



# Colombia towards a fossil fuel-free future



PARLIAMENTARIANS FOR  
A FOSSIL-FREE FUTURE



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# INTRODUCTION

This report was created within the framework of the *Parliamentarians' network for a fossil fuel free future*. This network, including more than 900 parliamentarians from 85 countries, has decided to inquire into the progress, both national and global, of fossil fuels phaseout, as they are, according to the Intergovernmental Panel on Climate Change (IPCC), responsible for more than 80% of the historic emissions of Greenhouse Effect Gases (GHG). This phaseout must be a global response to the climate emergency, and is needed to meet the goal of keeping temperature under 1.5°C. In Colombia, a group of eight members of congress from five different parties has led this research as a common cause. Its purpose is to show the country's trajectory to attain a future less dependent on coal, oil, and gas.

The planet requires each country to make significant efforts in transforming its economy to increasingly depend less on fossil fuels. Colombia's commitments to decreasing its emissions must include an energy transition plan that is aligned with its fair share of this global challenge. This report has been called *Colombia hacia un futuro libre de combustibles fósiles (Colombia towards a fossil fuel free future)* and provides key data that should be analyzed considering the climate emergency, but also considering the country's social and economic context.

This report has been written with a high-level technical support team that guided the members of congress by providing key elements for the research. In addition, experts participated in a public event held in Congress, where they presented the most relevant data to understand Colombia's progress, but also identify future strategic actions.

In this context, the report's structure offers a view of Colombia's current energy transition and climate commitments status, as well as the three strategic topics that allow for the planned phase-out process to be effective, fast, with larger positive impacts and suitable to the country's possibilities.

The report will be published within the framework of COP 28, the Summit for negotiations on climate action, that shall take place in December 2023 in Dubai. It will be presented during the Global Parliamentarians' Network's research's last public audience, and will be included as one of the main findings proposed for inclusion in the Global Stocktake.

**The report's structure offers a view of Colombia's current energy transition and climate commitments status, as well as the three strategic topics that allow for the planned phase out process to be effective**

**Colombia towards a fossil fuel-free future**



# CONTRIBUTIONS AND KEY MESSAGES

**Colombia's road map towards a fossil fuel free future must include at least two transitions: energy and economic.** The global climate crisis, as well as the planet's imminent transition towards different energy sources from oil, gas, and coal, requires the legislative and executive branches' immediate support, private parties' willingness to adopt new business models, and inclusion and openness of communities to implement the energy transition. For Colombia to be a leader in energy transitions in an international scenario, from the current administration and for the next 25 years, policies in Colombia need to be adopted. Colombia is also in a position to lead a Global South countries' alliance, particularly in Latin American countries, to structure an equitable financial support system for the transitions and to avoid raising the planet's average temperature over 1.5°C.

**Colombia's economic dependence on oil and coal exports should take an urgent turn, pointing towards a diversified economy:** In line with projected global demand reductions of these energy sources, Colombia could lose from 45% to 70% of its coal exports, and from 20% to 45% of oil exports between 2030 and 2035. There are no current substitutes for these exports; the national economy thus faces the huge challenge of offering, within a decade, the conditions required for the creation of new markets compatible with the ODS and the Paris Agreement's agendas around sustainable products and services that must amount to at least more than GDP's COP\$50 billion annually, and at least 200,000 direct local jobs. These new activities must amount to approximately USD 19 thousand million annual exports and also guarantee foreign investment of at least USD 1800 million annually (WWF, 2023).

**Colombia's energy matrix is highly dependent on fossil fuels. Although the electricity mix is labelled as "clean" and tends to expand to renewable sources, the most optimistic official projections show that the country is far from being able to move to an economy that does not heavily rely on fossil fuels.** According to JET's projections (2023), in the most ambitious scenario, by 2052 coal consumption would be reduced to zero, but gas and oil consumption will still be prevalent (5% and 20% of the energy matrix, respectively). To be completely independent from fossil fuels, the most consuming

sectors – transport and industry – should be prioritized in a gradual and fair decrease in their consumption.

**Colombia has the opportunity to enable a massive entry of renewables, with an expected participation of nearly 100% of clean sources in its electrical power matrix.** A newly installed additional capacity of between 10 GW and 27 GW from renewable technologies is projected by 2030, mainly in solar and wind energy, together with new regulation and new technologies that help strengthen the electrical power network's stability, displacing coal and gas generation. The implementation of this infrastructure will only be possible if the processes include communities living in the affected areas, creating a horizontal dialogue between the State, society, and the private sector. This will ensure these strategic projects may be successfully implemented while guaranteeing social and environmental safeguards.

**Reducing dependency on fossil fuels entails using different energy strategies: Planning the electrification of large part of consuming sectors should also be aligned with increased energy efficiency and the use of diverse local sources (wood energy, biogas, thermic solar energy, hydroelectric central peaks, among others).** The combination of large projects and potential energy use governed by communities in local territories is strategic due to its complementarity and productive value chain enablement.

**Given it is the sector that consumes most fossil fuels, the energy transition in transport is a priority.** Transformation must be fast in a scenario that, in addition to limitations related to emissions, shows depletion of hydrocarbon resources. Approximately 90% of available gasoline is consumed by vehicles and 90% of available diesel by freight transport. Significant energy savings can be achieved in the present and future with a combination of measures that discourage the private vehicle model (fossil or electric) and promote electric massive transport and active mobility. Likewise, the electrification of freight transport is essential, as well as substituting it for new more efficient modes of transport, such as trains and fluvial.

**Public policies must be oriented towards a mid-term phase-out of fossil gas.** Although it is evident that this energy source will be part of the energy matrix for a few more years, it is crucial that public policies promote its gradual phase-out, beginning with electrical power generation and residential sectors where technically and financially feasible alternatives already exist. Likewise, Colombia must avoid risking financial stability through Ecopetrol's investments in the expansion of the gas frontier towards Colombia's Caribbean Sea. Doing this would require annual investments of between COP \$6 and \$7 billion, as well as infrastructure investments estimated at around COP \$28 billion for the connection of gas pipes from the ocean. The promotion of policies incentivizing this fossil fuel's phase-out should be prioritized over financial interests that advocate for its permanence in the future.

**Within the framework of the common but differentiated responsibilities principle, Colombia's climate commitments are not compatible with science's call of keeping global temperature below 1.5 provided for by the Paris Agreement.** The country's NDC is far from ambitious, lacking significant restrictions on fossil fuel demand and supply. Although oil and carbon exports are not part of national greenhouse gases accounting, given it is one of the most vulnerable countries in terms of climate crisis, it is essential to start building new economic paths where preservation of nature is prioritized as both a mitigation and adaptation measure. In light of the financial risk of new oil and gas projects become stagnated assets, this investment must be diverted to sectors aligned with decarbonization goals.

**The Colombian State must continue programs aimed at the gradual elimination of the fossil sector's subsidies and incentives, protecting vulnerable populations from this exploitation's possible adverse effects, and avoiding social unease.** Only in 2022, approximately USD \$34 billion were spent – explicitly and implicitly – subsidizing the production and consumption of fossil fuels, primarily diesel and gasoline. These subsidies should not only be decreased gradually to avoid abruptly hurting consumers and over-stimulating inflation, but also be reinvested in economic sectors committed to increasing energy efficiency, pursuing an electrical power transformation process, and using renewable energy sources.

**Adoption of NDC, ODS and fair energy transition agendas, also requires institutional, comprehensive, and continuous follow-up by the executive and legislative branches.** According to Article 7 of Law 1931 of 2018 "Law of climate change", the Ministries included in SISCLIMA are responsible for the implementation follow-up of each sector's Climate Change Comprehensive Management Plan (CCCMP); pursuant to Law 1715 of 2014's Article 45, a mechanism was created for the national government's periodic follow-up of this Law's implementation progress. There is therefore a need to use the mechanisms created by this Law to further the comprehensive follow-up of actions taken towards complying with the Paris Agreement and the energy transition, in a way that guarantees their effective adoption. When needed, recommendations should be made on actions adopted and make amends when required by scientists in reports to the Intergovernmental Panel on Climate Change (IPCC) and other international agreements.

