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# The transition towards a low-carbon economy: the Colombian context

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# Indonesia and Colombia

INDONESIA	Statistic	COLOMBIA
275	Population (million)	52
1.914	Area ('000 sq. km)	1.142
144	Pop.density (inhab/km2)	45
31,1	Average age	31,2
66/70	Life expectancy (male/female)	69/76
1.319	GDP 2022 (MMUSD)	344
4.798	Per capita GDP (USD)	6.664
37,9	Gini	54,2
0,71	Human Development Index	0,75
932	Energy consumption per capita (kwh)	1.343



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# Colombia's GHG emissions by sector

Total emissions (Mton CO2 eq):	259	49.000
Sector	Share of total (Colombia 2016*)	Share of total (World 2014 **)
Forestry	36%	24,0%
Agricultural	26%	
Industry	11%	21,0%
Transport	11%	14,0%
Mines and energy	10%	34,6%
Waste	4%	
Commercial and residential	3%	6,4%

\*IDEAM: Inventario Nacional de Gases de Efecto Invernadero 2016

\*\*IPCC AR5 WG III: SPM p.9

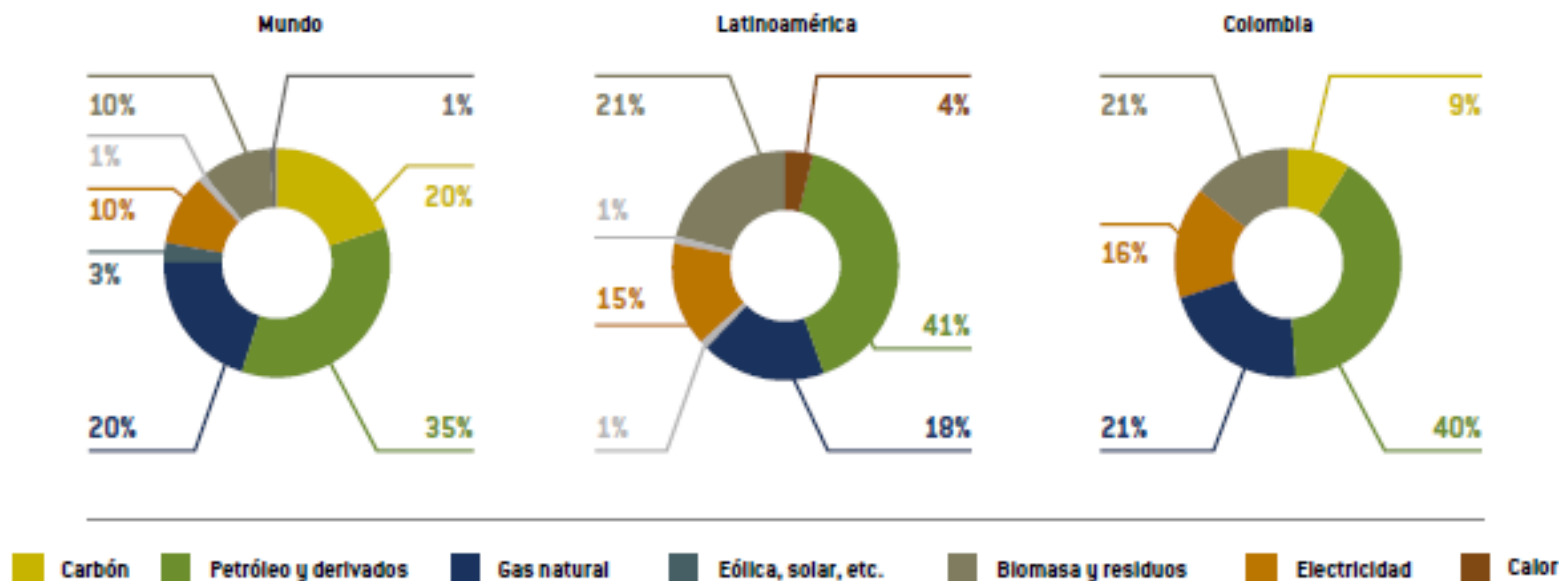
Direct emissions

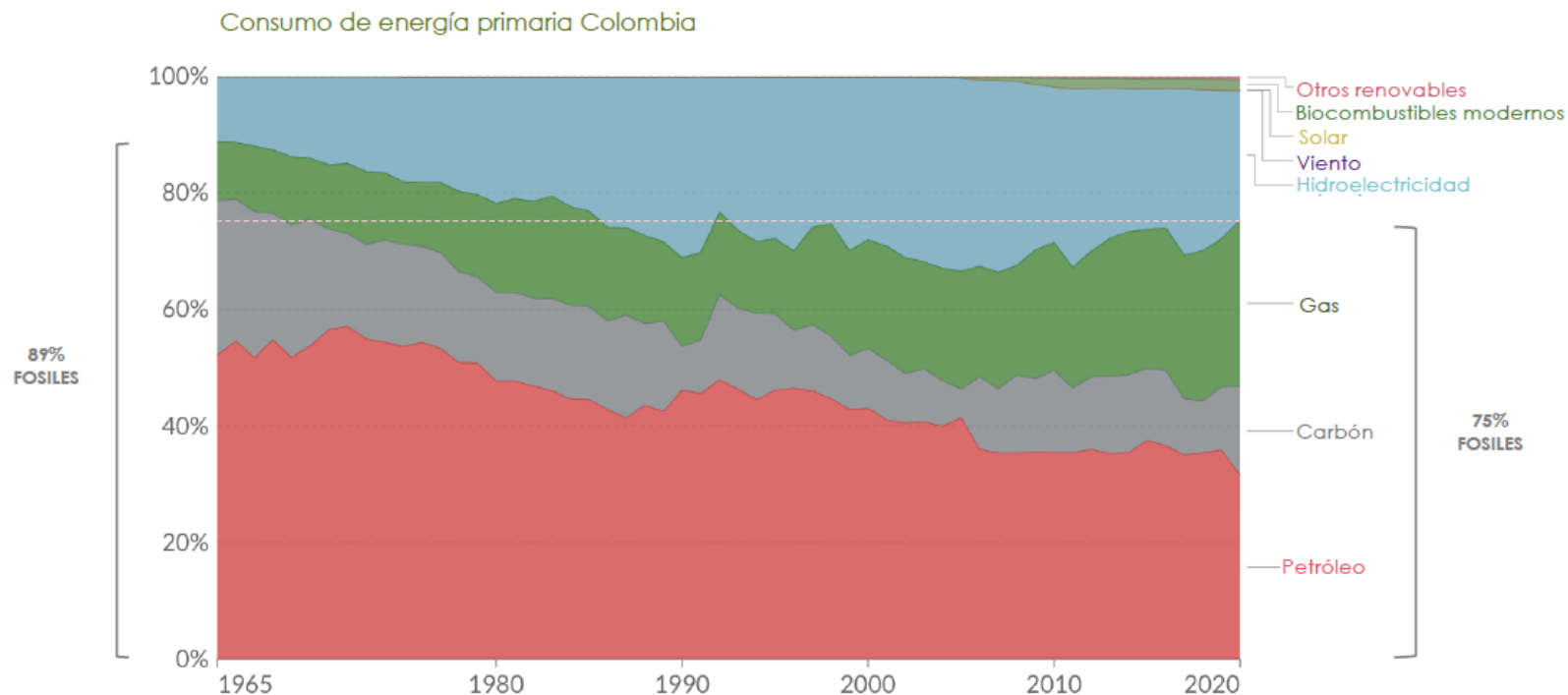


**All seems set for Colombia to transition to  
a low-carbon economy:**

# Colombia's energy sources are typical

*Oferta energética para consumo final (2018) – (PJ) (IEA, 2020; UPME, 2020)*



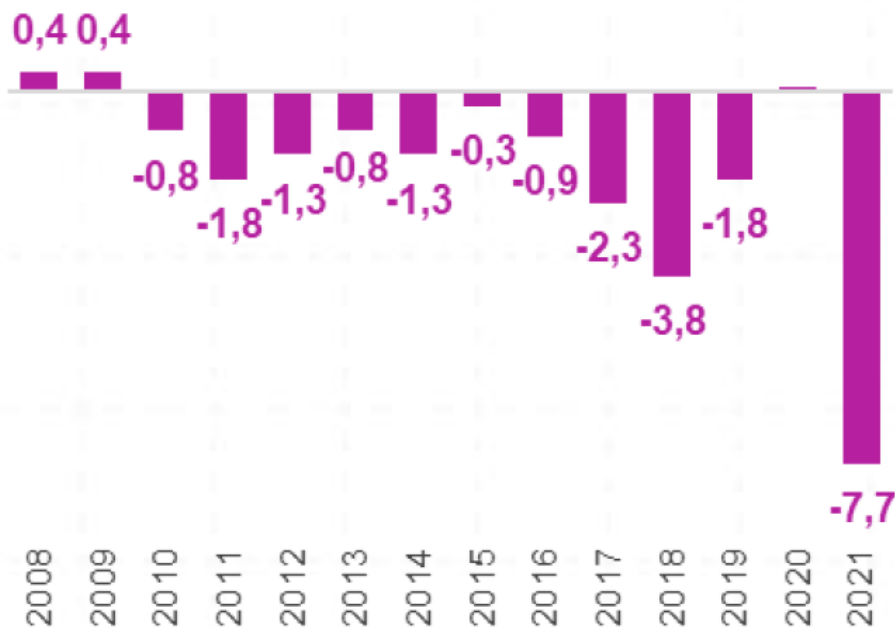


