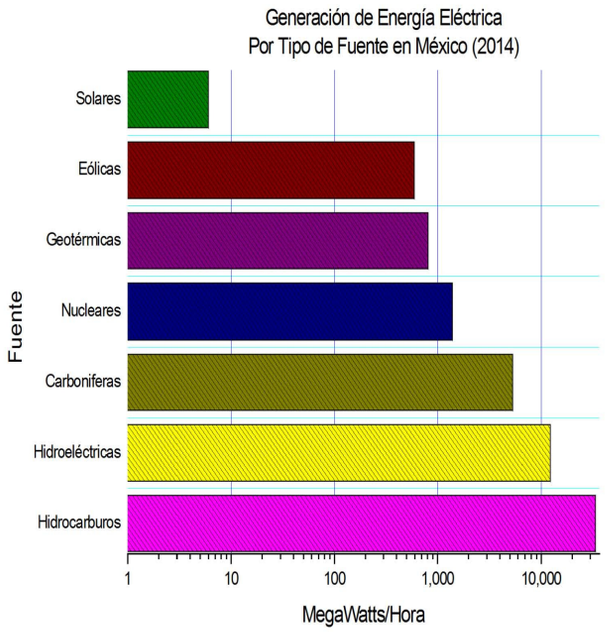

Contexto General

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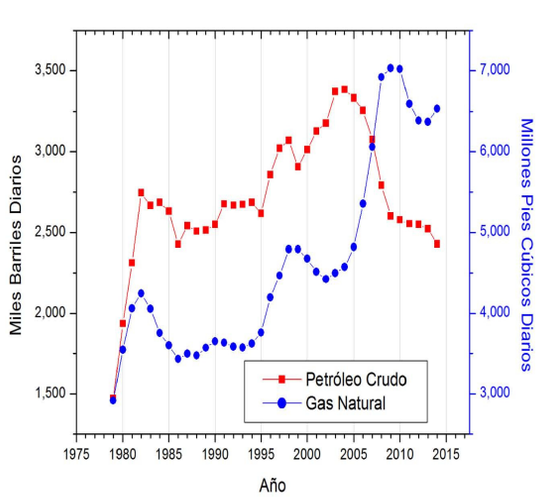

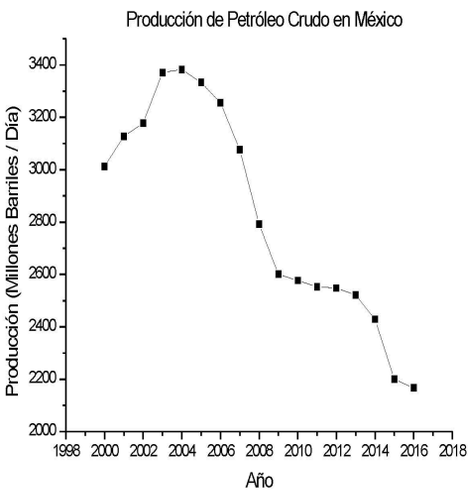

Detonantes Transición Energética en México

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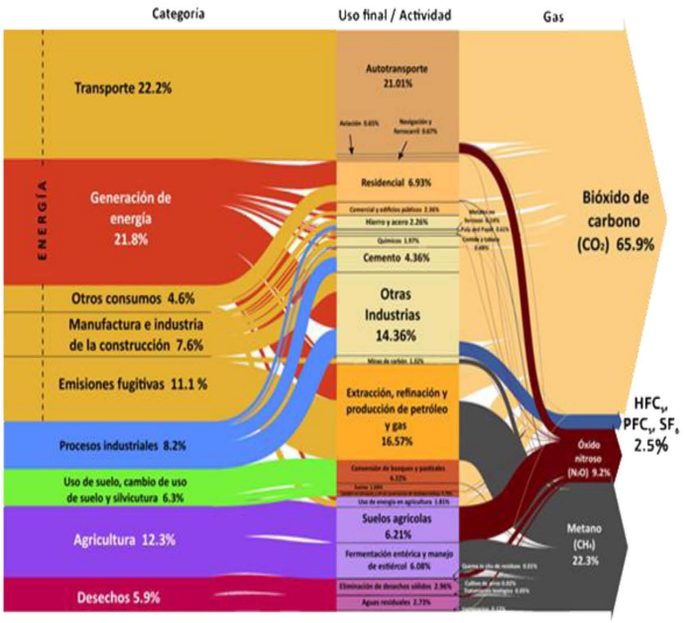
Mapa Emisiones Gases de Efecto Invernadero en México (INECC,2015)



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Cambios Legales

- Ley Aprovechamiento Sustentable de la Energía 2008
- Ley de Promoción y Desarrollo de los Bioenergéticos 2008
- Ley de Aprovechamiento de Energías Renovables y Financiamiento de la Transición Energética 2008
- Ley de Hidrocarburos 2014
- Ley CFE 2014
- Ley PEMES 2014
- Ley Industria Eléctrica 2014
- Ley Comisión Reguladora Energía 2014
- Ley de Energía Geotérmica 2014

Detonantes Transición Energética en México

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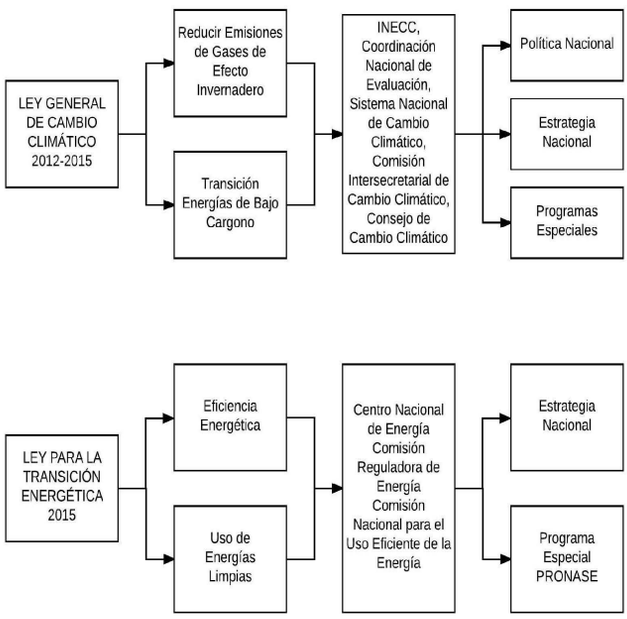

Detonantes Transición Energética en México

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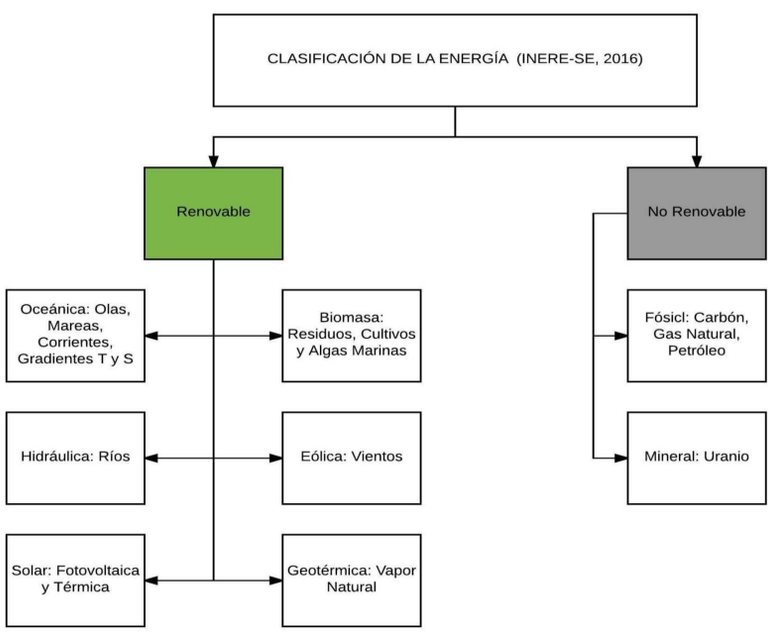

Estado Actual Uso Energías Renovables

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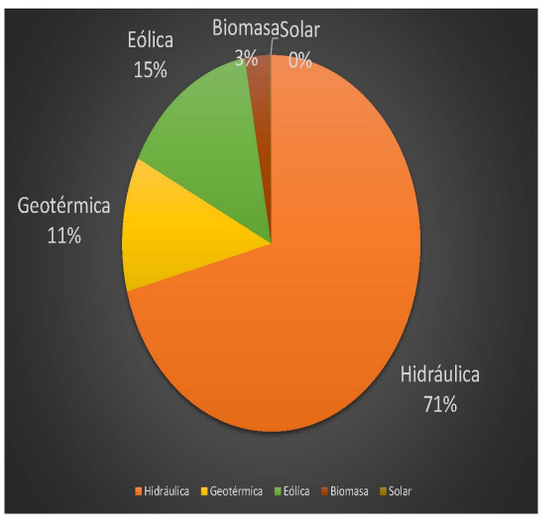
PRODUCCIÓN
Energía Convencional (2015):
225,986.65 GigaWatts/hora/año
Energía Renovable (2015):
52,108.00 GW/h/A (18.7%)



Estado Actual Uso Energías Renovables

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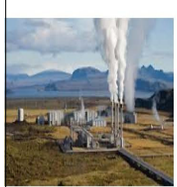
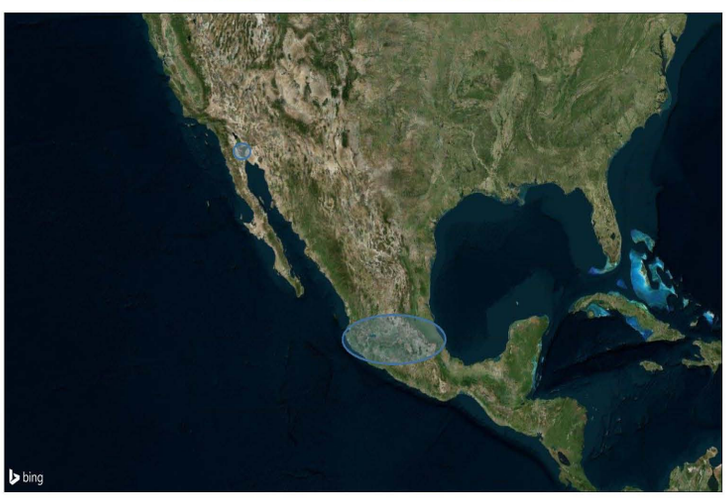
INVENTARIO NACIONAL DE ENERGÍAS RENOVABLES





January 17, 2017
Permisos_Concesiones
Concesion
Permiso

1:18,489,298
0 235 470 940 mi
0 362.5 725 1,450 km

SENER-CFE
Image courtesy of NASA Earthstar Geographics SIO © 2017 Microsoft Corporation

CFE - SENER
Copyright © ArcGIS for Server and CFE

Probado	2,355 GW/h/a
Probable	45,207
Posible	52,013

Potencial de Aprovechamiento Energías Renovables: Geotérmica

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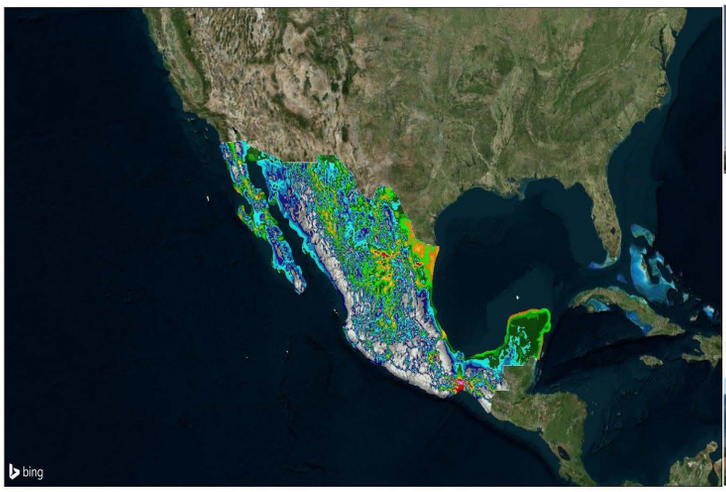

m/s

Probado	19,805 GW/h/a
Probable	----------
Posible	87,600

Potencial de Aprovechamiento
Energías Renovables: Eólica

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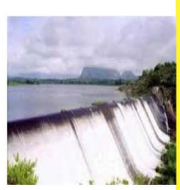

Probado	4,796 GW/h/a
Probable	23,028
Posible	44,180

Potencial de Aprovechamiento
Energías Renovables: Hidráulica

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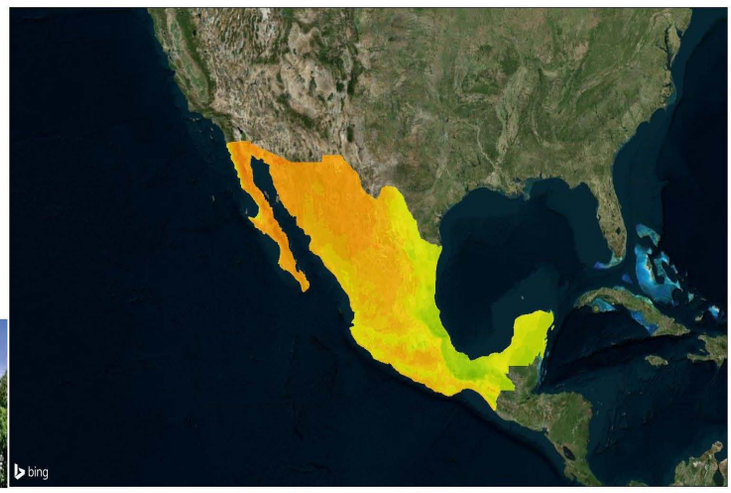

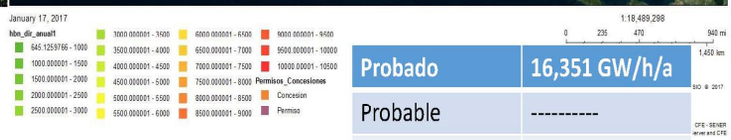

KWh/m^2/día

Probado	16,351 GW/h/a
Probable	----------
Posible	6,500,000

Potencial de Aprovechamiento
Energías Renovables: Solar

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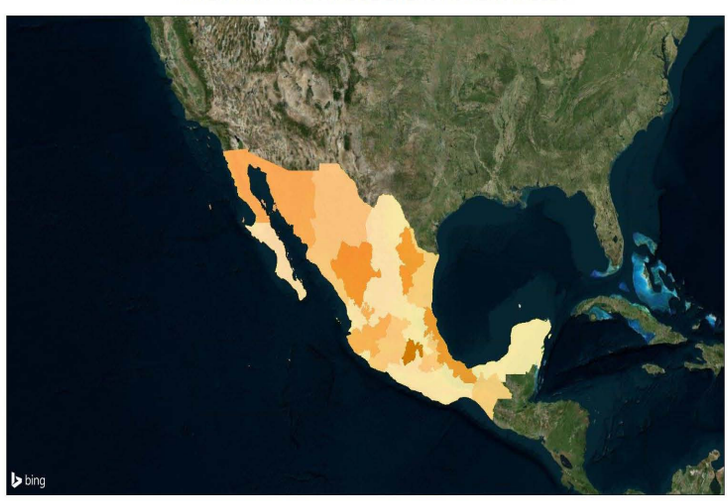

TeraJoules/año

Probado	2,396 GW/h/a
Probable	391
Posible	11,485

Potencial de Aprovechamiento
Energías Renovables: Residuos Urb

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Conclusiones

- México ha firmado compromisos internacionales para reducir las emisiones de gases de efecto invernadero a la atmósfera, para transitar hacía una sociedad de bajo consumo de carbono y para emplear energías renovables y limpias.
- México ha hecho las modificaciones en su marco legal para ser más competitivo en aspectos energéticos.
- No existe ningún proyecto estratégico nacional para generar energía eléctrica a gran escala por fuentes renovables y/o limpias.
- Se han implementado instalaciones eólicas y solares fotovoltaicas a mediana escala en el ámbito estatal.
- Problemas con la instalación a pequeña escala: fotovoltaico doméstico 7 años recuperación inversión; fotovoltaico comercial 5 años recuperación inversión. Los excedentes no se pueden vender y solo se acumulan por 1 año.

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- El histórico abandono de las zonas costeras y marinas mexicanas (zonas de mayor potencial de aprovechamiento) ha limitado el desarrollo de energías renovables y/o limpias, por ejemplo, granjas eólicas marinas, plantas mareomotrices, generadores undomotrices, generación de biocombustibles (e.g. microalgas, plantas con alto contenido de aceite de zonas costeras), etc.
- Los bajos apoyos gubernamentales, algunos problemas regulatorios y la desvinculación gobierno, empresa, academia ha limitado el desarrollo de proyectos de generación de energía potencialmente útiles.
- La carencia de una política de desarrollo urbano y de ciudades verdes, limita el aprovechamiento de residuos para generar energía, las iniciativas para transporte más limpio y los proyectos de generación de energía al caminar, conducir vehículos o bicicletas en el ámbito local.

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- En el mediano plazo la viabilidad de uso de energías renovables en México debería tener la siguiente estructura por orden de importancia:
  - Energía Solar: Fotovoltaica (norte del país) y Térmica (centro y sur del país)
  - Granjas Eólicas: costeras y marinas (en todo el litoral del país)
  - Energía Geotérmica: Expansión de las áreas existentes
  - Energía Hidráulica: de pequeña y mediana escala (sur y centro del país)
- La implementación de energías renovables en México es un área de oportunidad multidisciplinaria de colaboración internacional (aspectos técnicos, comerciales, jurídicos, gestión, planeación y gobernanza).

CEID CENTRO DE INNOVACIÓN Y DISEÑO

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Agradecimientos

- Se agradece todo el amable apoyo brindado por la Hankuk University of Foreign Studies HUFS, Seúl, República de Corea.
- Se agradece el apoyo brindado por el Centro de Excelencia en Innovación y Diseño en Ingeniería de CETYS Universidad, México.
- Se agradece el apoyo brindado por el Colegio de Ingeniería y la Escuela de Ingeniería de CETYS Universidad (Campus Ensenada).

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AIRES
Renewable Energy Sources

The Renewable sector in Argentina
Achievements and challenges

Ing. Esteban van Dam

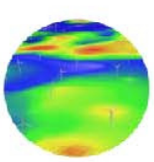
HUFS–ITBA International Conference
Climate change, Renewable Energy and Cultural Cooperation
ITBA, February 6th 2017

Aires Renewables

AIRES
Renewable Energy Sources

AIRES is a Company with argentine and italian capitals, with offices in Buenos Aires and Milan. Leaders in the local market in development and engineering in the Renewable Energy sector in Latin America.

We have broad experience in Argentina, Uruguay, Perú and Brazil.


DESARROLLO TEMPRANO


DESARROLLO AVANZADO


CONSTRUCCIÓN


OPERACIÓN

"Más de 4.200 MW de experiencia ***en estudios y proyectos*** en la Región"

Aires Renewables – Main Clients

AIRES Renewable Energy Sources

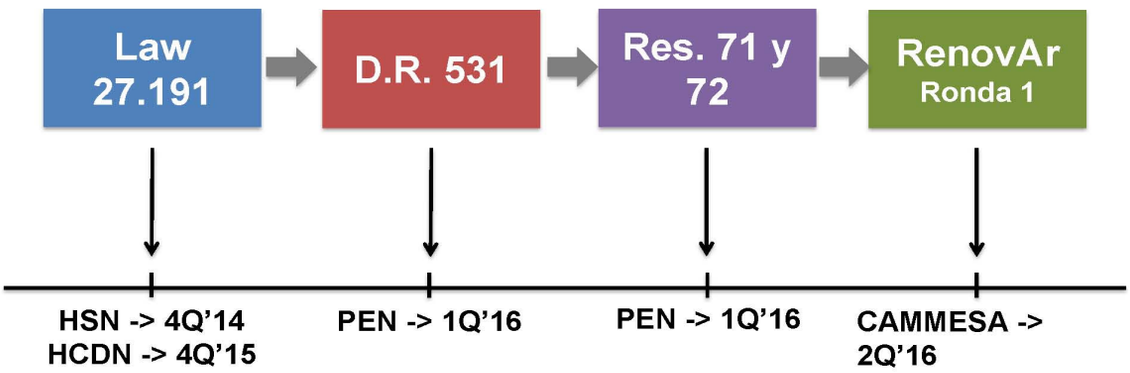
Grenergy
Pan American ENERGY
Orígenes
Piedra del Águila
sadesa
Enel Green Power
MAINSTREAM ENERGY
LAP LATIN AMERICA POWER
Vestas
SENADO de la Nación Argentina
Central Puerto
Petrominera
TECHINT
LADANER S.A.
bp
PARQUE EÓLICO PAMPA S.A.
SAN JUAN GOBIERNO
AUTOPISTAS DEL SOL
ENARSA Energía Argentina S.A.
EOLIASUR
D'E CAPITAL
CAMMESA
BANCOBICE
focus energy
IDB Inter-American Development Bank
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
SOGESIC
EPSE
Efice
EOLIASUR
BYKNAR S.A.
MIEM MINISTERIO DE INDUSTRIA, ENERGÍA Y MINERÍA
Power
HYCHICO
3GaL
Gobierno del Chubut
Tecpetrol
SECRETARIA DE ENERGÍA
FRALI DESARROLLOS INMOBILIARIOS
Cristalchile
NORDEX
Pampa Energía
Acindar Grupo ArcelorMittal

ARGENTINA – Key Aspects

AIRES Renewable Energy Sources

- Land Lease
- Resource studies (wind /solar)
- Environmental studies: simple process
- 40% of the country with >40% CF
- Big availability in grid
- "Agente MEM" status
- "Acceso a la capacidad de transporte" status
- **New law: Ley 27.191**

Law 27.191 – Evolution



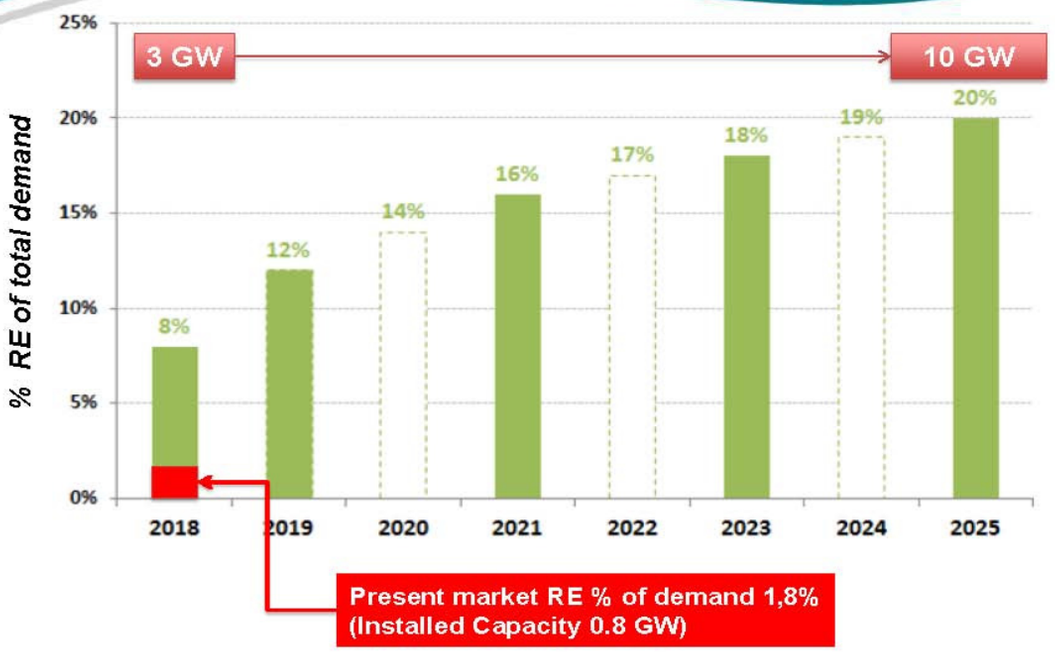
Resolution 71: Prepliego RenovAR

Resolution 72: "Procedimiento para la Obtención del Certificado de Inclusión en el Régimen de Fomento de las Energías Renovables"

Law 27.191 – Main Aspects

- Approved in Sept 2015 (FPV/PRO) – Ruled in Apr 2016
- Total support of all political sectors
- Target: 8% RREE@ 2018 / 20% @ 2025
- Transfer of the cost of PPA to consumers
- Specific Fund to guarantee PPA payments and financing debt (FODER)
- First tender: 2Q 2016
- More tan 3000 MW for 2017/2018

Law 27.191 – Demand evolution



Ley 27.191 – Tax benefits

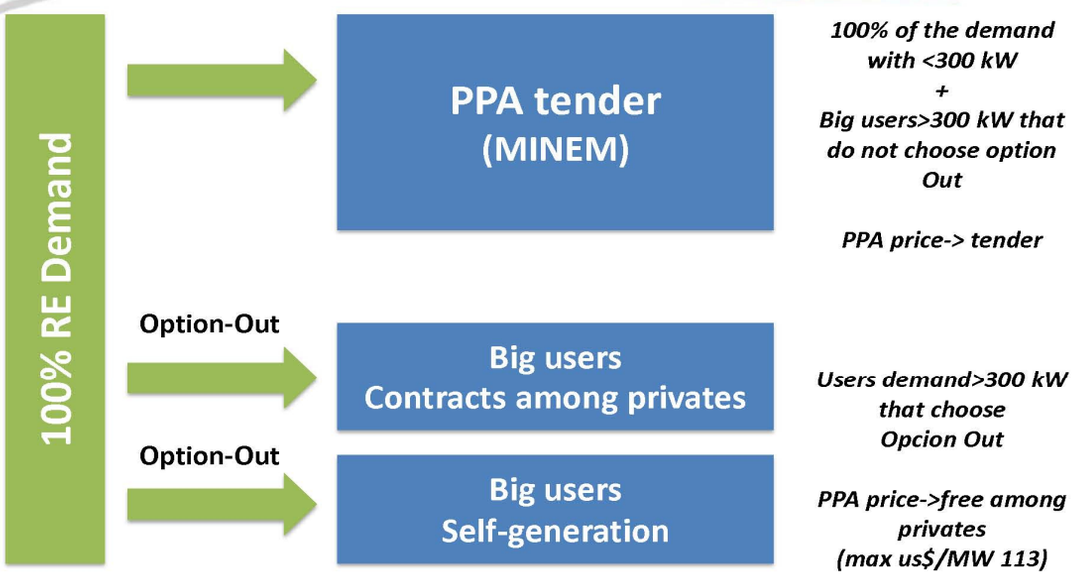
- Cahnges to tax benefits
  - No payment of GMP ("Ganancia Mínima Presunta")
  - No import taxes (until Dec 31, 2017)
  - Accelerated Depreciation (IIGG) and anticipated devolution of VAT
  - Fiscal Certificate: 20% of national component(>30%)
  - No tax to dividends distribution (10%) if reinvesting in infrastructure
  - Deduction of the financing cost in the IIGG

***Decreasing benefits→ incentive to quick development of RREE**

Law 27.191 – Local suppliers

- Priority to ER dispatch
- "Power reserve" supplied by the whole grid.
- Incentive to local suppliers
  - Credits with FODER for develpment of local manufacture
  - No import taxes for parts and machines needed for production
- Incentive to Energy generators tnat integrate most local components:
  - Priority for accesing FODER financing
  - 20% fiscal certificate if > 30% of capex is integrated

Law 27.191 – PPA/End users



Ley 27.191 – Cuenta FODER

- National treasure
- Own savings
- ANSES / FGS
- Multilateral/others

Financing account

- Loans for construction, long term
- Financing guarantees

Specific fee to demand

Guarantees account

Guarantee to PPA contracts (tender)

World Bank– FODER – Guarantee AAA

"The World Bank intends to support FODER through a series of IBRD Guarantees in support of renewable energy projects. At the outset, the World Bank would prepare a series of IBRD Guarantees for a total amount ofUS$500 million.

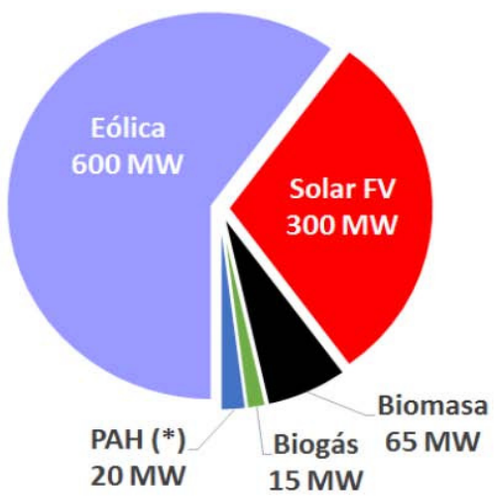
The World Bank reiterates its full support to this tendering process and remains available to discuss any queries the prospective bidders may have"

Tender

RenovAr – RONDA1

Goals and benefits

Open call
1.000 MW of new RE power



Expected benefits

- First step for 8% vs 1,8% (present) => 4,5% (2018)
- New jobs 5000 - 8000
- Savings per fuel imports 300 MM USD
- Emissions reduction 2 millon ton CO2/yr (= 900.000 cars)

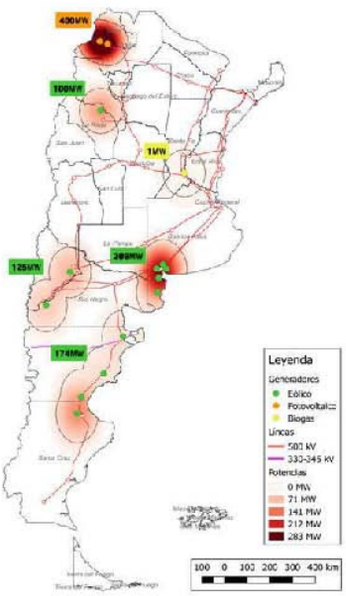
Renovar 1 - results

PROYECTOS ADJUDICADOS: DISTRIBUCIÓN GEOGRÁFICA

Total de Proyectos Adjudicados: 17

Tecnología	Proyectos	MW	GWh/año	Provincias
Eólica	12	708	3.002	Buenos Aires, Chubut, Río Negro, Santa Cruz, Neuquén, La Rioja
Solar	4	400	959	Salta y Jujuy
Biogas	1	1	9	Santa Fe
Totales	**17**	**1.109**	**3.970**	**9 Provincias**

2,9 % del Consumo Eléctrico Nacional



Renovar 1.5 - results

RONDA 1.5- PROYECTOS ADJUDICADOS: EÓLICA

TECNOLOGÍA	REGIÓN	ID	PROVINCIA	NOMBRE DEL PROYECTO	OFERENTE	MW	PRECIO ADJUDICADO (USD/MWh)
EÓLICA	BUENOS AIRES	EOL-29	BUENOS AIRES	P.E. Miramar	ISOLUX INGENIERIA S.A.	98	56,4
		EOL-45	BUENOS AIRES	P.E. Pampa	SINOHYDRO CORTPORATION LIMITED	100	46,0
		EOL-48	BUENOS AIRES	P.E. Vientos de Necochea 1	CENTRALES DE LA COSTA ATLÁNTICA S.A	38	55,5
	COMAHUE	EOL-19	LA PAMPA	P.E. La Banderita	FACUNDO FRAVEGA	37	50,0
		EOL-09	RIO NEGRO	P.E. Pomona I	GENNEIA S.A.	100	54,9
	PATAGONIA	EOL-27	CHUBUT	P.E. Loma blanca 6	ISOLUX INGENIERIA S.A.	100	53,5
		EOL-20	SANTA CRUZ	P.E. Del Bicentenario	PETROQUIMICA COMODORO RIVADAVIA S.A.	100	49,5
	RESTO EOLICA	EOL-37	CORDOBA	P.E. Achiras	CP RENOVABLES S.A.	48	59,4
		EOL-47	LA RIOJA	P.E. Arauco II (Etapa 3 y 4)	PARQUE EÓLICO ARAUCO S.A.P.E.M.	95	56,7
		EOL-32	MENDOZA	P.E. El Sosneado	EMPRESA MENDOCINA DE ENERGÍA S.A.P.E.M.	50	55,0

