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Cooperación Económica y Desarrollo (SECO)

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UNIDAD TÉCNICA CLÚSTER Colombia

MINAMBIENTE

GOBIERNO DE COLOMBIA

INTRODUCTION

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THE DISTRCIT ENERGY STRATEGY – MAIN SPONSORS

- The District Strategy project started in 2013 with the partecipation of:

Ministry of the Environment and Sustainable Develepment

As: Leader for the promotion of the District Energy project promotion and resources provider

Public Utilities Agency Of Medellin

As: Leader for resourcing and implementation of the Alpujarra Pilot Project

State secretariat for economic affair of the Swiss Confederation

As: Leader for International technical assistance and non reimbursable resources

Presidencial Agency for Cooperation

As: Presidential Observatory

DISTRICT ENERGY STRATEGY

ESTRATEGIA NACIONAL – OVERALL STRATEGY & RELEVANT CORNER STONES

DISTRITOS TÉRMICOS COLOMBIA

Promote the implementation of District Energy in Colombia to improve the energy efficiency in buildings.

Replace chillers based in ozone-depleting substances and greenhouse gases

District Cooling La Alpujarra - Medellín

Lessons learnt

Provide an enabling context for DE

End to end DE processes and methodologies for 5 major cities

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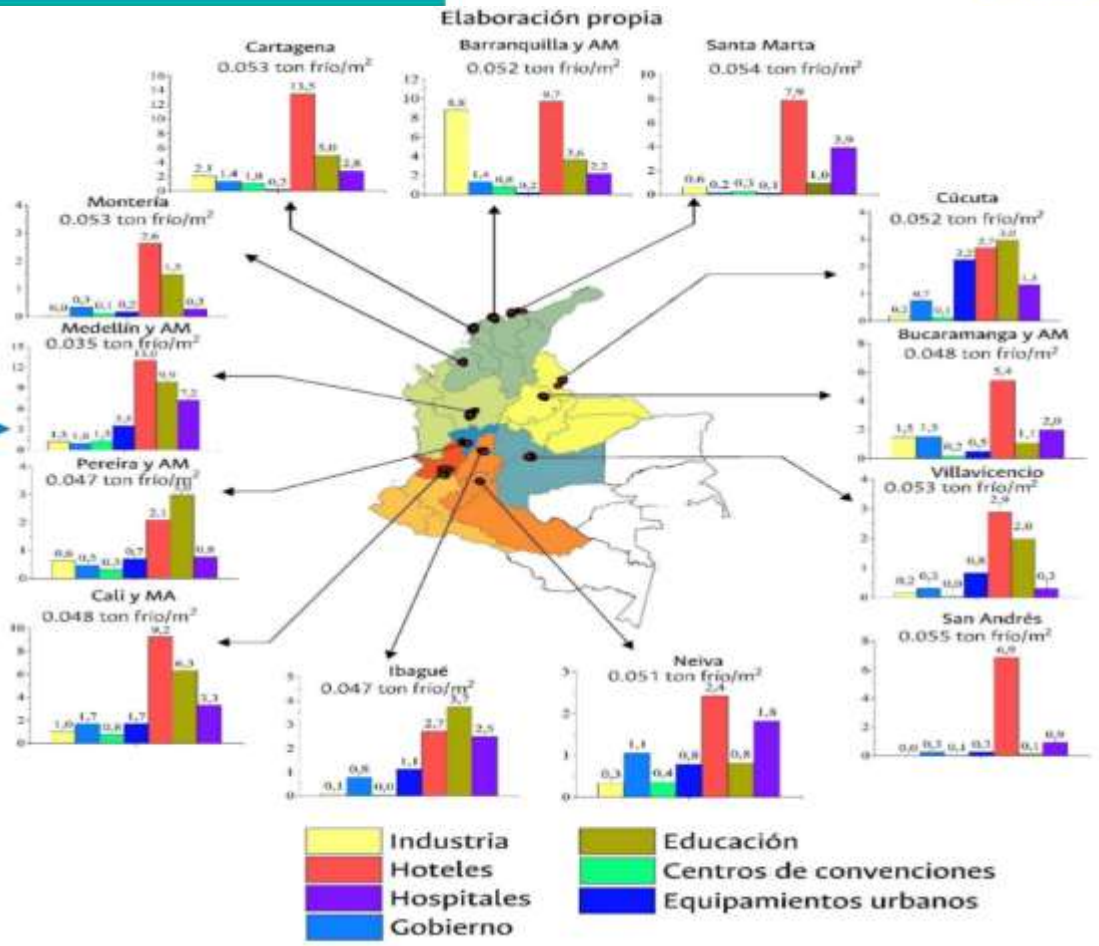
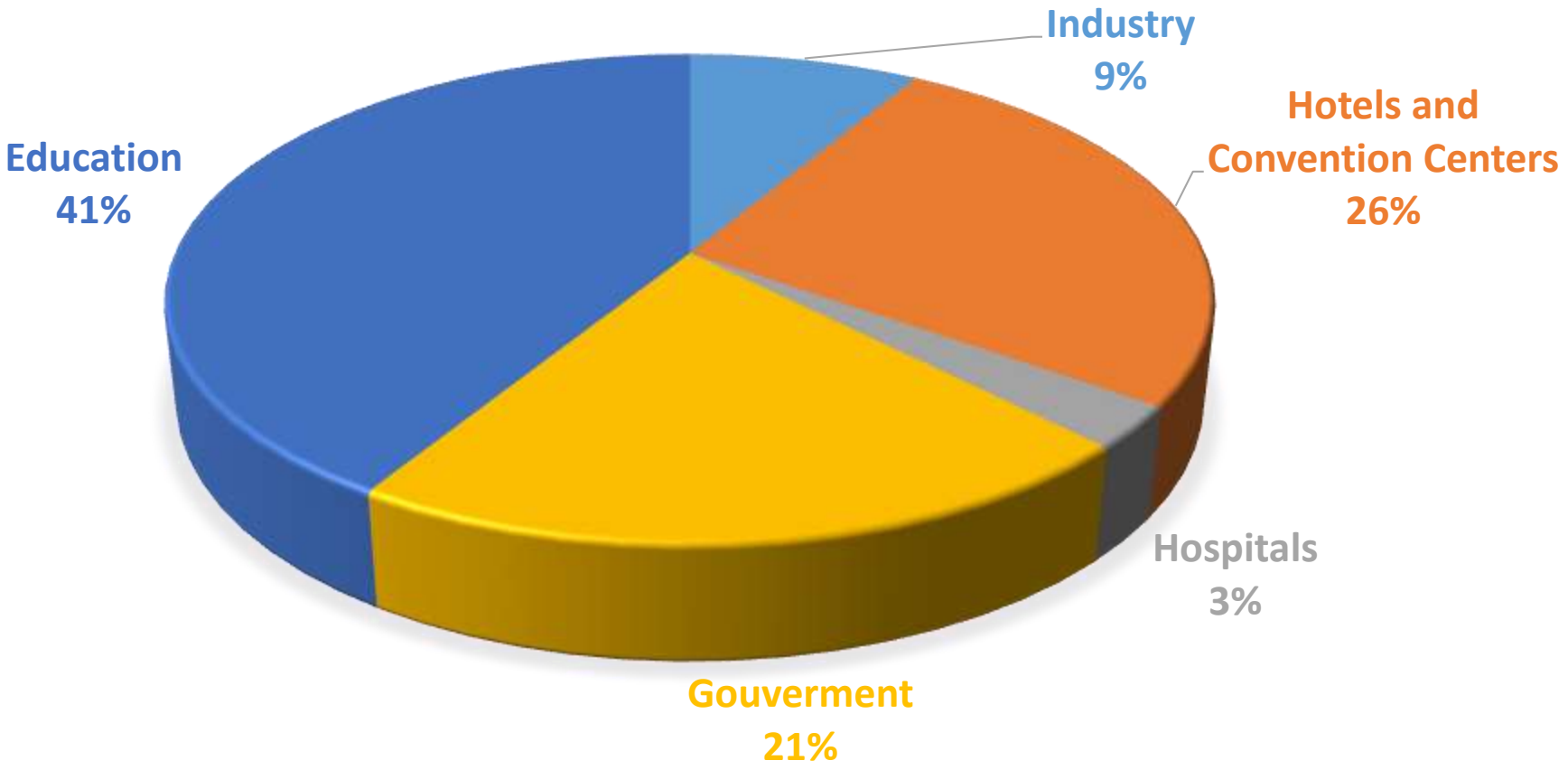
COOLING DEMAND – IMPACT BY REGION