● Fuente: CREE



## ... and fiscally expensive

Gráfico 2.1 Déficit del FEPC, billones

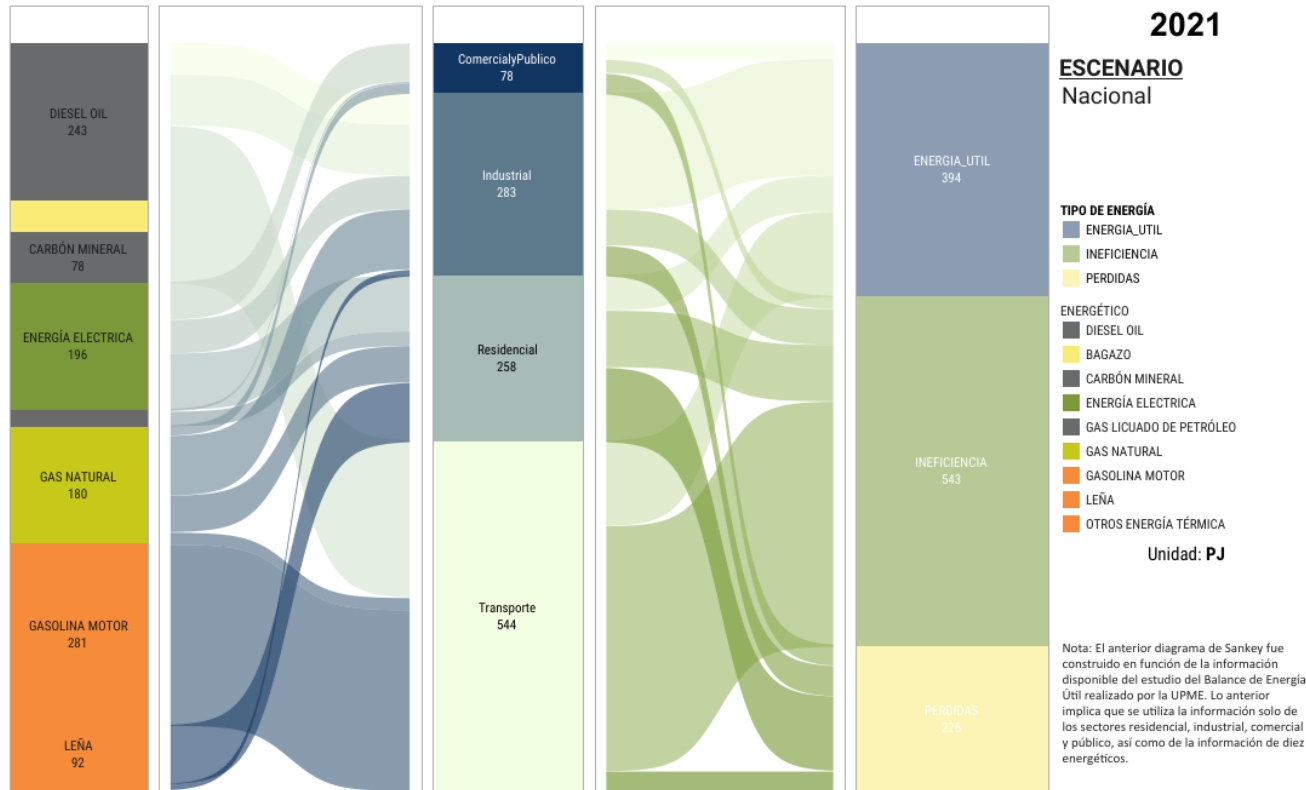


Fuente: Cálculos DGPM - MHCP.

- We subsidize gasoline and diesel at a high cost.
- Only in 2021, the net subsidy was 0,6% of GDP
- In 2023 it grew to almost 3% of GDP



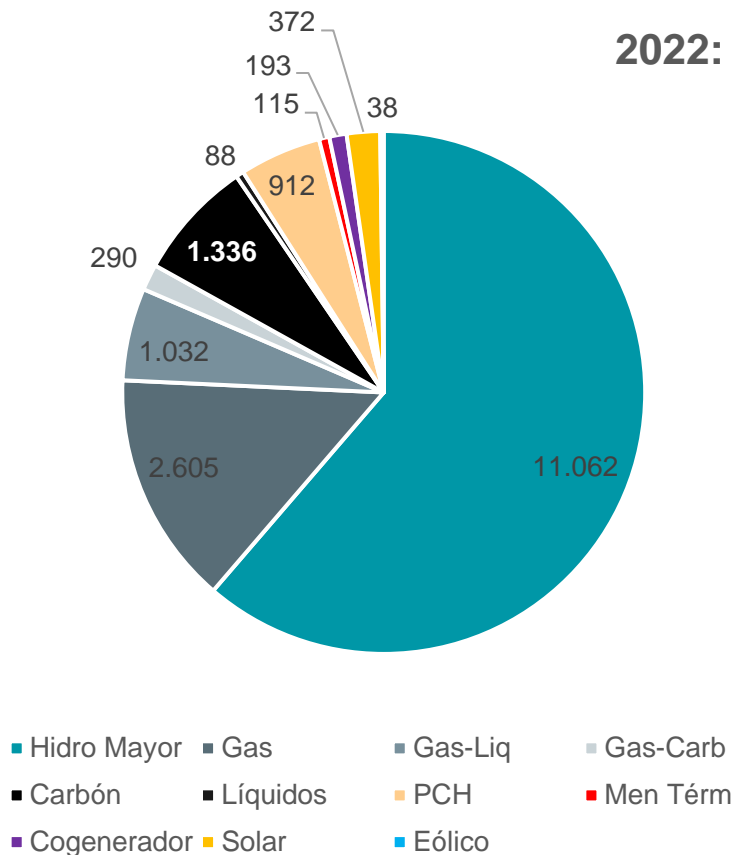
# We make very inefficient use of energy



- But the use of electricity is generally efficient.

## On the ther hand, our electricity matrix is clean

2022: 18.044 MW



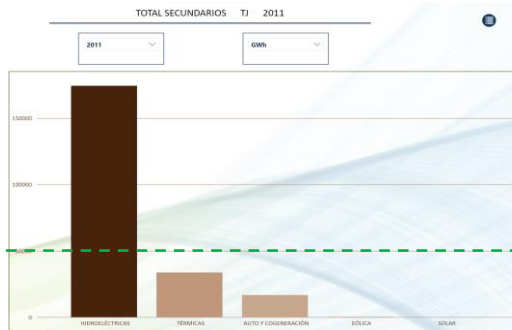
- 5% of the population lack access to electricity.
- 10% of households cook with wood regularly or occasionally.