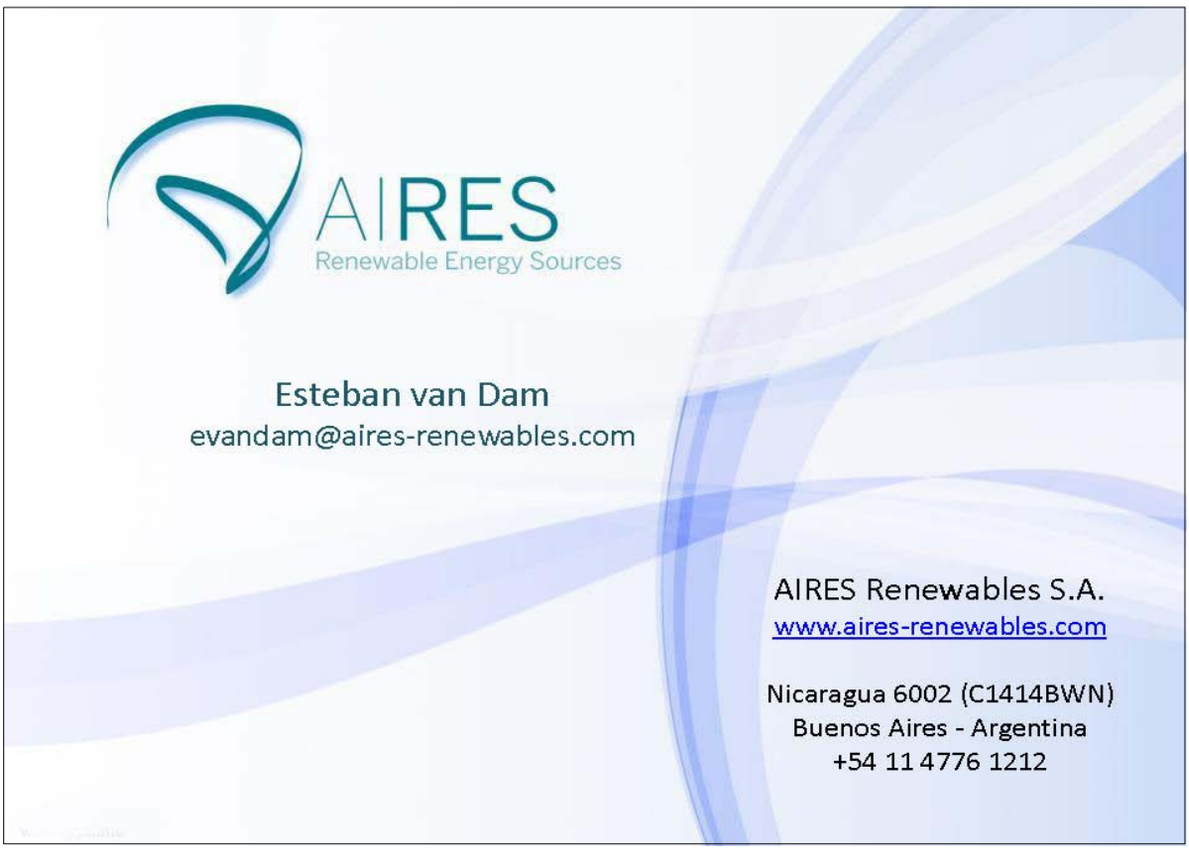
Renovar 1.5 - results

RONDA 1.5- PROYECTOS ADJUDICADOS: SOLAR

TECNOLOGÍA	REGIÓN	ID	PROVINCIA	NOMBRE DEL PROYECTO	OFERENTE	MW	PRECIO ADJUDICADO (USD/MWh)
SOLAR	RESTO SOLAR	SFV-49	SAN JUAN	P.S. Iglesia - Guañizuli	JINKOSOLAR HOLDING CO.LTD.	80	54,1
		SFV-57	SAN JUAN	P.S. Las Lomitas	LATINOAMERICANA ENERGIA	2	59,2
		SFV-31	SAN JUAN	P.S. Sarmiento	SOENERGY INTERNATIONAL INC.	35	53,0
		SFV-37	SAN JUAN	P.S. Ullum 4	COLWAY 08 INDUSTRIAL	14	56,5
		SFV-46	SAN JUAN	P.S. Ullum N1	FIDES GROUP S.A.	25	53,7
		SFV-45	SAN JUAN	P.S. Ullum N2	ALEJANDRO IVANISSEVICH	25	55,2
		SFV-32	SAN JUAN	P.S. Ullum3	ALEJANDRO IVANISSEVICH	32	57,6
		SFV-36	SAN LUIS	P.S. Caldenes del Oeste	QUAATRO PARTICIPACOES S.A.	25	58,9
		SFV-41	SAN LUIS	P.S. La Cumbre	DIASER S.A.	22	56,7

Main challenges

- PPAs among privates
- National Electrical Grid
- Financing
- Local components
- Distributed Generation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HUFS-ITBA INTERNATIONAL CONFERENCE

CLIMATE CHANGE, RENEWABLE ENERGY AND CULTURAL COOPERATION

Session 4: Environment and Renewable Energy Development in Argentina

Session Chair: Dr. Daniel Ryan(ITBA)

■Dr. Gilberto M. Jannuzzi(UNICAMP, Brazil)
"Latin American Scene on Renewable Energy: Challenges and International Cooperation"

■Dr. Si-Hong, Kim(HUFS)
"EU Climate Action and International Cooperation"

■Ing. Luzuriaga Diego(ITBA)
"ITBA commitment with research and management concerning renewable energies and environment"

“Bioenergy in Argentina”

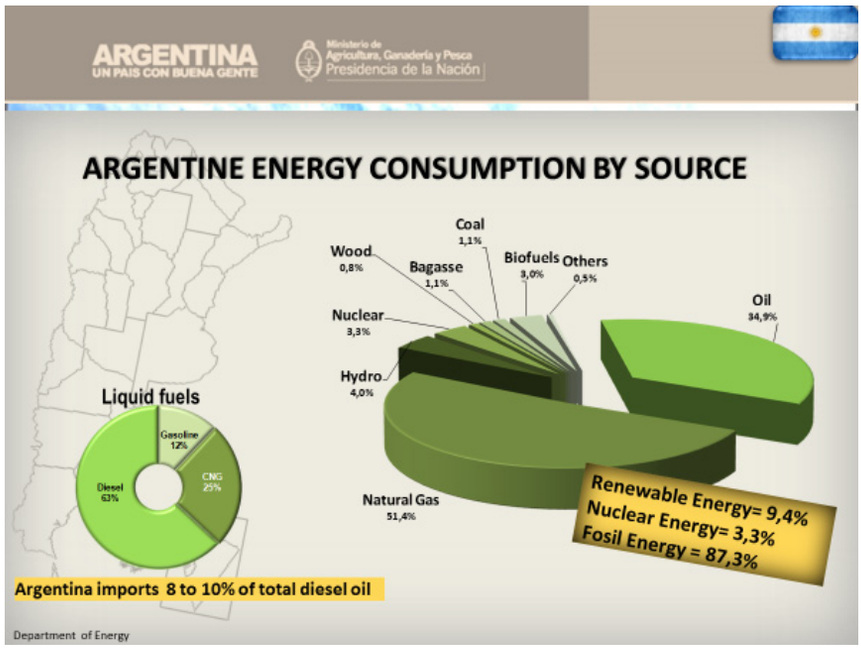
Martín Fraguío(Asociación Maízy Sorgo Argentino)

Abstract

A biofuels law was discussed in Argentina for the first time during 2003, which originated a long congress process finished in 2006, with the statement of 5% of ethanol and 5% of biodiesel blended in gasoline and diesel, by January 1st, 2010. - Initially, bioenergy was thought as necessary to improve the environmental footprint of fuels. Later, the debate moved to analyze bioenergy as a) an important source of primary energy compatible with the matrix of Argentina, b) an effective way to decrease the national GHG inventory and c) a driver of regional economic and social development.

Introduction

The emergence of biofuels mandates and regulations in the EU, the US and the long term successful sugarcane ethanol plan of Brazil added to the environmental discussion that was taking shape after the year 2000 started a local debate that rapidly reached the National Congress.

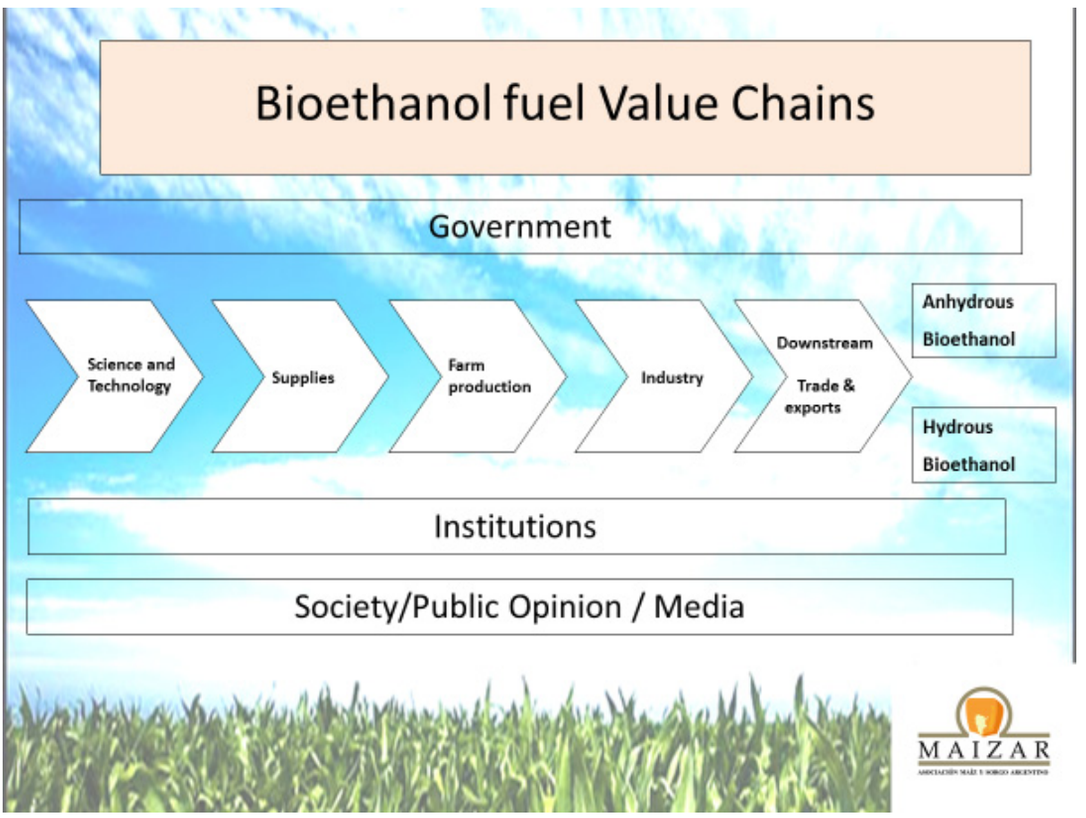


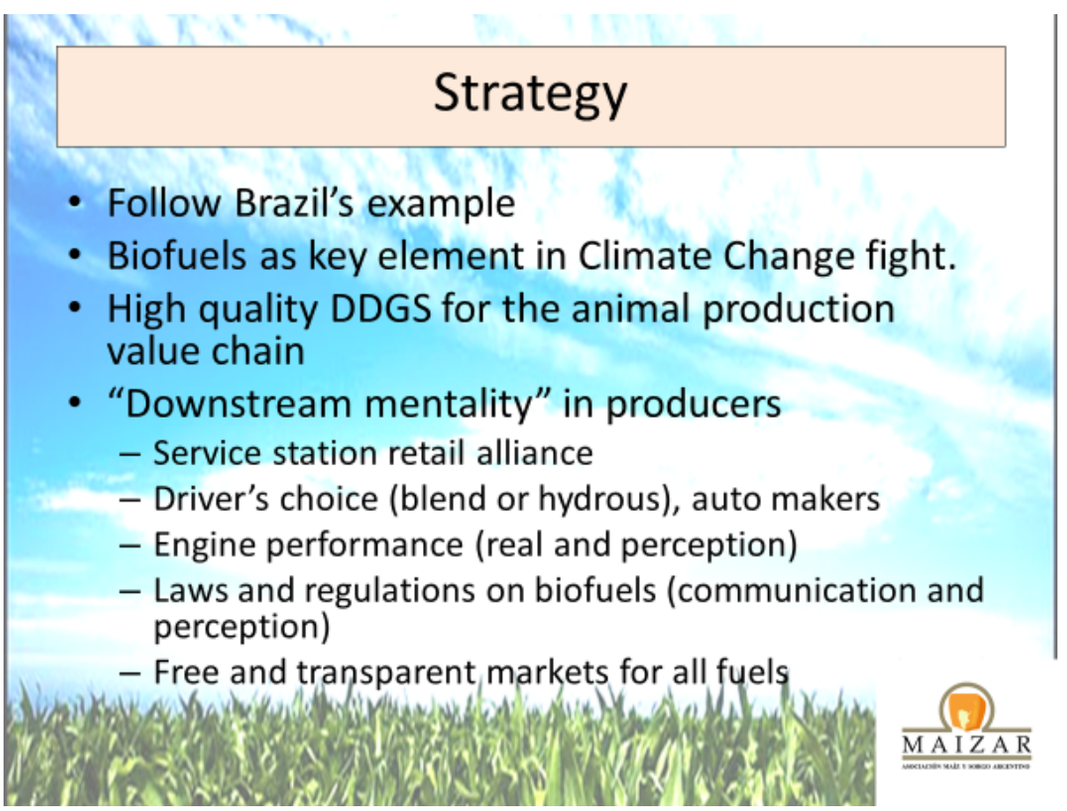
Two projects were being debated in the two chambers of congress, one was an only biodiesel law and the other was a more comprehensive biodiesel, bioethanol and biogas law project. In both cases, they mandated a certain blend rate of biodiesel and bioethanol and tax exemptions for a certain period of time. MAIZAR, the Argentine corn and sorghum value chain association understood that a biofuels law should include all biofuels used in internal combustion engines. Since then this organization and its members have become a strong voice in the world of biofuels, bioenergy and the bioeconomy.

In 2006 law 26.093 was finally approved stating the following:

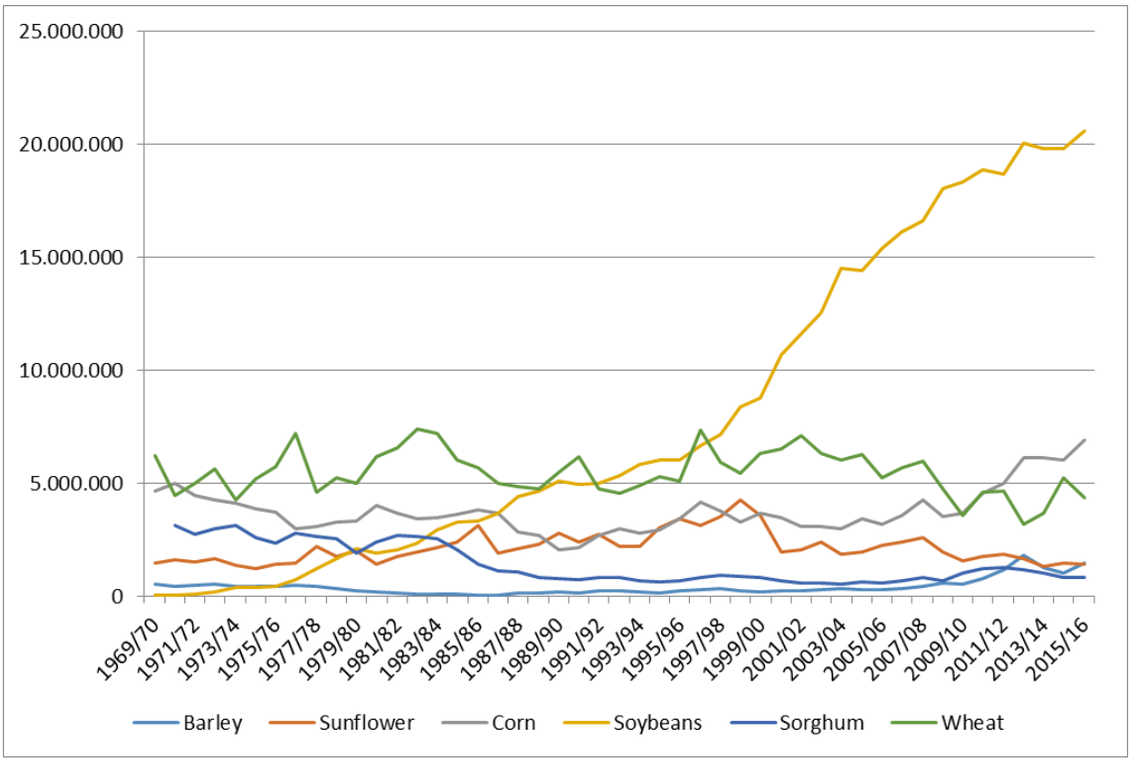
- By January 1st 2010 5% of biodiesel and 5% of bioethanol should be blended in diesel and gasoline respectively.
- The authority to decide on the implementation of the law was a group of ministries including Agriculture, Public Works (now Energy), Environment, etc.
- Investors interested in building a biofuels plant that would supply the mandate had to present their projects to the National Authority and, in case they were approved, they would receive an annual volume that would be bought by the downstream fuel industry.
- The price paid would be set by the National Authority periodically. The law set two different methods depending on market conditions. The first was wholesale price of premium gasoline and diesel for biodiesel and bioethanol. The other method (used in case fossil fuels were too cheap) production costs plus a fixed profit margin for the producer.
- Downstream companies would pick the biofuels from the production plants and do the blending, distribution and sale on their own.
- The law has a strong emphasis on rural social and economic development.

Bioethanol

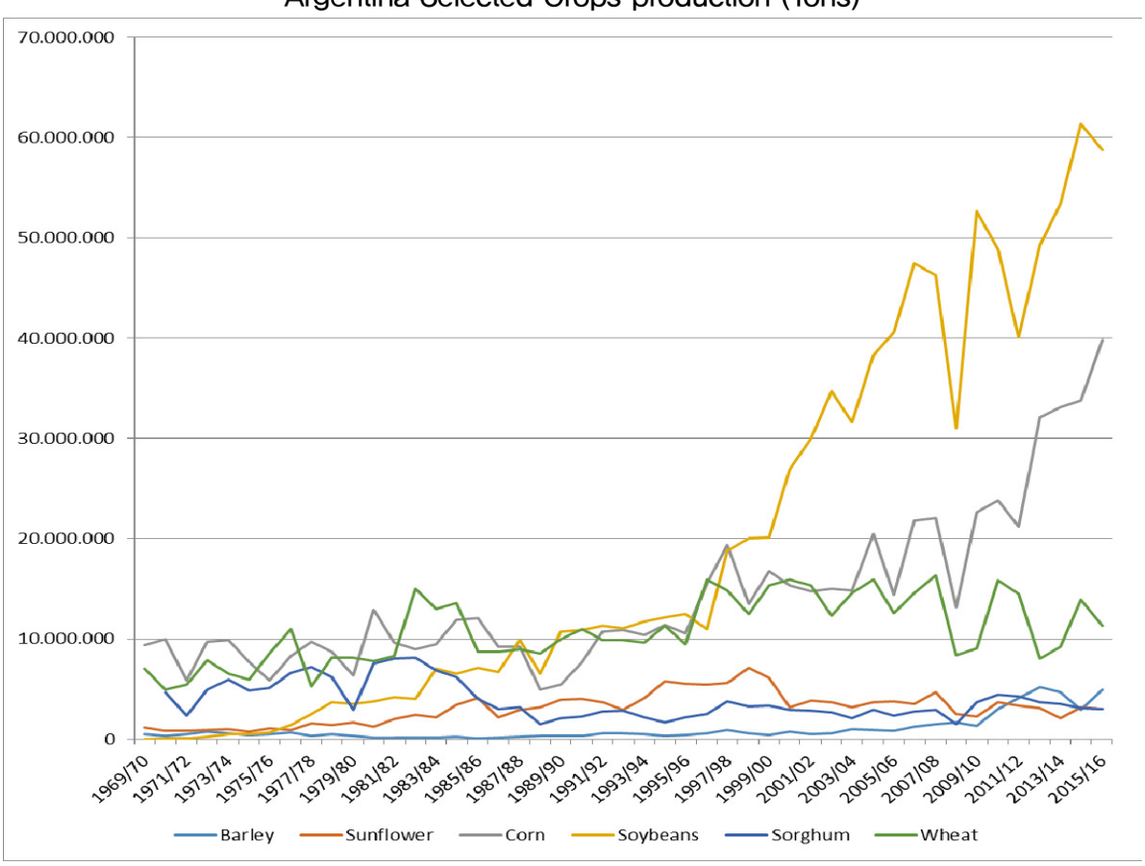

Bioethanol fuel Value Chains
Government
Science and Technology
Supplies
Farm production
Industry
Downstream
Trade & exports
Anhydrous Bioethanol
Hydrous Bioethanol
Institutions
Society/Public Opinion / Media
MAIZAR


Strategy
• Follow Brazil's example
• Biofuels as key element in Climate Change fight.
• High quality DDGS for the animal production value chain
• "Downstream mentality" in producers
– Service station retail alliance
– Driver's choice (blend or hydrous), auto makers
– Engine performance (real and perception)
– Laws and regulations on biofuels (communication and perception)
– Free and transparent markets for all fuels
MAIZAR

Argentina Selected crops planted area (Hectares)



Argentina Selected Crops production (Tons)



Argentina Corn used to produce bioethanol

Year	Tons
2014	644.000
2015	1.073.000
2016	1.570.000

Ethanol Plants in Argentina

Sugarcane ethanol	previous quota m3	2016 Quota m3	Increase
Alconoa S.R.L.	40.000	64.100	60%
Bio San Isidro S.A.	6.000	10.800	80%
Bioenergía La Corona S.A.	24.000	30.000	25%
Bioledesma S.A.	49.000	82.000	67%
Biotrinidad S.A.	22.000	28.000	27%
Compañía Bioenergética La Florida S.A.	60.000	101.000	68%
Compañía Bioenergía Santa Rosa S.A.	30.000	33.500	12%
Energías Ecológicas de Tucumán S.A.	25.100	31.100	24%
Río Grande Energía S.A.	12.200	16.800	38%
Bioatar S.A.	0	47.000	
Bioenergética Leales S.A.	0	14.300	
Frontera Energía S.A.	0	32.000	
Total Surgarcane ethanol	**268.300**	**490.600**	**83%**

Corn ethanol	previous quota m3	2015 Production	Corn used
Bio 4	50.000	81.338	116.279
Vicentín	48.000	62.323	111.628
Promaíz	135.000	133.130	313.953
ACA Bio	125.000	122.456	290.698
Diaser	82.500	75.198	191.860
Total corn ethanol	**440.500**	**474.445**	**1.024.419**

Corn ethanol plants pending for approval		Quota m3	Corn used
Company A		100.000	232.558
Company B		100.000	232.558
Company C		100.000	232.558
Total corn ethanol		**300.000**	**697.674**

2016 Total Ethanol Production for Domestic Market: aprox: 981.240 **m3**

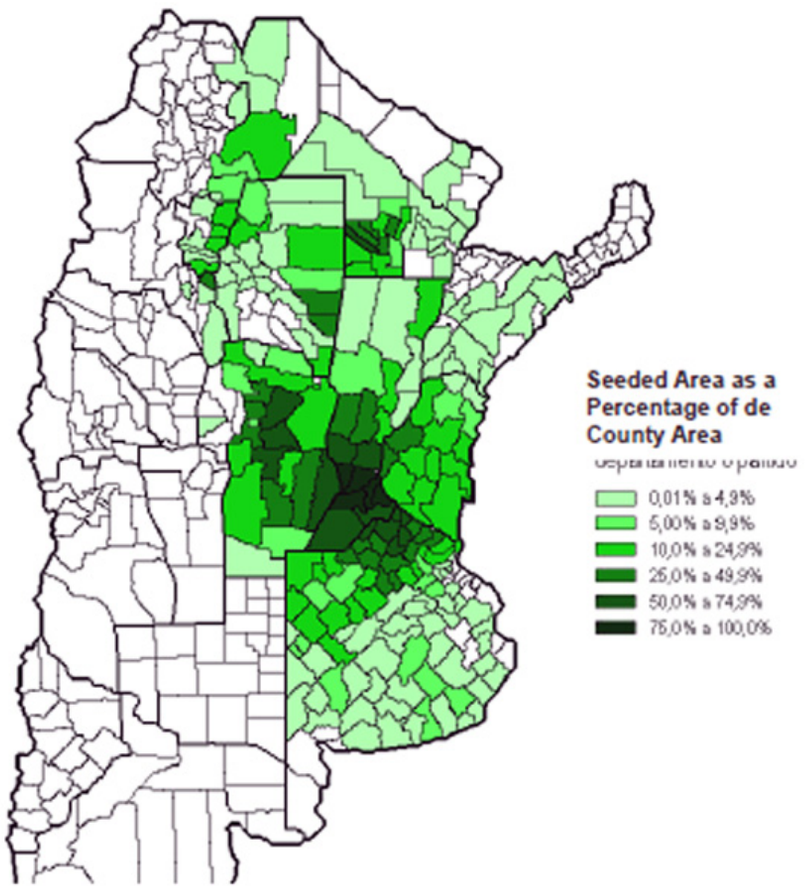
Strategic plan debate
The future of ethanol in the Argentine Market

	Total Gasoline Sales Arg Market	Ethanol m3 Mandatory Blend	Ethanol % Mandatory Blend	Ethanol sales m3 Free market Hydrous	Ethanol sales % Free Market Hydrous	Sugarcane Ethanol sales m3	Total Corn Ethanol Sales m3	Gasoline minus ethanol m3	Corn Used for Ethanol Tons
1994	7.055.489,00							7.055.489,00	
1995	7.042.726,00							7.042.726,00	
1996	6.574.394,00							6.574.394,00	
1997	6.232.181,00							6.232.181,00	
1998	5.849.093,00							5.849.093,00	
1999	5.498.836,80							5.498.836,80	
2000	4.764.436,00							4.764.436,00	
2001	4.245.892,65							4.245.892,65	
2002	3.754.691,86							3.754.691,86	
2003	3.402.248,37							3.402.248,37	
2004	3.448.579,52							3.448.579,52	
2005	3.710.554,51							3.710.554,51	
2006	4.321.736,38							4.321.736,38	
2007	5.068.449,58							5.068.449,58	
2008	5.616.724,33							5.616.724,33	
2009	5.819.857,83	2.664,00				2.664,00		5.819.857,83	
2010	6.239.910,73	117.806,00	1,89%			117.806,00		6.239.910,73	
2011	6.966.151,10	165.392,00	2,37%			165.392,00		6.966.151,10	
2012	7.503.921,06	237.843,00	3,17%			220.448,00	17.395,00	7.486.526,06	42.426,83
2013	8.169.724,98	474.752,00	5,81%			305.609,00	169.143,00	8.000.581,98	412.543,90
2014	8.093.857,07	663.102,00	8,19%			298.202,00	364.900,00	7.728.957,07	890.000,00
2015	8.544.062,42	803.639,00	9,41%			328.069,00	475.570,00	8.068.492,42	1.159.926,83
2016	8.177.000,00	981.240,00	12,00%	16.354,00	0,20%	490.600,00	506.994,00	7.670.006,00	1.236.570,73
2017	8.680.000,00	1.041.600,00	12,00%	26.040,00	0,30%	490.600,00	577.040,00	8.102.960,00	1.407.414,63
2018	9.010.000,00	1.081.200,00	12,00%	54.060,00	0,60%	490.600,00	644.660,00	8.365.340,00	1.572.341,46
2019	9.340.000,00	1.681.200,00	18,00%	186.800,00	2,00%	490.600,00	1.377.400,00	7.962.600,00	3.359.512,20
2020	9.670.000,00	1.934.000,00	20,00%	290.100,00	3,00%	490.600,00	1.733.500,00	7.936.500,00	4.228.048,78
2021	10.000.000,00	2.200.000,00	22,00%	400.000,00	4,00%	490.600,00	2.109.400,00	7.890.600,00	5.144.878,05

Sources

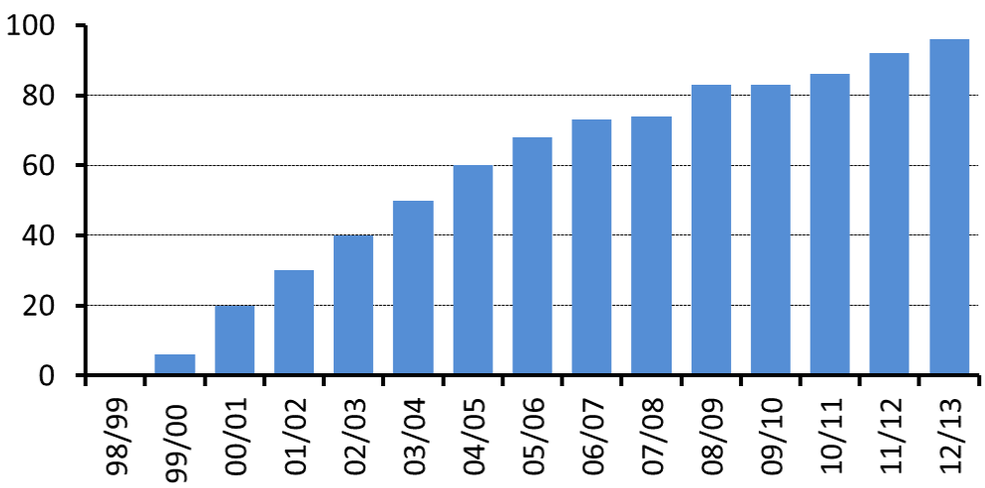
Gasoline and ethanol sales statistics from the Ministry of Energy until 2015
Gasoline and ethanol sales forecast prepared by author from different sources
Mandatory ethanol blending proyections prepared by author from different sources
Hydrous ethanol sales: trade is similiar to Brazil. It sells from a separate pump as E100.

Argentina Corn production map



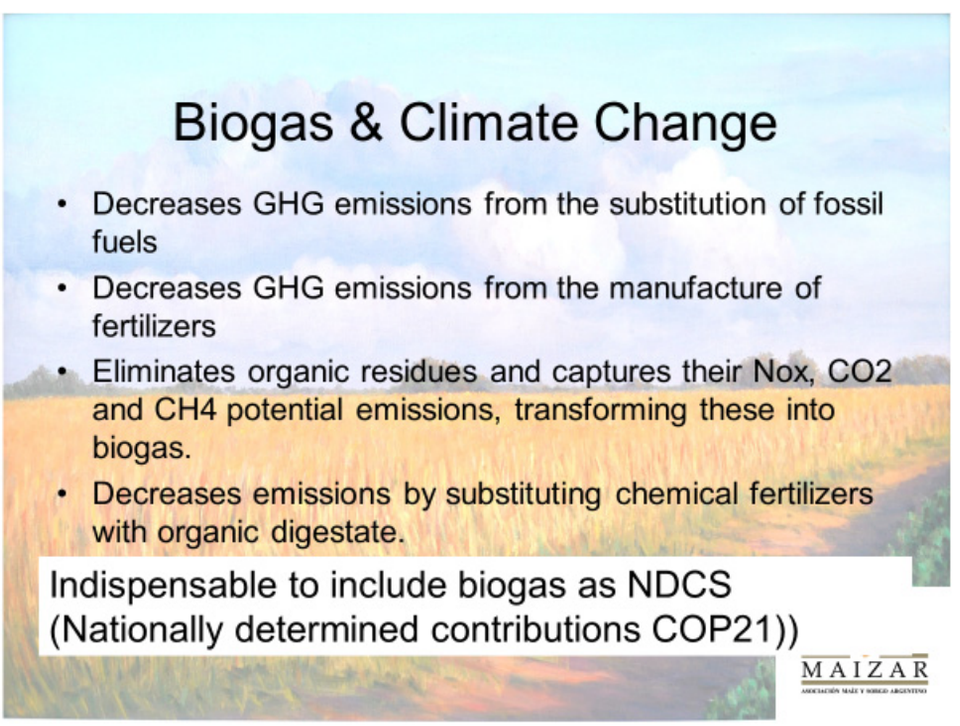
Adoption of Biotechnology in corn production in Argentina

Argentina established in 1991 a Biotech crop regulatory system. Based on science, transparency and with international recognition.



Early adopter – High adoption rates – Safe introduction

Biogas



Biogas turns:

- Residues into energy.
- Costos into incomes.
- Local and global pollution in improvements of wáter and land ecosystems.
- Unemployment and poverty into economic activity and social development.
- Scientific and educational development based on the Bioeconomy paradigm.