**Colombia should undertake a rigorous analysis of its energy and economic transition's costs and develop a short-, mid-, and long-term fiscal strategy focused on brokering local and foreign investment opportunities, and cost-effectively channeling government expenditure towards climate change adaptation and mitigation programs, and sustainable or non-emitting economic activities.** Colombia has a reduced fiscal space for the investment needed for an effective energy and economic transition, estimated between 5-8% of its annual GDP. Debt-for-environment swaps, international cooperation, and multilateral financial solutions should be pursued to enable these transformations. The role of the private sector should not be understated, and financing alternatives that do not represent additional public debt must be insisted upon and supported by different voices and groups of countries, or in treaties promoting a fossil fuels' planned phase-out.

**Expansion of the hydrocarbon extractive frontier in the Amazon must be stopped and opening the door for so-called "minerals for transition" must be avoided.** To articulate the two largest mitigation challenges faced by the country (deforestation and fossil extraction), it is essential to promote a Law transforming the region into a non-proliferation of fossil fuels area, and also create the conditions for the elements for the effective dismantling of the existing exploitation infrastructure, including plans to address historical impacts on territories and communities from an environmental justice perspective.

# A LONG TERM COMMITMENT



Concerned for a common cause, the undersigning members of congress commit ourselves to a collaborative work with all relevant actors in society to imagine together a future less dependent on fossil fuels.



We hope this multiparty effort sparks national and transnational discussions and consolidates a leading force in the legislative branch, for the sake of the energy transition and Colombia's future.

## **SIGNATORIES WHO SIGNED:**

**Hon. María del Mar**  
Pizarro García

**Hon. Daniel**  
Carvalho Mejía

**Hon. Duvalier**  
Sánchez Arango

**Hon. Andrés**  
Cancimance López

**Hon. Martha**  
Alfonso Jurado

**Hon. Cristian**  
Avenidaño Fino

**Hon. Juan Carlos**  
Lozada Vargas



a collaborative  
work **with all relevant  
actors in society** to  
imagine together a  
future **less dependent  
on fossil fuels.**



# 01

## COLOMBIA'S CURRENT ENERGY SYSTEM AND JET PROPOSAL REGARDING CLIMATE COMMITMENTS

### 1.1 ENERGY MATRIX. SUPPLY AND DEMAND

#### 1.1.1 Colombia's energy matrix

According to the Unidad de Planeación Minero Energética – UPME (Mining and Energy Planning Unit), Colombia's energy matrix is highly dependent on fossil fuels. In 2019, primary energy supply was dominated in 77% by oil, gas, and coal. Regarding demand, these fossil fuels' final consumption makes up around 70% of total consumption, the largest consumption being of oil with 42%, while electric power consumption is 18%. Comparing the situation to Argentina, Mexico, and Brazil, considering that these countries produce fossil fuels and are economically linked to this activity, it may be shown that Colombia has a significantly lower dependency when compared to Mexico or Argentina, with 90% energy matrix dependence on fossil fuels, in the case of Argentina, even its electric power matrix has a 68% dependence on thermic generation associated to hydrocarbons, and 70% in Mexico. Brazil supports its energy consumption on hydroelectric plants and biofuels and is therefore considered to be one of the world's less intensive carbon emission matrixes, representing 19% of its emissions (SEI, 2021).

Updated data on energy reserves show the following: Proven oil reserves went from 2.039 million reported barrels in 2021 to 2.074 million barrels in 2022 (MINENERGIA, 2023d), enough for 7,5 years. These figures represent 0,1% of global reserves. Regarding gas, proven reserves are approximately 2.8 TPC. This represents less than 0,05 % of global gas reserves, and approximately 7 years following present consumption trends. According to ANM (National Mining Agency), by 2023 there are 4.554 (Mt) coal proven reserves<sup>1</sup> in the country, with a complex prospect for future commercialization due to the global reduced demand trend driven by international climate commitments.

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<sup>1</sup> Metallurgic and thermic coal is extracted in the country, and reserves may be found in seven departments: Cesar, La Guajira, Cundinamarca, Boyacá, Córdoba, Norte de Santander, and Cauca.

### 1.1.2 Electric power generation matrix

By November 2023, the country's installed capacity is 19.928 MW, distributed in 6.056 MW (30%) fossil capacity, 13.679 MW in renewables, mainly hydraulic (68%) and solar 192 MW (2%).

Electric power generation by source may dramatically vary in extremely dry years or during El Niño phenomenon, such as in 2016 when hydroelectric capacity decreased to 50%, while in particularly rainy years or with La Niña phenomenon, hydroelectric participation may cover up to 85% of a year's total demand.

### 1.1.3 Energy demand and supply sectors

Energy consumption indicators registered by Colombia's Energetic Assessment (Balance Energético Colombiano-BECO (2021)), show significant transformations regarding final consumption in different sectors during the last 4 decades. By 2021, the transport sector had a participation on secondary energy consumption of 47%, followed by the industrial (25%), residential (22%), commercial and public (7%) sectors. (See Figure 1). This allows us to conclude that the transport and industrial sectors consume two thirds of the country's total energy.

According to BECO (2021), energy consumption in the transport sector includes passenger and freight transport in all their modalities, distributed as follows: land road transport, 543.845 TJ (92%); air transport, 38.380 TJ (7%); fluvial transport, 876 TJ (0,2%); maritime, 5417 TJ (1%), and railroad transport, 321 TJ (0,05%). National gasoline consumption shows a participation close to 98% for transport, maintained in 2012-2022. For 2022 it added a total of 162.428 daily barrels (d/b), showing an increase of 15.841 d/b compared to 2021,

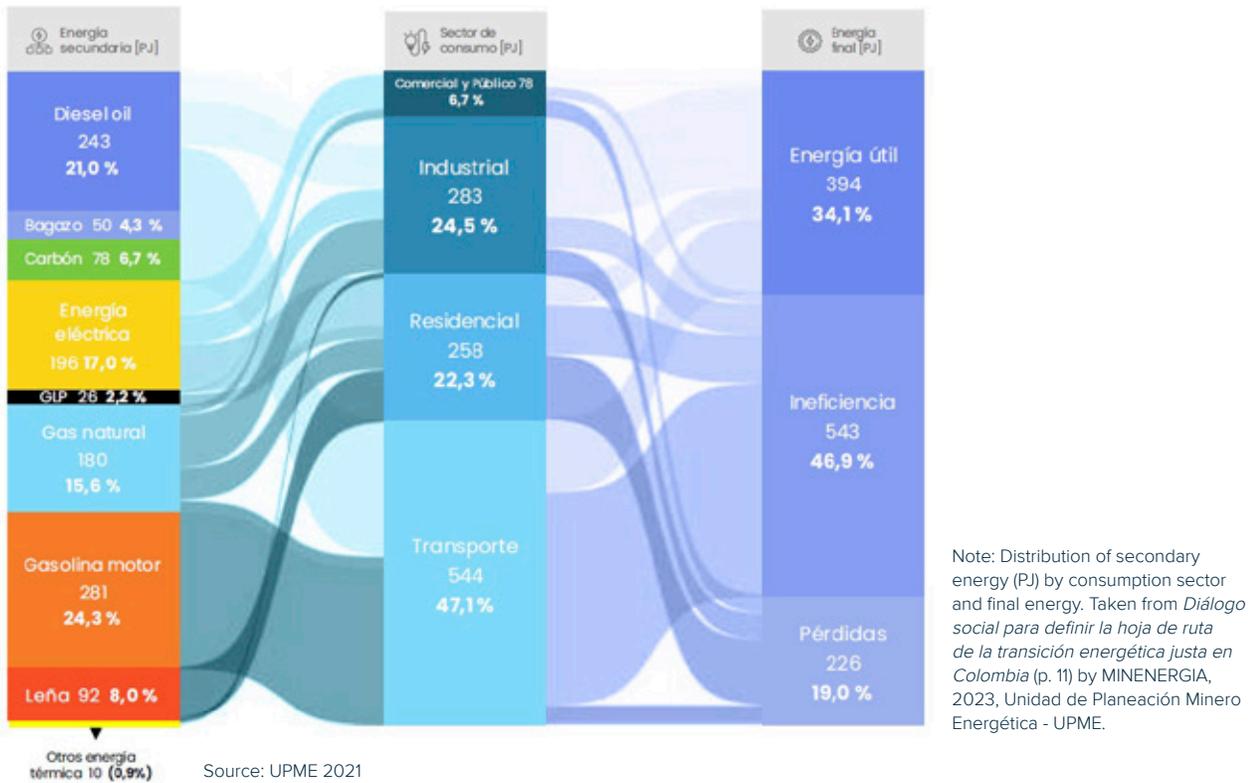
and a significant increase since 2014. Regarding motor fuel oil (ACPM), the transport sector amounts to 75,8% of ACPM d/b total consumption, with a registered total consumption of 163.010 b/d in 2022, the highest figure in the last 10 years (Ministry of Transport, 2023).