Fuente: XM

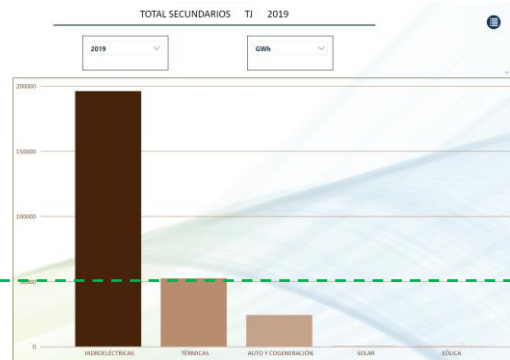


# ... but it is vulnerable to El Niño

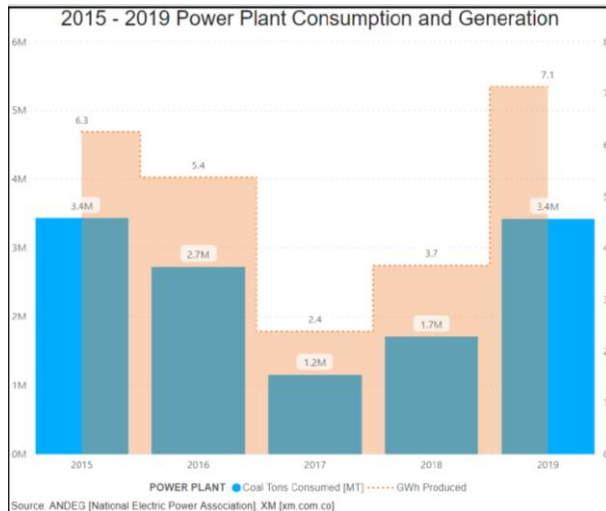
La Niña (2011)



Normal (2019)



El Niño (2015)



Fuente: BECO – UPME

<https://www1.upme.gov.co/DemandayEficiencia/Paginas/BECO.aspx>

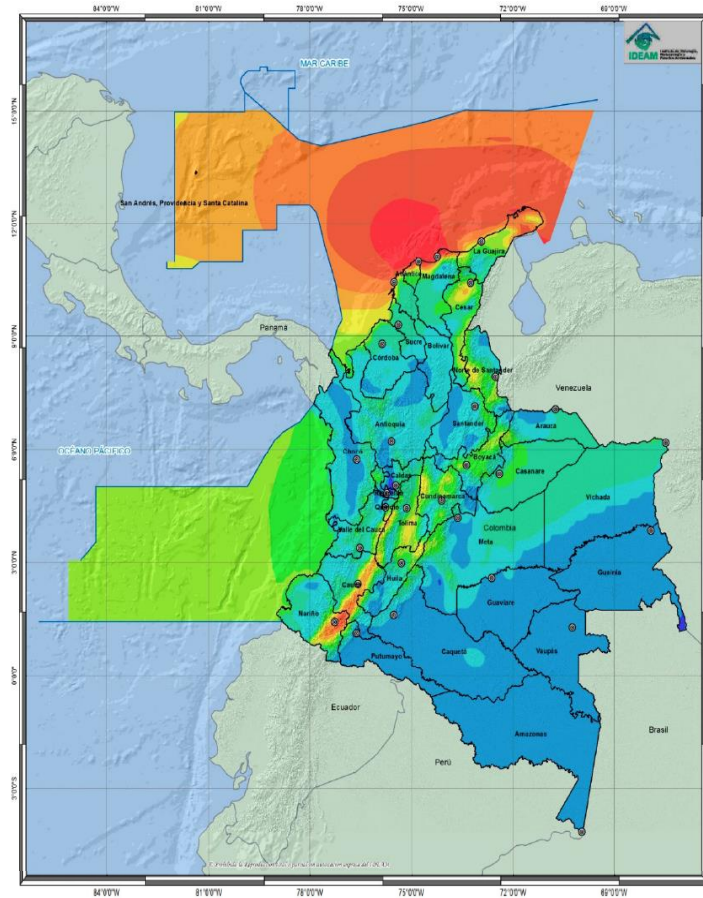
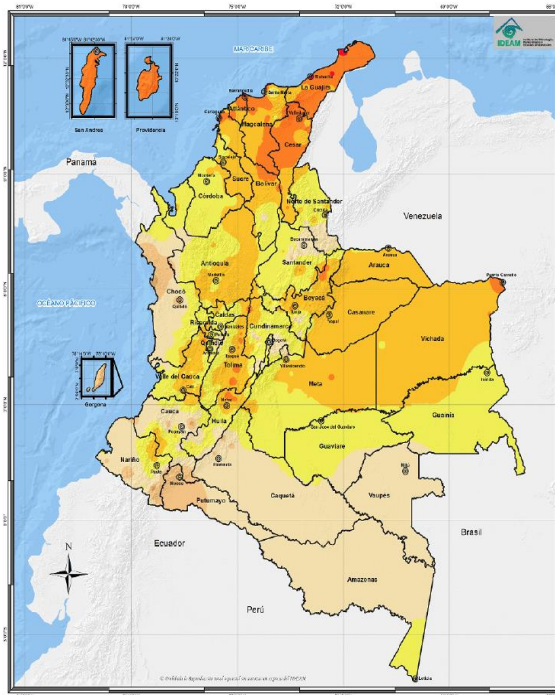
Boyd Colombian Coal Map

- In normal years, 80% of electricity is from renewables, 75+% from clean sources.
- During El Niño periods, necessary fossil fuel generation is aprox. 50%.