Source: chapter of book in press: Fraguío, Hilbert, Bondolich, Huergo, Menendez

MAIZAR

Cost analysis of biogas & biomethane

	15 U$S/ton silage	20 U$S/ton silage	25 U$S/ton silage
Biomethane U$S/MMBTU	5	6,2	7,51
Biomethane U$S/m3	0,19	0,23	0,28

Imports Jan-May 2016	Natural Bolivia Gas	Liquefied Natural Gas LNG	Totals
M3	1.776.250.428	703.409.900	2.479.660.328
U$S	241.852.411	167.101.670	408.954.081
U$S/MMBTU	3,69	6,44	
U$S/m3	0,14	0,24	

	Power generation	Price (Pesos)	U$S/MmBTU
Diesel. M3	2,240,000	$ 5,460.00	$ 17.00
Fuel oil. Tons	3,088,000	$ 5,234.00	$ 14.00

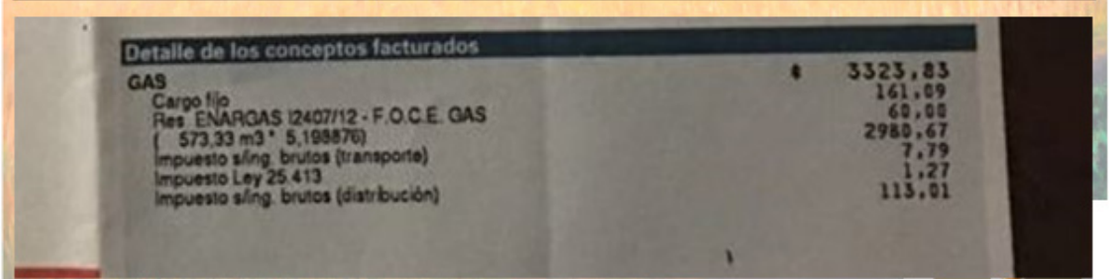
Source: chapter of book in press: Fraguío, Hilbert, Bondolich, Huergo, Menendez

MAIZAR

Cost analysis of biogas & biomethane

	Export Parity	Bulk LPG	Social Bottle
LPG	5,6 U$S/mBTU	20 U$S/mBTU	14 U$S/mBTU

	Min	Max
New Tariff for natural gas 2016	5 U$S/mBTU	9,5 U$S/mBTU


Detalle de los conceptos facturados

GAS

Cargo fijo	3323,83
Res. ENARGAS I2407/12 - F.O.C.E. GAS	161,09
(573,33 m3 * 5,198876)	60,00
Impuesto s/ing. brutos (transporte)	2980,67
Impuesto Ley 25.413	7,79
Impuesto s/ing. brutos (distribución)	1,27
	113,01

Source: chapter of book in press : Fraguío, Hilbert, Bondolich, Huergo, Menendez

MAIZAR

ASOCIACIÓN MAÍZ Y SORGO ARGENTINO

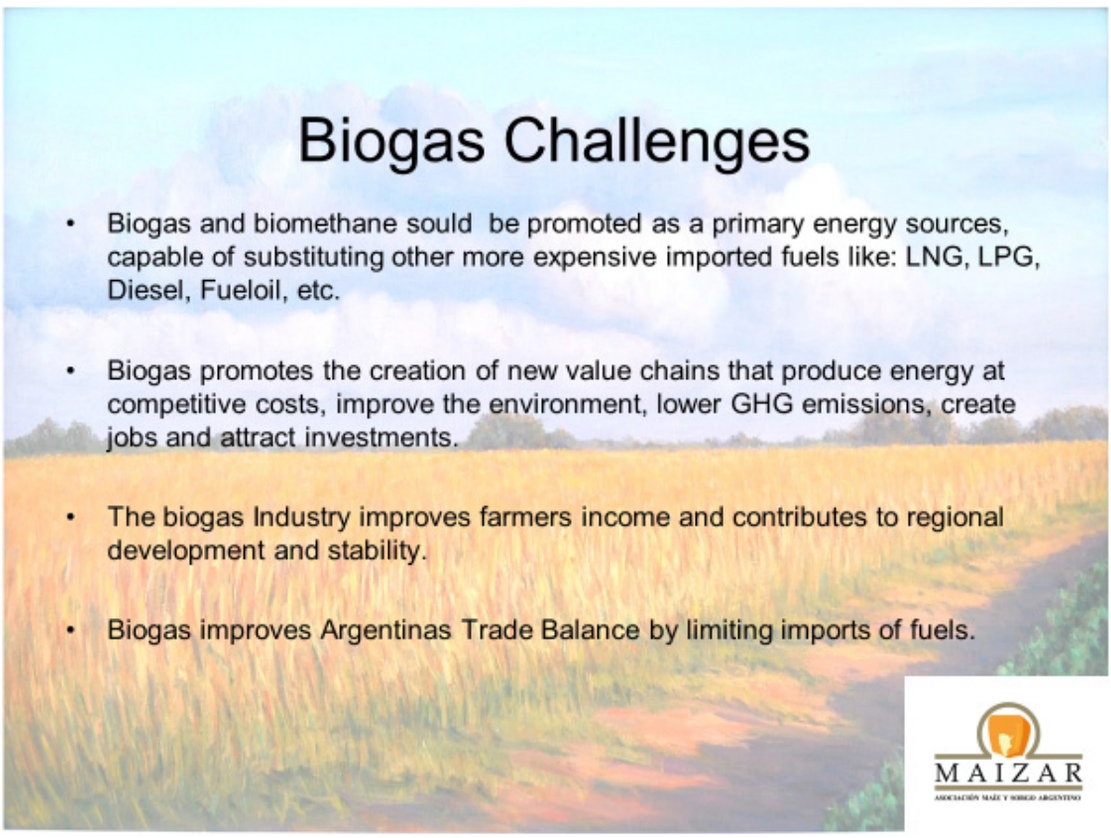
Cost analysis of biogas & biomethane

	Well Price for new production of natural gas
Res 74/2016 New natural gas	7,5 U$S/mBTU

Source: chapter of book in press : Fraguío, Hilbert, Bondolich, Huergo, Menendez

MAIZAR

ASOCIACIÓN MAÍZ Y SORGO ARGENTINO



Biodiesel

Biodiesel (Million Liters)										
Calendar Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Beginning Stocks	10	40	75	20	20	55	5	20	35	25
Production	830	1,360	2,070	2,760	2,800	2,260	2,935	2,060	2,690	3,100
Imports	0	0	0	0	0	0	0	0	0	0
Exports	780	1,305	1,545	1,910	1,770	1,305	1,820	895	1,500	1,700
Consumption	20	20	580	850	995	1,005	1,100	1,150	1,200	1,400
Ending Stocks	40	75	20	20	55	5	20	35	25	25
BalanceCheck	0	0	0	0	0	0	0	0	0	0
Production Capacity										
Number of Biorefineries	18	22	24	27	33	36	38	38	38	38
Nameplate Capacity	1,500	2,300	2,800	3,300	4,000	4,550	5,200	5,200	5,400	5,400
Capacity Use (%)	55.3%	59.1%	73.9%	83.6%	70.0%	49.7%	56.4%	39.6%	49.8%	57.4%
Feedstock Use for Fuel (1,000 MT)										
Soybean oil	750	1,230	1,870	2,500	2,530	2,050	2,660	1,860	2,440	2,800
Market Penetration (Million Liters)										
Biodiesel, on-road+Agriculture	20	20	580	850	995	1,005	1,100	1,150	1,200	1,400
Diesel, on-road+Agriculture	13,830	12,740	13,775	14,210	13,530	13,750	13,420	13,710	13,720	14,500
Blend Rate (%)	0.1%	0.2%	4.2%	6.0%	7.4%	7.3%	8.2%	8.4%	8.7%	9.7%
Diesel, total use	14,568	13,735	15,451	16,232	15,345	16,340	15,214	15,910	15,920	16,850

SOURCE: USDA GAIN REPORT 2016

Potential of the Geothermal Energy in Argentina

Dra. Silvia Barredo y Dr. Luis Stinco

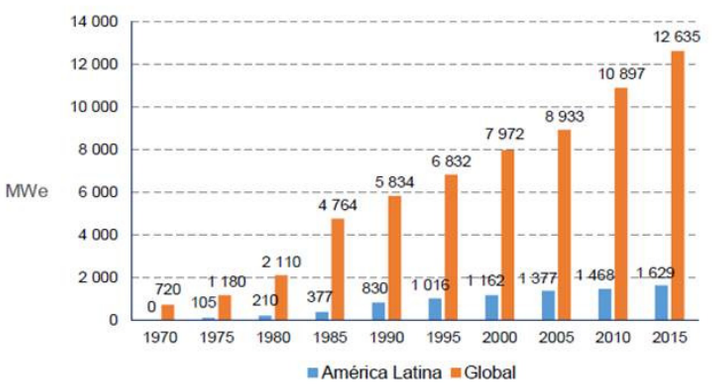
HUFS

ITBA
Instituto Tecnológico de Buenos Aires

Introduction

Geothermal electricity plants in Latin America

13 % of the whole world



Based on Bertani (2015), Bruni (2014)
In Bona and Coviello (2016)

Introduction

- Geographical conditions. High Andes, difficult access, sometimes extreme climate. Hazardous regions. Far from towns.
- Complex logistics and high costs.
- Electricity market highly competitive and dominated by low cost sources like natural gas and hydroelectricity.
- "Easier" and profitable fossil energies.

At the end of 90's gas demands increased but production decreased.

Climate change boosted the energy policies to the renewable energies.

Introduction

País	Inicio investigaciones geotérmicas	Cantidad manifestaciones termales	Áreas geotérmicas identificadas	Proyectos geotermo-eléctricos	Potencial estimado (MWe)[a]
Argentina	(años '50) -1971	450	~ 40	7	490 – 2 010
Bolivia (Estado Plurinacional de)	1975	~ 70	~ 20	3	510 – 2 490
Chile	(1921) 1968	> 300	20-25	11	1 000 - 2 950
Colombia	1968	~ 300	15	4	700 – 2 210
Ecuador	1979	167	24	3	500-1 700
Perú	1975	> 500	61	11	2 860
Venezuela (República Bolivariana de)	1974	~ 70	>30	1	370 - 910

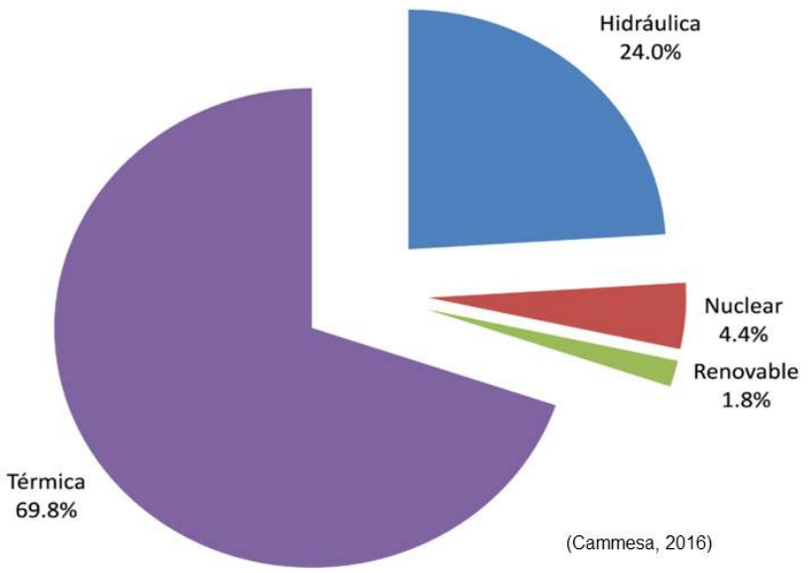
Barredo (2016), Bona and Coviello (2016)

Fuente: Elaboración propia.

[a] Rango de valores disponibles en literatura, con exclusión de las estimaciones que, según el criterio de autores del presente documento, proporcionan visiones altamente especulativas del potencial geotérmo-eléctrico efectivamente explotable.

Introduction

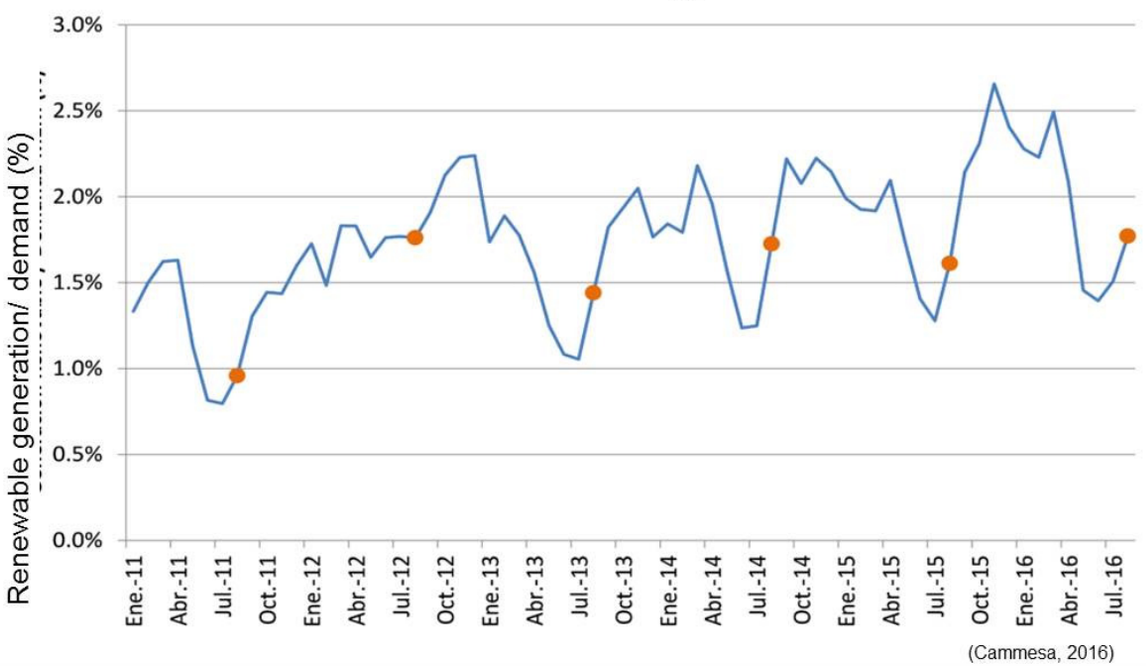
Electric generation sources



(Cammesa, 2016)

Introduction

Renewable Energy



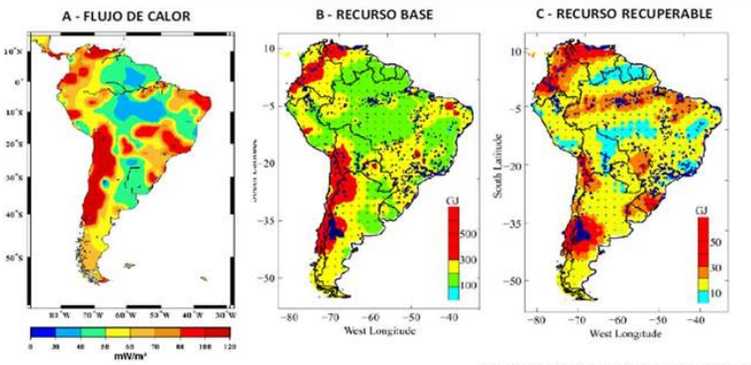
(Cammesa, 2016)

Heat flow distribution

Country	Area (10^3 km^2)	N	Resource (GJ/m^2)	
			RBUA	RRUA
Argentina	2790	233 (2941)	352	79
Bolivia	1100	52	245	41
Brazil	8480	930	178	10
Chile	760	56	499	61
Colombia	1200	57 (4425)	315	31
Ecuador	270	51	267	37
French Guiana	91	-	147	7
Guiana	215	-	144	7
Paraguay	407	35	244	24
Peru	1290	87	206	10
Suriname	163	-	146	9
Uruguay	178	7	225	27
Venezuela	912	40	324	44

N. Number of localities
Number in brackets refers to wells

Down to 3 km



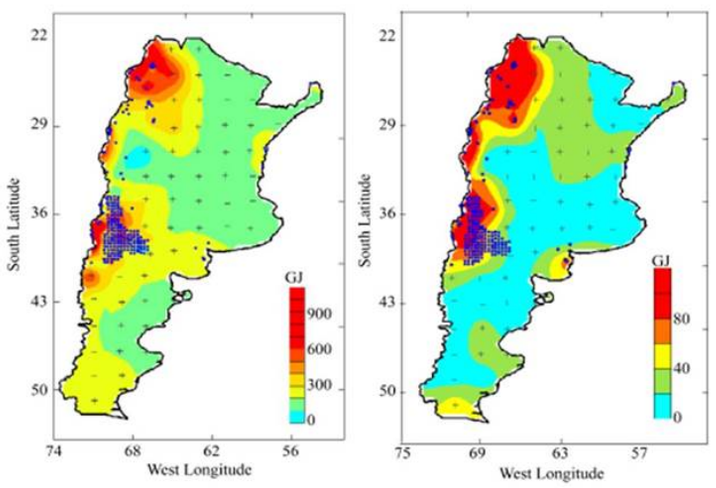
Blue dots are measured data
Uniform color are estimated data

Vieira and Hamza (2014), Barredo and Stinco (2015)

Heat flow distribution

Geothermal resource

Recoverable resource

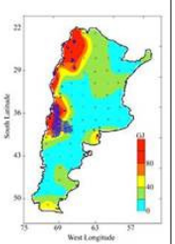


Dots observed data
Crosses estimated values

Vieira and Hamza (2014), Barredo and Stinco (2015)

Geothermal projects of Argentina

ADVANCE GRADE		PROVINCE	PROYECT NAME	
High Entalpia	Production	Neuquen	Copahue	
	Development	Neuquen	Domuyo	
		Jujuy	Tuzgle	
Low Entalpia	Exploitation	Entre Rios	Basavilbaso	Chaco-Parana Basin
			Victoria	
			Diamante	
			San José	
		Santa Fe	Campo Timbó	
		Misiones	Obera	
			Cerro Azul	
			Posadas	
		Buenos Aires	San Clemente del Tuyu	Salado Basin
			Necochea	
			Mar de Ajo	
	Development	Buenos Aires	Tapalqué	Chaco-Parana Basin
		Corrientes	Curuzú Cuatiá	
			Monte Casero	
	Pre-feasibility	Misiones	Iguazu	
		Chaco	El Cachape	
		Santa Fe	Moises Ville	



Pesce (2010)

Classification of the geothermal resource

Volcanic

- **Vapor dominated** — Copahue
- **Water dominated** — Domuyo
- **Hot Water**

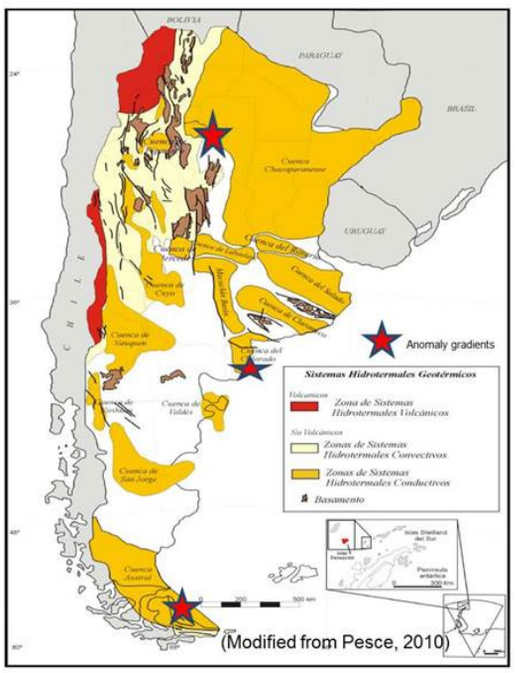
Thermal fields of high enthalpy
Electricity, baths, heating drying agricultural products

Non-Volcanic

- **Conductive** — Sedimentary basins
  - Normal gradient
  - Abnormal gradient
- **Convective** — Tectonic faults

Therapeutic-recreational
Boron, Cadmium, Lithium

Main Argentinian fields



(Modified from Pesce, 2010)

Cuencas Cuyana , Neuquina, Cretácica y Paleozoica

Cuenca Cuyana (Cacheuta, Villavincencio)
Cuenca Bermejo
Cuenca Cretácica (Salta): Rosario de la Frontera)
(Jujuy): Caimancito, Laguna, La Quinta, El palmar, Reyes

Santiago del Estero: Cuenca Tacoralo Rio Hondo
Cuenca Chaco Paraná
Buenos Aires, Bahía Blanca, Cuenca Pedro Luro

Hydrothermal convective-conductive

- (Spa) Bathing: 81 sites
- Greenhouses
- Individual space heating: Domuyo (Neuquén)
- Fish farming
- Agricultural drying
- Industrial process heat
- Snow melting

Hydrothermal convective-conductive

Low enthalpy

Greenhouses

Plants are placed on a slotted floor and receive heat by its root part

Bahía Blanca

Volcanic Fields

High enthalpy

Copahue (Neuquén Province)

Copahue is the most advanced geothermal project in Argentina and it is among the most advanced in South America,

Exploration and drilling of wells was carried out in the '70s -'80 by the Japanese International Cooperation Agency (JICA). Determined the feasibility of a development of 30 MWe for a period of 30 years.

A binary pilot plant (670 kWe) has been installed in 1988 by the CREGEN and worked until 1997 before being abandoned.

In 1998, it was installed a system of road snow melting in Caviahue town powered by geothermal steam.

In August 2010, the Government of Neuquén awarded a contract for the development of 30 MWe in Copahue to the Canadian company **Geothermal One**, but it passed to a Australian company **Earth Heat Resources**, which took control of the project. However, in August 2013 the company withdrew claiming several reasons, such as financial and investment security in the country.

Geothermal Regional Center of Neuquén (CREGEN)

Volcanic Fields

High enthalpy

Saetad in an extensive caldera. Thermal area is 1.2 km^2

Vapor-dominated (saturated dry vapor). Reservoir is between 850 and 1200 meters
Four wells: T°C 230°C at 600-800 m; 230°C – 240°C at greater depths.

Operated by a binary cycle using isopenthane as intermediate working fluid.

The plant is portable and easily removable.

The hydrothermal reservoir is generating a geothermal fluid to 6.7 tons / hour (171°C) of saturated steam.

The center can deliver electricity to a 13.2 kv line Caviahue-Copahue 10 km long and is a subsidiary of a 33 kv line Caviahue-Loncopue (50 km long) that binds to the provincial grid of 132 kilowatts.

Volcanic Fields

High enthalpy

Domuyo (Neuquén Province)

The second stage of prefeasibility has been concluded on a Geothermal area of 40 Km^2

T° 214-223°C

Reservoir is at 800 and 1000m, controlled by fractures. Three areas: small vapor-dominated area with gas fumaroles; transition area of water-vapor-mixed type and a water dominated.

The nearest town center is located about 20 km south of the geothermal area, while the nearest town is located about 65 km Andacollo south.

In March 2015, the Federal Government, through the Ministry of Energy awarded of the contract to a consortium between the Mexican geothermal company ENAL and the engineering consultancy PROINSA of Argentina.

Hydrotermal convective-conductive

High enthalpy **Low enthalpy**

Tocomar (Salta Province)

The second stage of prefeasibility has been concluded, establishing the geothermal pattern and defining the area of major economical importance, where exploration wells are scheduled to be made.

Structural control by regional faults, the Calama-Olacapato-El Toro, over the eruptive centers and the geothermal reservoir.

Surface temperature is around 80º C.

Temperature in depth is between 132º to 142º C.

It is crossed by the international electrical transmission line that connects with Chile. The line has a capacity of 345 kV and operated by TermoAndes, sporadically energy exports to Chile, although partially occupying the transmission capacity of the line.

Hydrotermal convective

High enthalpy **Low enthalpy**

Cerro Tuzgle field (Jujuy Province)

Tuzgle volcano area.

Structural control permits fluids to be conductively heated at depths of 2000 m to 180-220 ° C and reached hot to the surface.

In 1979, a program of cooperation with the Government of Italy (Aquater) made the first reconnaissance surveys, identifying the sector comprising the Tuzgle Volcano.

1980 -1989 Prefeasibility program. The results revealed two areas with high gradient, one located south and another northwest margin of the volcano (Coira, 1995). It finally stopped in 90's.

Since 2009, Geothermia Andina has been doing preliminary work to resume geothermal exploration, but no known specific activities were undertaken to date.

Hydrotermal convective

High enthalpy **Low to medium enthalpy**

Valle del Cura (San Juan Province)

Located at 4000 m.a.s.l, no human settlements, but there are important mining centers, like Veladero and Pascua-Lama, whose camps host 3,000 and 4,000 people, and are 4 and 15 km northwest of the geothermal center.

Hydrothermal field is associated with deep convective flow feed by meteoric waters along tectonic structures. Spring with hot waters at 78°C but it can reach 150°C at deep.

Pre-feasibility (phase 1). GASA conduct geothermal exploration in a "Joint Venture" (UTE) with the provincial power company San Juan (EPSE) between 2010 and 2012.

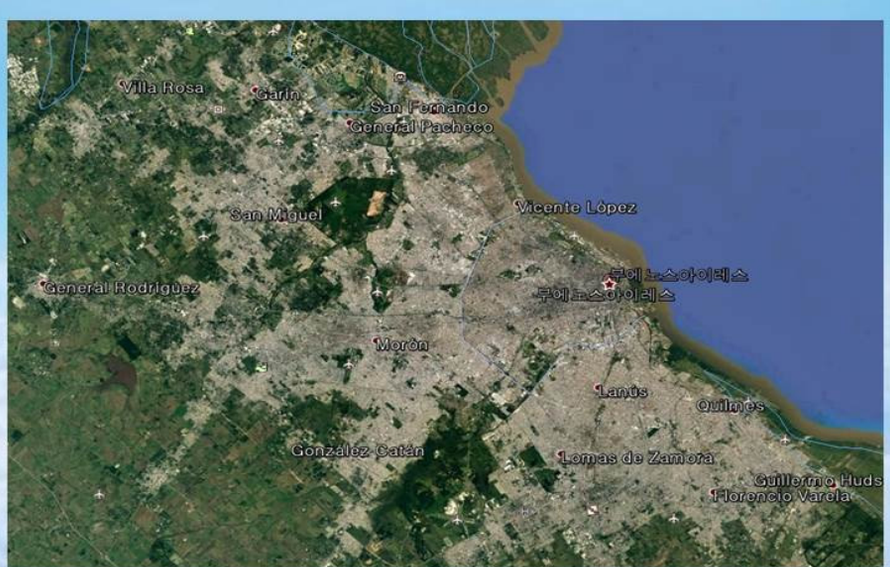
In 2013, Barrick Gold Corporation, with the technical support of GASA and under supervision of the consulting firm GeothermEx, drilled five wells of 250 m deep, reporting temperatures up to 57°C. The project was successively announced to proceed with deep exploratory drilling and a feasibility study for a geothermal 20 Mwe plant (Energy News, 2013), however activities stagnated and there was no report of further progress in the project to date.

The analyses of Micro-meteorology in Buenos Aires, Argentina

Park Il Soo, Jang Yu Woon

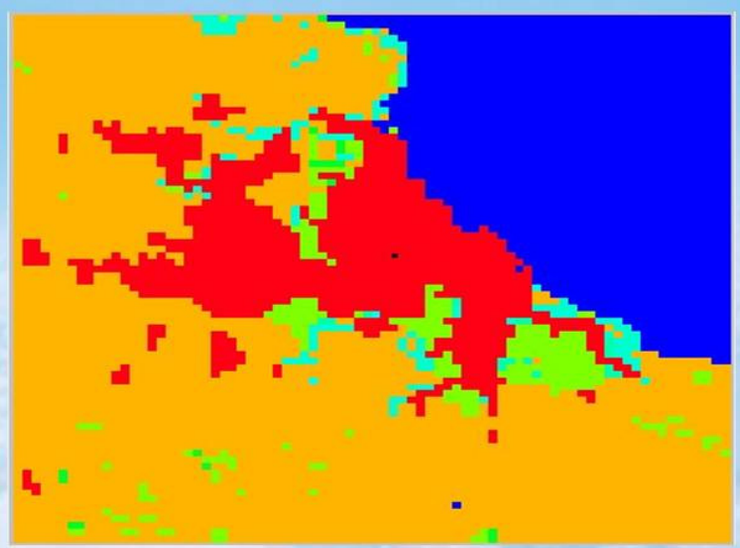
Korea-Latin America Green Convergence Center
Hankuk University of Foreign Studies

Studying Region in Buenos Aires



Buenos Aires Vegetation

Urban, Pasture, Grassland, Water



Meteorological Component

$$\frac{du}{dt} = F(u) + \frac{\partial \overline{w'u'}}{\partial \sigma}\frac{\partial \sigma}{\partial z} - \theta_v\left(\frac{\partial \pi}{\partial x} + \frac{\partial \pi}{\partial \sigma}\frac{\partial \sigma}{\partial x}\right) + fv - N_s(u - u_s)$$

$$\frac{dv}{dt} = F(v) + \frac{\partial \overline{w'v'}}{\partial \sigma}\frac{\partial \sigma}{\partial z} - \theta_v\left(\frac{\partial \pi}{\partial y} + \frac{\partial \pi}{\partial \sigma}\frac{\partial \sigma}{\partial y}\right) - fu - N_s(v - v_s)$$

$$\frac{\partial \sigma}{\partial \sigma} = -\left(\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y}\right) + u\frac{\partial}{\partial \sigma}\left(\frac{\partial \sigma}{\partial x}\right) + v\frac{\partial}{\partial \sigma}\left(\frac{\partial \sigma}{\partial y}\right)$$

$$\frac{d\theta_v}{dt} = F(\theta_v) + \frac{\partial \overline{w'\theta_v'}}{\partial \sigma}\frac{\partial \sigma}{\partial z} + S_{\theta_v} - N_s(\theta_v - \theta_{vs})$$

$$\frac{\partial \pi_H}{\partial \sigma} = -\frac{g}{\theta_v}\left(\frac{\partial \sigma}{\partial z}\right)^{-1}$$

t : time(s)

x, y, σ : the terrain-following coordinates(m)

$$\sigma = Z_T\left(\frac{Z - Z_S}{Z_T - Z_S}\right)$$

Z : cartesian vertical coordinate(m)

Z_T : height of model top(m)

Z_S : terrain height(m)

f = Coriolis parameter ($4\pi_c \sin(lat)/(24\times3600)$) ($s^{-1}$),

π_c = 3.14159265,

lat = latitude (°),

u_s, v_s, θ_{vs} = large scale synoptic winds and potential virtual temperature,

N_s = large scale nudging coefficient ($1/(24\times3600)$),

$$S_{\theta_v} = \frac{\theta_v}{T}\left(\frac{\partial T}{\partial t}\right)_{RADIATION} - \frac{\lambda}{c_p}S_{qv}$$

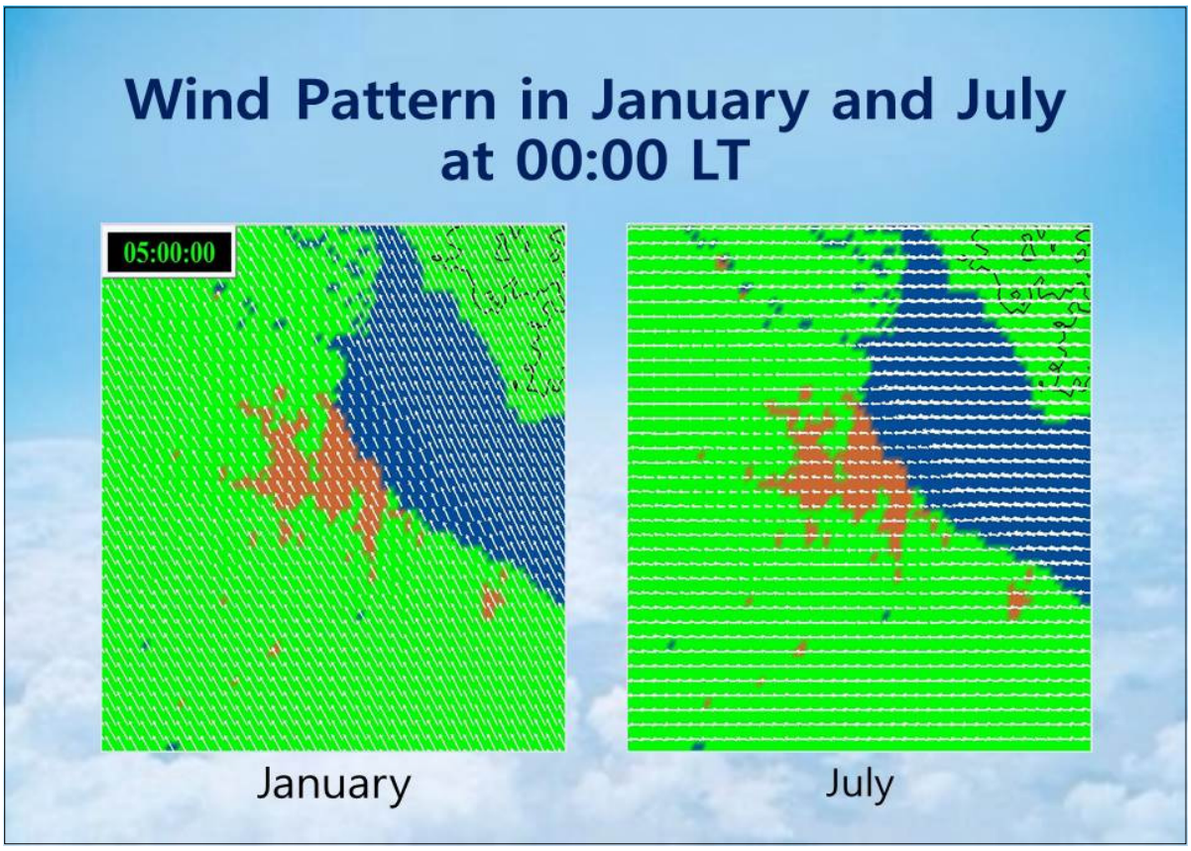
T = temperature (K),

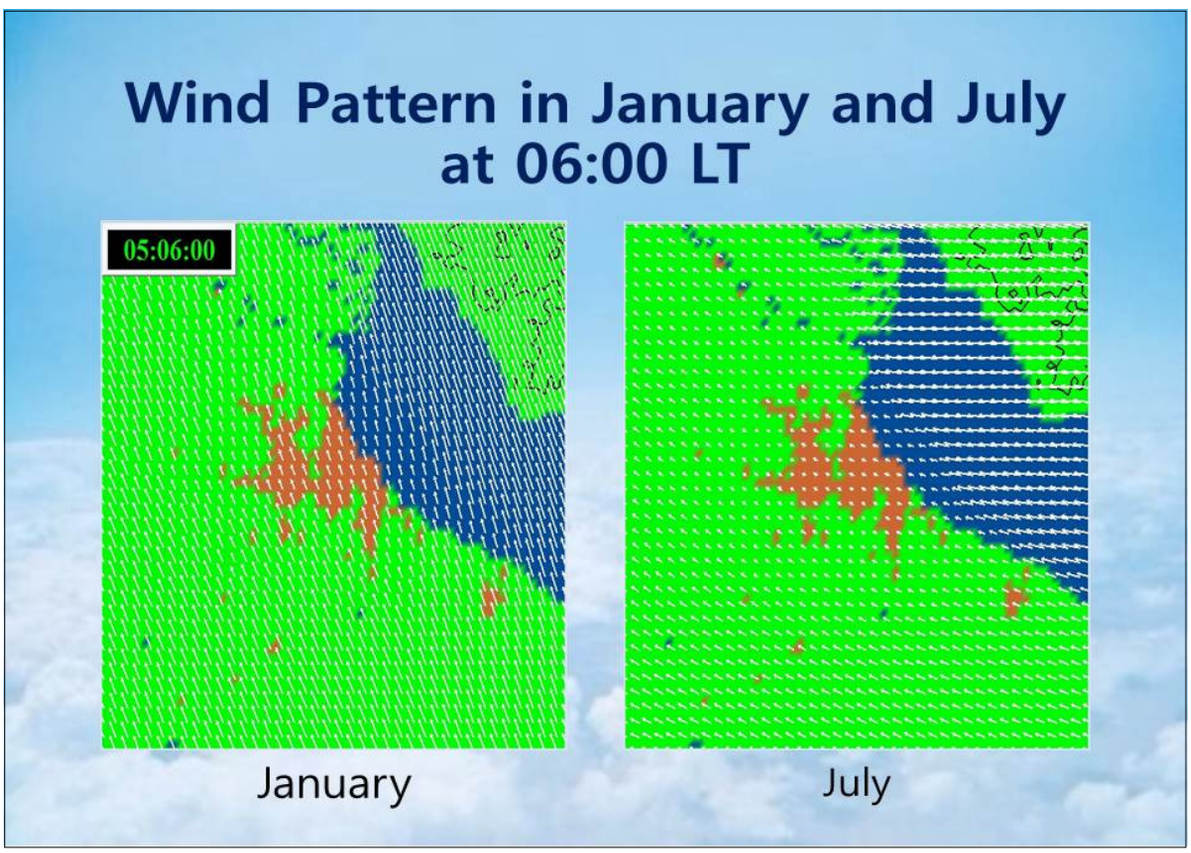
g = gravitational constant (9.81 m s^{-2}),