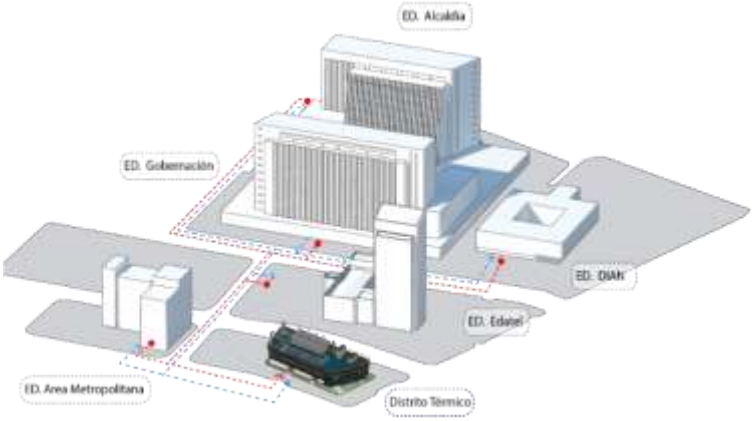


COOLING DEMAND – POTENTIAL DEMAND BY SECTOR



The Alpujarra District Cooling

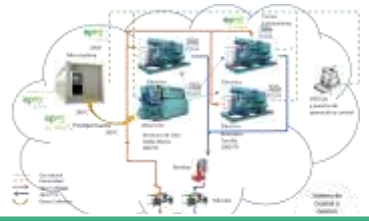
THE PILOT PROJECT

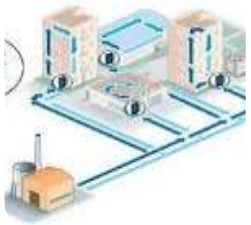


Fuente: *Google Earth*

The Alpujarra District Cooling

PILOT PROJECT HIGHLIGHTS





PROJECT HIGHLIGHTS

Total Capacity:	3,600 TR – hour
Engaged Capacity:	1880 TR-h **52.2% of total**
Available Capacity:	1720 TR-h **47.8%**
Residual Capacity:	**3,600 TR-h**

COMMERCIAL OFFER

24/7 Chilled water production and transfer to each client's station

Energy Transfer Station is part of the commercial offer

performance, economic and historical reports available online

Customers services by different channels

The Alpujarra District Cooling

Learnes Lessons

- With the extension project the DE is further strengthened
- EPM in the process to develop new DE, applying lessons learned
- End users cooling demand is overestimated, is necessary monitoring real demand. Cooling demand and existing systems assessment is necessary. Financing to improve internal systems as a commercial strategy.
- Permanent technical and commercial support to the end user since the early stages of the project. Business plan with connections deadlines and signed contracts.
- Environment technical conceptions have additional costs, natural refrigerants or HFC?
- A DE must be evaluated as a private and industrial project and not as an urban city extension
- A DE must have access to cheap primary energy
- Distribution networks as short as possible, especially with suitable materials
- The DE have greater potential for zones with new urban developments

DISTRICT ENERGY PROMOTION

DISTRITOS TÉRMICOS COLOMBIA

Institutional Actions

- Tax & Financial Benefits
- DE is a NDC + priority Energy efficiency measure
- National thermal context analized and characterized
- International DE context identified
- DE study methodology implemented
- Contract and guarantees models available