# We can use wind and solar!

Wind potential (UPME)

SPV potential (UPME)

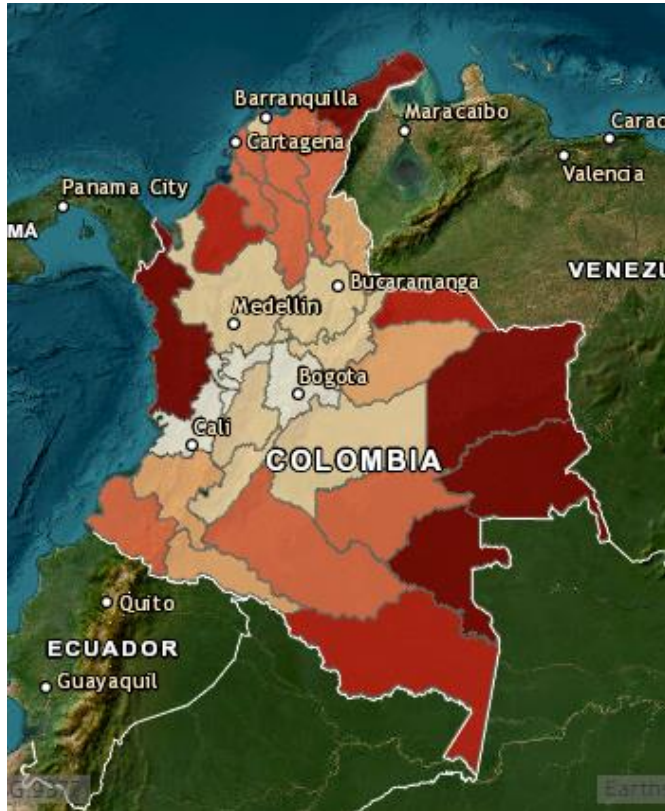


**All seems set for Colombia to transition  
to a low-carbon economy,**

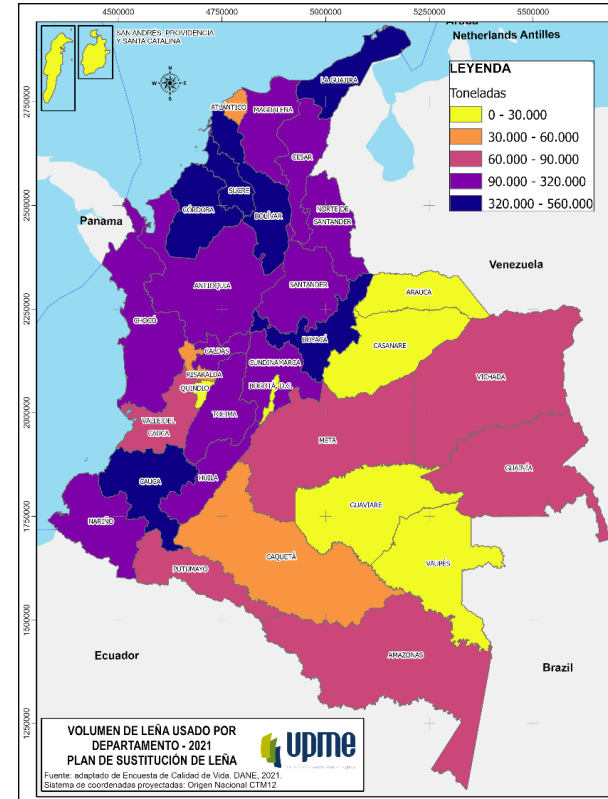
**BUT...**



# Poverty in Colombia varies extremely across regions



**Necesidades Básicas Insatisfechas (NBI)**  
**DANE**

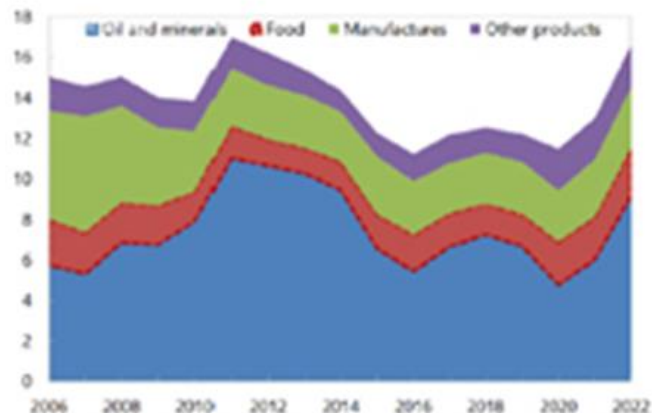


**Consumption of wood for cooking**  
**UPME**

# The country depends on fossil fuels for foreign currency

## Evolution and Composition of Goods Exports

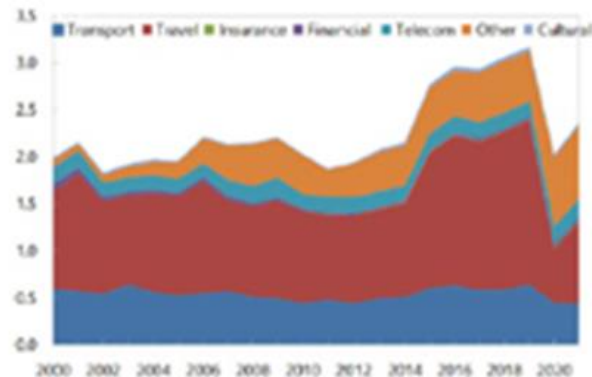
(Percent of GDP)



Sources: DANE; IMF staff elaboration.