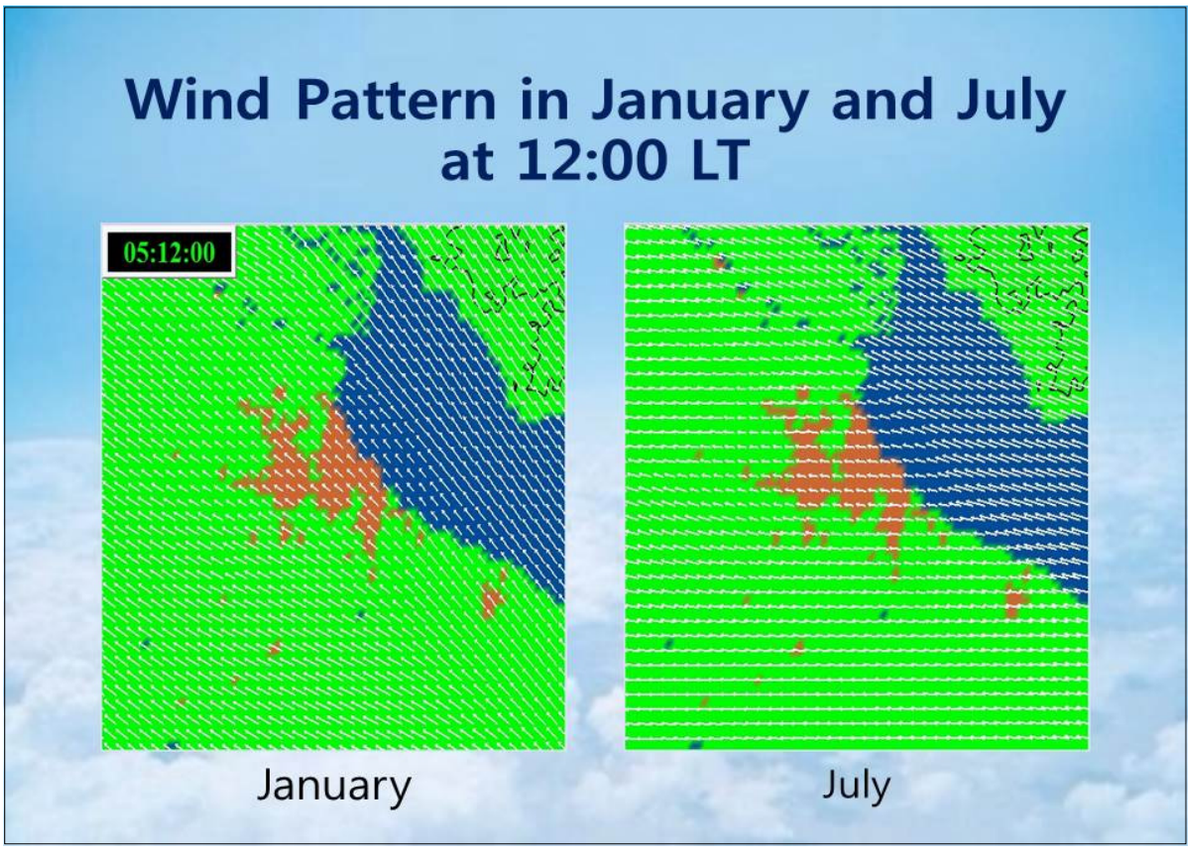
λ = latent heat of vaporisation of water (2.5×10^6 J kg^{-1}),

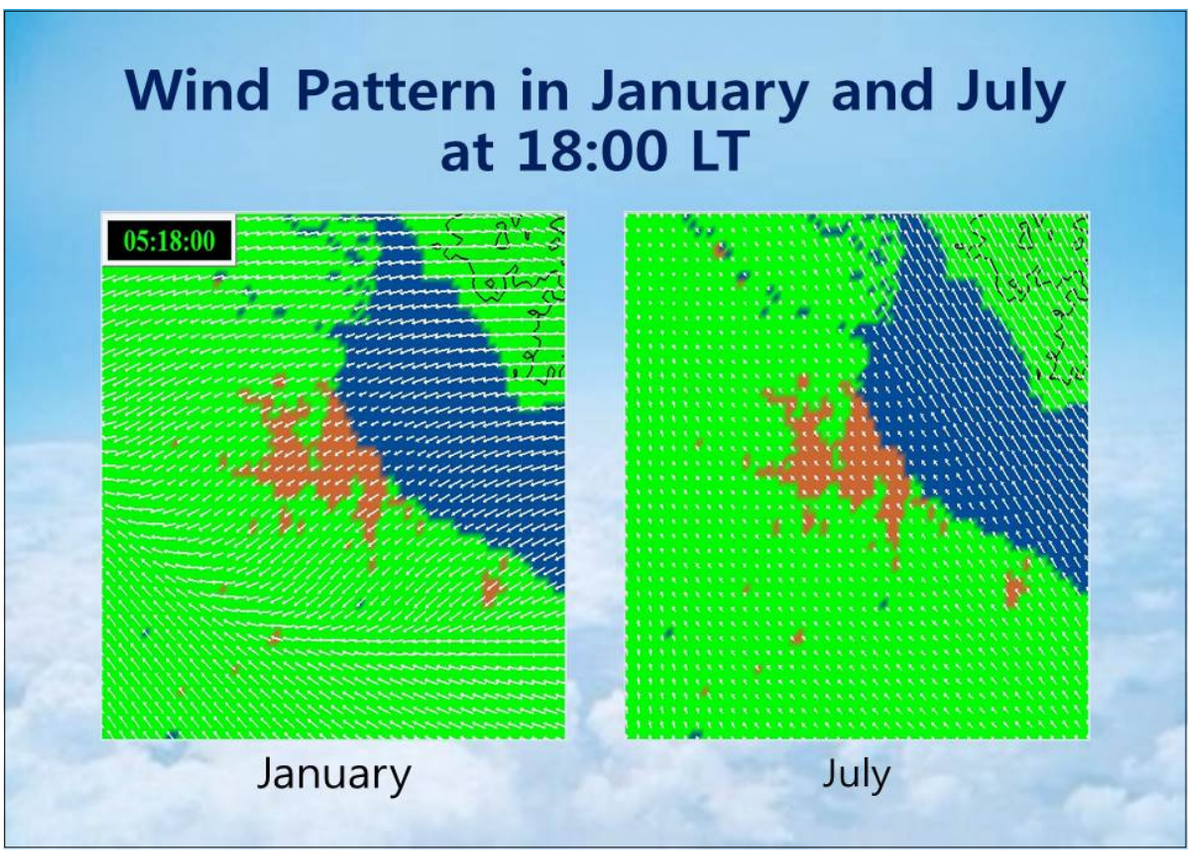
c_p = specific heat at constant pressure (1006 J kg^{-1} K^{-1}),

$$\frac{\partial \sigma}{\partial x} = \left(\frac{\sigma - z_T}{z_T - z_s}\right)\frac{\partial z_s}{\partial x}, \quad \frac{\partial \sigma}{\partial y} = \left(\frac{\sigma - z_T}{z_T - z_s}\right)\frac{\partial z_s}{\partial y}, \quad \frac{\partial \sigma}{\partial z} = \left(\frac{z_T}{z_T - z_s}\right).$$


Wind Pattern in January and July
at 00:00 LT
05:00:00
January
July


Wind Pattern in January and July
at 06:00 LT
05:06:00
January
July


Wind Pattern in January and July
at 12:00 LT
05:12:00
January
July


Wind Pattern in January and July
at 18:00 LT
05:18:00
January
July

Wind Fields in January

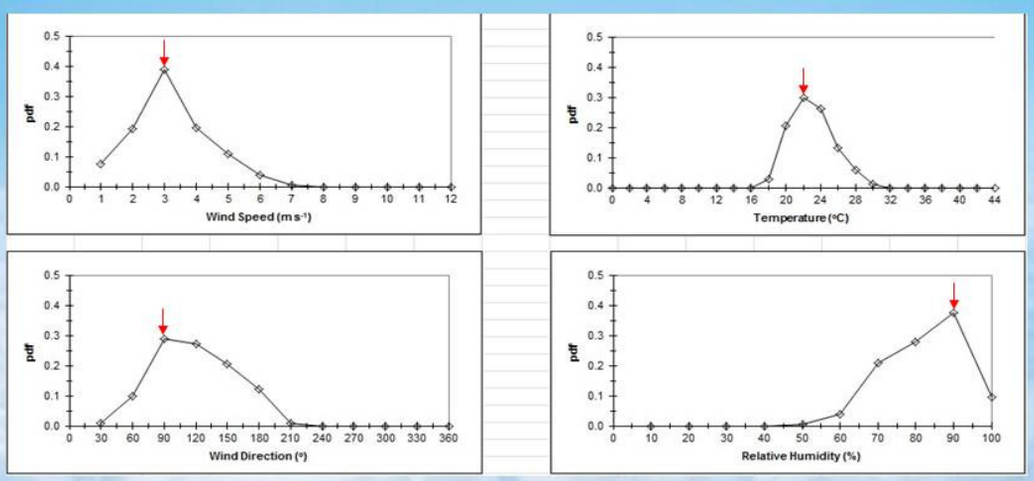
bandicam 2017-01-03 14-32-37-371.avi

IOA between Prediction and Observation Values

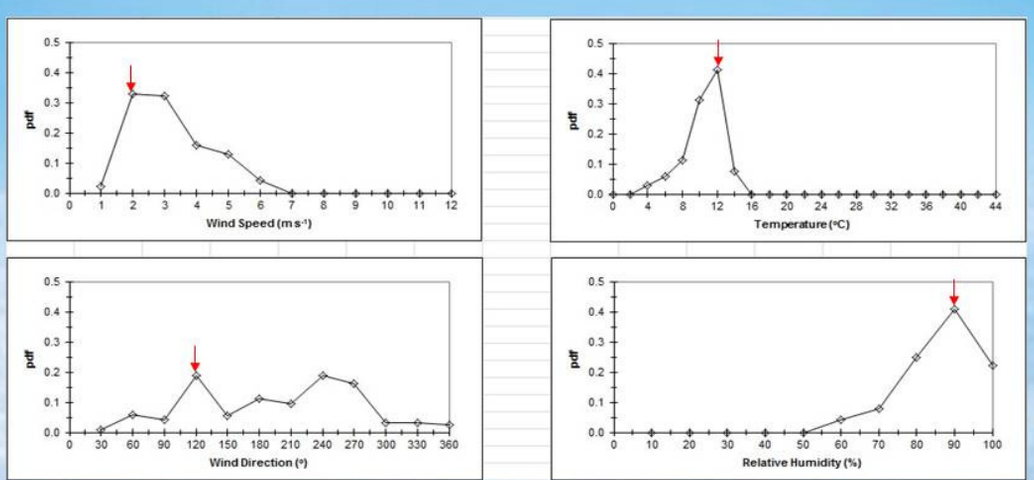
	WD (degree)	WS (m/s)	Temp. (℃)	RH (%)
January	0.79	0.59	0.59	0.95
July	0.65	0.73	0.85	0.99

IOA=Index of Agreement(0=no, 1=perfect)

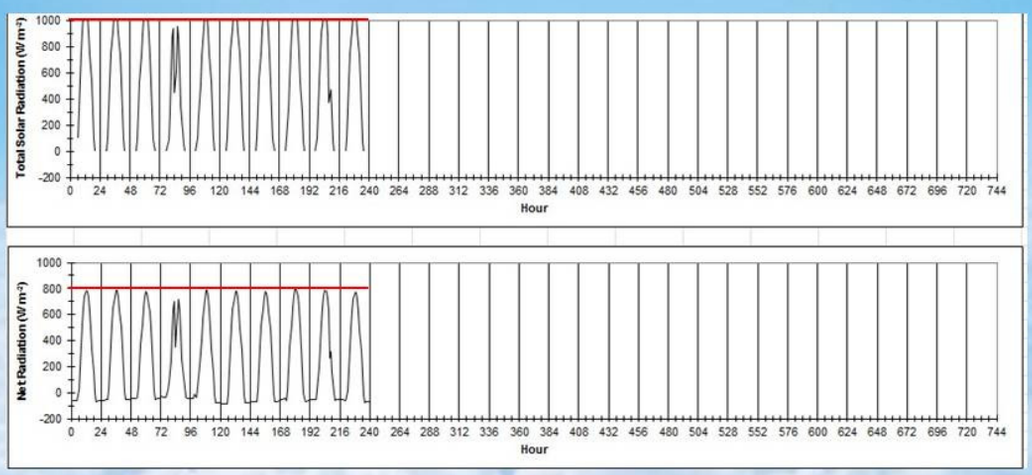
PDF frequency for wind, temperature and relative humidity in January



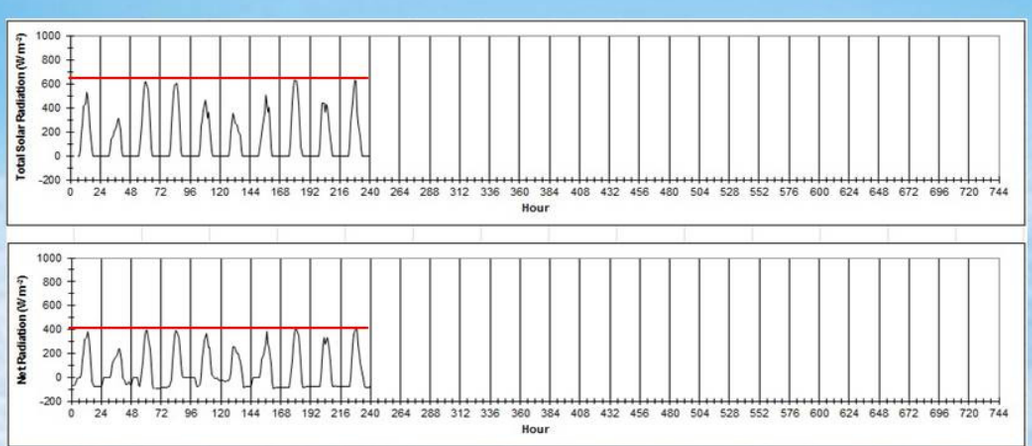
PDF frequency for wind, temperature and relative humidity in July



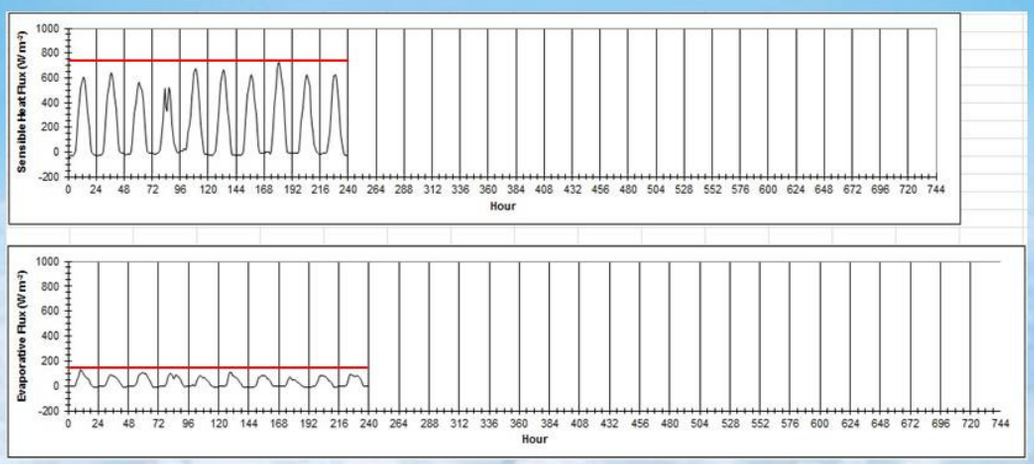
Hourly variation for total solar and net radiation in January



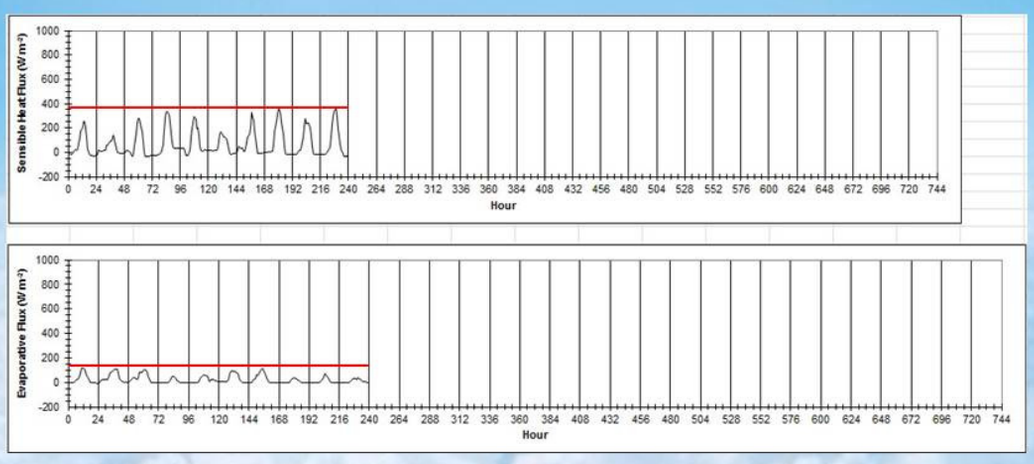
Hourly variation for total solar and net radiation in July



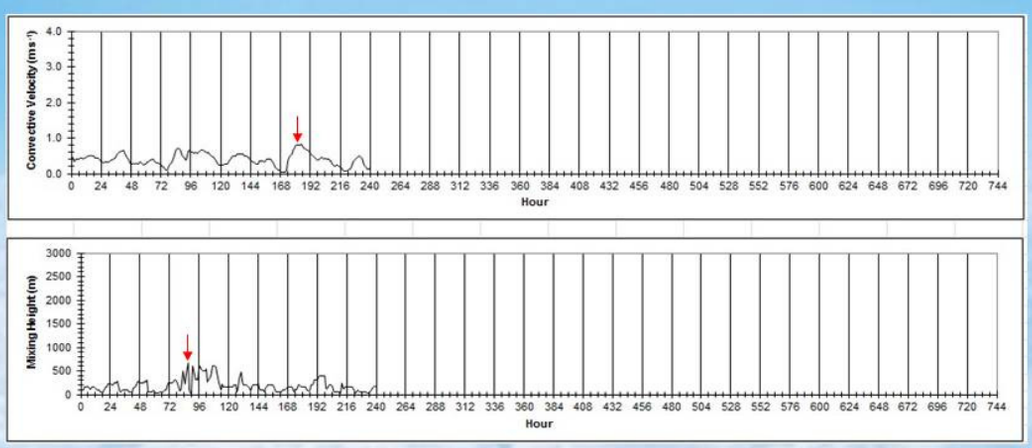
Hourly variation for sensible heat and evaporative flux in January



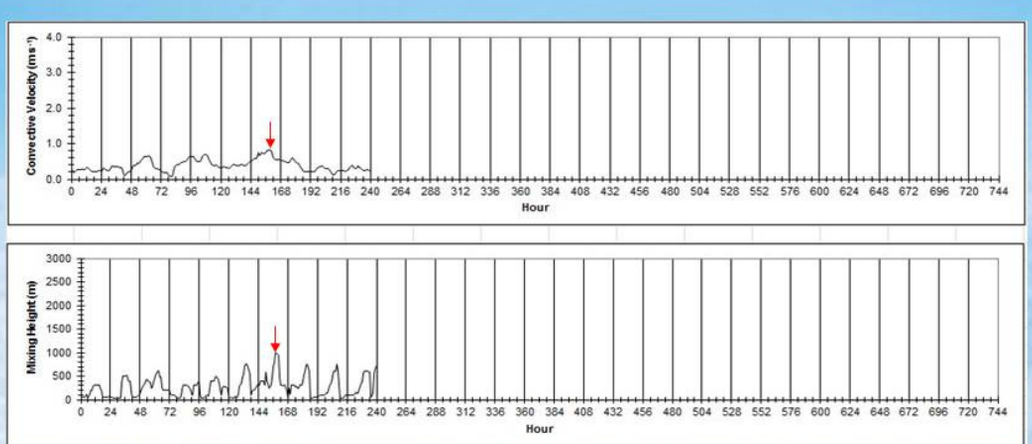
Hourly variation for sensible heat and evaporative flux in July



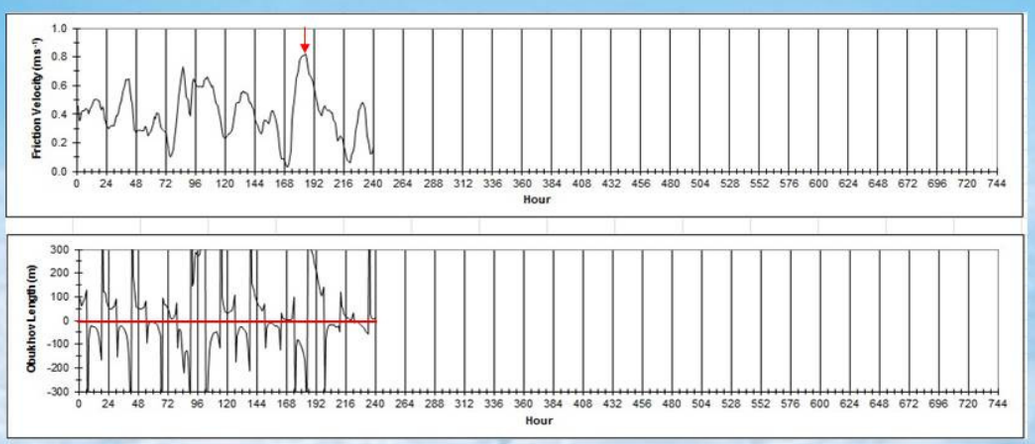
Hourly variation for convective velocity and mixing length in January



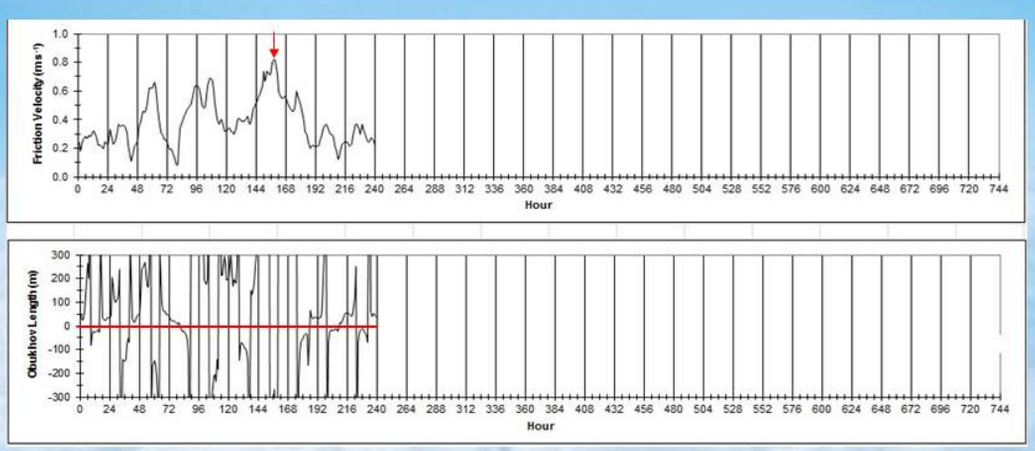
Hourly variation for convective velocity and mixing length in July



Hourly variation for friction velocity and Obukhov length in January



Hourly variation for friction velocity and Obukhov length in July



Conclusion

- **prevailing wind direction, averaged wind speed, temperature and relative humidity**
  - ◆ In January NE~92.5°, 2.4 m/s, 24.0℃, 67.1 %
  - ◆ In July, SSE~199.9°, 1.9 m/s, 9.1℃, 82.7 %
- **Averaged total solar (W/m^2), net radiation(W/m^2), sensible heat(W/m^2), evaporative flux(W/m^2), convective velocity(m/s), mixing length(m), friction velocity(m/s), and Obukhov length(m)**
  - ◆ In January, 366.4, 211.8, 175.9, 21.0, 0.8, 395.9, 0.5, 23.7
  - ◆ In July, 117.5, 44.5, 60.6 22.6, 0.4, 325.8, 0.4, 172.2
- **TAPM can be applied to useful science tool for understanding micro-meteorology, predicting air pollution, evaluation wind power energy in Buenos Aires**

HUFS-ITBA INTERNATIONAL CONFERENCE

CLIMATE CHANGE, RENEWABLE ENERGY AND CULTURAL COOPERATION

Session 5: Academic Study on Climate Change and Scientific Research

Session Chair: Ing. Norberto Lerendegui(ITBA)

■Dr. Yu-Woon, Jang(HUFS)
"The improvement of air quality using green harvest of sugar cane in Bauru, Brazil"

■Dra. Gloria Lucia Camargo(UPTC, Colombia)
"Co-composting of solid waste organic urban with sludge"

■Dra. Cecilia Smoglie(ITBA)
"Efficiency in hydrogen production, storage and combustion"

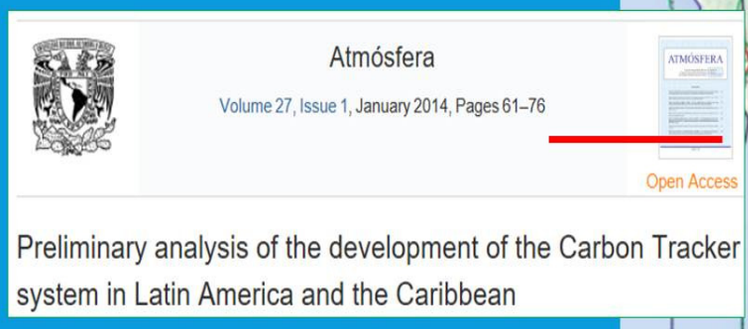
STUDY OF AIR QUALITY BY SUGARCANE BURNING IN BAURU, BRAZIL

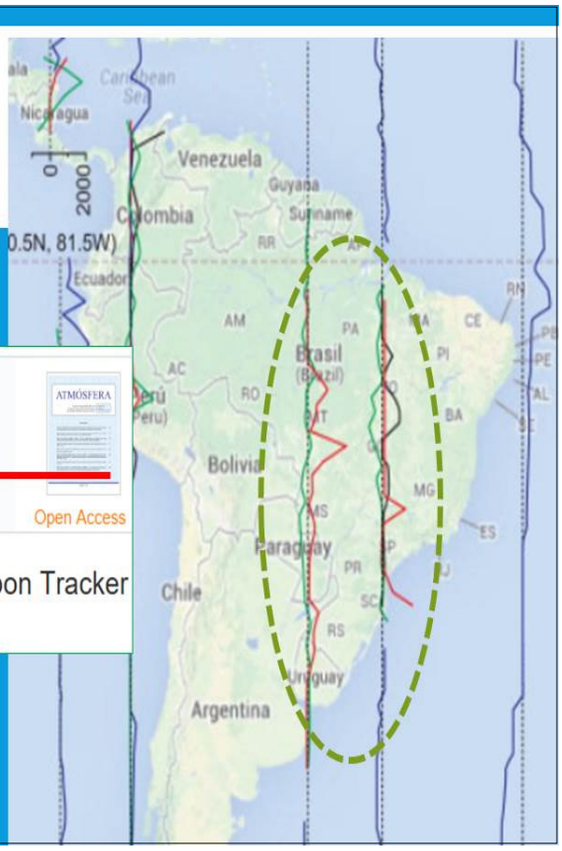
Yu Woon Jang & Il-Soo Park

Hankuk University of Foreign Studies, Korea

CO_2 FLUX IN LATIN AMERICA

Il Soo Park





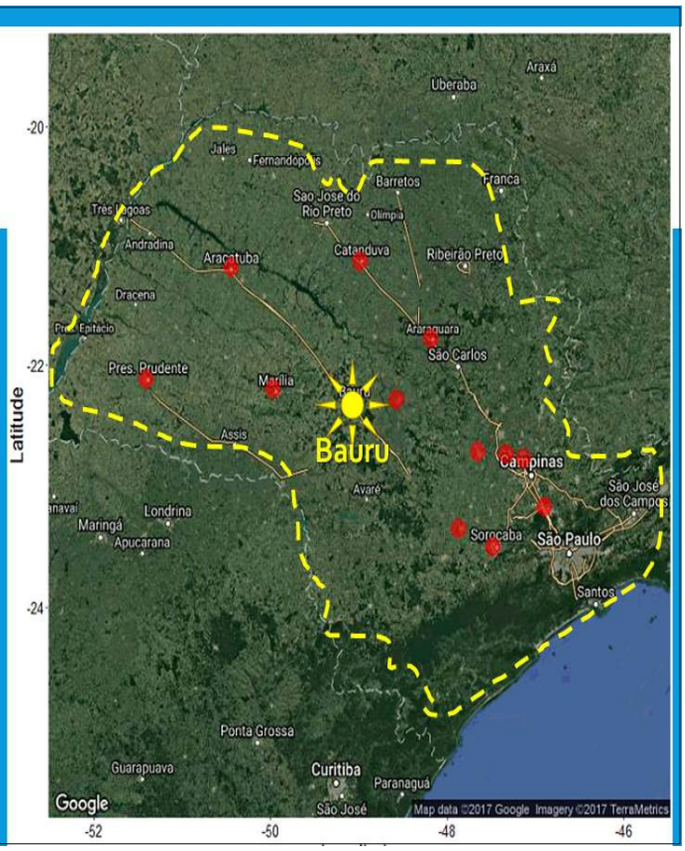
PRE-HARVEST BURNING IN SÃO PAULO, BRAZIL

CONTENTS

- **Pre-harvest burning** in São Paulo State
- **Impact of** air quality by pre-harvest burning
- **Evaluation** of improvement of air quality

BAURU AREA, SÃO PAULO STATE

- São Paulo state occupies 60% in Brazil
- Harvest period : May ~ October
- 13 air monitoring stations except metropolitan area
- Data : Aug.2008 ~ Oct.2016



LAW 11.241 AND GREEN ETHANOL PROTOCOL

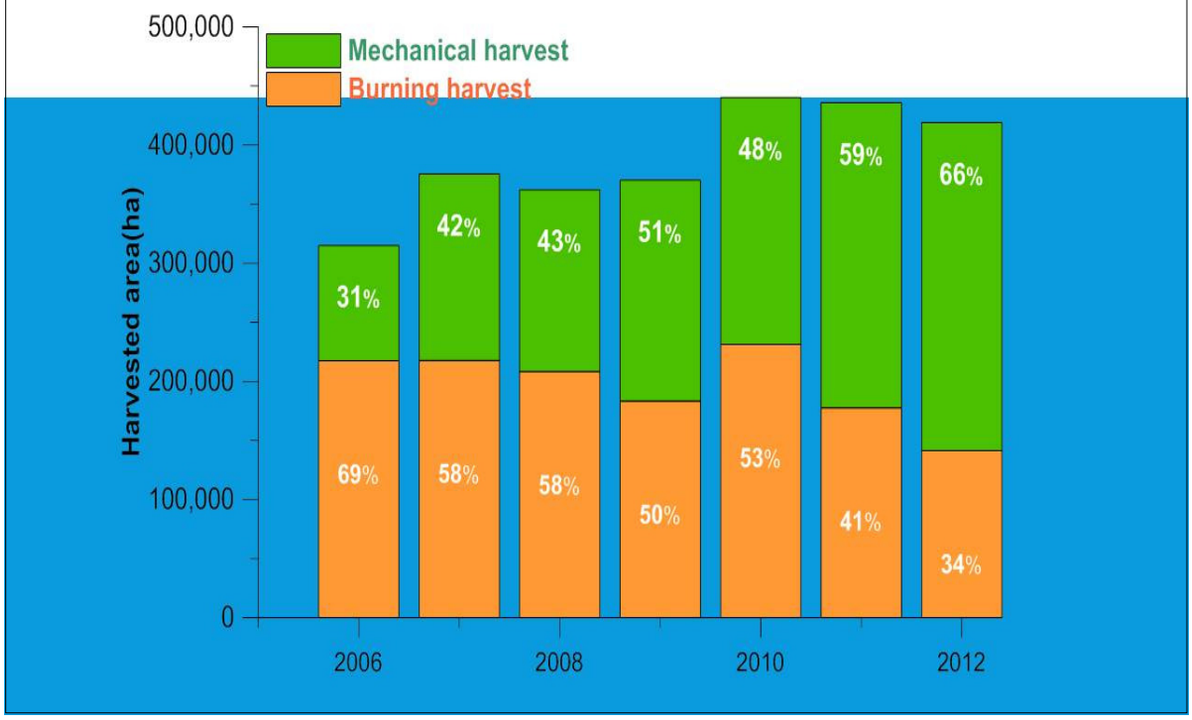
organization

- The São Paulo State **Law 11.241** establishes the **extinction** of the pre-harvest straw burning practice by the year **2021** for most of the sugarcane cultivated areas in São Paulo State.
- The **Green Ethanol Protocol** is an initiative of both the State government and **the sugarcane sector** to anticipate the end of the pre-harvest burning practice to the year **2014**.