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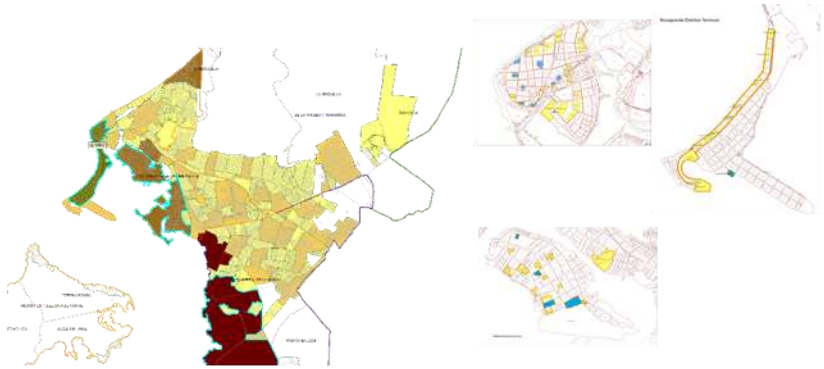
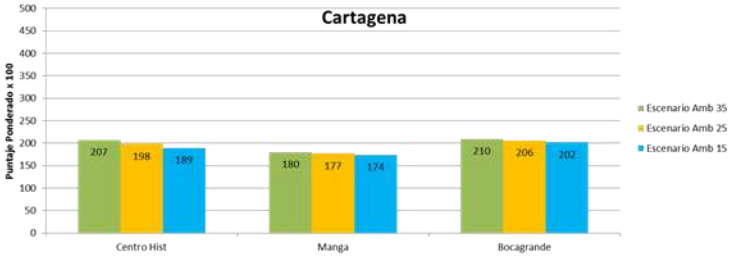
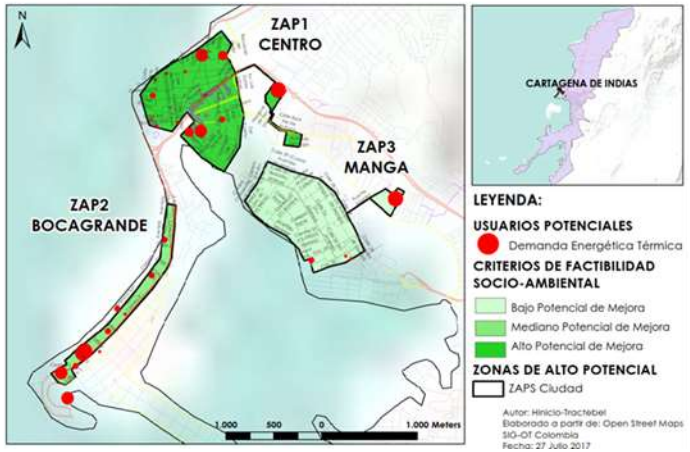
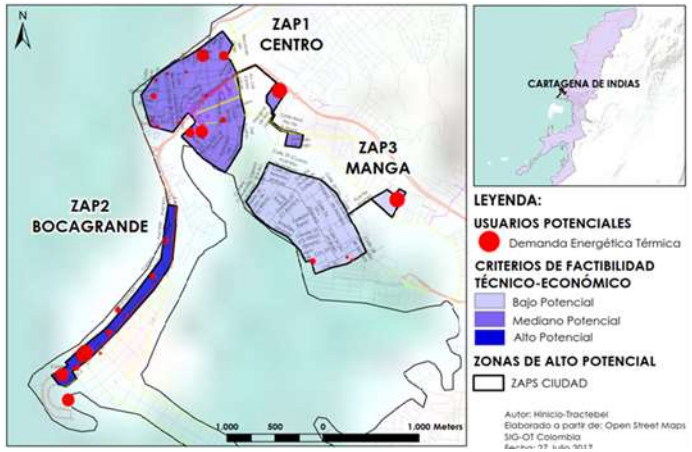
DISTRICT ENERGY PROMOTION