## Evolution and Composition of Services Exports

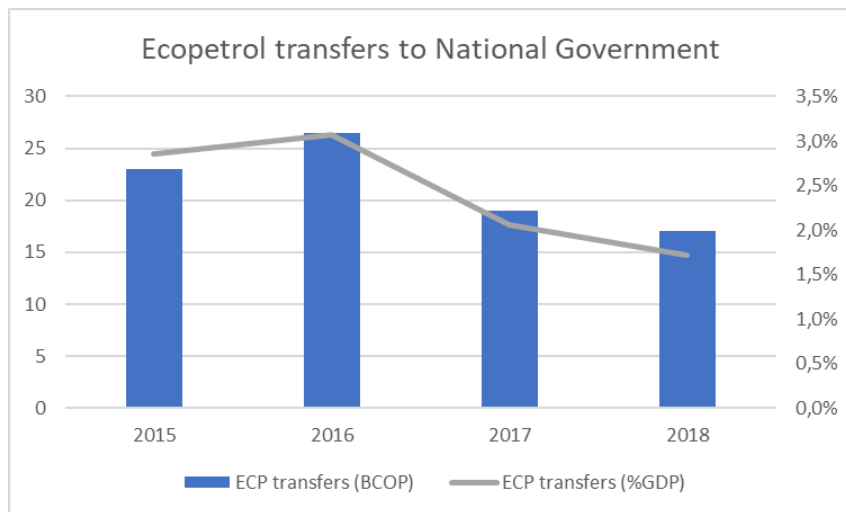
(Percent of GDP)



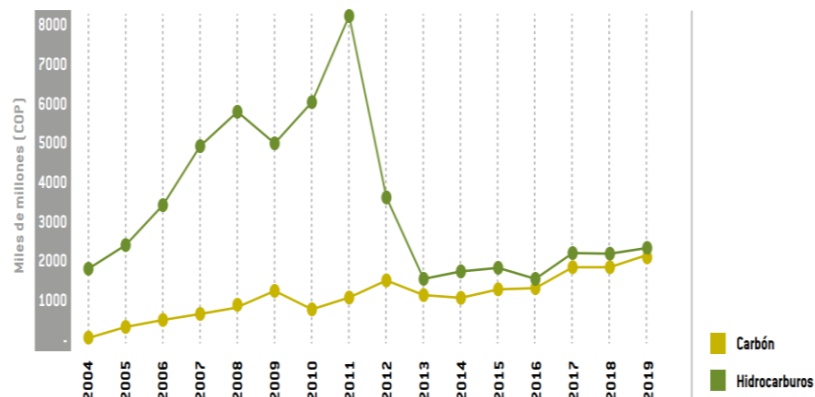
Sources: Haver Analytics; IMF staff elaboration.



# The Government depends on fossil fuels for revenue



Aportes al sistema general de regalías del sector minero-energético (ANH, 2019; ANM, 2020; ANM, 2016)



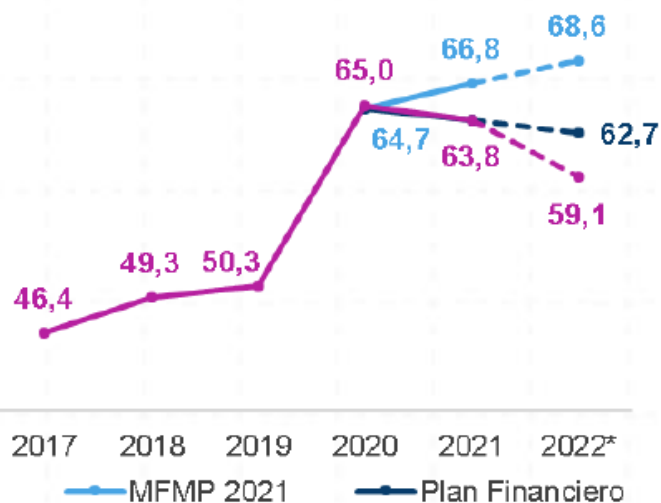
MFMP, DANE



## ... at a time of fiscal stress

**Gráfico 1.6. Deuda neta del GNC 2017-2022, % del PIB**

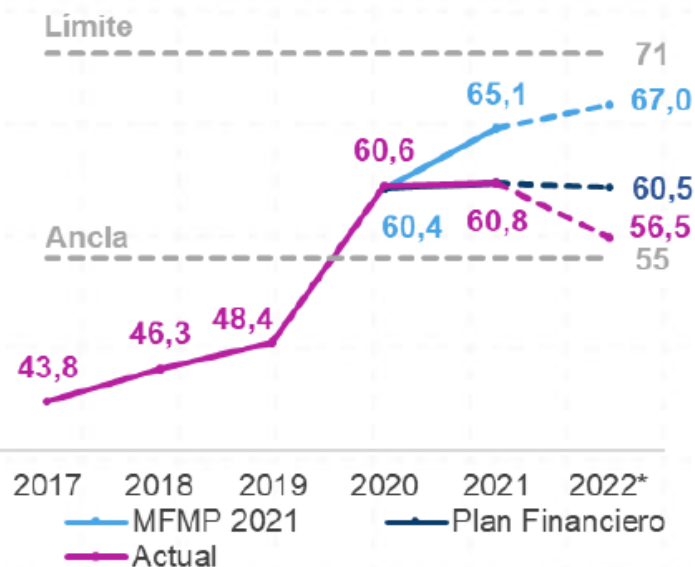
**A. Deuda bruta**



Fuente: Cálculos DGPM-MHCP.

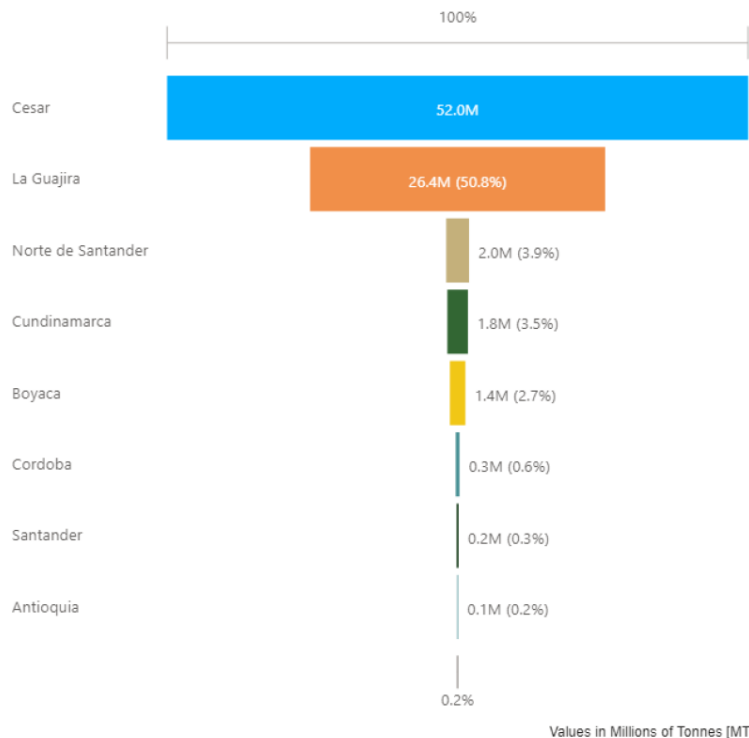
\*Cifras proyectadas.