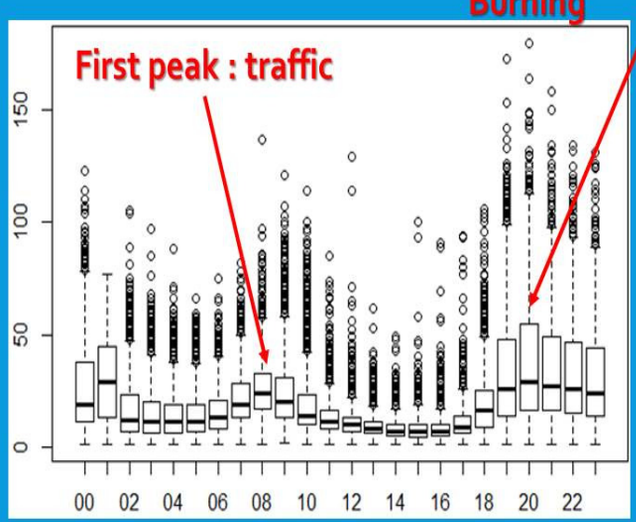
support

http://www.dsr.inpe.br/laf/canasat/en/crop.html

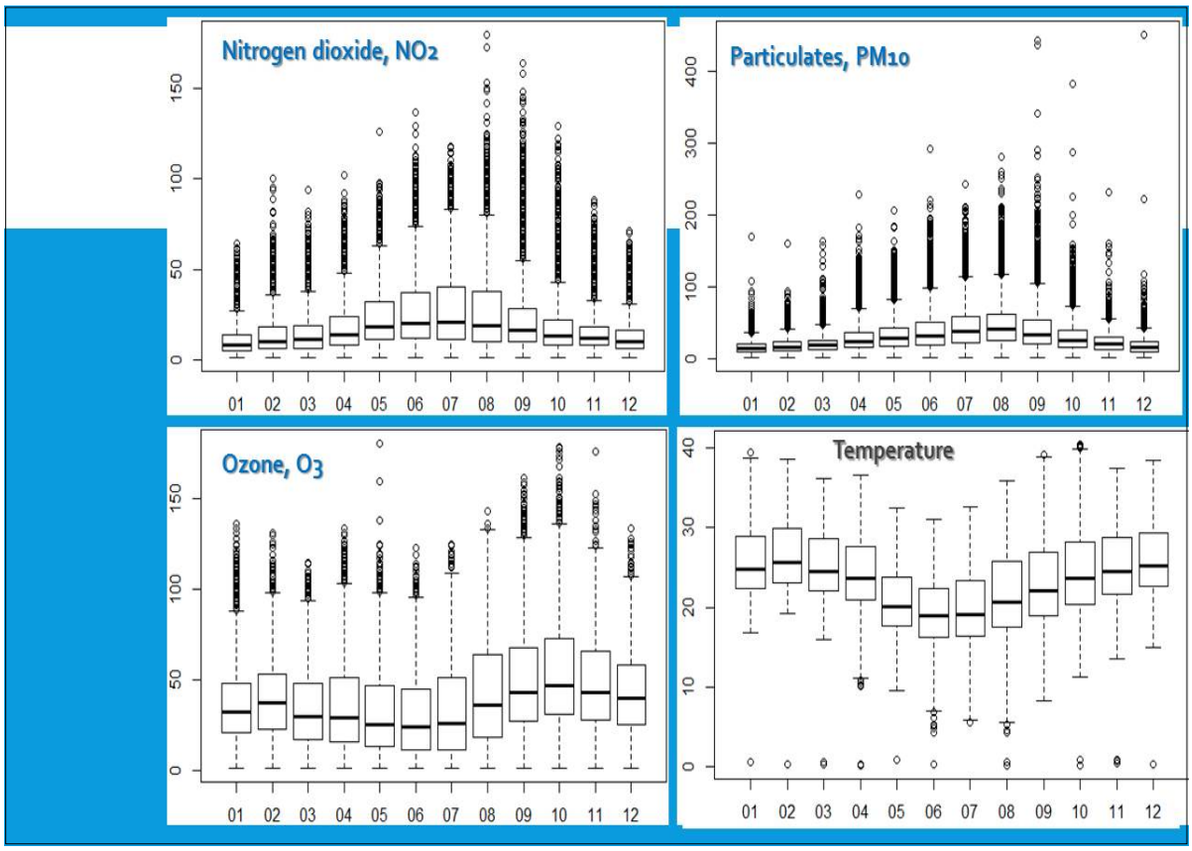
HARVEST METHOD : MECHANICAL AND BURNING

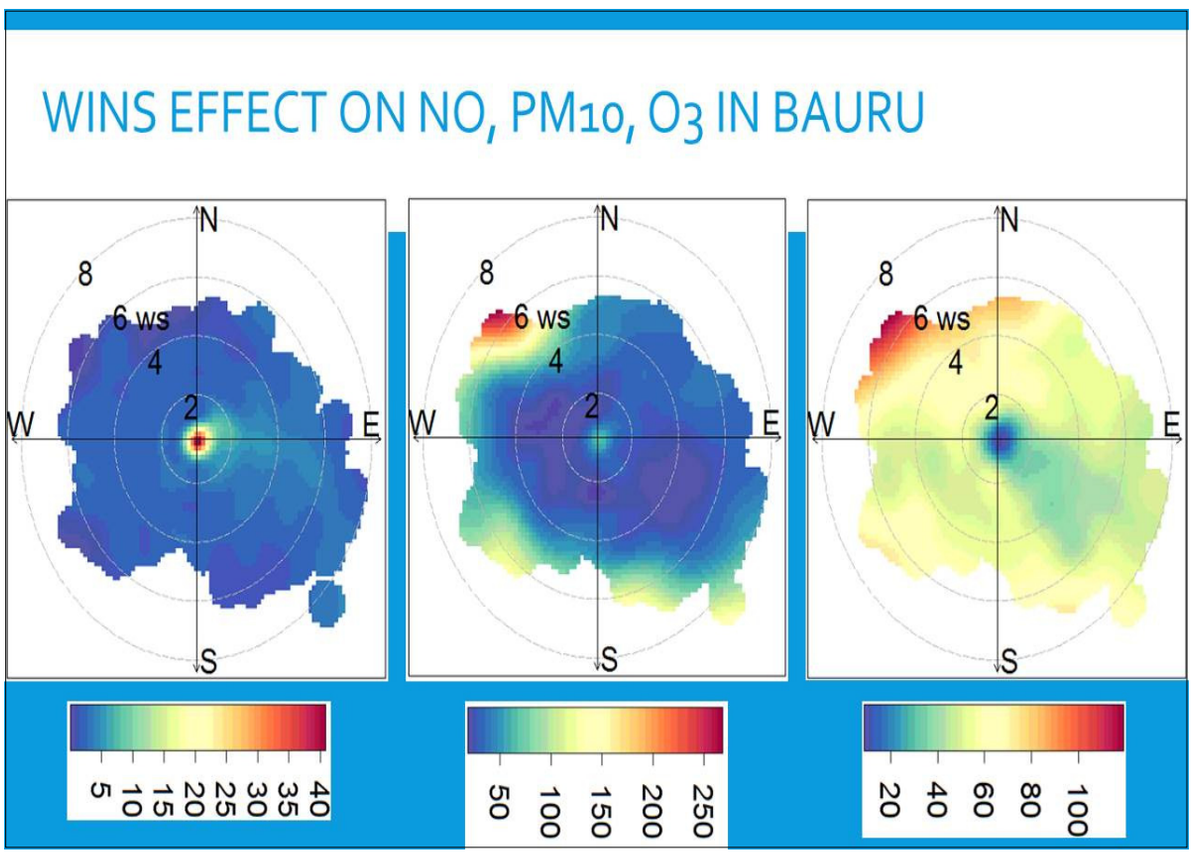


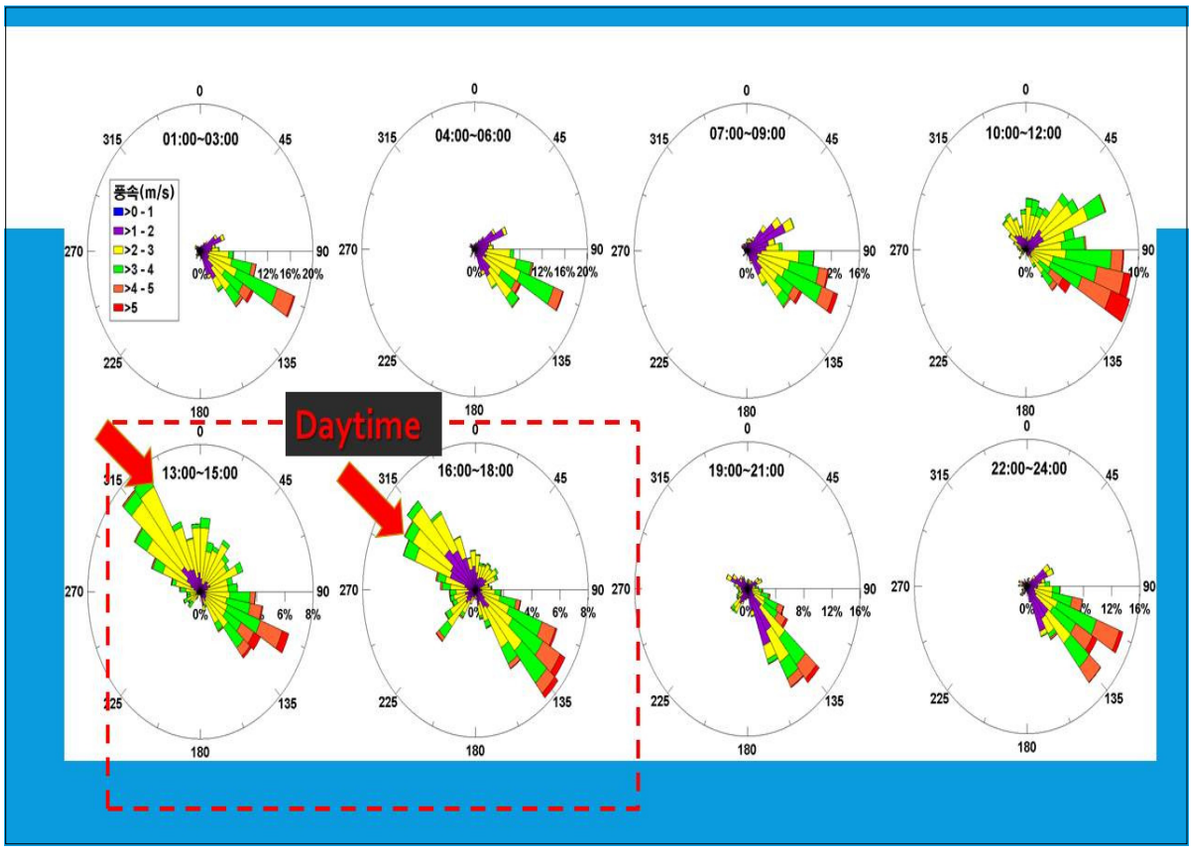
CURRENT STATE : DAILY VARIATION OF NO_2

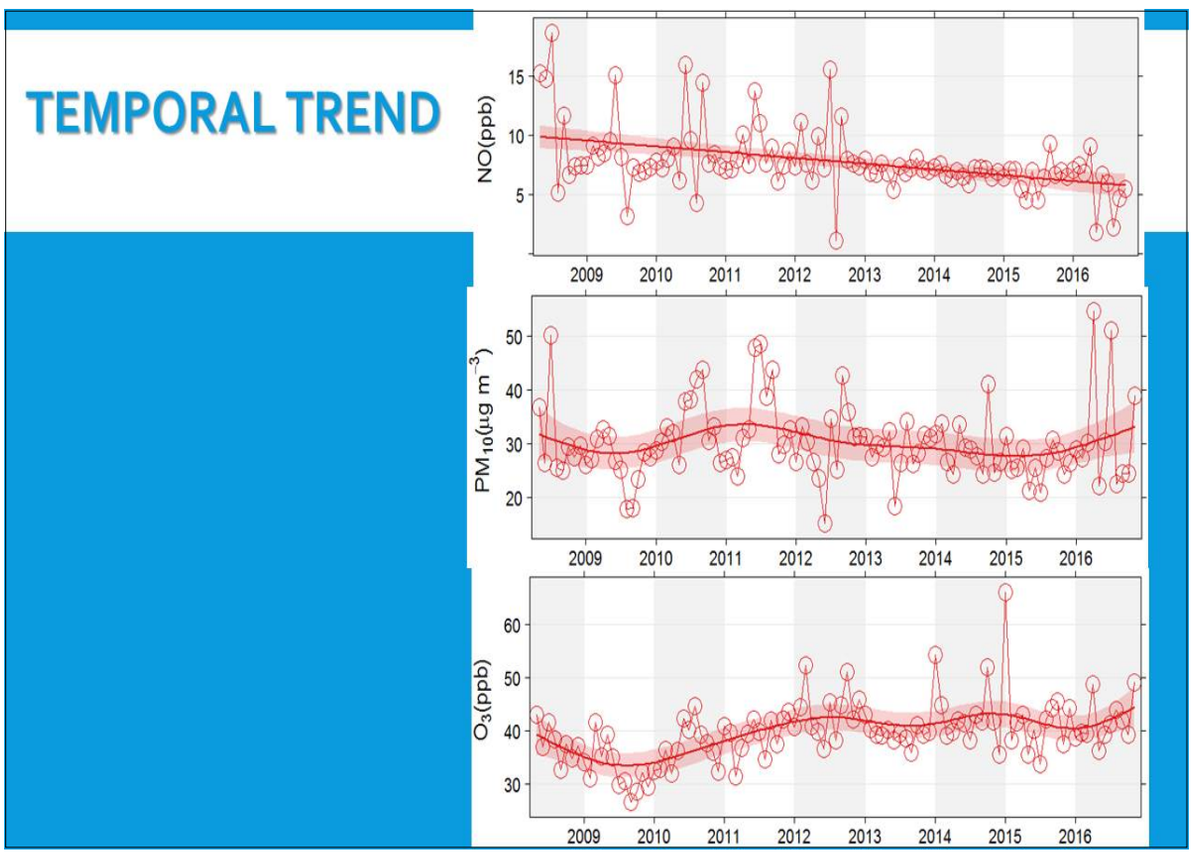


The sugarcane straw burning practice typically occurs **at night** (between 8:00 pm and 6:00 am local time) as required by the **environmental legislation** of the state of São Paulo.
(França et al., 2014)


Nitrogen dioxide, NO2
Particulates, PM10
Ozone, O3
Temperature
01 02 03 04 05 06 07 08 09 10 11 12


WINS EFFECT ON NO, PM10, O3 IN BAURU
N
S
W
E
8
6 ws
4
2
5 10 15 20 25 30 35 40
50 100 150 200 250
20 40 60 80 100


풍속(m/s)
>0 - 1
>1 - 2
>2 - 3
>3 - 4
>4 - 5
>5
01:00~03:00
04:00~06:00
07:00~09:00
10:00~12:00
Daytime
13:00~15:00
16:00~18:00
19:00~21:00
22:00~24:00

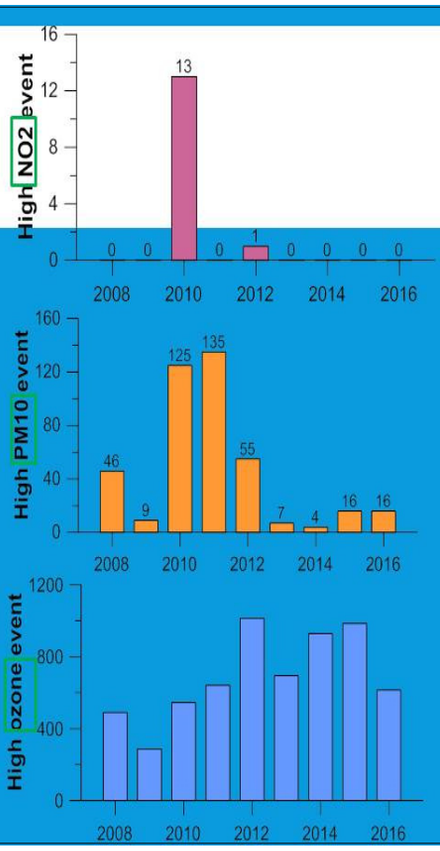

TEMPORAL TREND
NO(ppb)
PM10(μg m-3)
O3(ppb)
2009
2010
2011
2012
2013
2014
2015
2016

AIR QUALITY STANDARD, BRAZIL

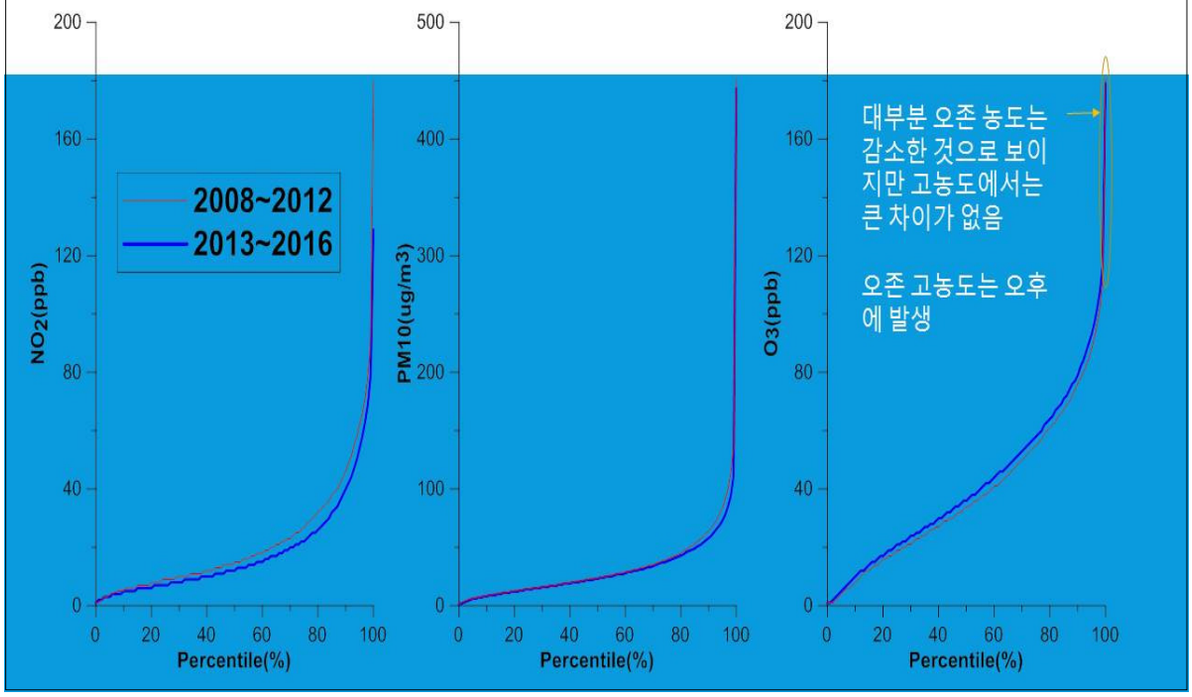
(ug/m³)

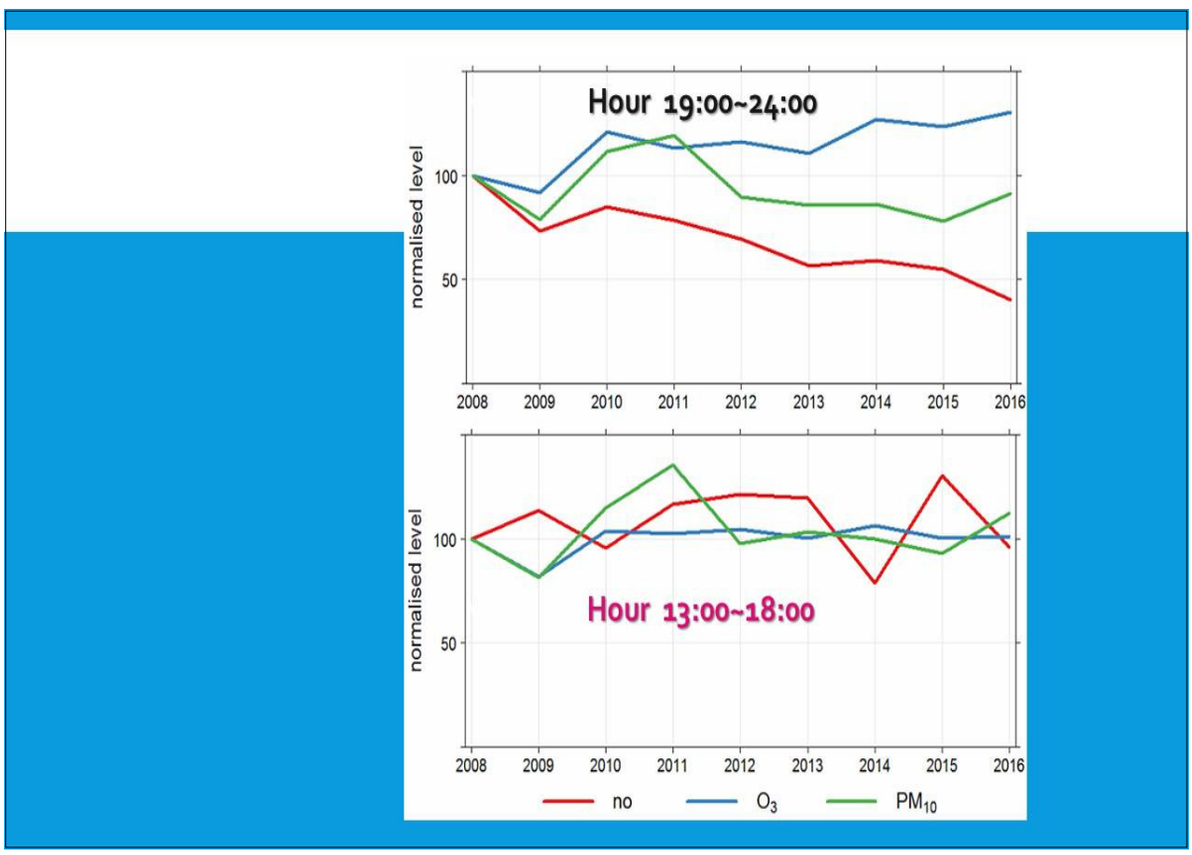
Pollutant	Average time	MI1	MI2	MI3	PF
PM10	24 hours	**120**	100	75	50
	1 year	40	35	30	20
NO2	24 hours	**260**	240	220	200
	1 year	60	50	45	40
O3	8 hours	**140**	130	120	100

TEMPORAL TREND

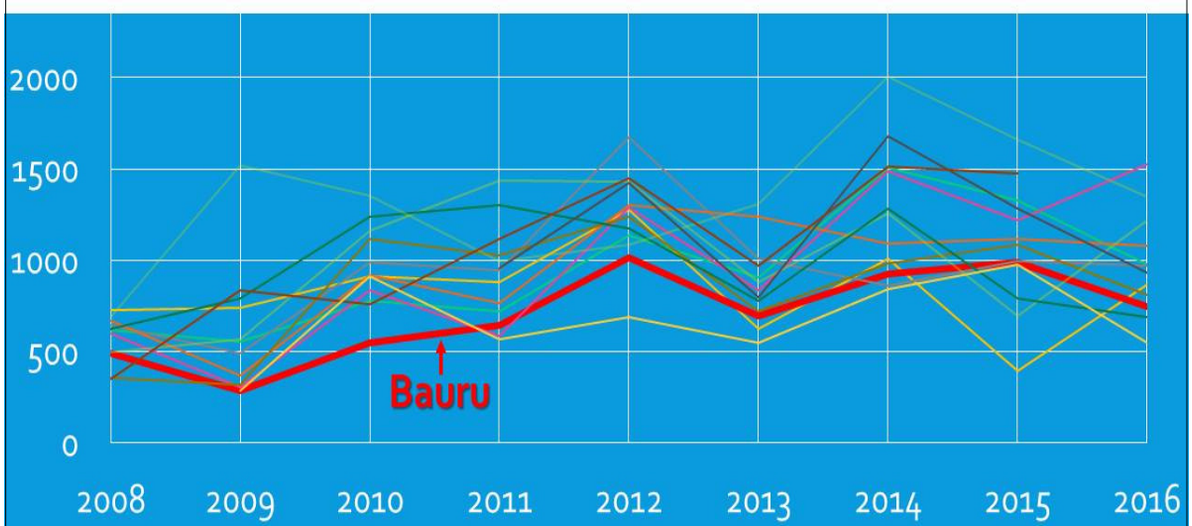


DIFFERENCE OF BEFORE AND AFTER 2012

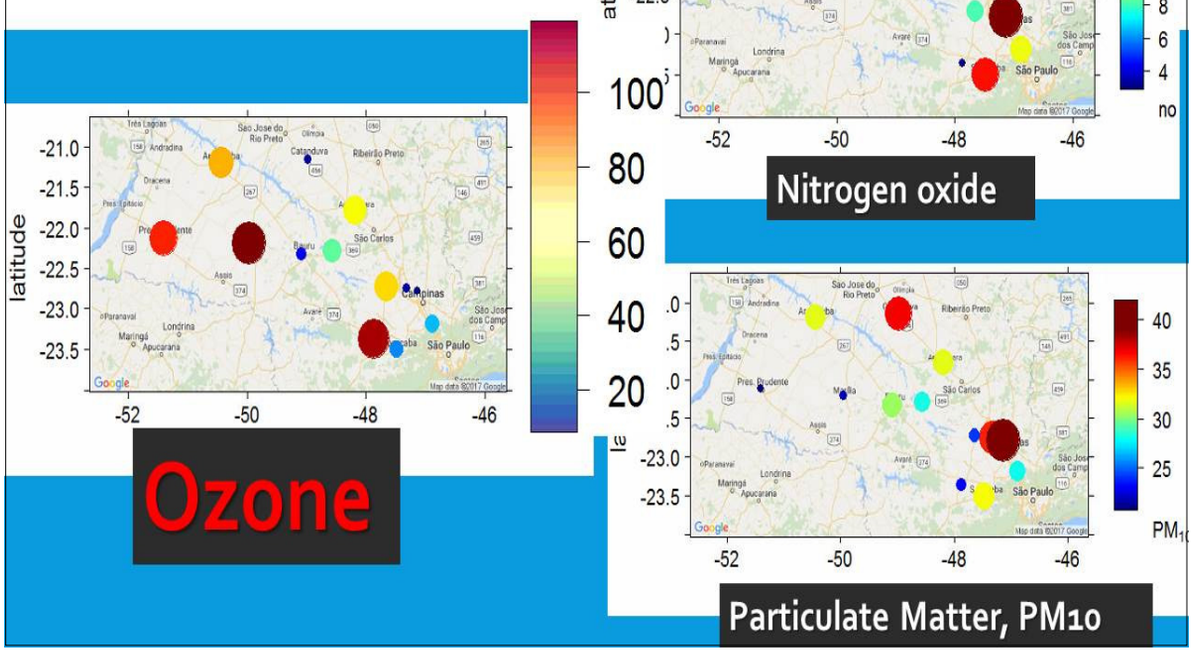




TREND OZONE CONC. IN 13 MONITORING STATIONS



YEARLY MEAN CONC. IN SAO PAULO STATE



CONCLUSION

- The state law would contribute to reduce the green house gases.
- NO change of the Ozone and NO during the day.
- To estimate the high ozone episode in other regions of São Paulo state.

CO-COMPOSTAJE DE RESIDUOS SÓLIDOS ORGÁNICOS URBANOS CON LODOS

GLORIA LUCIA CAMARGO MILLÁN*

RESUMEN

Los lodos de plantas de tratamiento de aguas residuales (PTAR) de municipios de Boyacá, poseen bajos contenidos de metales pesados tal y como lo requiere la normatividad colombiana, lo cual permite tener un gran potencial de aprovechamiento como mejoradores de suelos. Estos al ser empleados en la producción de cultivos ornamentales o en la recuperación de suelos dan lugar a un impacto ambiental positivo. Este proyecto desarrolló un ensayo en campo de co-compostaje de residuos orgánicos sólidos municipales con lodos de PTAR en un municipio de Boyacá encontrando la proporción óptima de estos materiales, caracterizando las dos materias primas y la mezcla más adecuada. Actualmente se están revisando los requerimientos para registrar el bioabono o mejorador de suelos ante los entes nacionales (Superintendencia de industria y comercio, e Instituto Colombiano de Agricultura (ICA)) con miras a su futura comercialización.

ABSTRACT

Sludge from wastewater treatment plants (WWTP) in municipalities of Boyacá has low levels of heavy metals as required by Colombian regulations, which allows a great potential for use as soil improvers. These, when used in the production of ornamental crops or in the recovery of soils, give rise to a positive environmental impact. This project developed a field trial of co-composting municipal solid organic waste with PTAR sludge in a municipality of Boyacá, finding the optimum proportion of these materials, characterizing the two raw materials and the most suitable mixture.

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Currently, the requirements for registering the biofertilizer or soil improver are being reviewed before national entities (Super intendency of industry and trade, and Colombian Institute of Agriculture (ICA)) with a view to its future commercialization.

PALABRAS CLAVE
Co-compostaje, lodos, bioabono.

KEY WORDS
Co-composting, sludge, biofertilizer.

INTRODUCCIÓN

En la actualidad se cuenta con un elevado potencial para el aprovechamiento de los lodos generados por las plantas de tratamiento de aguas residuales (PTAR) como abonos orgánicos, los cuales contribuyen con los requerimientos nutricionales de cultivos, y mejoran las condiciones físico-químicas del suelo. Las normas ambientales (Decreto 1287 de 2014 del Ministerio de Vivienda, Ciudad y Territorio de Colombia) exigen el cumplimiento de criterios específicos para el uso de los biosólidos producidos a partir de los lodos generados de las PTAR municipales y dada las características de los lodos en las PTAR de Boyacá, se podrían aprovechar para la producción y comercialización de bioabonos, en especial en la zona andina en donde se encuentran muchas regiones con altos índices de erosión. El co-compostaje tendría las siguientes ventajas: a) se reducen las emisiones de metano y generación de lixiviados; b) se extiende la vida útil de los rellenos sanitarios al eliminar la fracción orgánica de los residuos; c) se mejora la fracción de materia orgánica presente en el suelo lo que contribuye a la nutrición de cultivos y al uso sostenible de este recurso.

En términos generales el compostaje se puede definir como una biotécnica donde es posible ejercer un control sobre los procesos de biodegradación de la materia orgánica. La biodegradación es consecuencia de la actividad de los microorganismos que crecen y se reproducen en los materiales orgánicos en descomposición. La consecuencia final de estas actividades vitales es la transformación de los materiales orgánicos originales en otras formas químicas. Los productos finales de esta degradación dependerán de los tipos de metabolismo microbiano y de los grupos fisiológicos que hayan intervenido. Es por estas razones, que los controles que se pueden ejercer, siempre estarán enfocados a favorecer el predominio de determinados metabolismos y en consecuencia a determinados grupos fisiológicos. Lo importante no es biodegradar, sino poder conducir esta biodegradación por rutas metabólicas, que permitan la obtención de un producto final lo más apropiado posible, en el menor tiempo posible [1].

Todos los procesos de compostaje aerobio son similares en cuanto que incorporan tres pasos básicos: 1) preprocesamiento de los Residuos Sólidos Urbanos (RSU), 2) descomposición aerobia de la fracción orgánica de los RSU, y 3) preparación de comercialización del producto. Los tres métodos principales utilizados para el compostaje de la fracción orgánica de los RSU son hilera, pila estática aireada, y en biorreactor. Aunque estos procesos difieren principalmente en el método utilizado para airear la fracción orgánica de los residuos sólidos, los principios biológicos siguen siendo los mismos, y cuando se diseñan y se operan correctamente, todos producen un compost de similar calidad en aproximadamente el mismo periodo de tiempo [2].

La legislación Colombiana vigente exige unos criterios mínimos de calidad para el compost según la norma NTC 5167. De acuerdo a lo anterior, se deben tener en cuenta las siguientes consideraciones teóricas a la hora de realizar el diseño para el proceso de compostaje aerobio:

- Los tamaños óptimos de las partículas están entre 25 y 27mm.
- Las relaciones carbono-nitrógeno iniciales (por masa) de entre 25 y 50 son óptimas para el compostaje aerobio.
- El contenido de humedad debe estar entre el 50 y 60 por 100 durante el compostaje.
- Para prevenir el secado, encostramiento y la canalización del aire, el material que está compostándose debe ser mezclado o volteado regularmente o cuando sea necesario.
- La temperatura deberá mantenerse entre 50 y 55°C durante los primeros días y entre 55 y 60°C para el resto del periodo del compostaje activo
- El pH debe permanecer en el rango de 7 a 7,5 unidades.
- Aireación 40-60%.

Los lodos obtenidos de plantas de tratamiento de aguas residuales son una mezcla de aguas negras y sólidos sedimentados. Los sólidos extraídos por los diversos métodos en las plantas de tratamiento de aguas servidas, incluyen arenas, basuras y lodos, los cuales constituyen el subproducto más importante de los procesos de tratamiento. El lodo está compuesto principalmente por nutrientes, patógenos, metales, químicos orgánicos tóxicos y contenido orgánico. El lodo contiene tres nutrientes esenciales para el crecimiento de las plantas: nitrógeno, fósforo y potasio, sin embargo los niveles típicos están mucho más bajos que los fertilizantes comunes; en cuanto a patógenos, una significativa proporción de bacterias, virus, protozoos y huevos de helmintos llegan a concentrarse en un lodo durante el tratamiento de las aguas servidas. Un pequeño porcentaje de éstos puede causar enfermedades, es decir ser patógeno [3].

Las PTAR de Colombia generan 274 toneladas de biosólidos al día (94 toneladas base seca). El 97% de esta producción es generada por tres plantas: El Salitre (Bogotá), Cañaveralejo (Cali) y San Fernando (Medellín). Las características de los biosólidos obtenidos en las grandes plantas del país muestran que las concentraciones de la totalidad de los metales pesados analizados se mantienen por debajo de los límites máximos permitidos por las principales regulaciones internacionales. La

generación de biosólidos por parte de las grandes PTAR colombianas ha propiciado la investigación de este tipo de materiales, con el fin de identificar la mayor cantidad de formas de aprovechamiento y garantizar así la sostenibilidad ambiental del tratamiento de las aguas residuales. Los biosólidos de las PTAR de Colombia han permitido reducir los requerimientos de suelo orgánico para la cobertura final de los sitios de disposición final de residuos sólidos de las principales ciudades del país. De igual manera, han permitido recuperar suelos degradados por actividades antrópicas. Hasta el primer semestre de 2003 se habían cubierto más de 20 Ha con mezclas de biosólido suelo para cobertura final y recuperado más de 22 Ha de suelos degradados usando biosólidos de las PTAR de Colombia [4].

Los biosólidos son el producto resultante de la estabilización de la fracción orgánica de los lodos generados en el tratamiento de aguas residuales municipales, con características físicas, químicas y microbiológicas que permiten su uso (Decreto 1287, 2004). La estabilización se realiza para reducir su nivel de patogenicidad, su poder de fermentación y su capacidad de atracción de vectores. Gracias a este proceso, el biosólido tiene aptitud para utilización agrícola y forestal, y para la recuperación de suelos degradados [4].

Cofie et al. (2009), estudiaron el potencial y el rendimiento del tratamiento combinado de lodos fecales y residuos sólidos urbanos a través del co-compostaje. Ellos investigaron el tipo apropiado de residuos sólidos urbanos, la relación de mezcla de residuos sólidos/lodos fecales y el efecto de la frecuencia del volteo en la madurez y calidad del compost, ellos combinaron los residuos sólidos con lodos fecales deshidratados en las proporciones de mezcla de 2:1 y 3:1 en volumen y compostaron aeróbicamente durante 90 días, después de cuatro ciclos de compostaje realizaron una caracterizaron para establecer el tipo de residuo sólido apropiado y la proporción de mezcla. Además como cultivo indicador plantaron berro. Los resultados mostraron una preferencia de residuos de mercado sobre los residuos de casa y la relación de mezcla de 2:1 sobre 3:1. Una duración de co-compostaje de 12 semanas fue indicada por la prueba de berro para lograr un producto maduro y estable [6].