According to the Ministry of Energy's Just Energy Transition (JET) Roadmap (MINENERGÍA 2023), Colombia's residential sector consumes primarily GLP, natural gas, wood, and electricity. The sector's energy demand is distributed between two large groups: i) urban area users: who get 50% of their energy demand through electricity (refrigeration, light, television and other appliances), and cook with natural gas (37%) and GLP (8%); and ii) rural area users: who get 67% of their total energy consumption for cooking from wood, because the wood stoves they currently use have under 10% efficiency rates. Regarding natural gas specifically, the largest consuming sector is the oil sector, followed by thermoelectric plants, industrial and residential sectors, the later mainly for cooking and water heating; there is no current policy promoting technological substitution and change of habits aiming at reducing gas demand in the industrial and residential sectors, however, this substitution may include electrification of industrial and residential processes, by using, for instance, electric induction stoves, electric boilers, or electric arc stoves (Corral, 2023).

### 1.1.4 Energy consumption inefficiency

Energy efficiency is essential for reducing energy consumption while increasing productivity. However, Colombia's context shows that by 2021, 66% of final energy is not consumed in a useful manner. In particular, the transport and residential sectors do not profitably use half of the energy they consume. Inefficiency and losses amount to between USD \$6.600 and USD\$11.000 million dollars per

**Figure 1:** Synoptic representation of national secondary (user available energy) energy balance for 2021



year, according to the Balance de Energía Útil – BEU (Useful Energy Assessment).

The Figure above shows how energy sources are distributed by sector (only secondary energy, no primary sources included). Among those with larger inefficiencies is the residential sector, due to the high and inefficient consumption of wood in rural areas. According to DANE’s (National Administrative Department of Statistics) statistical data (2021), approximately 17% of Colombia’s population uses wood for cooking, with efficiency rates of only between 5% and

15%. Transport, the sector with the largest liquid fossil fuels consumption, is also one of the more inefficient sectors due to the use of internal combustion engines, that reach approximately 20% efficiency rates, compared to electric engines that may reach up to 60% efficiency rates. The industrial sector shows a significant potential for energy efficiency, particularly in heating processes that represent up to 88% of the sector’s energy consumption (MINENERGIA, 2023). Adopting better technologies for the substitution of current boilers and stoves would improve efficiency in 20%. Furthermore, it shows that

only 34% of secondary energy is transformed into useful energy, mainly due to inefficient combustion processes at industrial plants, residential uses, and diesel and gasoline engines.

### 1.1.5 JET starts with a mainly fossil fuel energy matrix

The specific balance for Colombia's energy matrix is critical when thinking of a fossil fuel free future. As shown in section 1.1.1, the current energy matrix is dominated by fossil fuels, both regarding supply and final consumption. This context places Colombia's just energy transition before a very challenging goal to reduce its dependency on highly contaminating energy sources and attain a decarbonized energy matrix.

## 1.2 EXTRACTIVE SECTOR AND FOSSIL FUELS' TAX SUBSIDIES AND BENEFITS

### 1.2.1 Energy sector's subsidies and exemptions

The country's fossil fuel production and consumption have been historically promoted and supported by government policies that make environmental limitations to extraction flexible, demand moderate royalty payments for the territories where they take place, and create economic and legal incentives to maintain fossil fuels' demand. Data from the International Monetary Fund (2023) shows that, for 2022, the country explicitly and implicitly subsidized a total of USD \$34 billion, mainly in energy products such as: diesel (USD \$14 billion), gasoline (USD\$13 billion), coal (USD\$3 billion) and natural gas (USD\$1 billion).

An example thereof is the Fondo de Estabilización de Precios de los Combustibles – FEPC (Fuel Prices Stabilization Fund), which has been historically funded with public resources, through a public debt mechanism, that should have been paid to the Nation (MinHacienda, 2022). During 2020 fossil fuel consumption was disincentivized due to the COVID-19 pandemic, but was overcome by measures aiming at economic recovery, with a USD\$1.100 million provided for investments in fuel production, while USD\$4.41 million were invested in implementing renewables. Given this record, the FEPC's accumulated deficit by

2022 was COP\$7,8 billion, provided for the transport sector's gasoline consumption (USD\$960 million in 2019). This expenditure is undertaken within the context of a growing fiscal deficit (ODI, 2022), and prevents the country's budget from addressing other needs. Another example is coal, for which extraction tax benefits are assigned, fast environmental licenses issued, and minimal royalties' payments required. This activity has also benefited from public policies such as the "Plan Vallejo", which allows for the partial or total exception of customs fees when importing fossil fuels, raw materials, or intermediate supplies required for transforming exporting products (Picciariello, A., Quevedo, A. and Gençsü, I. 2022).

The Glasgow<sup>2</sup> Climate Pact insisted on the importance of eliminating subsidies that do not contribute to the energy transition and, on the contrary, incentivize consumption. Likewise, the International Energy Agency (IEA) reported that, in 2023, countries with this behavior tend to be emerging, fossil fuel exporting economies, probably impacted strongly by the energy crisis<sup>3</sup> arising from the tensions between Ukraine and Russia<sup>4</sup>, a situation that increased oil subsidies by 85% and doubled them in the case of gas and electricity access between 2022 and 2021. Given the above, there is a need to gradually reduce these subsidies or exemptions allowing for the protection of the most vulnerable consumers and showing coherence with the proposed goals for the energy transition.

<sup>2</sup> After a two-week negotiation during COP 26, the Glasgow Climate Pact was endorsed by almost 200 countries. Its purpose is to keep the Paris Agreement's commitments, more specifically, limiting temperature rise to 1,5°C above post-industrial levels (Externado, 2021)

<sup>3</sup> During an energy crisis and to avoid an economic crisis, governments prioritize consumer protection from prices' harmful impacts rather than committing to the gradual elimination of subsidies. (IEA,2023)

<sup>4</sup> Due to the conflict between Russia and Ukraine, Russian oil commercialization was promoted through significant discounts. However, several countries decided not to buy it. During this time, there was a crisis created by low supply and refinery capacity for total demand, which led to a dramatic increase in fuel prices (IEA,2023)

### 1.2.2 Extractive sector's tax benefits

National mining activities are carried out by private, many foreign corporations, that pay royalties dependent on annual production rates and the type of mineral extracted. Unlike the hydrocarbon sector, where public information regarding production volumes and royalties paid is available, the mining sector's payments are based exclusively on information provided by the corporations, which prevents its adequate and trustworthy monitoring (Rudas, 2021). One of the State offered tax benefits for the extractive sector is an initial investment's payoff during the project's first five years, deducting income tax during the more productive phases of the exploration and assuming the sector's commercial risk during this period. Moreover, the oil extraction phases are exempt from paying fluvial and income taxes to municipalities and departments where this activity takes place, a proposal taken from the mining code that also prevents departments from taxing mining activities.

According to Rudas (2021), mining corporations deduct the assets directly associated to their activities from their presumptive income. There are no clear guidelines for income tax base in these sectors, so royalties' payment is deducted from taxes as if it were an additional expenditure and not a compensation for extracting resources belonging to the Nation, which could represent a decrease of up to one third of State earnings. According to Matamoros and Valdeleón (2023), the last tax reform, Law 2277 of 2022 in Article 19, forbade the use of royalties' payments as deductibles from income taxes by corporations exploiting natural resources in Colombia. This led to lawsuits before the Constitutional Court aimed at maintaining this tax benefit, based on the infringement of constitutional provisions caused by its elimination. In November 2023, the Constitutional Court declared Law 2277 of 2022's Article 19 unconstitutional

(Corte Constitucional de Colombia, 2023), a decision contrary the policy of eliminating the extractive sector's tax benefits that makes it harder to meet the energy transition's goals.