Methodology in cities









DISTRICT ENERGY PROMOTION IN CITIES

District Cooling in Bogotá

DISTRITOS TÉRMICOS COLOMBIA

Key Performance Indicators

Site	Zona CAN – Bogota', business offices sector under development; 9 potential clients mainly business offices, hotels and malls
Site Capacity	20MWt (5714 TR) with an yearly use factor of 1000 hrs (EFLH)
ROI & Payback Period	11.9% and 11 years (17 years actualized)
Total Investment	24MM USD
Envaironmental Impact	Reduction of 135 ton CO2/year Can replace ~7500kg of harmful refrigerant
Rates w/o taxes	Connection rate: 786 USD/TR Consuption rate: 0.11 USD/TRH Capacyi rate: 550USD/TR a year

Autoridad Ambiental Distrital

Grupo Energía Bogotá

Gas Natural

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DISTRICT ENERGY PROMOTION IN CITIES

District Cooling in Bucaramanga

DISTRITOS TÉRMICOS COLOMBIA

Key Performance Indicators

Site	Bucaramanga – Cabecera sector, mainly offices, hotels, malls and hospital with 6 potential clients
Site Capacity	9.0MWt (2571 TR) with an yearly use factor of 2874 hrs (EFLH)
ROI & Payback Period	11.4% and 12 years (19 years actualized)
Total Investment	15.3MM USD
Envaironmental Impact	Reduction of 709 ton CO2/year Can replace ~3325kg of harmful refrigerant
Rates w/o taxes	Connection rate: 721 USD/TR Consuption rate: 0.12 USD/TRH Capacyi rate: 765 USD/TR a year

- Autoridad Ambiental
- Ruitoque ESP
- Sector Constructor

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DISTRICT ENERGY PROMOTION IN CITIES

District Cooling in Cali

Key Performance Indicators

Site	Cali – Central sector, mainly officesand malls with 11 potential clients
Site Capacity	17.4MWt (4971 TR) with an yearly use factor of 2262 hrs (EFLH)
ROI & Payback Period	12.7% and 11 years (16 years actualized)
Total Investment	23MM USD
Envaironmental Impact	Reduction of 1080 ton CO2/year Can replace ~3325kg of harmful refrigerant
Rates w/o taxes	Connection rate: 883 USD/TR Consuption rate: 0.32 USD/TRH Capacyi rate: 646 USD/TR a year

- Autoridad Ambiental
- Emcali ESP
- Gases de Occidente

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DISTRICT ENERGY PROMOTION IN CITIES

District Cooling in Cartagena

Key Performance Indicators

Site	Bucaramanga – Bocarande sector, mainly hotels and malls with 9 potential clients
Site Capacity	32.4MWt (9257 TR) with an yearly use factor of 3456 hrs (EFLH)
ROI & Payback Period	14.8% and 10 years (13 years actualized)
Total Investment	36.6MM USD
Envaironmental Impact	Reduction of 4700 ton CO2/year Can replace ~12000kg of harmful refrigerant
Rates w/o taxes	Connection rate: 727 USD/TR Consuption rate: 0.11 USD/TRH Capacyi rate: 710 USD/TR a year