Bien et al. (2013), estimaron la dosis óptima de lodos de depuradora en la mezcla de compostaje con el fin de obtener un compost maduro y estable. La mezcla se preparó a partir de lodos de depuradora (10-40%), la fracción orgánica de los residuos sólidos municipales (30%), hierba (20-50%) y aserrín como agente de carga. La temperatura máxima en el biorreactor alcanzó 68,9 °C entre primero y tercero día de compostaje, y la temperatura media durante este período fluctuó 36-46 °C. Más tarde, la temperatura disminuyó gradualmente y después de 30 días de compostaje se acercaba a la temperatura ambiente, que significo el fin del proceso. Observaron que la inactivación de los huevos de helmintos en el compost se puede lograr, si la temperatura en el interior del reactor es suficientemente alta; además, como un proceso exotérmico, el compostaje causó alta pérdida de agua en el material compostado. Obtuvieron un material compostado de apariencia y estructura similar a la de un suelo hortícola [7].

Torres et al., (2007), muestran la viabilidad del proceso de compostaje de biosólidos de la PTAR Cañaveralejo de Cali, siendo necesario incorporar materiales de soporte y de enmienda que aporten estructura, manejabilidad y mejoren la relación C/N tanto inicial como final. Los materiales que mostraron los mejores resultados fueron el residuo de poda y la cachaza en porcentajes del 10 y 18 % respectivamente. Con el proceso de compostaje obtuvieron una reducción en peso de las pilas de biosólido del 70% [7].

Torres et al., (2008), evaluaron la estabilización alcalina del compost obtenido a partir la planta de tratamiento de aguas residuales Cañaveralejo de Cali, Colombia (PTAR-C), utilizando ceniza de calderas de una industria papelera, Cal Hidratada (CH) y Cal Viva (CV), en combinaciones con el compost del 8, 15 y 30% para CH y ceniza y de 15% para CV, en proporciones peso a peso. Durante 13 días se monitoreó temperatura, pH, humedad, coliformes fecales y huevos de helmintos. Los resultados obtenidos mostraron que CV y CH al 15% lograron elevar el pH a 12 unidades por más de 72 horas y obtener cero huevos de helmintos viables, lo que muestra una eficiente reducción de patógenos y el alcance de estándares para compost clase A, lo que no se alcanzó con la ceniza en las proporciones evaluadas. En términos de humedad, CV al 15% presentó mejor desempeño que CH, la cual requirió un 30% y de 3 a 5 días para reducir la humedad hasta el 20% sugerido para la aplicación agrícola de compost [8].

MATERIALES Y MÉTODOS

Este proyecto se desarrolló siguiendo las siguientes fases:

FASE 1. MUESTREO Y CARACTERIZACIÓN DE MATERIAS PRIMAS PARA EL CO-COMPOSTAJE

Esta fase tuvo como objetivo establecer las características físicas y químicas para los lodos de PTAR, y los residuos orgánicos urbanos del municipio de Chinavita. El muestreo de residuos orgánicos se hizo según la norma ASTM D5231- 92 (2008) Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste; para el muestreo de lodos de PTAR se consideró la NTC – ISO 5667-13 (Gestión ambiental. Calidad de agua. Parte 13. Guía para el muestreo de lodos de aguas residuales y plantas de tratamiento de aguas), la resolución No. 0062 de 2007. IDEAM (protocolos de muestreo y análisis de laboratorio para la caracterización fisicoquímica de los residuos o desechos peligrosos. La determinación de los parámetros fisicoquímicos se realizó en el laboratorio Ambiental de la Universidad de los Andes, acreditado ante el IDEAM, en las tablas 1 y 2 se presentan los parámetros evaluados.

Tabla 1.Parámetros Evaluados RSOU.

PARAMÉTRO	MÉTODO
Materia Orgánica	MT-PRE-043 SSSA SERIE 5
As	EPA 3051-A Revisión 1A- 2007 y EPA 6010-C Revisión 3-2007
Cd	
Zn	
Cu	
Hg	
Ni	
Pb	
Se	
Humedad	MT-PRE-032
Sólidos Totales	MT-PRE-073
Nitrógeno Total Kjeldhal	MT-PRE-081
Fósforo Total	MT-PRE-038 y SM-4500PC, edición No 22 – 2012

Fuente: Este estudio.

Tabla 2. Parámetros Evaluados lodos PTAR.

PARAMÉTRO	MÉTODO
Sólidos Totales	SM 2540G Edición 22-2012.
Solidos fijos	SM 2540G Edición 22-2012.
Humedad	SM 2540G Edición 22-2012.
Sólidos Volátiles	SM 2540G Edición 22-2012.
pH en suelos a 22,1°C	EPA SW-846 9045 D-Revisión 4-2004.
Materia Orgánica	MT-PRE-043 SSSA SERIE 5
Nitrógeno Total Kjeldhal	MT-PRE-081
As	EPA 3051-A Revisión 1A- 2007 y EPA 6010-C Revisión 3-2007
Cd	
Zn	
Cu	
Hg	
Ni	
Pb	
Se	

Fuente: Este estudio.

FASE 2. OBTENCIÓN DEL BIOABONO

Al co-compost obtenido se le realizó una caracterización en la Universidad de los Andes, determinando los parámetros de la tabla 3.

Tabla 3. Parámetros Evaluados Bioabono.

Parámetro	Método
Arsénico As)	EPA 3051-A Revisión 1A- 2007 y EPA 6010-C Revisión 3-2007
Cadmio (Cd)	
Mercurio (Hg)	
Níquel (Ni)	
Plomo (Pb)	
Coliformes Fecales	Número más probable y confirmación en medio de cultivo EMB Merk (UFC)
Salmonella s.p	Número más probable y confirmación en medio de cultivo Salmonella-Shigella Merk (UFC)
Huevos de Helminto	Norma Mexicana NMX-AA-113-SCFI-1999
Sólidos Totales	SM 2540G Edición 22-2012.
Solidos fijos	SM 2540G Edición 22-2012.
Humedad	SM 2540G Edición 22-2012.
Sólidos Volátiles	SM 2540G Edición 22-2012.
pH en suelos a 22,1°C	EPA SW-846 9045 D-Revisión 4-2004.
Materia Orgánica	MT-PRE-043 SSSA SERIE 5
Nitrógeno Total Kjeldhal	MT-PRE-081

Fuente: Este estudio.

FASE 3. REVISIÓN DE TRAMITES ANTE EL INSTITUTO COLOMBIANO AGROPECUARIO (ICA)

Los procesos a tenerse en cuenta para el trámite y obtención del registro ICA, se presentan a continuación:

- Teniendo como referencia la Resolución 150 de 2003 del ICA, se dará inicio al proceso con el trámite del Registro de la Empresa, en este caso la empresa de servicios públicos de Chinavita, de acuerdo con los requisitos de su Artículo 4, una vez registrada la empresa, se procederá a realizar la prueba de eficacia, la cual será contratada con un tercero, y su protocolo se presentará previamente

para su revisión y aprobación del ICA. Con los resultados de la Prueba de Eficacia y demás requisitos contemplados en el Artículo 26 de la resolución, se procederá a iniciar el trámite de Registro ICA del bioabono, el tiempo promedio requerido para obtener este registro es de 7 a 12 meses.

RESULTADOS Y ANALISIS DE RESULTADOS

- Resultados y análisis de la caracterización físico-química de las materias primas

En las tablas 4 y 5, se presentan los resultados obtenidos de la caracterización físico-química de los lodos de PTAR y de los RSOU, respectivamente.

Tabla 4. Características fisicoquímicas del lodo de PTAR.

PARAMÉTRO	UNIDADES	VALOR
Sólidos Totales	% BH	44.9
Solidos fijos	% BS	75.3
Humedad	% BH	55.1
Sólidos Volátiles	% BS	24.7
pH en suelos a 22,1°C	UNIDADES	5.09
Materia Orgánica	% BS	14.3
Nitrógeno Total Kjeldhal	% BS	0.20
As	mg/Kg BS	<14.7
Cd	mg/Kg BS	“4.06”
Zn	mg/Kg BS	380
Cu	mg/Kg BS	62.7
Hg	mg/Kg BS	<5.07
Ni	mg/Kg BS	“10”
Pb	mg/Kg BS	44.0
Se	mg/Kg BS	<11.04

Fuente: Este estudio, resultados del laboratorio de Ambiental. Universidad de los Andes.

En la tabla 4, se pueden observar que los valores obtenidos para: Sólidos totales de 44.9 %BH (Base Húmeda), Sólidos fijos del 75.3%BS, Humedad del 55.1%BHy sólidos volátiles del 24.7% BS, son valores típicos para esta clase de material, De acuerdo con Mendoza y Vigíl (2012), la cantidad y composición de los lodos varía según las características de las aguas negras de donde hayan sido retirados y depende, sobre todo del proceso de tratamiento por medio del cual hayan sido obtenidos [10]. El pH es ligeramente acido (5.09 unidades), respecto al contenido de materia orgánica y de nitrógeno total, se observa que estos valores son importantes, al considerar la conversión en bioabono,

siendo estos del 14.3 y 0.20 mg/Kg BS, respectivamente. En lo referente a los metales pesados, al comparar los valores obtenidos con los del decreto 1287 de 2014 [11], se encuentra que todos están en concentraciones inferiores a las máximas permisibles, clasificándose como lodo tipo A. Es de gran importancia regular la concentración de metales en los biosólidos, debido a la posibilidad de incrementar la disponibilidad de algunos de ellos que pueden causar problemas de fitotoxicidad o acumulación en los cultivos, sin embargo, el riesgo de lixiviación de metales a los acuíferos es poco probable siempre y cuando los biosólidos no contengan altas concentraciones de ellos (Jiménez et al., 2001), [12].

Tabla 5. Características fisicoquímicas del RSOU.

PARAMÉTRO	UNIDADES	VALOR
Materia Orgánica	% BS	46.4
As	mg/Kg BS	<14.7
Cd	mg/Kg BS	<2.76
Zn	mg/Kg BS	20.9
Cu	mg/Kg BS	<9.25
Hg	mg/Kg BS	<5.07
Ni	mg/Kg BS	<2.07
Pb	mg/Kg BS	“4.44”
Se	mg/Kg BS	<11.4
Humedad	% BH	77.1
Sólidos Totales	% BH	22.9
Nitrógeno Total Kjeldhal	% BS	0.36
Fósforo Total	% BS	1.16

Fuente: Este estudio, resultados laboratorio Ambiental de la Universidad de Los Andes.

A partir de la tabla 5, se puede observar que el contenido de humedad es elevado (77.1%BH/), para el proceso de compostaje, considerando que se realiza la mezcla con otros materiales, en este caso el lodo de PTAR y aserrín, buscando disminuir el contenido de agua del co-compost. De acuerdo con los valores obtenidos para los metales pesados se observa que se encuentran por debajo de los valores recomendados en la norma NTC 5167, por lo anterior este material se recomienda para obtener el bioabono. Respecto al Nitrógeno total y el fósforo total se encuentra que estos parámetros están en proporciones adecuadas según NTC 5167.

- Resultados prueba de co-compostaje

Se puede concluir que se obtuvo un co-compost de buena calidad, para esto se constituyó una mezcla del 33% de lodo y 67% de los RSUO, se agregó aserrín como material de soporte, cal apagada para ajustar pH y Microorganismos Eficientes (EM) para desarrollar el proceso de una manera más eficiente. A los RSUO se les redujo el tamaño de partícula con una trituradora, se procedió a realizar el montaje de una celda con esta mezcla, a la cual se le realizó volteo periódicamente cada semana; la duración del proceso fue de 8 semanas. En la tabla 6, se presentan los resultados de la caracterización fisicoquímica del co-compost obtenido.

Tabla 6. Características fisicoquímicas y microbiológicas co-compost obtenido

PARÁMETRO	UNIDADES	VALOR
Arsénico As)	mg/Kg BS	8.72
Cadmio (Cd)	mg/Kg BS	3.3
Mercurio (Hg)	mg/Kg BS	<1.72
Cobre (Cu)	mg/Kg BS	46
Selenio (Se)	mg/Kg BS	<3.57
Zinc (Zn)	mg/Kg BS	161
Níquel (Ni)	mg/Kg BS	9.5
Plomo (Pb)	mg/Kg BS	20.7
Coliformes Fecales	NMP/g de biosólido	10
Salmonella s.p	NMP/25g de biosólido	Ausencia
Huevos de Helminto	HH/4g de biosólido	0

CONCLUSIONES

Es viable obtener co-compost a partir de los lodos de PTAR y de los residuos sólidos urbanos orgánicos del municipio de Chinavita, considerando la calidad de las materias primas principalmente en lo que respecta a la concentración de metales pesados (valores inferiores al límite máximo permisible), lo que reduce la migración de los mismos al suelo. Por otra parte el elevado contenido de materia orgánica, fosforo y nitrógeno permite que el bioabono sea empleado como mejorador de suelos.

La tecnología para producir el co-compost es sencilla de implementar y este ensayo puede ser replicado por otras empresas de servicios públicos municipales en la región. Se considera fundamental el reducir con esta tecnología el porcentaje de residuos sólidos orgánicos que se envían al relleno sanitario, logrando de esta manera reducir las emisiones de metano y la generación de lixiviados,

incrementar la vida útil del relleno sanitario al eliminar la fracción orgánica de los residuos, finalmente se mejora la fracción de materia orgánica del suelo lo que contribuye a la nutrición de los cultivos y al uso del recurso suelo en una forma sostenible.

Se debe completar el ejercicio de solicitud de permisos ante el ICA, con el fin de lograr comercializar el bioabono de tal forma que se valoriza un subproducto de la planta de tratamiento de aguas residuales y hace más sostenible su operación, por otra parte se recomienda realizar campañas de concientización ambiental para que la comunidad acepte el producto.

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Efficiency in hydrogen production, storage and combustion

Dr. Ing. Cecilia Smoglie
ITBA

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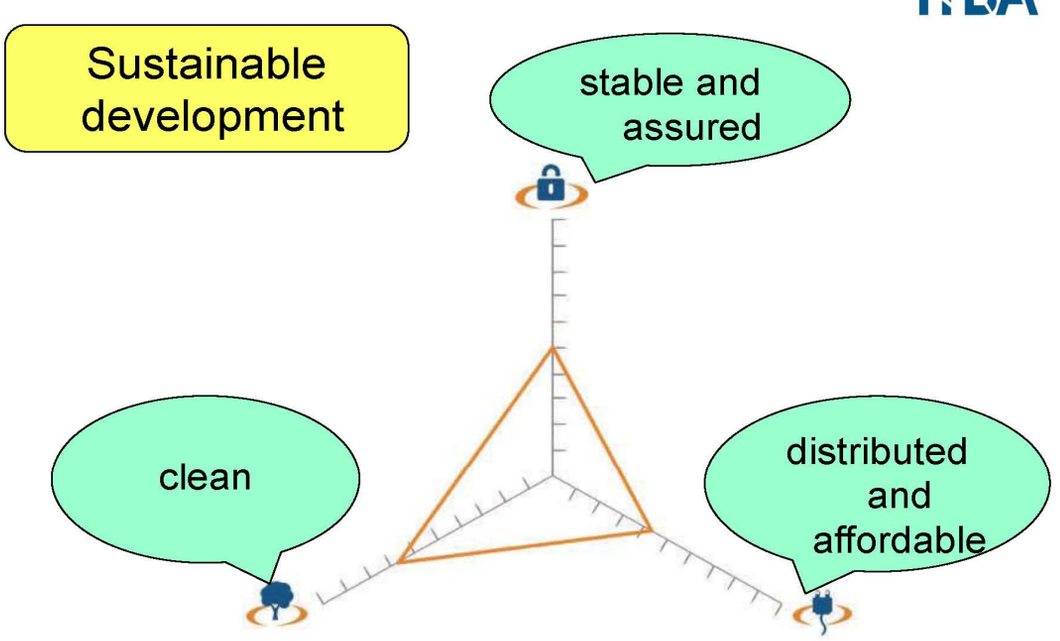

Source: World Energy Council

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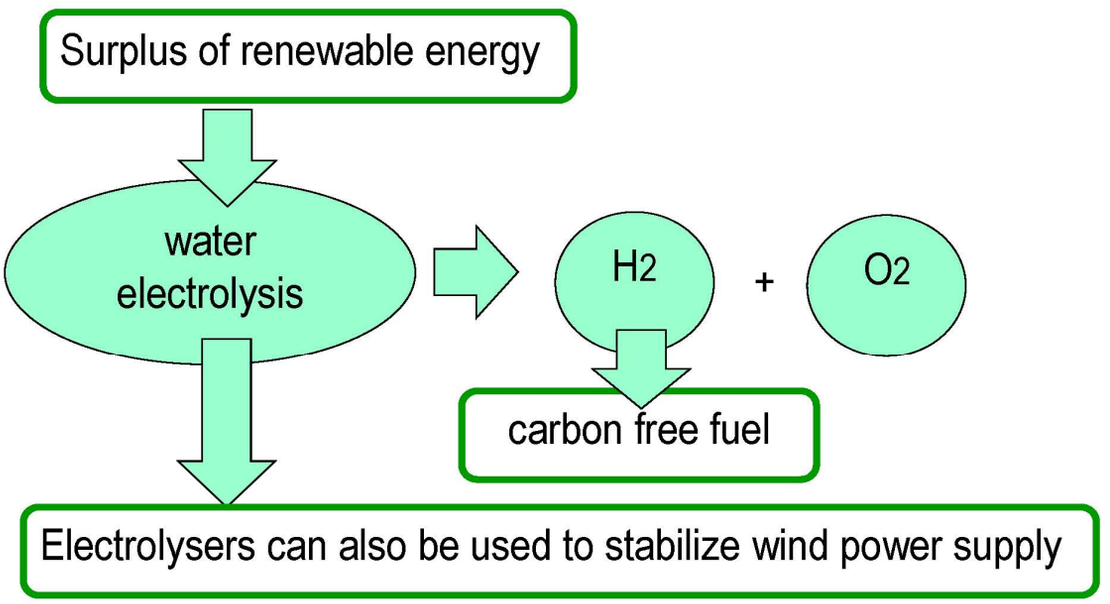
Clean, stable, distributed and affordable energy



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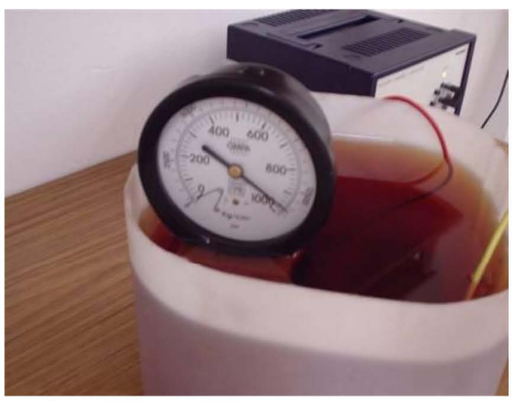
Technology for efficiency in the hydrogen chain

- Selfpressurized electrolysers
- Catalytic hydrogen cleaning
- Innovative hydrogen storage
- Clean hydrogen combustion

Test of electrolytic reaction at high pressure



ITBA Electrolyser Prototypes

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Technology for efficiency in the hydrogen chain

- Selfpressurized electrolysers
- Catalytic hydrogen cleaning
- Innovative hydrogen storage
- Clean hydrogen combustion

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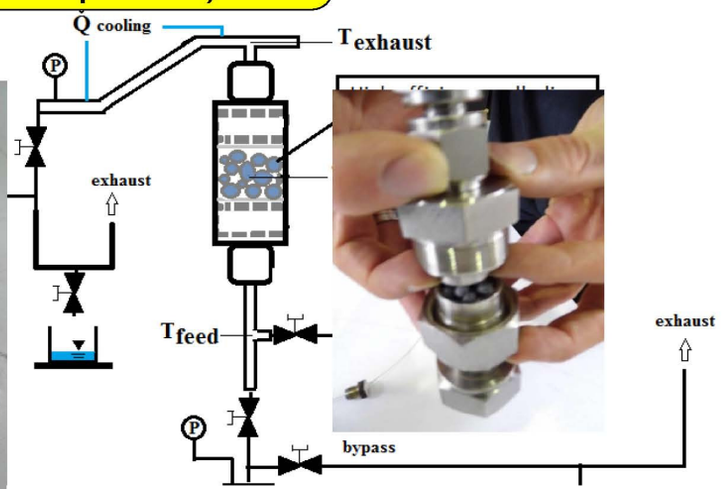
Comparison of the obtained hydrogen purity

Company	Casale Chemicals	ErreDue	Hydrogen Systems	Norsk Hydro	Teledyne	ITBA
Max pressure [bar]	10	6	10	30	7	200
H_2 production [Nm^3/hr]	10	20	10	10	11	1-5
Electric power [KW/Nm^3H_2]	N/A	6	4,2	4.8	6,1	5
Purity [%vol]	99,8	99,7	99,999(*)	99,8	99,999(*)	99.7
Origen						

(*) Purity reached using postproduction purity enhancers.

High pressure catalytic cleaning (confidential development)



KIT/ IKET develops a catalytic converter to be placed in ITBA electrolyser at 200 bar.

ITBA adapts its electrolyser to include and test the converter.

Technology for efficiency in the hydrogen chain

- Selfpressurized electrolysers
- Catalytic hydrogen cleaning
- Innovative hydrogen storage
- Clean hydrogen combustion

Hydrogen storage

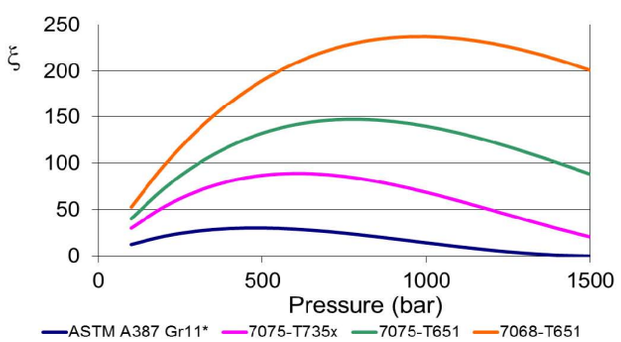
Hydrogen vs. conventional fuels			
1 bar, 25°C	Density (kg/m3)	IHV (MJ/kg)	Mass equivalent
Hydrogen	0.09	120	1.0
Natural Gas	0.72	45	2.7
Fueloil	970	41	2.9
Gasoil	810	42	2.9
Gasoline	750	44	2.7
Methanol	792	20	6.0

Effect of H2 compressibility on storage at 25°C	
Pressure (bar)	Density (kg/m3)
1	0,1
350	28,3
700	47,0
1050	60,5
1400	70,7

Hydrogen high pressure storage in coiled Aluminium tube

- Not affected by hydrogen damage
- High heat transfer capacity
- Safe due to slow flow through small breaks
- Unrestricted shape
- Recyclable

Storage efficiency ξ = H2 Nm3 / tank weight (kg)



Tank cost: USD/kgH_2 (including valves and fittings)		
Storage Pressure (bar)	Conventional Steel Tank	Coiled Tank Al 7075-T651
150	200	160
480	1500	260
540	2000	280
875	-	500

ITBA

Technology for efficiency in the hydrogen chain

- Selfpressurized electrolysers
- Catalytic hydrogen cleaning
- Innovative hydrogen storage
- Clean hydrogen combustion

ITBA

Hydrogen fueled Otto engine test and simulation

- Programmable ECU (*Engine Control Unit*)
- Gaseous fuel mixing and injection systems
- In-cylinder pressure transducer
- In-cylinder heat transfer sensor
- Inlet and exhaust gas thermocouples
- Exhaust gas analyzer
- Simulation software GT POWER, GFD

10 kW, 1 cylinder Otto engine

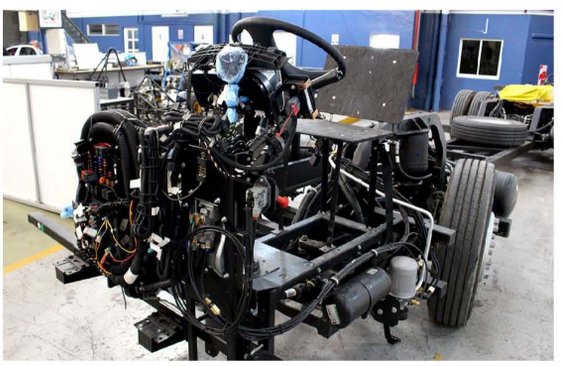
Cooperation Mercedes Benz - ITBA

ITBA

DIESEL BUS → OTTO HYBRID BUS

OTTO HYBRID BUS CONCEPT

- Diesel engine → Otto fueled with H2
- Lean burn for zero NOx emission
- Innovative tank for H2 at 700 bar
- Engine coupled to electricity generator
- Bus powered electrically
- Regenerative brake system

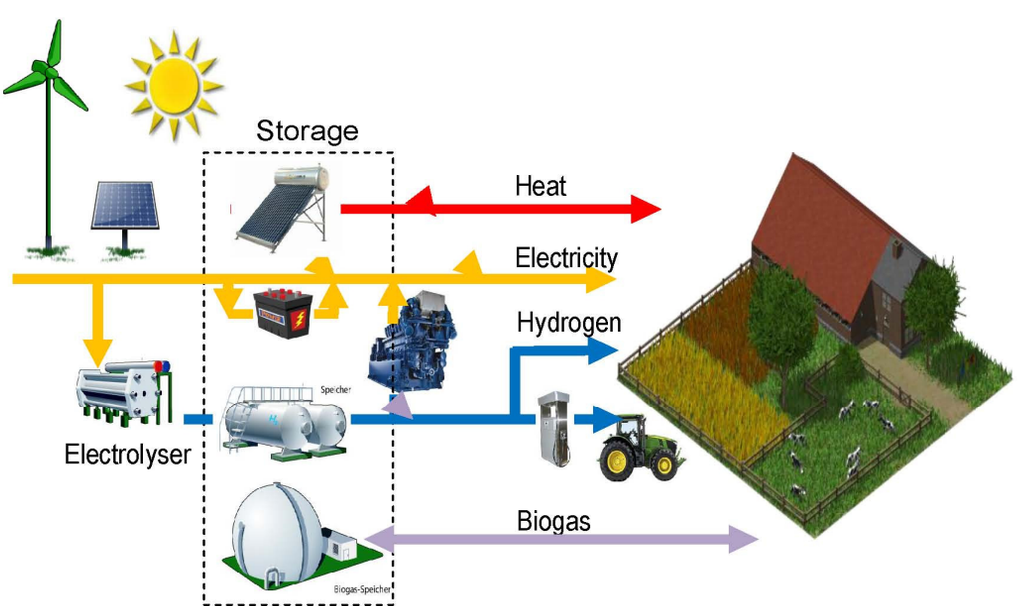


Diesel engine, OM 904LA.III/22,130 kW

H2-electric bus without fuel cells: greener and cheaper

Stable clean energy at isolated places

ITBA



Thank you

고맙습니다 Gracias

ITBA
Instituto Tecnológico de Buenos Aires

Ricardo Lauretta
Pedro Orbaiz

Mechanical Engeneering
Electronical Engineering

KIT
Karlsruhe Institute of Technology

Thomas Jordan
Michael Ranft

Hydrogen Labs
Energy Tech Labs

Cecilia Smoglie

cuaa-dahz
deutsch-argentinisches hochschulzentrum
centro universitario argentino-alemán

Martin Gabi

ITBA

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HUFS-ITBA INTERNATIONAL CONFERENCE

CLIMATE CHANGE, RENEWABLE ENERGY AND CULTURAL COOPERATION

Session 6: International Cooperation Between Korea and Latin America: Korean Studies, Wave and Economy

Session Chair: Dr. Won-Dug, Han(HUFS)

■Dr. Gi-Woong, Jung(HUFS)
"Korean Studies in Latin America: Current Scenario and Future Cooperation"

■Dr. Eun-Young, Lee(HUFS)
"Korean Wave and Entertainment Law"

■Dr. Nam-Kwon, Mun(HUFS)
"The Prospect of Mexican Economic Reform"

Korean Studies in Latin America:
Current Scenario and Future Orientation

Giwoong Jung

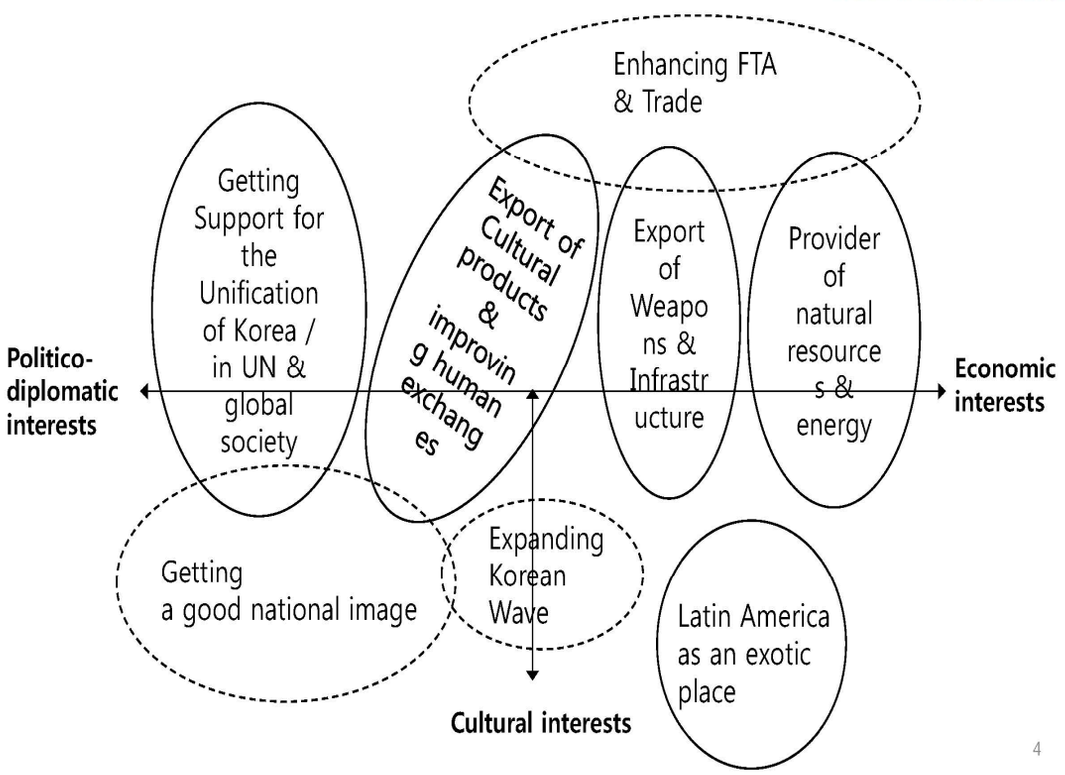
Center for International Area Studies
Hankuk University of Foreign Studies

한국외국어대학교
Hankuk University of Foreign Studies
한국외국어대학교 국제지역연구센터
Center for International Area Studies, Hankuk University of Foreign Studies

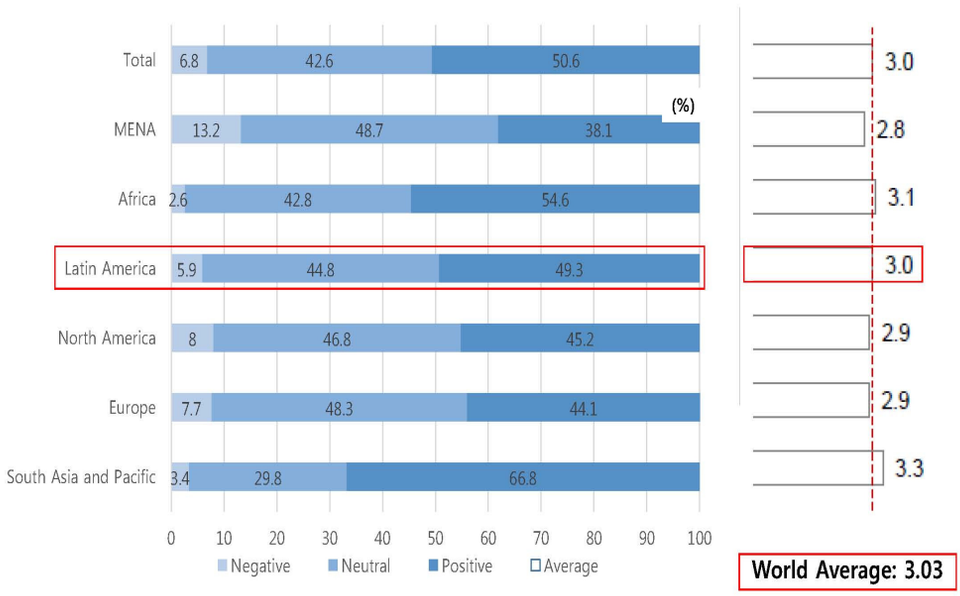
Contents

1. Introduction

What does ROK want from Latin America?

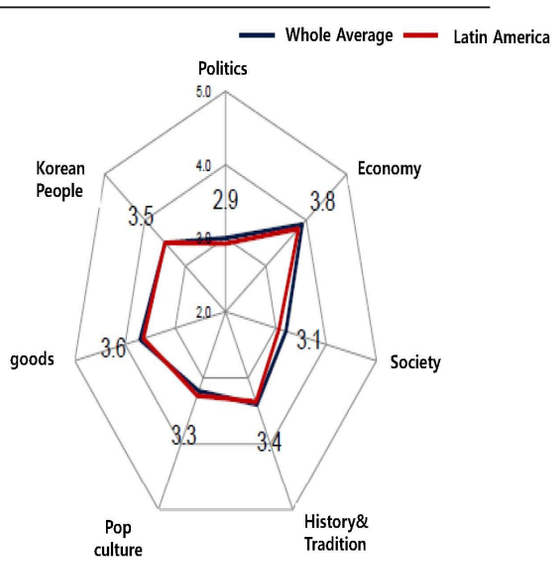


National Image Index



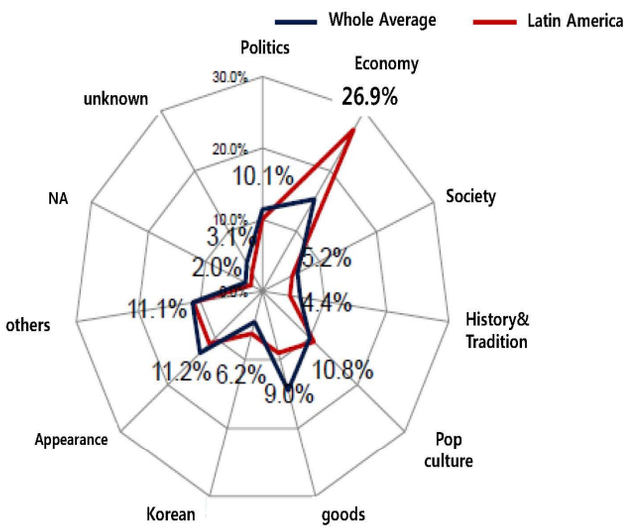
Source: KPMG Report to MOFA 2013, p.80.