### 1.2.3 The challenge of dismantling fossil fuels' subsidies

Subsidies are important because they contribute to mitigate households' economic burdens. However, due to their design, they end up benefiting population sectors with larger purchasing power, turning them into inefficient mechanisms that do not meet their initial goals (Riveros, 2019).

Despite previous administrations' tendencies, the present administration has decided to start a progressive dismantling of subsidies to level the price of gasoline with international prices and overcome the problem created by the



FEPC, which had an accumulated debt of COP\$36,7 billion in 2022 (MINHACIENDA, 2023).

The progressive dismantling of subsidies is an effective measure that may contribute to accelerate the internal consumption matrix energy transition, especially by sourcing with electric power energy's final uses in households and transport. This dismantling, however, also entails significant social and economic impacts for millions of people in Colombia, given that most of the country's consumer products are carried by road transport. It is important, therefore, that the government compensates the dismantling of subsidies with incentives to make the transition affordable.

If Colombia does not change its fossil fuels' internal consumption matrix, on the one hand, and does not increase its reserves with current exploration contracts, it faces a dangerous scenario of increased fuel imports, further depending on international markets' dynamics regarding supply, suppliers, and prices, particularly for gas and oil derivatives. This may only be achieved by increasing the benefits of a green tax policy that creates benefits and new jobs by introducing energy transition technologies, both for demand and supply.

### 1.3 NATIONAL ENERGY SYSTEM'S PROJECTION

#### 1.3.1 Energy matrix composition's goal according to PEN and Roadmap

In what follows, the most ambitious mid- and long-term projections from the two documents presently guiding the country's energy vision are summarized. On the one hand, the National Energy Plan, published by UPME (2023), projects by 2052 a primary energy matrix primarily composed by FNCER (Non-conventional renewable energy sources) (57% - 58%), followed by fossil fuels (25 y 26%), that still represent a significant part of the energy matrix, and the rest in hydrogenation (6%) and by biomass (10%). On the other hand, the Roadmap published by the Ministry of Mines and Energy (2023), considers within the "Just Energy Transition" and "COP26 Commit-

ments" scenarios, by 2050, a 30% and 10% reduction in the fossil fuels' final demand, and an increasing FNCER participation of 45% and 74% respectively. Several documents consider that, by 2030, Colombia could add between 10 GW and 27 GW in new installed capacity, mainly from solar and wind energy.

It should be emphasized that the projections in both documents regarding fossil fuels' participation is still very high by 2050. PEN projects a fossil dependence of approximately 25% in line with the Roadmap's "Energy Transition (ET)" scenario of approximately 30%. Given its renewable resource potential, Colombia could execute a massive entry of renewable supply for increasing demand in the following years, and, additionally, supply electric power processes with 100% clean sources and thus comply with the "COP26 Commitments" scenario presented in the JET roadmap. This can only be possible with the enactment of regulations that coordinate the adoption and incentivizing of renewables' entry with new technologies for the stability the electric power network and incorporating horizontal dialogue with communities in the affected areas through a threefold entity including the State, society, and private actors.

#### 1.3.2 National government's renewable goals by 2026

Regarding the goal of installing new renewable energy capacity, the present administration, in its National Development Plan, considers meeting the goal of at least 2 GW installed in solar and wind energy by the end of the administration in 2026 (DNP, 2023). However, President Petro, publicly and through government officials, has shown his intention of ending his mandate with an installed capacity of at least 6 GW (Strategic Energy, 2023).

#### 1.3.3 Colombia's renewable energy projects' current situation

The evolution of Colombia's installed capacity in renewable energies, mainly solar and wind, began with small projects in 2014, when Law 1715 was enacted by Congress. However, it was with the announcement of the first renewables' auction (2019), that attention of national and international investors

to Colombia's renewables market was drawn. An example thereof is the window of applications for connection of generation projects, closed by UPME in October 2023, where approximately 86,2 GW in solar and wind projects were presented (UPME, 2023). Since 2018, the Autoridad Nacional de Licencias Ambientales – ANLA (National Authority for Environmental Licenses), has licensed 4,5 GW of non-conventional renewable energy sources (ANLA, 2023), 34 projects in total which, from an environmental and sustainable perspective, could begin operating in the short term. Regarding electric power transmission to the system, projected expectations have not been met. By the end of 2023, only 1 GW of the expected 3,3 GW are projected to be operative and delivering energy to the National Interconnected System (SIN).

Despite investor's interest and the competent authorities' granting of environmental licenses, there is a bottleneck associated with the lack of active inclusion of communities living in the territories from the project's setoff and planning. A threefold dialogue between the government, corporations and communities is essential to facilitate the execution of these of projects; imposing them on the communities creates rejection, partly due to previous experiences with fossil fuel extraction models.

#### **1.3.4 ¿Es suficiente la meta que se propuso en el PEN para cumplir con los compromisos internacionales de Colombia?**

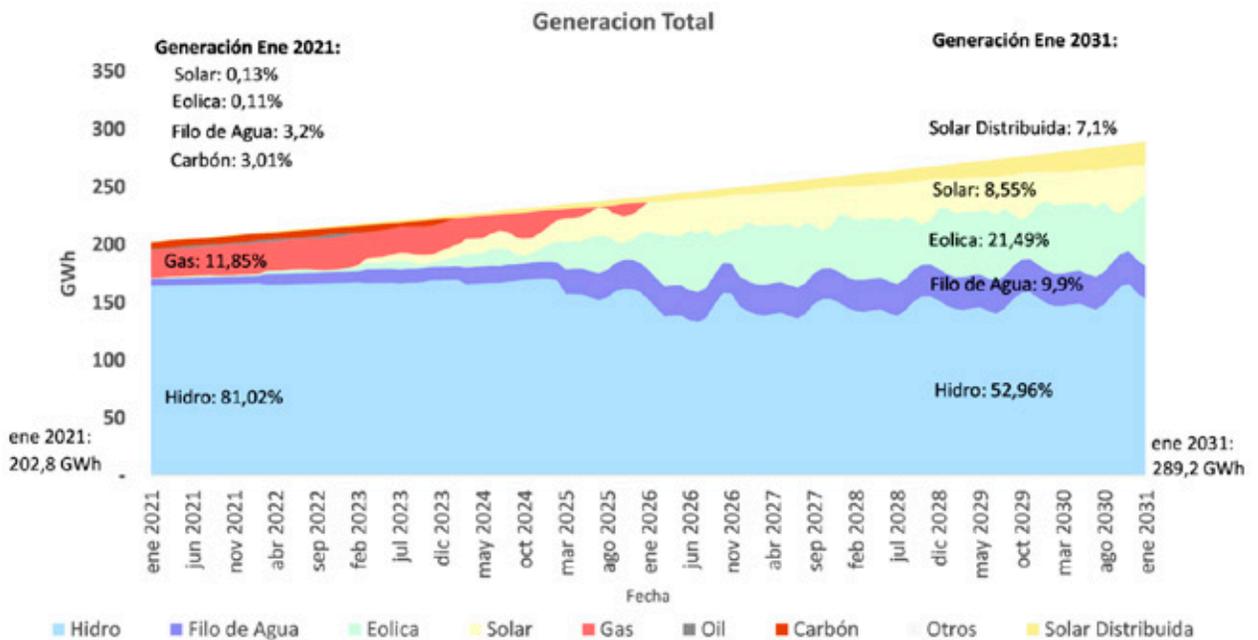
According to UPME's published PEN (National Energy Plan) 2022 - 2052 (2023), for an energy transition scenario, by 2032, a FNCER's participation of 50% (22 GW) is considered including solar, wind, on- and off-coast, geothermic, nuclear and distributed generation, with a total electric power generation capacity of 44,40 GW; by 2042, 65% (38 - 47 GW) with a total generation capacity between 57,66 GW and 72,98 GW; and by 2052, 71% (68 - 85 GW) with a total generation capacity between 96,42 GW and 120,80 GW.



Given these projections, before the next 20 years, Colombia should have an entry of at least 30 GW renewable energy capacity to comply with the country's increasing demand, and its goal should be focused on getting a 100% renewables electric power matrix before 2040, as other countries have done, such as Costa Rica, Paraguay, and

Uruguay, the abundance of its natural resources permitting. With social support and political willingness, it could even attain 100% renewable electric power matrix before the end of the decade, by focusing not only in the Guajira's potential, but also on distributed generation (Dyner et al, 2022).