- Secretaría Planeación Plan 4C
- Instituto de Turismo
- Surtigas

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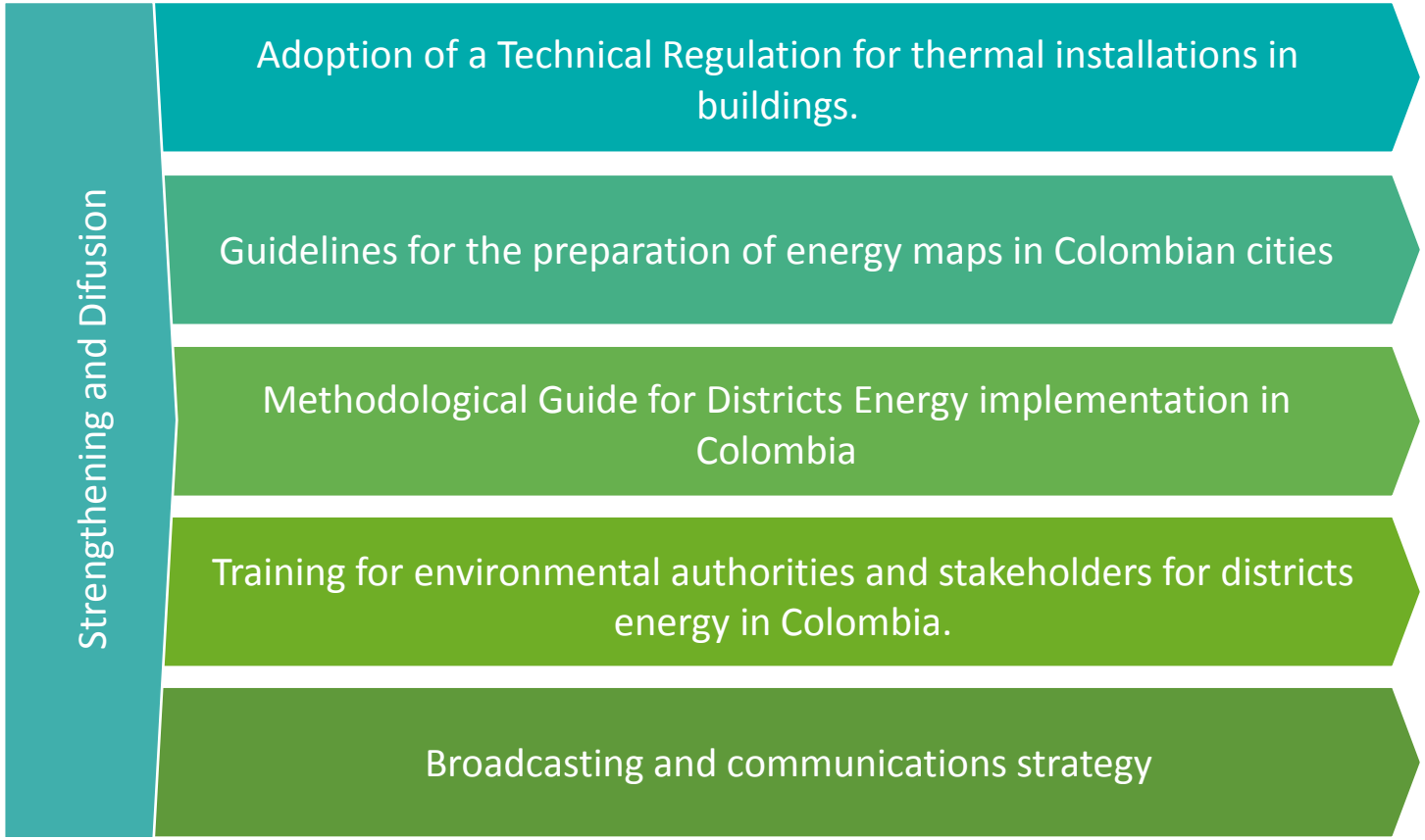
Institutional strengthening

National strategy



DISTRICT ENERGY AS STRATEGY

AIR CONDITIONING SECTOR TRANSFORMATION

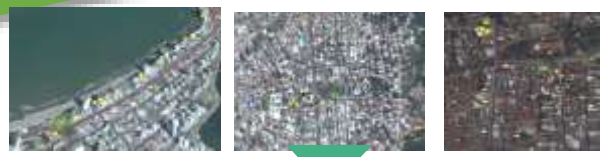
DISTRITOS TÉRMICOS COLOMBIA

SUBSTITUTION SWITCH OVER

Conventional Systems

2012

NEW ALTERNATIVE SOLUTION



Five cites studied with DE

District Cooling

2014

INTEGRATED STRATEGY

Training

Sustainable technology

Institutional strengthening

2020 ....