Positive Perception on Korea



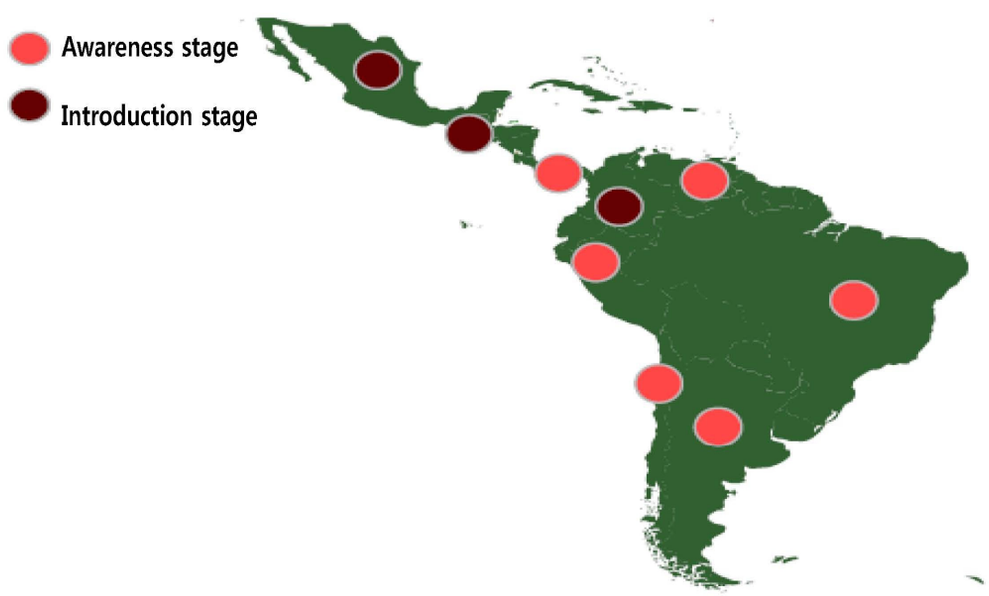
- Source: The Global Competitiveness Report 2013-2014, World Economic Forum

The First Image on Korea



• Source: The Global Competitiveness Report 2013-2014, World Economic Forum

The Status of Korean Wave in Latin America



How Latin American Countries Feel about South Korea: Averages in the Countries' Thermometers

CIDE Centro de Investigación y Docencia Económicas
División de Estudios Internacionales

Source: The Americas and the world: Foreign Policy and Public Opinion In Colombia, Chile, Mexico and Peru (2008), CIDE
http://dominio1.cide.edu/documents/320058/c2d02485-839c-453c-a3d1-fbe0bcbb04b5

Colombia			Chile			Mexico			Peru		
Country	Degrees	Rank	Country	Degrees	Rank	Country	Degrees	Rank	Country	Degrees	Rank
United States	70	1	China	60	1	Canada	71	1	Japan	65	1
Spain	68	2	Canada	59	2	Spain	66	2	China	65	1
Brazil	64	3	Australia	59	2	Germany	65	3	Brazil	62	3
Canada	63	4	Germany	58	4	China	65	3	Canada	60	4
Mexico	61	5	Spain	58	4	Brazil	64	5	United States	60	4
Germany	59	6	Japan	57	6	Japan	64	5	Mexico	56	6
Chile	58	7	Brazil	56	7	United States	62	7	Argentina	50	7
Argentina	57	8	United States	53	8	Argentina	60	8	Colombia	48	8
China	57	8	Mexico	47	9	Australia	60	8	India	45	9
Japan	57	8	South Korea	44	10	Chile	58	10	Spain	44	10
Australia	54	11	India	43	11	South Korea	55	11	Cuba	44	10
Peru	49	12	Argentina	41	12	Iran	53	12	Chile	42	12
South Korea	47	13	Guatemala	38	13	Guatemala	51	13	Venezuela	42	12
India	46	14	Colombia	37	14	Colombia	51	13	Iran	36	14
Guatemala	44	15	Venezuela	36	15	El Salvador	50	15			
Cuba	44	15	Cuba	36	15	Peru	49	16			
Venezuela	43	17	El Salvador	35	17	Cuba	48	17			
El Salvador	42	18	Peru	33	18	India	48	17			
Iran	37	19	Iran	33	18	Venezuela	47	19			

Latin America	Signed: 22	Effectuated: 22
Countries	Signed	Effectuated
Brazil	66.02.27	67.10.20
Nicaragua	68.04.30	69.02.20
Mexico	66.04.29	69.03.17
Dominican Republic	68.04.09	69.11.21
Argentina (old agreement)	04.11.15 (68.08.08)	07.11.12 (70.01.04)
El Salvador	70.06.26	70.11.01
Costa Rica	66.07.29	71.07.04
Bolivia	71.09.07	72.01.19
Honduras	70.12.15	74.04.01
Uruguay	71.05.14	74.09.13
Panama	74.06.03	75.01.17
Paraguay	73.06.28	75.07.31
Colombia	67.07.27	76.07.14
Guatemala	78.05.11	78.09.18
Suriname	78.11.18	81.01.05
Barbados	81.09.18	82.02.02
Jamaica	81.10.10	82.02.02
Chile	83.12.07	84.09.21
Ecuador	85.05.14	86.06.18
Peru	83.12.06	88.09.14
Haiti	84.07.26	85.03.13
Venezuela	94.11.17	95.03.10

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Cultural Agreements between Korea and Latin America / Source: Ministry of Foreign Affairs

	2007	2009	2011	2013
Guatemala	9,944	9,921	12,918	12,918
Nicaragua	477	531	550	648
Dominican Republic	435	518	454	467
Mexico	12,070	12,072	11,880	11,364
Venezuela	306	325	293	250
Bolivia	629	640	671	597
Brazil	50,523	48,419	50,773	49,511
Argentina	21,591	22,024	22,354	22,580
Haiti	26	47	125	103
El Salvador	825	1,418	1,300	930
Ecuador	270	272	249	267
Honduras	491	406	284	283
Uruguay	144	152	169	181
Chile	2,018	2,249	2,510	2,575
Costa Rica	443	730	520	461
Colombia	613	710	885	890
Paraguay	315	306	310	364
Panama	5,431	5,229	5,205	5,126
Peru	854	812	1,305	1,337

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Koreans Living in Latin America / Source: Ministry of Foreign Affairs

	Residents	Travelers	Companies
Brazil	45,000-50,000	5,000-6,000	50-60
Paraguay	5,803	-	2
Argentina	19,171	-	17
Chile	1,853	1,757	11
Peru	622	7,000 (estimated)	5
Venezuela	150	800	2
Uruguay	130	120	7
Ecuador	850	-	7
Mexico	14,571	8,000	95
Guatemala	11,000	252	200
El Salvador	290	2,211 (2004)	18
Dominican Republic	450	2,226	24
Costa Rica	476 (2003)	-	2

Koreans Living in Latin America / Source: Ministry of Foreign Affairs

The Number of Students supported by the scholarships sponsored by the Korean Government
Sep. 1, 2012 (4,004 students from 132 countries)

Japan	China	Mongolia	Vietnam	Russia	Indonesia	Malaysia	Myanmar	Kazakhstan	Uzbekistan	India
4093 / 278	55427 / 266	3797 / 217	2447 / 183	623 / 179	729 / 120	735 / 117	? / 103	? / 102	? / 100	615 / 95
6.9%	6.6%	5.4%	4.6%	4.5%	3.0%	2.9%	2.6%	2.5%	2.5%	2.4%
Thailand	**USA**	**Taiwan**	**Cambodia**	**Bangladesh**	**The Philippines**	**Mexico**	**Kyrgyzstan**	**Turkey**	**Others**	**Total**
524 / 95	2665 / 82	1510 / 79	? / 71	? / 69	543 / 67	110 / 59	? / 59	? / 57	? / 1,606	86,878 / 4,004
2.4%	2.0%	2.0%	1.8%	1.7%	1.7%	1.5%	1.5%	1.4%	40.1%	100%

Trade between ROK and Latin America

(100 million dollars)

Year	Export (Total)	To Latin America	Import (Total)	From Latin America	Trade (Total)	Latin America	Balance (Total)	Latin America
2013	5,596	363 (6.4%)	5,155	183 (3.5%)	10,751	546 (5.0%)	441	180
2014	5,727	359 (6.2%)	5,255	183 (3.4%)	10,982	542 (4.9%)	472	176
2015	5,267	307 (5.8%)	4,362	160 (3.6%)	9,629	467 (4.8%)	905	147

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Korean Wave Clubs in the World

Area	Korean Wave Clubs	
North America	55	3.6
Latin America	749	50.3
Europe	306	20.5
Middle East / Africa	73	4.9
Oceania	16	1.1
Asia	294	19.6
Total	**1,493**	**100%**

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Korean Related Institutions & Clubs in Latin America

	Cultural	Educational	
Governmental Institutions	Cultural Center	Sejong Institute	
	-Mexico -Argentina -Brazil	-Peru -Colombia -Chile	-Brazil -Argentina

	Korean Wave Clubs & Societies					
autogenous	Guatemala	18	Ecuador	4	Colombia	20
	Nicaragua	0	El Salvador	16	Trinidad and Tobago	1
	Dominica	7	Honduras	4	Panama	34
	Mexico	70	Uruguay	3	Paraguay	6
	Venezuela	27	Jamaica	1	Peru	55
	Brazil	35	Chile	6	Total	343
	Argentina	20	Costa Rica	16		

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2. Korean Study Support Program

Three Main Bodies of Korean Study Support Programs

Ministry of Education	Ministry of Foreign Affairs	Ministry of Culture, Sports and Tourism
• The Academy of Korean Studies • Korean Studies Promotion Service • Global Korean Studies	• Korea Foundation • KF Chair of Korean Studies & Language Programs (at college level)	• King Sejong Institute Foundation • Sejong Hakdang • Korean Language & Culture Programs

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Trade Scale and KSPS Recipient

Trade Scale (Descending Order)	Korean Study (or Language) Program in College Level	KSPS Recipient
Mexico	○	×
Brazil	○	×
Chile	○	○
Panama	×	×
Peru	○	○
Argentina	○	○
Colombia	○	×
Ecuador	×	×
Guatemala	○	×
Venezuela	×	×
Non Top 10 Countries in Trade Scale		
Costa Rica	○	○
El Salvador	×	○

Seed Program Recipients

- Seed program final selection of 2016

http://ksps-pms.aks.ac.kr/jsp/rschr/sl/SlLastSlcList_eng.jsp?bizCd=INC&bizYr=2016&bizNgr=1

- Historical Seed program:

http://ksps.aks.ac.kr/hpjsp/hmpeng/rschinfo/ingsbjtmng.jsp

- AKS: http://intl.aks.ac.kr/english/portal.php?sid=a70ff02cdbc9a94dd06cd211a1eb703a

- Official websites of Korean Studies Promotion Service: http://ksps.aks.ac.kr/hpjsp/hmpeng/

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Center for International Area Studies, Hankuk University of Foreign Studies

3. Current Scenario in Latin America

Korean Study (or Language) Program

	Guatemala	Mexico	Brazil	Argentina	Chile	Costa Rica	Colombia	Peru
University	1	4	2	3	3	2	2	11
Sejong Institute	1	3	2	1	1	1	1	1
Language Course	1	15	34	15	1	1	1	1
Elementary / Middle	0	1	5	1	1	0	0	0

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Current Scenario of Global Korean Studies

Area	Seed Program	Core University Program	Laboratory Program
North America	5	18	11
Latin America	8	0	0
Eastern Europe	12	6	0
Western Europe	12	9	6
Africa	5	0	0
Middle East	5	0	0
Oceania	2	3	2
Asia	47	17	4
Total	**47Countries / 96 Programs**	**17 Countries / 53 Programs**	**9 Countries / 23 Programs**

Country	Project Title
Argentina	Living History in 1894 Korea: The Kabo Reforms
	“Korea after World War II: A country struggling for unity and peace” How to use new methods of t eaching to enhance the knowledge about Korea
Chile	Korean Language Text Book Development
	Chilean-Korean Study Center Program (ChKSC-Program): For cross-country future integrati on based on deeper understanding in terms of Politics, Economics and Society Korea
Costa Rica	Promotion of Korean Studies in Costa Rica
Peru	To inform and propagate Korean Culture and Studies in Peru through Ricardo Palma Univer sity’s Instituto de Estudios Clásicos Occidentales y Orientales and the UNESCO Chair on C ultural Diversity and Dialogue)
El Salvador	Korea through its Cultural Products: An Innovative Strategy to Setting Up Korean Studies in Del Salvador University (Buenos Aires)
Paraguay	Project for cultivating the teachers of Koreanlogy in Paraguay

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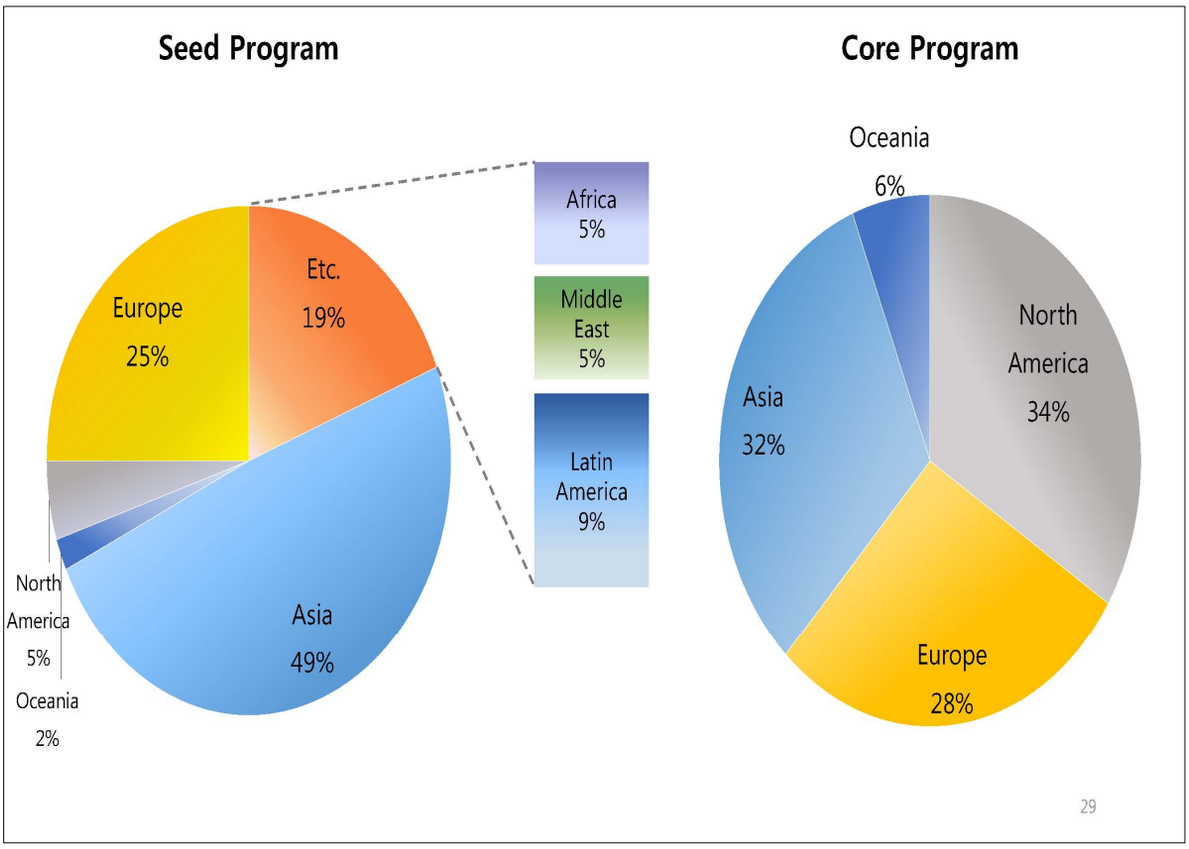
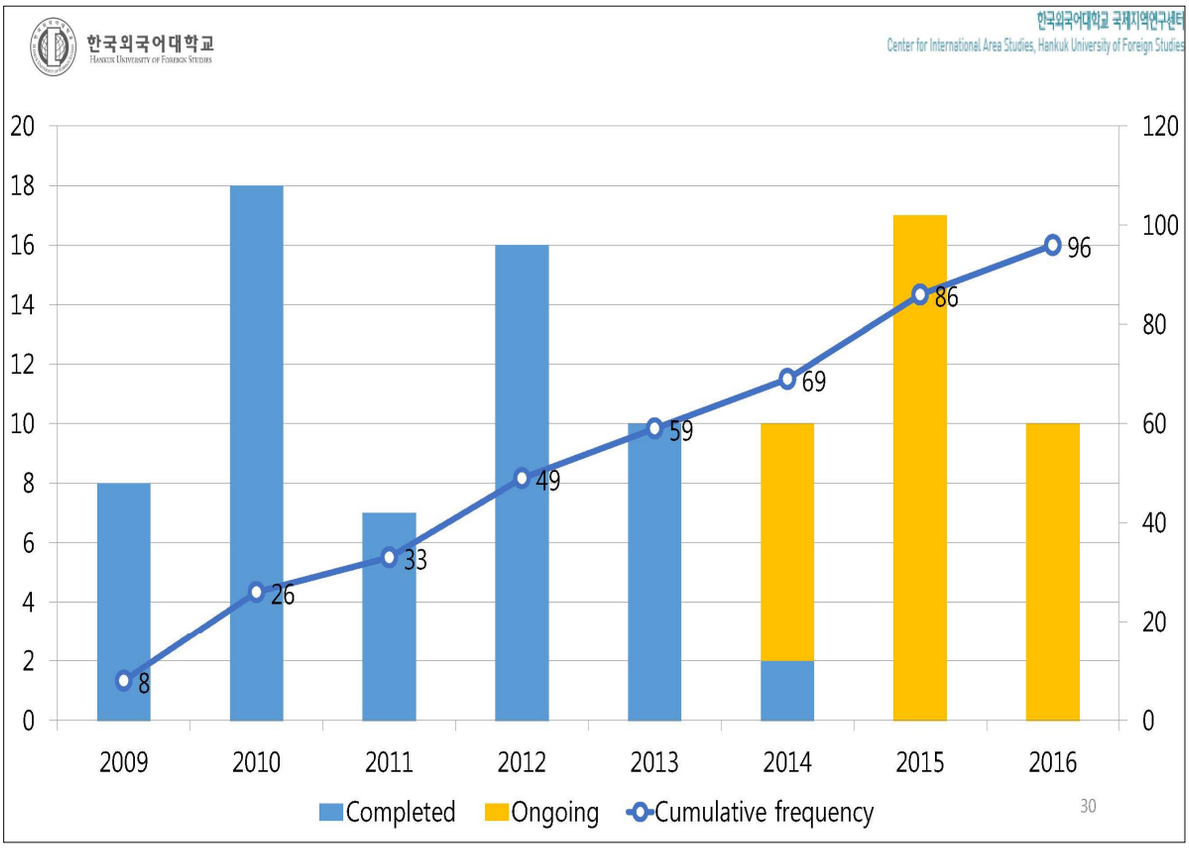

Seed Program
Core Program
Europe 25%
Etc. 19%
Asia 49%
North America 5%
Oceania 2%
Africa 5%
Middle East 5%
Latin America 9%
Oceania 6%
North America 34%
Asia 32%
Europe 28%
29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한국외국어대학교 국제지역연구센터
Center for International Area Studies, Hankuk University of Foreign Studies
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86
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2009
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Completed
Ongoing
Cumulative frequency
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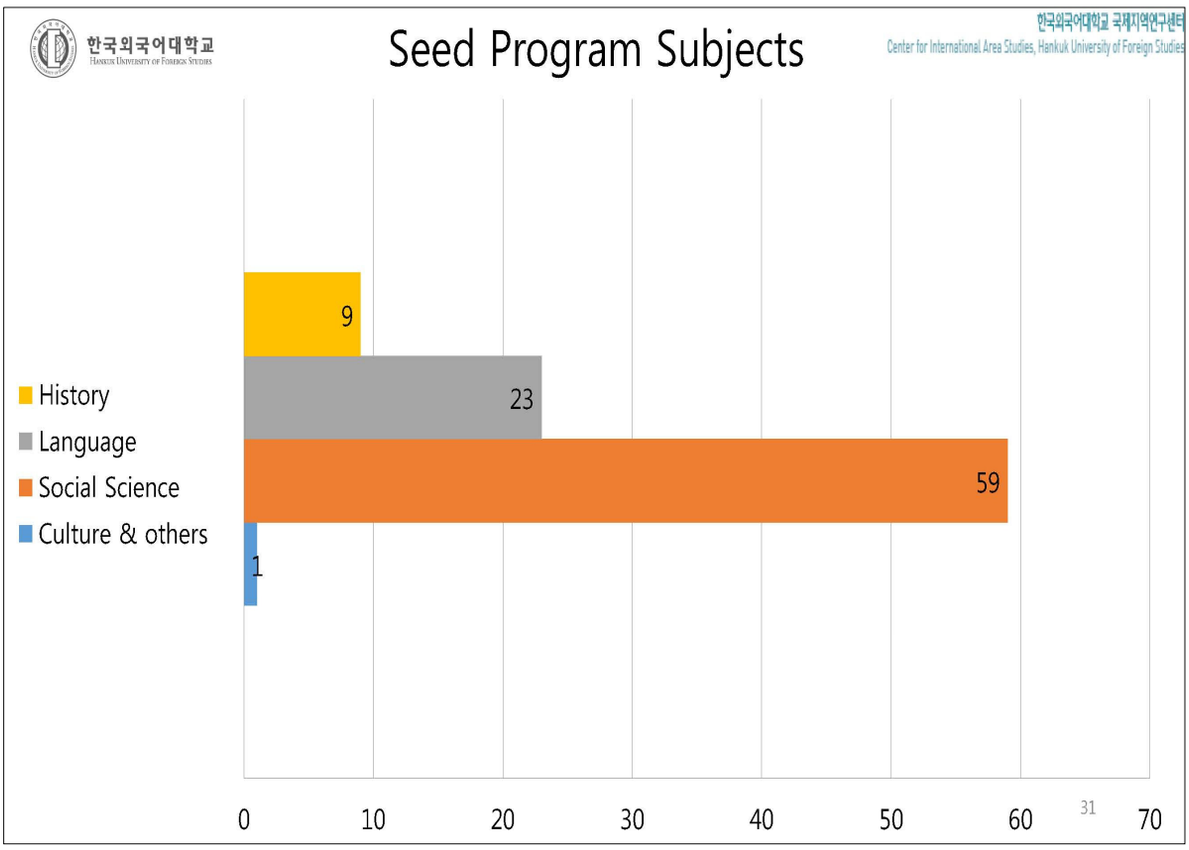
한국외국어대학교
Seed Program Subjects
한국외국어대학교 국제지역연구센터
Center for International Area Studies, Hankuk University of Foreign Studies
History
Language
Social Science
Culture & others
9
23
59
1
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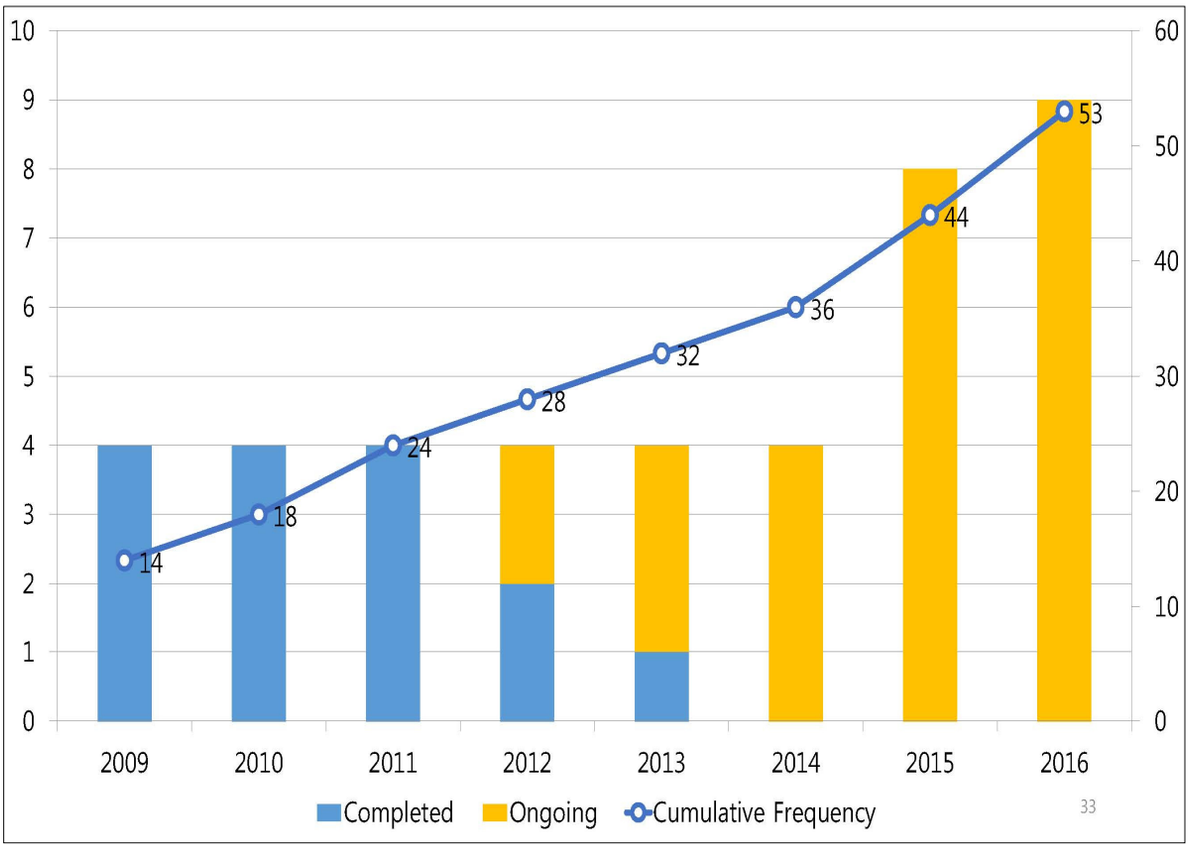
Core Program Distribution
South Pacific Ocean
32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2009
2010
2011
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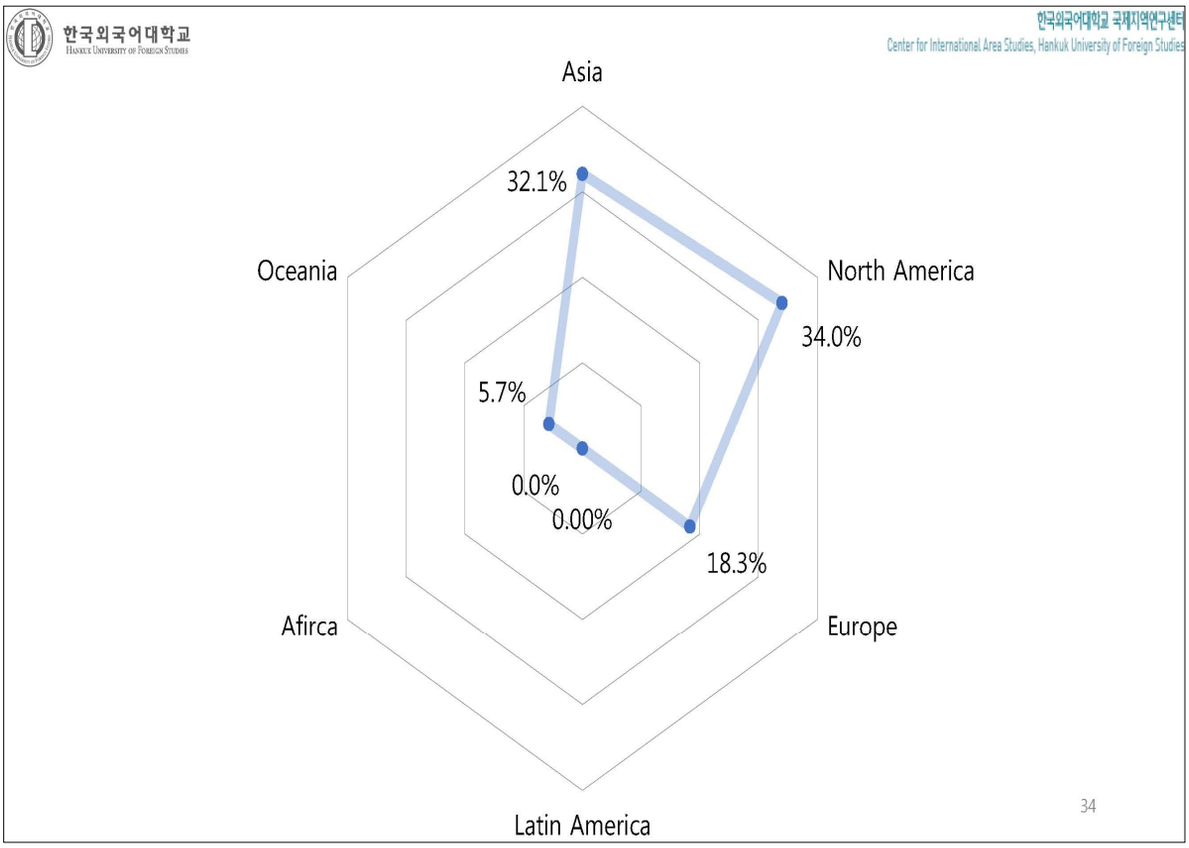
2014
2015
2016
Completed
Ongoing
Cumulative Frequency
33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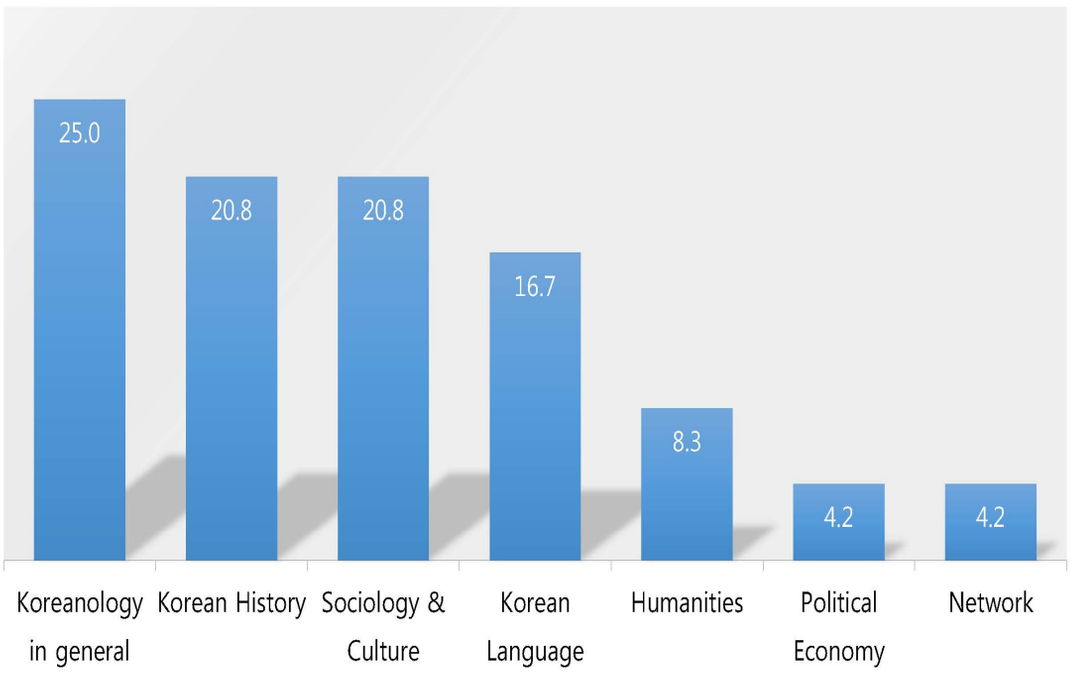
Center for International Area Studies, Hankuk University of Foreign Studies
Asia
32.1%
North America
34.0%
5.7%
0.0%
0.00%
18.3%
Oceania
Afirca
Europe
Latin America
34

한국외국어대학교 HANKUK UNIVERSITY OF FOREIGN STUDIES

Core Program Subjects

한국외국어대학교 국제지역연구센터 Center for International Area Studies, Hankuk University of Foreign Studies