**Figure 2:** Total generation under Green Democracy scenario



Note: The graph represents energy generation (GWh), in its different sources, according to the projections of a "Green Democracy" scenario. Taken from Roadmap for 100% renewable electricity in Colombia to 2030 (p. 49) by Dyner et.al, 2022, Universidad Jorge Tadeo Lozano.

Given its installed capacity goal, the country is generally going at a slow pace on implementing renewable energies. However, it is expected that once the economic, regulatory, social, and environmental obstacles are removed, renewable implementation should increase to meet a

rhythm of between 2 to 3 GW capacity installed per year, especially given the interest on the part of investors, and the fact that the universe of potential projects all over the country is approximately 100 GW. However, complying with and implementing the proposed goals largely depends on



strong government's action on implementing and using renewable sources, together with society's commitment to these initiatives (Dyner et al, 2022).

In the road towards NDC compliance by 2030 and the long-term strategy towards 2050, Colombia and several Latin American countries shall be compelled to endorse international initiatives that include commitments to a significant increase in renewable capacity and reduction of fossil fuels demand in different economic sectors, including electric power generation. It is important for Colombia not only to participate in these international initiatives, to join other Latin American countries in these scenarios, including COP 28 at the end of 2023, in their urgent appeal to developed economies to support a fair and low interest financing for developing countries to attain NDC's goals.

### 1.3.5 Gas is not a transition fuel

Fossil gas is not a transition fuel. Methane, gas' main component, is responsible for an approximate 30 % increase in global temperature since the Industrial Revolution (IEA, 2022a). Its effect when directly released into the atmosphere is 28 to 86 times more powerful (GWP, global warming potential) than carbon dioxide within a 20-year horizon (Myhre et al, 2013, p. 714). According to the IEA (2022a), releasing methane is a recurring practice in the oil industry, with a recorded 180.000 million cubic meters, a figure 70% larger than official data. Methane leaks' climatic impact in the United States of America during 2015 was equivalent to that of all operated

electric power plant's carbon dioxide emissions during that same year (Álvarez et al, 2018). Estimates for the Permian basin show that approximately 9,4 % of total extracted gas leaks into the atmosphere, due to malfunctioning of equipment, among other reasons (Chen et al, 2022).

In terms of gas reserves, and the only extractive sector's argument for the need to continue exploration, it is important to consider the present situation in light of Colombia's consumption distribution. In 2017, for example, the oil sector was the largest consumer after the industrial sector. Faced with a lack of fossil fuel markets and its storage difficulties, a large portion of Colombia's extracted gas is used for electric power generation for these same oil operations or is reinjected into the oil sites. During January 2023, 62,1 % of the extracted gas was commercialized, and 65,9 % in February. Occasionally, this figure has even reached below 50% (Gómez, 2023). Extending gas reserves in the country should therefore go through an analytical framework different from that of incorporating reserves through new projects, particularly those with high economic and environmental risks, such as those in the Caribbean's deep and ultra deep waters (Uchuva y Gorgon) (Gómez, 2023).

The electric power generation, residential, commercial, oil and transport sectors, consume 79% of the country's gas (IEA, 2023). Given that gradual descaling of oil extraction should begin at sites with fewer energy return rates (a value that is also reflected in economic terms), the mid-term use of gas in this sector should decrease. Regarding electric power generation, residential and

transport uses, there are economically viable alternatives: renewables with storage, induction stoves, solar water boilers and electric buses, among others. For a minority of gas uses, such as heavy industries, where there are no current available or affordable alternatives, a quick technological development is considered, with expected commercial use by the beginning of the 2030s (Muttitt et al, 2021). This kind of alternatives could accelerate this fossil fuel's phase-out and allow for an appropriate management of present reserves, with no need for new extractive projects.

The country must therefore avoid risking its finances with Ecopetrol's plans for expanding the gas frontier to the Colombian Caribbean Sea, which may entail investments of between COP\$ 6 to 7 billion per year (Zapata, 2023), and infrastructure projects for gas pipeline connection from the sea that would amount to USD\$7 billion (Machado & Vargas, 2022). These projects' lack of competitiveness, additionally located in deep waters, make them unviable in most future economic scenarios (SEI et al., 2023).

Before the conflict between Russia and Ukraine, it was estimated that, in scenarios where the Paris Agreement's commitments were met, Latin America and the Caribbean (ALC)'s oil production would have to decrease in 60% by 2035 (Solano-Rodríguez et al, 2021), which would entail the loss of USD\$3 billion in tax revenues (Vogt-Schilb et al., 2021). The role natural gas plays in the region's economies is expected to decrease progressively and half of the reserves shall remain unexploited, reducing associated tax revenues in 80% (Welsby et al, 2022). Promoting incentive policies to gradually abandon this fossil fuel must overcome the pervasive influence of the oil sector seeking to protect its interests.

## 1.4 COLOMBIA'S CLIMATE POLICIES AND COMMITMENTS WITHIN THE PARIS AGREEMENT

### 1.4.1 Colombia NDC goals and commitments

In 2020, Colombia updated its NDC<sup>5</sup> to the following goal regarding mitigation of GHGs in the country: *"Emit a maximum of 169.44 million CO<sub>2</sub>eq in 2030 (equivalent to a 51% reduc-*

*tion in emissions compared to projected emissions in 2030 in the reference scenario), starting an emissions' decrease between 2027 and 2030 aiming at carbon-neutrality by mid-century"* (República de Colombia, 2020).

### 1.4.2 Distribution of CO<sub>2</sub>eq emission by IPCC sector and emissions associated with fossil fuel exports

According to the last GHG emissions' national inventory published by IDEAM et al. (2022), Colombia emitted 302.974 Gg CO<sub>2</sub>eq in 2018. 59,1% of these emissions correspond to those estimated by the Agriculture, Forestry and Other Land Uses sector - AFOLU, followed by the energy sector with 30,7%, jointly representing 89,8% of the country's emissions. The remaining 10,2% is made up by the residue's sector (6,8%) and the Industrial Processes and Use of Products – IPPU sector (3,5%). Specifically, the energy sector's emissions include: Transport (12,49%), Energy Industries (8,10%), Manufacturing and Construction Industries (4,34%), leaking emissions due to fuel production (3,02%), and other sectors (2,73%).

Current IPCC's (Intergovernmental Panel for Climate Change) methodology for determining a countries' GHG emissions does not include fossil fuel product exports, but only emissions generated by them in the national territory. However, given the fact that Colombia exports coal and oil, representing more than 50% of the country's exports (MINCIT, 2022), and being one of the most vulnerable countries to the effects of climate change, it is essential to act, for the atmosphere does not recognize territorial limits. According to DANE's (2023) published data, in 2022, approximately 59,63 million tons (MT) of coal and 177,65 million barrels of oil were exported, equivalent to approximately 173 million

<sup>5</sup> The National Determined Contribution (NDC) is the commitment set forth and undertaken by Colombia under the Paris Agreement to counter climate change. It includes actions aiming at reducing GHG emissions, and adapting to climate change, as well as the development and implementation of necessary measures. Making the need to counter climate change a national priority, Colombia adopted in 2017 the National Climate Change Policy and enacted in 2018 the Climate Change Law (Law 1931 of 2018), establishing therein the guidelines for managing this threat in the country.

tons of CO<sub>2</sub> eq<sup>6</sup>, representing around 57% of the emissions reported in national inventories.

### 1.4.3 Energy sector's goals and commitments

According to MINENERGÍA (2023) emissions' projections by 2030 in the "trending scenario", supposing the preservation of current tendencies in energy consumption, 84 MtCO<sub>2</sub>eq would be reached, of which 78% would come from transport. Within the "Just Energy Transition scenario" a reduction of 16 % is projected regarding the "trending scenario" with 72 MtCO<sub>2</sub>eq for the first 7 years, enabled by measures adopted in the transport sector, such as conversion and electromobility incentives. Within the "COP26 scenario" that complies with the commitment to carbon-neutrality, an emission of approximately 60 MtCO<sub>2</sub>eq is projected, reducing 28% of the emissions regarding the "trending scenario." This would require the acceleration of coal thermoelectric plants phase-out before 2030, which, for some plants, would mean phasing-out before the date set for compliance with firm energy obligations; limit the expansion of liquid fuels use in transport, which means drastically increasing the electrification of massive public transport's goals, to address the population's mobility and freight transport needs in the midst of reindustrialization; and, regarding the residential sector, the expansion of natural gas coverage would have to be restricted, which would entail noncompliance with the PND 2022-2026's goals. In general, it may be said that there is a commitment to reduce this sector in 11,2 MtCO<sub>2</sub>eq, and a reduction margin of 11,8 al 18 MtCO<sub>2</sub>eq within the possible scenarios.