**B. Deuda neta**



# Some regions depend critically on coal mining

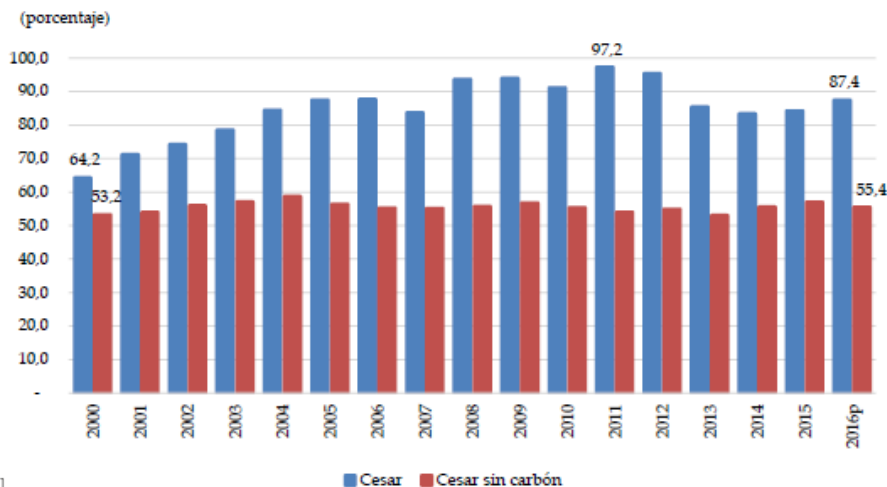
2019 Coal Production by Department



Source: DANE [National Statistics Bureau]; ANM [National Mining Agency]

**For the department of El Cesar, coal mining is one third of GDP.**

PIB per cápita del departamento del Cesar con y sin carbón sobre el promedio de Colombia, 2000-2016p



Fuente: DANE y cálculos de los autores.

Fuente: Bonet y Aguilera (2018)

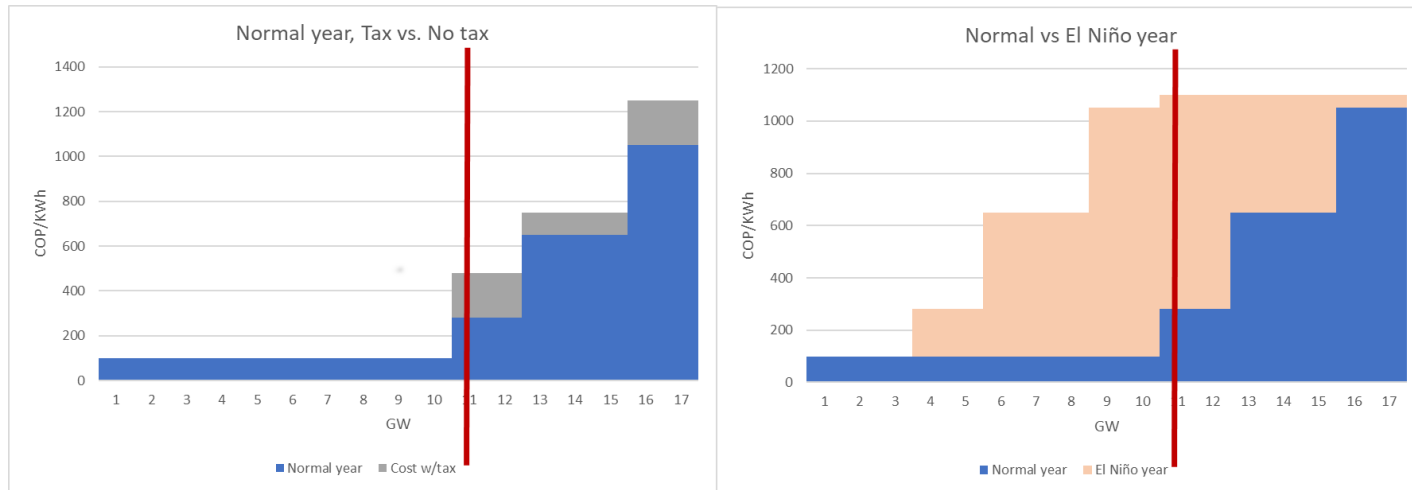
**This led to compromises  
and changes of plans:**

# Carbon tax in Colombia

- The Carbon Tax is levied on the carbon content of all fossil fuels, including all petroleum derivatives and all types of fossil gas that are used for energy purposes, whenever they are used for combustion.
- The Colombian carbon tax was created by Act 1816 of 2016. "Cost-effective tool to contribute the reduction of GHG emissions from the burning of fossil fuels in the country, generating opportunities to improve efficiency and sector productivity, in addition positive impacts on air quality and environmental health."
  - Initially it did no tax coal.
  - Carbon offsets up to 100% of tax.