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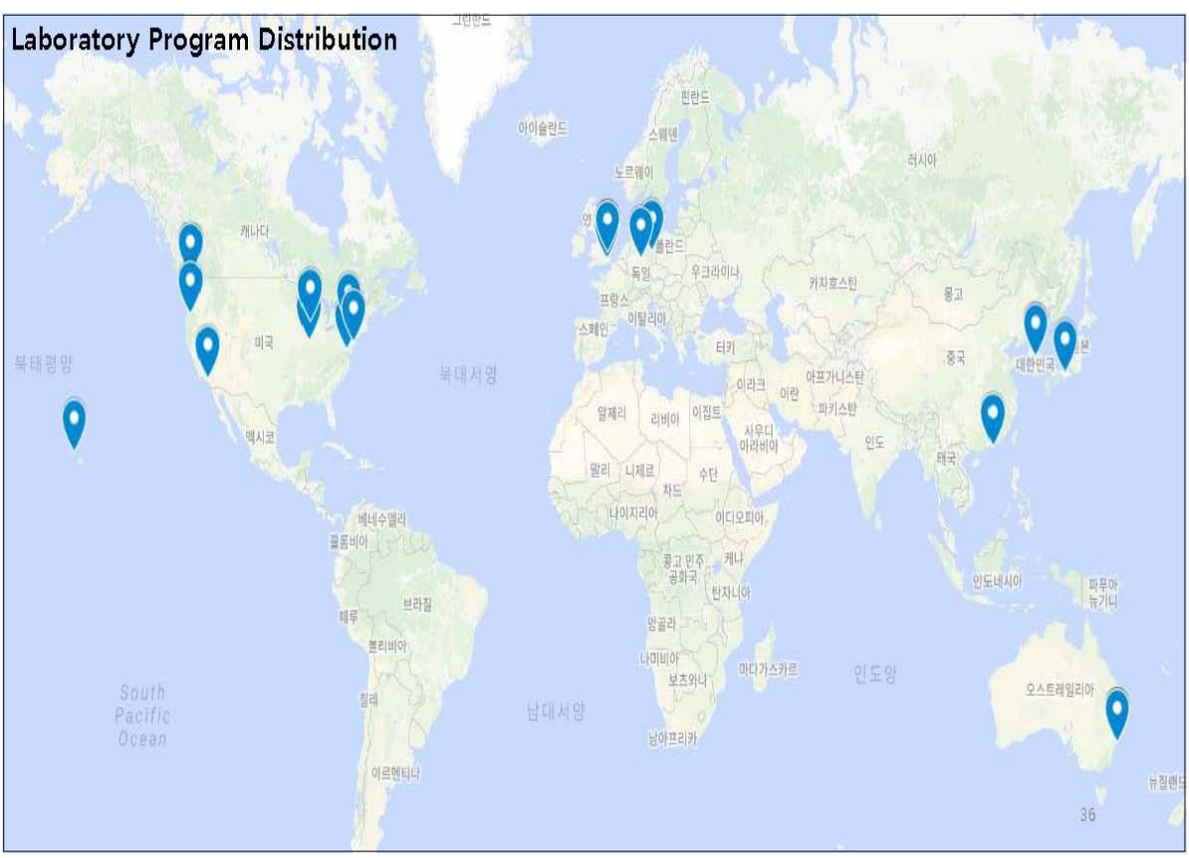

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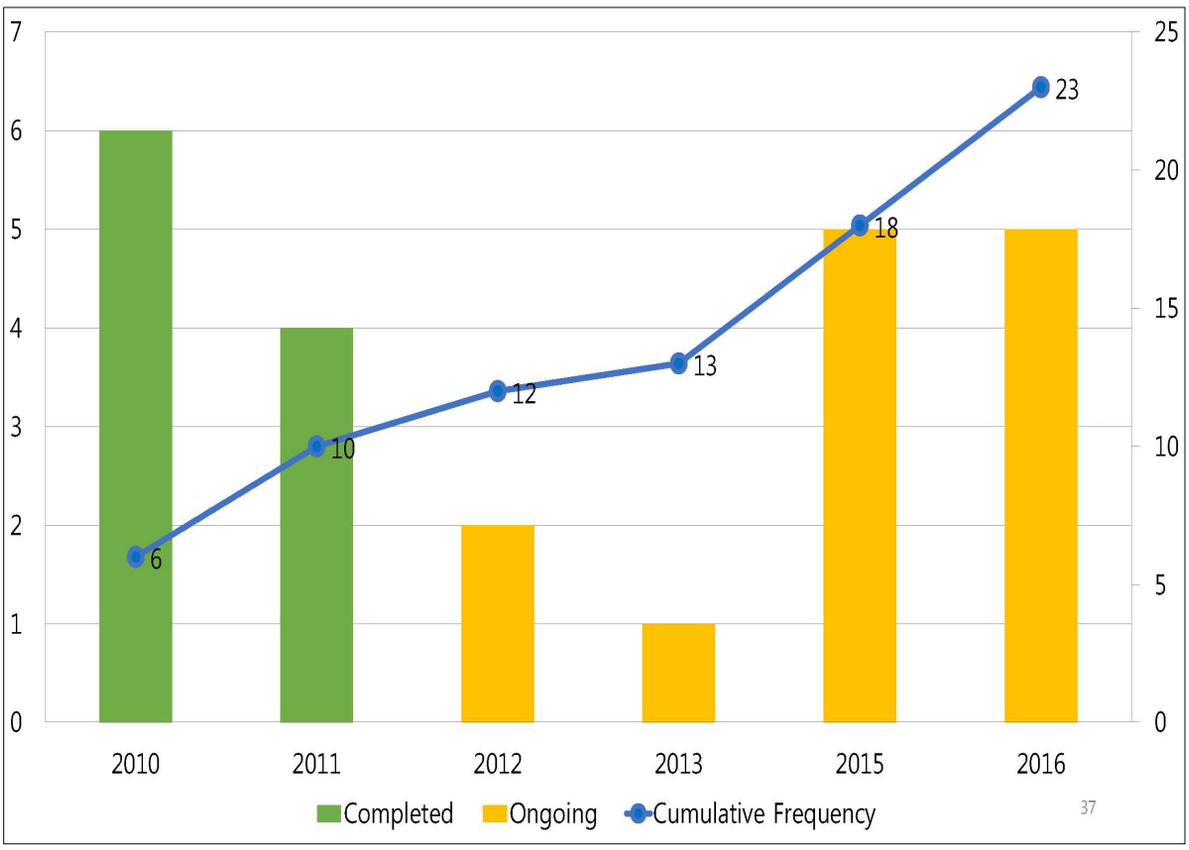

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한국외국어대학교 국제지역연구센터
Center for International Area Studies, Hankuk University of Foreign Studies

USA*	Canada	UK	Germany	Belgium	ROK	China	Japan	Australia	Total
9	2	3	2	1	2	1	1	2	23
North America		Western Europe			East Asia			Oceania	

38

Politics & Diplomacy	Economy	History	Humanities *	Area Studies	Language	Consilience
4	3	7	9	2	4	1

* Archaeology(2), Anthropology(2), Gender/Family(1), Religion(2), Philosophy(1), Korean Wave(2).

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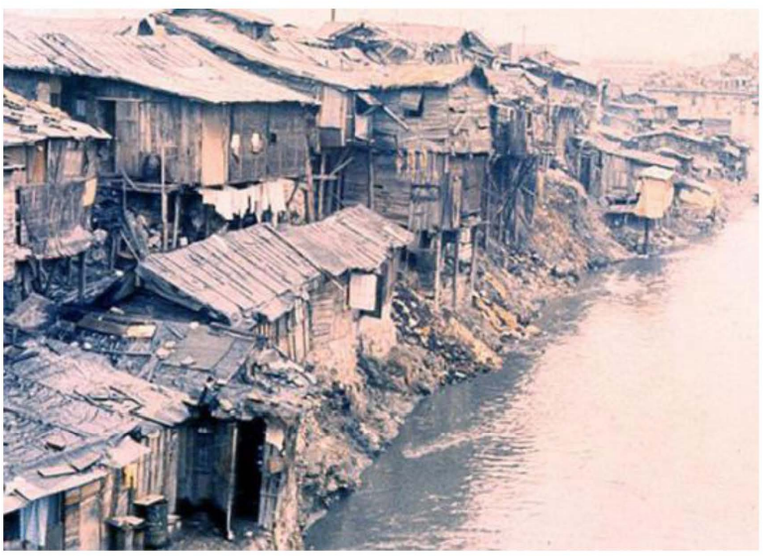
한국외국어대학교 국제지역연구센터 Center for International Area Studies, Hankuk University of Foreign Studies

4. Conclusion

Korea Then (Cheong-Gye Cheon in 1950s)



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Korea Now (Cheong-Gye Cheon in 2015)

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Thank You!

Korean Wave and Entertainment Law

LEE, EUNYOUNG (Professor of Law School, Hankuk University)

1. Korean Wave in Latin America

(1) Settlement of Korean Wave

Korean drama was broadcasted in East Asia and Southeast Asia, and the Korean Wave created in Asia in the 1990s spread rapidly to Latin America in the 2000s. As the influence of Korean culture has grown rapidly in foreign countries, the increase in demand for foreign culture has been called Korean Wave, and this cultural trend is forming a new international exchange on the private level. It is widely understood that Korean Wave is not only the popular culture of Korea, but also the phenomenon of enlargement and reproduction that increases the preference of Korean products, services, and ideas as they are adapted to the preferences of foreigners.

In Central and South America, Korean cultural products such as TV dramas and K-POP have created a new cultural frenzy called 'Hallyu'. Since the beginning of the 1990s, Korean films have been promoted to the Korean Wave starting in 2002. Until now, the export of video to Central and South America has been intermittent through public broadcasters and cable broadcasters. The Korean Wave in Central and South America is felt in the kind words of people who have watched Korean dramas such as 'Stairway to Heaven' and 'Secret Garden' from the Amazon basin to Oji Village. I can feel that the attitude toward the Korean people in Argentina, which had never broadcasted Asian dramas including Japan and China, was quite different from the past.

In addition to the drama, the content of Hallyu has led to the popularity of K-pop through

YouTube. There are Hallyu clubs in every Latin American city, K-POP fans gather and enjoy singing and dancing, and Korean lectures are being popular at school. If a K-POP contest or a study abroad fair is held in Korea, the applicant will be crowded in a matter of seconds. Due to the influence of the drama, the preference for Korean food such as beverages and shochu has also increased.

(2) Expansion of Korean Wave

Central and South American countries are requesting cooperative support from Korea to traditional civil engineering plants such as bridges, dams, power stations, and oil pipelines, to urban railways, new city construction, and large-scale construction projects such as school construction. The Rural Development Administration has sent researchers to traditional farming countries in Central and South America, such as Bolivia and Paraguay. The Central American countries worrying about security because of drug organizations are supporting the advanced security and investigation techniques of Korea and the techniques of correctional administration. It is helping to implement state-of-the-art e-government in many Latin American countries, including customs clearance systems.

(3) Future policy directions

In order for the Korean Wave to continue expanding in Latin America, it is necessary to grasp the taste and sensitivity of Latin American viewers and to plan the content of the Korean Wave in a friendly manner in Latin America and improve access to Latin American market. Latin culture has the potential to match well with the exciting traditional Korean culture represented by farm music and wind pond play. The mainstream of the Latin American population is the descendants of Spanish and Portuguese immigrants, and among Europeans, it has a strong understanding of the Asian culture. Aborigines are very familiar with Oriental culture because they have a Mongolian lineage that came from ancient Asia long ago. The Africans migrated to Latin America for the cultivation of tropical crops, which have a sense of homogeneity in Korea in terms of percussive percussion rhythms and flexible movements.

It is necessary to establish a human network for co-production of South and Central and South America by expanding communication with Latin American broadcasters and actively communicating. In addition, it is necessary to study the entertainment related laws of Latin

America in order to expand other profits in the spread of the Korean wave content, and to pave the way for a good exchange between Korea and Latin America.

2. Entertainment Law

(1) Copyright Act

At present, the law that constitutes important contents of entertainment law is copyright law. The Korean Copyright Act aims to contribute to the improvement and development of culture and related industries by protecting the rights of authors and their neighboring rights and by promoting the fair use of their works (Law No. 14432, revised on December 20, 2016).

The Minister of Culture, Sports and Tourism may establish and enforce the following measures in order to achieve the purpose of the Copyright Act, such as establishing policies on copyright protection.

* Basic policy for copyright protection and fair use environment of works,
* Education and publicity for copyright awareness,
* Matters concerning rights management information such as copyrighted works and policies on technical protection measures.

The role of trust companies and brokers plays a major role in the dissemination of Hallyu cultural products. A copyright trust management business is a business that is entrusted with the right to be entrusted with the rights of author's proprietors, exclusively issuing rights, publishing rights, neighboring rights, or database producers, and is entrusted with comprehensive management And the case of substitution. Copyright brokerage brokerage business refers to a brokerage or brokerage business in connection with the use of the right for author rights holders, exclusive publishers, publishers, neighboring rights holders, or persons with the rights of database producers.

(2) Games

Protection of copyright law is a form of creative expression that expresses human ideology or emotion specifically to the outside by means of words, letters, sounds, colors, etc. Therefore, in order to cover infringement of the right of reproduction or secondary works, In judging whether there is any similarity, it is necessary to prepare only those that correspond to the creative expression form. Article 5, Paragraph 1 of the Copyright Act The prescribed secondary works shall be based on the original work and shall maintain substantial similarity with the original work and shall be accompanied by new amendments, will be.

The Korean Supreme Court, in its ruling on the prohibition of infringement of copyright, said, "In order to be a copyrighted work, it must be a creation expressing human thoughts or feelings" (Supreme Court Decision No. 63409, Dec. 2010). In the case of a character that refers to the shape and name of characters, animals, etc. appearing through media such as comics, television, movies, newspapers, and magazines, the creativity of the creator May be a work protected by copyright law apart from the original work. If creativity is recognized in a character appearing in the game, it can be protected by the copyright law separately from the original game product. Whether or not commercialization of the character has been made is a matter to be considered in judging whether or not it is protected by copyright law no. Reproduction of another person's work in an unauthorized manner is an infringement of the right of reproduction. In this case, even if the work is not reproduced in its original form, and some modifications, changes, or changes are made, it should be regarded as a reproduction if it does not add new creativity. If a work becomes a separate and independent new work that does not have substantial similarity with an existing work, even if some works of the existing work are used, it does not infringe the copyright of an existing work as a creation.

(3) Sound source

If the necessity of extracting part of the original song is recognized by the nature of the business or service provided by the operator of the music site on the Internet, the music site operator of the service provider, What part of the pre-listening service should be set to what extent and when only a part of the service is to be played back? Which part of the sample is to be provided as a sample,? Excerpts from the ringtone, music ringtone music file, And what

extent of the length should be agreed with.

The judgment of the lower court of Korea was decided as follows (Seoul High Act 2008.9.23. Decision 2007 or 70720 judgment, damages compensation). The purpose of protecting the author's name display right is to allow the name of the author to be displayed in a proper way regardless of the awareness of the Internet users. Therefore, it is possible that the internet users recognize the lyric / composer related to the musical works as someone other than the author Whether it is illegal or not, can not affect the infringement of the right to display the name. If the operator of the music site displays the name and the name of the singer and the producer of the music on various pages or screens of the web page or music service related to the musical works, but does not display the name of the composer or librarian in the proper way, It is infringed.

(4) Necessity of reform of copyright law

Digital and the Internet have greatly changed the environment of technology and media on which copyright was originally based. Everyone has maximized efficiency in accessing information and exchanging information. In terms of producers of cultural products, technological and economic barriers for creation are eliminated. It has expanded the opportunity for citizens to enjoy culture. On the other hand, these characteristics made it easier to infringe on copyright. Rights protection of copyright holders faced a serious crisis. In the 2000s, the United States and the European Union each attempted to reform the Copyright Act. In 1998, the United States enacted the Digital Millennium Copyright Act. In the European Union, in 2010 scholars and practitioners jointly worked on the European Copyright Code and the Policy Report of the Lisbon Council in 2003.

The basic direction of the 21st century copyright law reform is as follows.

* Ensure that the copyright is registered as much as possible. So everybody knows exactly who is claiming copyright for a work.
* The private use of a work must be allowed to a certain extent.
* The copyright owner must be able to donate his / her work to the public domain. Once the information is transferred to the public domain, you must keep it in the public domain.

* As the only copyright registration authority, a copyright office should be established and operated. The Office should establish a system for people to use fairly.

* A dispute resolution system should be established to resolve small and large copyright disputes easily and quickly.

3. Conclusion

A multifaceted approach is needed to further expand the Korean Wave that is spreading in Latin America in the 21st century.

* Create an economic and social basis for creative creativity. It is necessary to constantly create cultural contents in order to attract global sympathy for Korean culture, and it is necessary to support the government for this.

* Improve the circulation environment of works. Business areas that spread Korean cultural products, such as copyright trust management business and copyright agent brokerage business, should be active in Latin America.

* Expand mutual exchanges between Latin American cultural products and Korean Wave products. We will improve various environments such as cultural performances and broadcasting departments so that the two countries can develop mutual attention based on continuous exchanges.

The Prospect of Mexican Economic Reform

Mun, Nam Kwon(HUFS)

I. Introduction

In the wake of the global financial crisis, world is currently aware of the danger of neoliberal economic system and looking for alternative post-neoliberal model. The ongoing financial crisis, polarization, low economic growth, unemployment are the typical symptom of neoliberal capitalism, and bring about new wave of alternative model like warm capitalism in South Korea. In this regard, new concepts and models of economic democratization, coexistence, warm capitalism are being raised.

It is ultimately about phasing out polarization caused by conflict and confrontation, and searching for harmonious development of all economic players and therefore boosting the growth and distribution of the economy in the middle and long term (2012: 186 Kim). Worldwidely, Anatole kaletsky pointed out in his book of Capitalism 4.0 that market-centered neoliberalism reveals all the limitations, and government and the market face failure in all senses under the unpredictable current capitalist system. Therefore, no longer is possible to manage the economic system with a uniformed point of view (Anatole Kaletsky, 2010).

Until the 1980s, different models in the global level were present in each region like the East Asian development model, Import Substitution Industrialization development strategies of Latin America, and Scandinavian model. But these models faced some convergence to neo-liberalism of the Washington Consensus after the stagflation and oil crisis, and are diverging again after the crisis to the post neoliberal models according to their political and economic conditions. Intensive government intervention, high export concentration, high savings rate characterized East Asia's growth strategy, and went through the articulation and embracement with the British and American models in the 1990s. However, constant and recurrent financial crisis and low growth bring up the doubts about the merits of the same model.

Latin America and Africa, countries that followed the recommendations of the international financial institutions like IMF and World Bank are less likely to show a positive economic performance. Neoliberalism, represented by trade liberalization, macroeconomic stability, shrinking state's role, has led to a recurrent economic crisis, dependence on exports, income inequality in those

areas (Cho et al, 2011). Witnessing the poor economic performance, each region is exploring new models of development, serving as the foundation of economic management.

Since 2000, the Latin America has been the most active area in the post-neoliberal debate that goes beyond a simple change in state role, calling into question the model itself in economic development. To mention various alternative models that began in the 1990s, the 21st century socialism in Venezuela, neo-structuralism of Brazil and Chile, Andes - Amazonian capitalist model in Bolivia are the emerging models. In recent years, indigenous or social movement, and some intellectuals deny the western concept of development, claiming for post structuralism in their philosophy and epistemology debate.

To find such alternatives so actively was because of that economic and social results left in this area was so harsh during neoliberal period. After the lost decade in the 1980s, fiscal discipline through reducing expenses in the areas of government spending, high economic efficiency, financial and trade liberalization and privatization of state enterprises, were carried out. But such a restructuring witnessed just lower growth rates, increased regional and class inequality and rising unemployment.

Therefore, Brazil and Chile conducted since the mid-1990s neo-structuralism calling a globalization with a human face, as a combination of social equality and capitalist globalization. Export-driven growth didn't meet automatically the expectation of job creation, welfare expansion, and the virtuous circle structure of enhancing equality. A policy focused on economic growth and employment was unable to address the root cause of polarization (Leiva, 2008: 12 - 14). As a result, the rhetoric of growth with equity persisted in reality the continued economic problems of the poverty. And for now new forms of social policies are in an attempt to deal with continuing economic problem.

Venezuela and Bolivia is pursuing a more fundamental change about it. Though neo-structuralism is status quo defending strategy, the Andes and Amazonian capitalism and the '21st century socialism in Bolivia and Venezuela are more likely status quo transformative strategy (Leiva, 2008: 225). It proceeds to change the economic relations between the established economic elite and the poor that accounts for more than 40 % of population, through new ownership structure in the national strategic industrial sectors, land reform, and the creation of cooperatives, etc. The restoration of a strong role of the government, giving away market fundamentalism, and new developmentalist strategy based on the structural heterogeneity of Latin American society mark the new approach of the region.

II. The Contending Post-neoliberal Development Models

Unlike the above countries, Mexico has been running the country most strictly within the framework of neoliberal model throughout Central and South America until recently. In 1986, joined GATT and pursued unilateral market liberalization and trade openness, after a widespread state sector reform and privatization. In particular, the NAFTA with United States and Canada served as a starting

point to widen its FTA network to more than 45 countries around the world positioning the country as a faithful follower of neoliberal model. Mexico's neoliberal model promoted FDI and export growth, and allegedly the specialization and competition of the manufacturing industries yielded positive effect on productivity and efficiency tremendously.

Nevertheless, President Enrique Peña Nieto, who took office in 2012, declared the post- neoliberal reform specifying that what Mexico needs now is not partial reforms, but overall structural reforms. This meant that the economic management of the previous regimes sacrificed economic growth for their macroeconomic stability, yielding negative results of low growth and increased regional and class inequality.

The average growth of import substitution industrialization period until the 1940s - 1970s was 6.2 %, whereas Mexico marked low average economic growth rate of 2.5 % during 1994 -2012 by neo-liberalism. In addition, Mexico witnessed growing income inequality and the regional imbalances. National Statistical Office data shows, between 1970 and 1987, a regional GDP per capita standard deviations (GDPPC) disparity has declined 18 percent, as was Gini coefficient dropped 14 percent in the same period. However, income inequality between regions in the period between 1987 and 2010, turned out to be increased by more than 14 percent. As a result, trade and investment liberalization in Mexico has proved to be beneficial to the relatively more affluent areas and highly educated people. It required to Mexican government aggressive industrial policy and social policy options to ensure the benefit for the poor people. However, the drop in revenue, the fall in oil price, and the fiscal balance policies have prevented the Mexican government from exercising further proactive social policies (Luis Quintana, 2014: 109 - 110).

In the midst of the reduced state role of neoliberalism and the limit of market fundamentalism, Mexican new government posted two big goals in the National Development Strategy through 2013 to 2018. First, it seeks to boost annual growth rate to 6% through the second-generation reforms while potential growth rate drops to 3 %. Secondly, it tries to rebuild the basis of agricultural and industrial area of the central and southern Mexico, in an attempt to increase employment, strengthen domestic market, and resolve the imbalance between areas through structural reforms. To that end, a far-reaching reform in the field of energy, telecommunications, finance, health care, education and labor is currently undertaken.

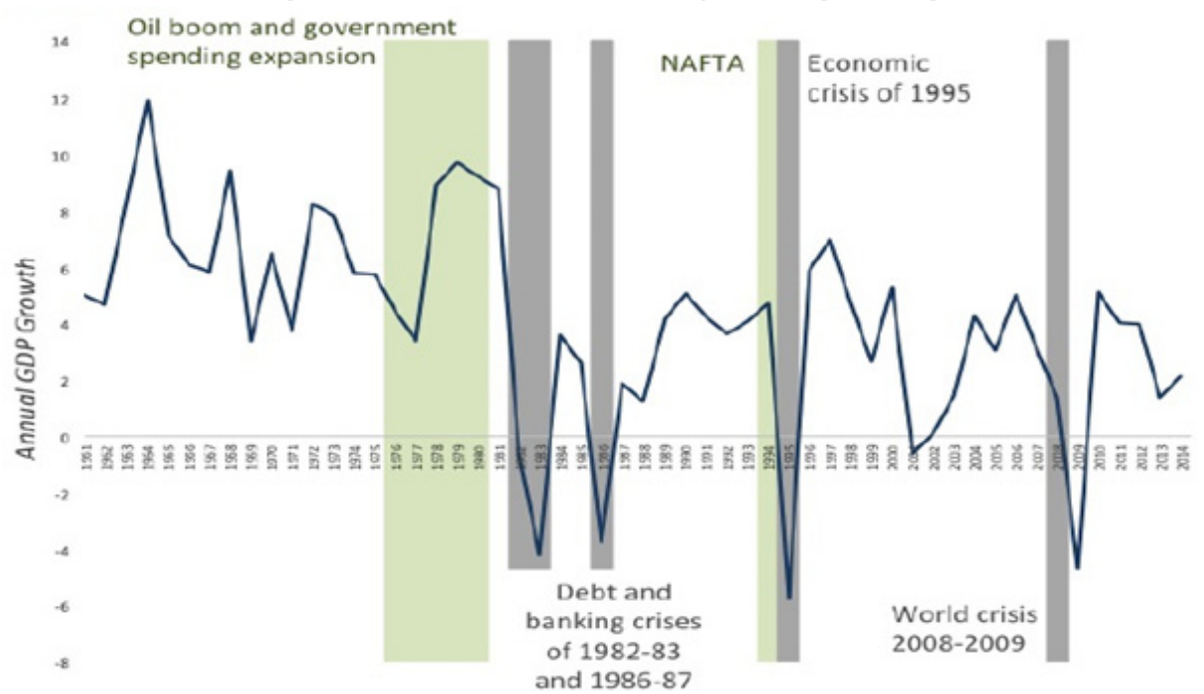
On the other hand, the criticism is being raised about the current reform drive in a sense that it has been limited to the 1980s reform like a prudent fiscal policy, restricted monetary policy for anti-inflation, tax policy for increase in revenue, and more flexible labor market. But other aspects are that low public investment as the cause of low growth and falling productivity in the industry are addressed in the new reform through the monopoly elimination in the major industries. And, to improve the infrastructure, human resources, and technology that lead to the development, shows differentiation from neoliberal policies.

The U.S.-triggered global financial crisis of 2007 and 2008, clearly exposed the vulnerability in the British and American neo-liberal models of development, and the whole world is not solely dependent on the current model, seeking sustainable growth strategy that will work for each country. All countries around the world pursue new development model according to their peculiar social conditions. East Asia and Latin America region have shown the similarities and differences in their policies within the framework of neoliberalism.

Industrialization of East Asian model is the combination of the government's intense involvement in various sectors of economy, the gradual liberalization of financial and capital sector during the industrialization period, customs refund, regulating foreign capital inflows, trade finance, which was the different points from the Anglo-American model. (Cho, 2011: 61 - 63). As the region accepted the British and American market mechanism since the Asian crisis, government show rather limited role than before. However, to find a new development model is being required following the expansion of low growth and economic inequality according to the weakened government industrial policy since 2000.

Mexico's current neoliberal model is of strict market-based model because macroeconomic stability are a key goal in the national economy. In addition, nationalization in energy sector, higher education public spending, monopoly in major industries demonstrate hybrid nature of Mexican neoliberal model.

〈Figure 1〉 Mexican GDP's annual percentage change



Source: Pedro Valenzuela (2016)

In the case of East Asia, Japan, South Korea, China, and Taiwan's development models show difference by country, and is hard to present as a single model. Unlike the post neoliberal model in Latin America, the East Asian model is not an alternative to neoliberalism. South America's neo-structuralism that began in Chile, is claiming for ‘a human face of globalization’. The same model argues that economic growth and social equality are not tradeoffs, and declare that equality is just as important as economic growth.

In other words, neoliberal system that made deep polarization can be overcome by the role of the state. The model ask for the state to lead 1.productivity growth through innovation, 2. high-value-added exports, 3. quality jobs, 4. equality, 5. virtuous circle structure from states and civil society partnership to enhance economic growth with ‘equality’.

In addition to the neo-liberalism of the existing macroeconomic stability and deregulation, neo-structuralists are an advocate of the more flexible labor market and gradual exchange rate policy, and subsidies to develop manufacturing sector. This is supposed to automatically create jobs, social integration, and a virtuous circle structure of the more equal society. But in reality, these synergy effects was not automatically created, and the theory failed in the 1990s. Since 2000, Chile and Brazil's economic policies dropped the excessively positive viewpoint about ‘productive transformation with social equity’, which were dominant in the 1990s. They look for the growth through creating a stable investment environment, and promote the strategy of the correlation between growth and equality in social policy.

In other words, post neoliberal discourse acknowledges that unlike the original initiative, neo-structuralism does not automatically improve equality by export and productivity growth, and that it’s necessary to implement a policy for social integration under the leadership of the state. United Nations Economic Commission for Latin America and the Caribbean, who led the neo-structuralism, argues for now that everything begins from economic growth or employment, so that social policy needs not to hamper economic growth, and wise and appropriate funding strategies are used to support economic growth (ECLAC, 2004).

Neo-structuralism is of ‘a status quo defensive strategy’ because they don’t directly address the causes of inequality, in a sense that economic growth takes priority, social spending is limited by the financial responsibility, and ownership structure changes in assets are not a possible policy options in Latin America. On the contrary, post neoliberal strategy in the leftist Venezuela and Bolivia governments is seeking a more fundamental change.

The post neoliberal model of Venezuela and Bolivia is officially the transitional model for the construction of a socialist model, and its strategy is of a statist neo-developmentalism. Venezuela's ‘21st century socialism’ intends to replace the institutional framework of the neoliberalism with the new frame of popular power. The 21st century Socialism, emphasizing the complementarity, solidarity, and cooperation rather than the competition in capitalist economy, seeks to spread the non-market

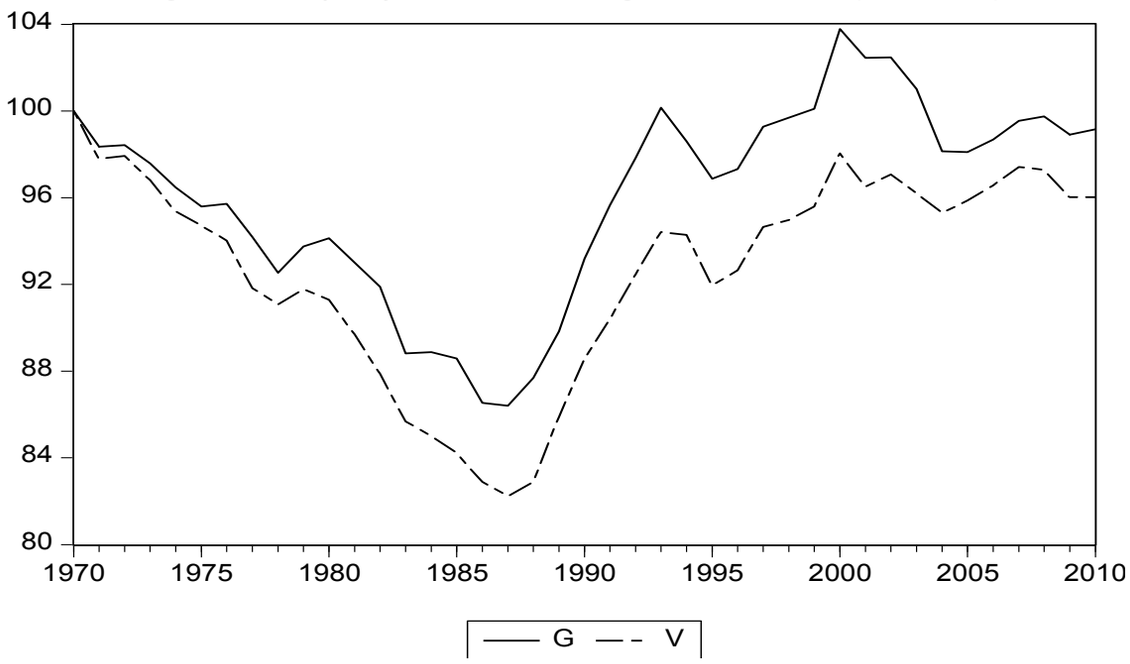
forms of distribution and trade.

The country exerts national distribution of profits of oil industry through social policy, and expands civic engagement through various institutional framework. As a result the number of cooperative that are considered to be the most democratic form of economic organization, multiplied by more than 100 times during the past 10 years under left-wing governments.

III. Mexican post neoliberal economic reform

Mexico began the ongoing economic reforms acknowledging that if they don't change the constitution of the overall economy, they can't reach the optimal balance of economic growth.

〈Figure 2〉 Inequality of income among Mexican states (1970=100)



G: Standard deviation of GDPPC among states, V: Gini coefficient

Source: Luis Quintana Romero (2014, 116)

The President Peña Nieto, who took office in 2012, define the objectives of economic reform as "economic growth and poverty reduction", and Congress and the four political parties agreed together to 'Pacto por Mexico'. The pact is divided into the fields of macro economy around the tax and financial sector reform; industrial policy centering on restructuring of financial, energy and telecommunications sector reforms; social policy such as health and pension system; and finally the field of social infrastructure such as education reform and public sector anti-corruption.

〈Table 1〉 Mexican economic reform

Sector	Reform
Labor	■ Reduced hiring and firing costs by allowing different ways of contracting ■ Increased certainty to both employers and employees by speeding the resolution of labor disputes ■ Elevated productivity of the worker, enterprises, and the overall economy ■ Diminished transaction and administrative costs by professionalizing the judicial bodies in charge of labor-rights enforcement
Competition	■ A new institutional design that creates autonomous bodies with operational and decision-making independence to interpret and enforce the law ■ → The Federal Economic Competition Commission (COFECE) has been redesigned with seven independent commissioners. ■ Inclusion of new tools and concepts attached to international standards to determine the lack of economic competition ■ → The new regulation defines various concepts such as absolute monopolistic practices or collusion, relative monopolistic practices or creating barriers due to abuse of a dominant market position.
Finance	■ Increasing transparency ■ Expanding the scope and functions of development banks and public institutions ■ Expanding credit and improving its conditions ■ Monitoring the levels of capitalization of the banking institutions
Telecommunication	■ Access to information and to communication technologies is now defined as a fundamental right protected by the Constitution. ■ Foreign investment is allowed up to 100 percent for fixed telecoms and up to 49 percent for radio and television. ■ The Federal Telecommunications Institute (IFT) was created. ■ The reform proposes the use of diverse bandwidths and parts of the spectrum so that broadband services may be more widely available in the country.
Transparency and	■ Increased access to public information

Anti-corruption	■ Consolidation of a national system ■ Renovation of the National Institute of Transparency, Access to Information and Protection of Personal Data (INAI)

Source: Pedro Valenzuela (2016)

IV. The prospect for the reform

Mexico's reform faces several serious challenges and obstacles in its implementation. A pretty modern public administrative body, sufficient resources, committed citizenry, and appropriate intergovernmental organization and coordination are necessary for the successful results. On the other hand, fighting against excessive bureaucracy, corruption, and lack of trust in the government are the major challenge in this task.

Finally, Mexico needs to confirm its stick to the fiscal discipline and anti-inflationary policy. A proper political willingness and adequate governance are in demand to meet the circumstantial challenges of the world.

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