From 2040 onwards, the speed of decarbonization would be slightly reduced, due to an increased demand and re-industrialization and the increase in massive transport coverage and quality proposed by the just transition policies. Finally, by 2050 projected emissions are approximately 45 MtCO<sub>2</sub>eq.

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<sup>6</sup> Estimate based on IPCC 2006' factors, assuming coal is used for electric power generation and oil for refining.

### 1.4.4 High fossil consumption sectors not being ambitiously addressed

Given the country's decarbonization goal, high consumption sectors that are not being ambitiously addressed should be considered, such as the energy sector including transport (47,1%) and residential (22,3%) sectors. Regarding the transport subsector, actions to be undertaken include public and private transport electrification, which entails acquiring new technology, reducing final use gas, and reducing oil, gas, and coal exploitation and processing. For the residential subsector, even though social factors may difficult the undertaking of some measures, actions are much more feasible both technically and financially, for instance, substituting natural gas for electricity in stoves. It is therefore important to reconsider the actions currently undertaken in these sectors.

Particularly for Colombia, *the hard to abate*<sup>7</sup> represent a challenge for emission reduction, because they are needed to move economic sectors. According to DANE's (2023) statistical data, during 2022, 14,6 million tons of gray cement were produced and, according to the World Steel Association - AMA (2023), this same year 1,3 million tons of steel were produced, key raw materials for building the country's infrastructure.

When addressing actions focused on emission reduction from deforestation to manage one of the most GHG emitting sectors in the country (AFOLU), a great opportunity of effective reduction in sectors such as the energy sector may be ignored.

### 1.4.5 Insufficient climate goals to comply with the NDCs

Colombia's climate commitments are not headed towards keeping temperature under 1.5°C as demanded by the Paris

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<sup>7</sup> Despite technological progress focused on industry's sustainable production in the world, there are emission generating processes that are hard to avoid, better known as "hard to abate." According to Laure (2022), this category includes cement, steel, and chemicals production, as well as freight, maritime and air transport. These contribute to approximately 30% of global emissions, hence the importance of addressing them.



Agreement (in accordance to Colombia's fair contribution). The scientific project "Climate Action Tracker" deems Colombia's proposed NDC's climate action as "insufficient". The country is not on the way to comply with its NDCs updated in 2020, for its current policies are approximately 24% over goals. Even with the planned measures, Colombia needs more actions to meet its current goals and be compatible with 1,5°C. To improve in terms of climate action, the country must sign the coal phase-out, a sector increasingly uncertain due to pressure exerted on corporations to decarbonize foreign investment. Renewable energies' development, and the global drive towards decarbonizing may leave Colombia with stranded assets and lost economic opportunities if it does not begin the transition towards a fossil fuels' phase-out (Climate Action Tracker, 2022).

Although carbon dioxide associated to oil and coal exports is not part of the methodology for determining emissions established by international negotiations (IEA, 2023b), as one of the most vulnerable countries to climate change impacts, it needs to act by building new economic pathways that prioritize nature's preservation as an action addressing mitigation and adaptation simultaneously. The moratorium on granting new oil and gas exploration projects is an important first step; likewise, the National Mining Agency's willingness to prevent new open-sky coal exploitation agreements entails leaving measured and indicated coal reserves of approximately 345 million tons buried in the ground (Semana, 2022). A general estimate, that contemplates extracting only half of this mineral, indicates that it would prevent the emission of 320 million tons of carbon dioxide equivalent (320

MM ton CO<sub>2</sub> eq.), representing almost twice the NDC' objectives (Gómez, 2023a).

#### 1.4.6 Three strategic sectors to place the JET on a path compatible with 1.5°C

Given the country's context and the economic and energy projections towards which the world is heading, addressed in this report, three strategic issues are emphasized to accelerate and increase climate action in Colombia while the Just Energy Transition becomes a reality. These issues would help Colombia approach its goal (common but differentiated) of keeping the planets' average temperature below 1.5°C:

In the first place, the need to diversify exports, which entails diversifying the economy through the establishment of a State's planned legal framework. This framework must 1) gives options to corporations with main purposes dependent on fossil fuels that take greater risks due to market dynamics, to guarantee their continuity; and 2) potentializes the characteristics of each territory to guarantee the income and work of those communities living in areas dependent on mining and hydrocarbon activities.

In second place, decarbonization of the transport sector, which has a high potential for transformation and decarbonization given its high energy consumption, historically dominated by fossil fuels. Such decarbonization entails a cultural, technological and infrastructure process, allowing for the sector to reduce its energy consumption or use less-emitting fuels. It is therefore necessary to promote sustainable mobility strategies that incentivize the use of public and private vehicles driven by fuels such as electric power based on FNCER and facilitate recharging infrastructure throughout the national territory.

And in third place, the need of a transition to cleaner energy sources in the country's energy supply, generated from renewable energy projects that impact communities as little as possible and includes them in the process, and supports workers who leave the fossil industry.

The next chapter examines each one of these axes in greater detail.

# 02

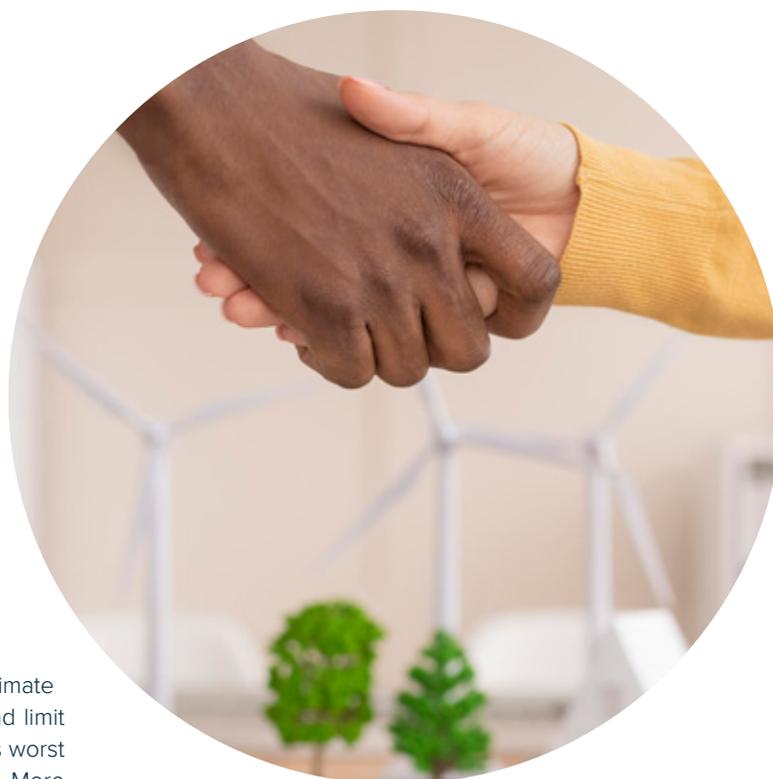
## STRATEGIC ISSUES FOR A JUST AND FAIR ENERGY TRANSITION IN LINE WITH THE CLIMATE EMERGENCY

### 2.1 THE DIVERSIFICATION OF THE COLOMBIAN ECONOMY

#### 2.1.1 Scientific basis on the downfall of a fossil fuel economy

According to the Intergovernmental Panel on Climate Change – IPCC (2023) to face the climate crisis and limit global warming to 1,5 °C to contain climate change's worst scenarios, fossil fuel extraction must be restricted. More specifically, regarding proven reserves by 2018, coal (90%), oil (58%) and gas (59%) cannot be extracted to have a 50% possibility of preventing an increase in average global temperature beyond 1,5°C. For Latin America, these numbers of unexploited oil and gas increase to 73% and 67%, respectively (Welsby, 2021).

Likewise, the International Energy Agency - IEA (2023a) shows, in the scenario aligned with the Paris Agreement (NZE), a fossil fuels' demand downfall of approximately 25% by 2030 and 80% by 2050, due to an increase in renewables capacity. The Agency has repeatedly insisted



that no new oil, gas, or coal extraction project is compatible with limiting the rise of global temperature to 1,5°C.