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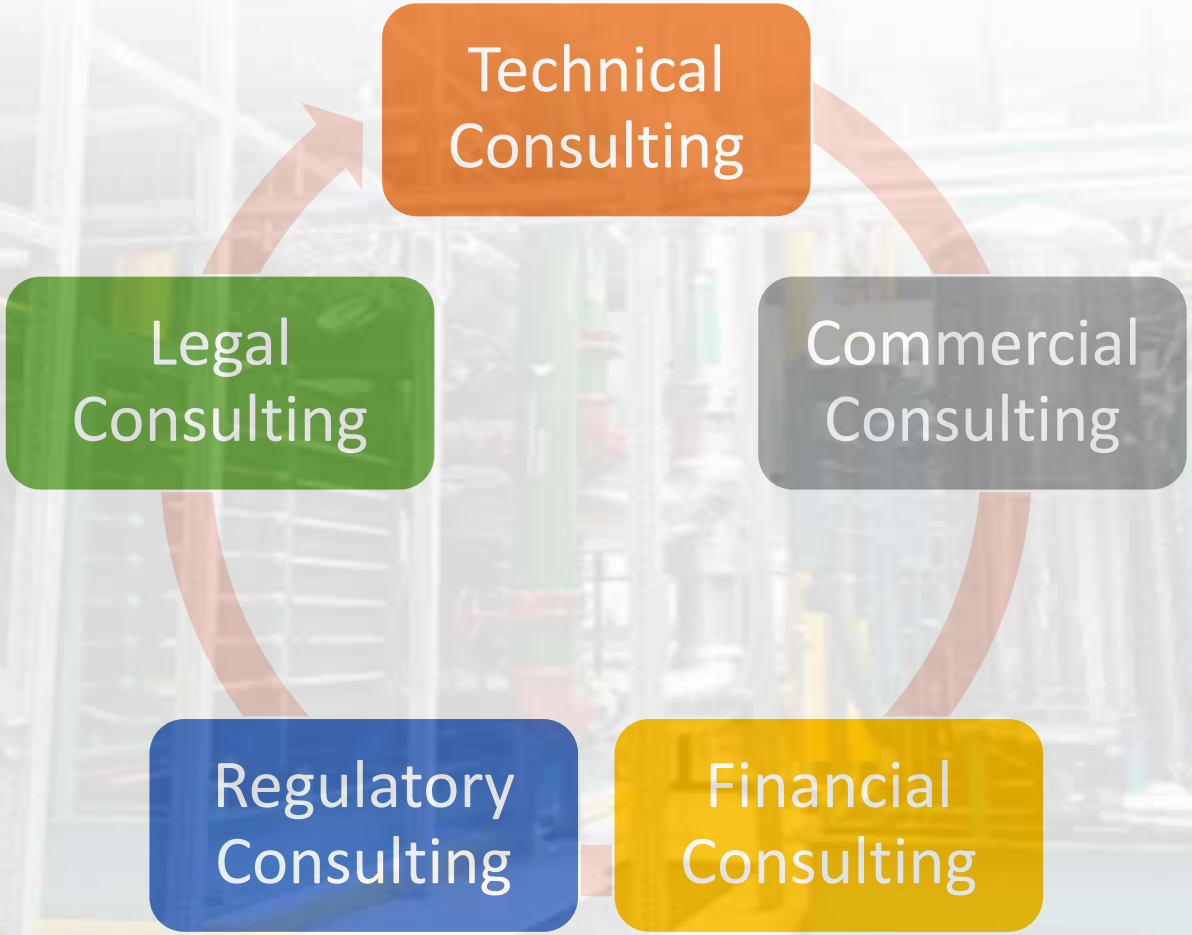
DISTRICT ENERGY - FUTURE ACTIONS IN COLOMBIA

RESEARCH AND DEVELOPMENT CENTER - AIR CONDITIONING SECTOR



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GRACIAS

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