# Why coal was exempt

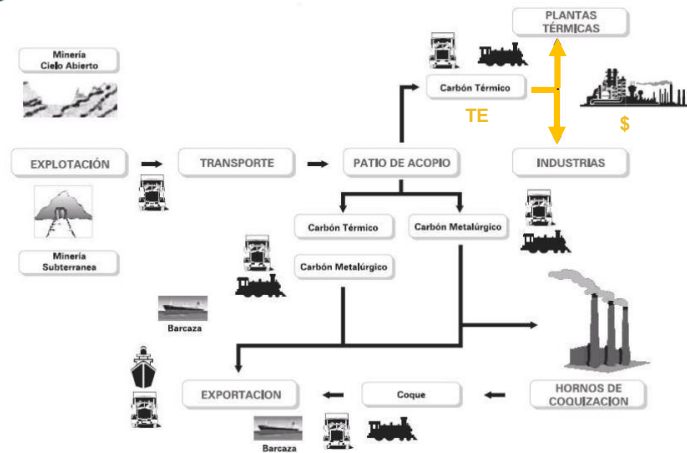


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  - Initially it did not tax coal.
  - Carbon offsets up to 100%.
- Since its creation it has been modified six times. The most important modification was the Act 2277 of 2022.
  - USD 4.43/tCO<sub>2</sub>e for all petroleum derivatives and all types of fossil gas used for combustion, starting 2023. Stepped hikes until 2028.
  - Local sale of coal for energy generation is now taxed.
  - Carbon offsets up to 50% of tax (previously exempt).



# Carbon Tax in coal (today)

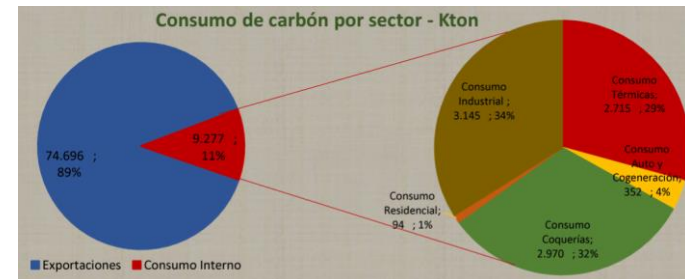


The taxable event is the acquisition or use for self consumption of coal.  
The purchaser/user is the passive (taxed) subject.

Passive subject is responsible for payment (self-assessment).

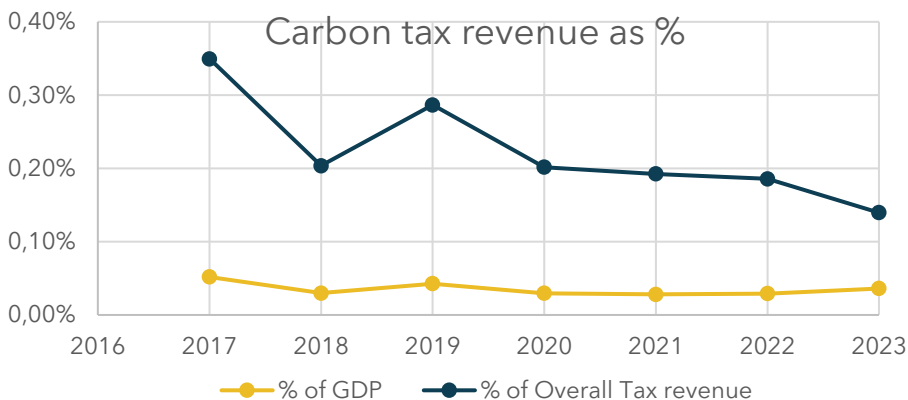
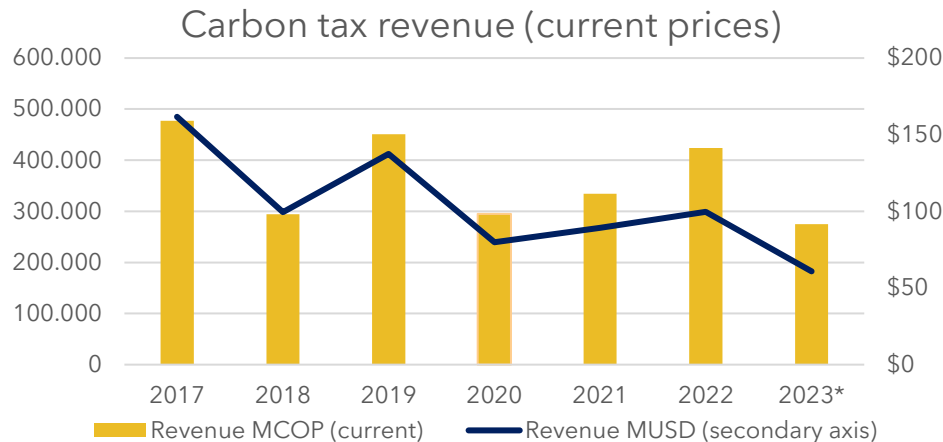
95% of the coal production is exported → not taxed.  
Coal for coke (metallurgical) → not taxed.

Only 3.5% of coal production is being taxed → electricity generation.



Source: ANDI-2021

# Carbon Tax Revenue



Source: Own elaboration.

2023\*: From January to June

Revenue MUSD: Using average exchange rate of the year

- Carbon tax revenue (2022): \$99,61 MUSD
- Carbon tax revenue (until July 2023): 82,57 MUSD
- + 29% in the same period of 2022.
- Carbon tax revenue as % of GDP: 0.04%
- Carbon tax revenue as % of tax revenue: 0.14%






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