On the other hand, according to Oil Change International (2023), beyond preventing fossil expansion, as suggested by the IEA when stating that 60% of existing reserves in developing sites should remain underground to limit the global temperature increase over 1,5°C, the numbers indicate a risk for economies that depend on these natural resources in a mid-term global scenario, necessarily restrictive for this kind of energy.

### 2.1.2 Views on macroeconomic dependence on fossil fuels

According to MINENERGIA (2023) Colombia is a medium-high income country built upon a peripheral, heterogeneous, and not diversified economy, dominated by extractive sectors. Dependence on fossil fuels has consolidated over the last 40 years due to national circumstances, such as public policies and the extractive sector's high utility rates, and international circumstances, such as the dynamics of high demand and market prices. This economic relationship of dependence on fossil fuels has prevented the growth of other sectors such as industrial, agricultural, and services sectors, leaving the country in a highly vulnerable economic position.

MINENERGÍA thus characterizes dependence on fossil fuel from 3 dimensions: a public finance dimension acknowledging the hydrocarbon and coal sectors' important contribution to the nation's public resources (in 2019 it represented 19% of total income with COP\$33 billion pesos), that translates into local income through royalty contributions in more than 50% for the Department of Casanare, more than 40% in Cesar and Meta, and more than 20% in Guajira. A productive dimension, including not only exports, but also investment's contribution to economic growth in general, underlining the sector's importance in consolidating the productive structure and the tendencies that support the economy; between 1990 and 2022, investments had a 5% annual growth that contributed an annual average of 0,6% to its growth. Finally, a balance of payments dimension that includes the sector's importance in export's income; currently, the country exports 55% of the energy extracted and leaves 40% to internal consumption (UPME, 2023), confirming the abovementioned dependence.

According to the Regional Center for Sustainable Finances at Universidad de los Andes' survey (Centro Regional de Finanzas Sostenibles - CFS Uniandes 2023), due to the global transition to a low-carbon economy, Colombia faces an important loss risk equivalent to USD\$88 billion in terms of present net value between 2022 and 2050 (or 27% of 2019's GDP), a risk transferred to different economic actors.

Corporation with investments in the coal, oil, and gas sectors would be directly impacted with a loss of USD\$ 63,6 billion, due to decreased production and exports, turning Colombia into a hydrocarbon net importer and, if there is no technological transformation, impacting between 25.000 and 30.000 direct jobs. Local administrations would be impacted in USD \$11,8 billion, due to a structural reduction in hydrocarbon royalties, which are their public investment's main source. And finally, the national government would be impacted in USD\$ 13 billion because of the public finance effect generated by the economic decrease, that would be transferred, in the end, as a passive contingent.

Given this context and in an effort to create a diversification policy, the national government, through MINCIT (2022) has launched three policies to support efforts for economic diversification; these are a new tourism policy, an external trade policy aimed at incentivizing and diversifying national exports and attracting investment in sustainable business; and a reindustrialization policy, including five strategic points: 1. A just energy transition 2. Agricultural industrialization and food sovereignty 3. Reindustrialization in the health sector 4. Reindustrialization in defense of life 5. Territories and their corporate networks

Likewise, as strengthening of technical assistance and institutional capacity is required, to support policymaking and regulation processes, as well as risk-oriented investment. Although the risk is important, accelerating the transition in sectors such as transport and industry could also represent an opportunity to create investment flows and employment growth in the country.

### Risk of stranded assets for Colombia due to global transition

The scenarios proposed by the IEA for reducing fossil fuels' global demand, mentioned above, show the urgency of effective action regarding the climate crisis and, therefore, the energy transition's inevitability. From an economic standpoint, capitals for financing fossil fuel projects that require huge sums of initial investment, will have increasingly

uncertain returns, and high rates of risk exposure. Investments in this kind of business will create “stranded assets”, defined as those that are impacted by payouts, devaluation or unforeseen or premature conversions to passives, due to environmental restrictions, in this case, those associated to the climate crisis. Given that hydrocarbon use is projected to fall, prices will decrease and there will be elevated competition in a market with less room for new projects (IDB, 2016).

According to the Institute of Energy Economic and Financial Analysis – IEEFA (2022), support for oil and gas markets is weak, as the sector’s corporations show volatility, false innovation, and political calamity. Disinvestment in fossil fuel assets is thus observed as a defensive strategy amidst loss of value, that profits from the versatility of cleaner alternatives in the electric power, transport, and petrochemical sectors. They conclude that the fossil industry faces larger obstacles both for competition in final markets, as for the legal and regulatory risks generated by the climate crisis, making such investments undesirable. For the Carbon Tracker Initiative (2021), within a context of restrictive policies such as that foreseen for fossil fuels, Ecopetrol would lose more than 75% of its market participation. The slower the decarbonization process, the larger its negative impact for the country, if unprepared without an economic diversification strategy.

### 2.1.3 Economic diversification challenges for the sector’s corporations

With the projected reduction of the fossil fuel global market, the hydrocarbon and coal mining sectors have been expressing a significant concern for the risk entailed by an energy transition, together with climate, water, and bio-

diversity management risks that, combined, may impact their business’ continuity in the future. As an option for facing these risks, Colombian extractive industries may start working on diversifying their business lines and investing in other services aligned with the energy transition, for example, coal mining corporations may consider the opportunity of investing in other mining activities, such as copper and other transition minerals, under new extraction standards different from the old extraction models that only benefit a few.

Searching for new alternatives in the framework of economic diversification, companies such as Ecopetrol<sup>8</sup> have structured additional business lines different to hydrocarbon extraction, that amount today to 82% of its income: a second line of “low-emissions solutions” promoting the creation of businesses around renewable energies and hydrogen, and a third line of “energy transmission and roads” resulting from the acquisition of ISA a few years ago, amounting to 17% of its income. Ecopetrol considers in its vision of the future, that by 2040, 40% of its income will be obtained from low-emission businesses, and that its resource assignment will equally grow on this business line, assigning 60% to the oil and gas extractive line. Although



<sup>8</sup> Ecopetrol S.A. is the main oil corporation in Colombia, organized as a national corporation assigned to the Ministry of Mining and Energy. Its stock is listed in Colombia’s Stock Exchange and in New York’s Stock Exchange represented in ADR (American Depositary Receipt). The Republic of Colombia is the controlling shareholder with an 88,49% participation.

Ecopetrol has a model for advancing its corporate vision and leading the productive transformation of hydrocarbon companies, it is one of the few global energy sector's corporations with a vision to adapting to the future amidst an imminent energy transition, it is expected that, during the present administration, this company may accelerate its transformation processes towards the additional business lines different to hydrocarbon extraction, getting thus closer to a corporate vision that meets carbon-neutrality by 2050, as demanded by the Paris Agreement.

The national economy's transformation is dependent on the transformation of the corporate sector and will gradually be forced to abandon the extractive model that has been part of the national economy for decades towards processes of creating new service and reindustrialization businesses around an energy transition value chain.

#### 2.1.4 Local economic transition challenges

In the communities and territories there is an awareness of the need for an energy and economic transition, entailing opportunities and risks and generating concern over its planning and implementation processes, particularly in those areas dependent on fossil fuels' extraction and production.

One of these areas is the city of Barrancabermeja, where more than 100 years ago the oil exploitation sector was born, and whence its name "Colombia's oil city". It is currently considered a special and port district because of its fluvial connections; it houses Barrancabermeja's industrial refinery, and due to its rich natural resources, it is a touristic and biodiverse city. It amounts to 27% of the Department of Santander's GDP, mainly through its refinery, processing approximately 250,000 oil barrels per day, and producing approximately 36.000 barrels of oil per day; during the last years, it has contributed between 5% and 7% of the national oil production.

According to Laura Flechas' intervention at the Public Audience (2023), Barrancabermeja's inhabitants know that there will be changes in their territory associated with the

energy and economic transitions, that should be planned because all actors will be impacted, and they emphasize the need to tailor actions taken to the local context. Four important factors were therefore identified as relevant: 1) employment, because this economic transition could increase unemployment in the hydrocarbon and its derivative value chains; 2) Economic dependence on hydrocarbons that entails diversifying economic activities, 3) risking a change in the municipal category, since with an important economic downfall Barrancabermeja would cease to be a special category municipality, and be demoted to a lower ranking status; and 4) internal conflict created by the population's displacement.

According to long work and construction processes carried out with the territory's inhabitants, some of the actions that may be implemented at the local level are associated with education and human capital building through the creation of new capabilities, as well as potentializing existing capabilities in line with the economic diversification process taking place in the territory; promote industry creation as new private sector's activities; integrating government plans with productive diversification using territorial advantages (geographic location, natural abundance, infrastructure, among others). Particularly for Barrancabermeja, this last proposal included 4 axes: Logistics Hub given access to railroads and fluvial transport, Hydrogen and fertilizers Hub, Agricultural-industrial Hub articulated with the Magdalena Medio region and the petrochemical sector.

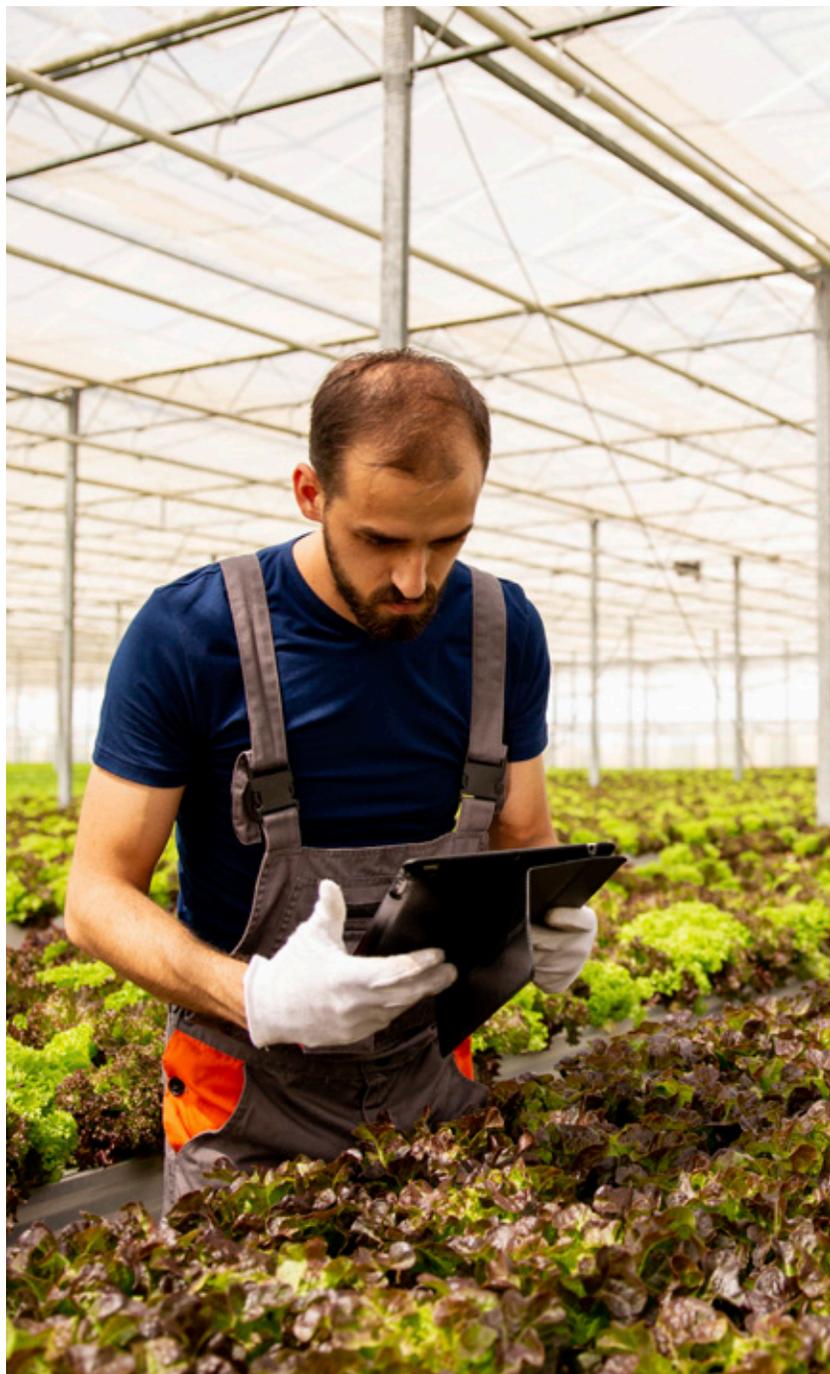
In the mid-term public budgetary framework published by the government in 2023, a deacceleration of Colombia's economy during 2023 and 2024, partially due to the fall of oil and coal prices is foreseen. For the last few decades, Colombian economy has been characterized by a de-industrialization process, where productive sector participation has fallen from 20,5 % in 1976 to 11,5% in 2022; while, at the same time, raw material exports, such as coal and oil, represented approximately 55% of total exports (MIN-HACIENDA, 2023a). According to the recently published reindustrialization policy, the current administration plans to reverse this tendency and work on the proposed axes, with the aim to gradually abandon dependence on extrac-

tive processes that have dominated Colombian economy in the last decades.

Fossil fuel producing territories, particularly coal and hydrocarbons, will generally receive the highest economic impact, especially regions such as La Guajira, whose regional GDP depends on average between 35% and 40% on coal extracting activities. Additionally, this region will be impacted by the fall in royalties' distribution that, according to the Transforma think tank, could fall annually in approximately, 10% from 2025 onwards (Uribe et al., 2021). Faced with this situation, both the national government and local administrations have to develop a just transition strategy allowing for the diversification of economic and employment models, contributing to social welfare and promoting public investment.

### 2.1.5 Conclusion

In Colombia there is no current consensus on a temporal framework for the Just Energy Transition, and it is not clear when fossil fuels shall abandon the market given their position in the present energy matrix, to comply with the zero-emission goal the world is moving towards. However, due to external economic factors, this is an imminent scenario that could open a window for action in less than 10 years. Planning how to diversify the economy should begin under the diversification policies established by the present administration.



## 2.2 TRANSPORT DECARBONIZATION

### 2.2.1 Relevance of the transport sector in the energy transition

Because of its impact in consumption, the transport sector is of vital importance in the country's energy transition roadmaps. The energy alternatives and technologies available for its transformation will make it a central actor in many transition policies. Currently, transport consumes 47% (See Figure 1) of the country's total energy, motor vehicles being responsible for almost 12,5% of total emissions<sup>9</sup> (Caldas, 2023), becoming the largest growing emitting subsector between 2010 and 2014, with the largest participation in energy final consumption (UPME, 2023). By 2012 there were 8,2 million vehicles registered in Colombia, 90% of which were privately owned. Today, according to RUNT, there are 18 million registered vehicles at the national level. Private vehicles (cars, motorbikes, and SUVs) consume approximately 80% of the gasoline available, and freight and passenger transport (trucks, large trucks, buses) 87% of the diesel available (UPME, 2014). Following this trend, Colombia will have a fleet of 27 million vehicles by 2040.

However, electrification of vehicles must be accompanied by different strategies, such as implementing a network of public-private charging stations, as well as the creation of policies strengthening infrastructure to increase active mobility, such as walking or bicycle riding, which are the most efficient practices to mitigate emissions and comply with Colombia's NDC; mobility transition also depends on systemic urban planning (World Bank, 2023).

In Bogotá only 20% of its inhabitants own a car, which is used on average by 1,5 passengers and supplies transport for only 11,9% of the trips made (Bogotá cómo vamos,

2023); this figure is worrying, if we consider that 67% of the total trips made have a sustainable modality, from the standpoint of energy efficiency or emissions, with bicycles and walking representing 30% and public transport 37% of total trips (Alcaldía Bogotá, 2019). Lower income population have sustainable transport modalities (walking 22% to 32%, buses 18% to 24%, bicycles 6% to a 9%). 32% to 42% higher income inhabitants are transported in a private car, 9% to 12% in taxi, and 4% to 6% in informal transport (Alcaldía Bogotá, 2019). Figures are similar for other main cities in the country, which leads us to consider that there is a minority that contributes the largest part of emissions per capita, and that also benefits from subsidies like the gasoline subsidy, that divert public resources to individual and not collective practices. The government's aim to eliminate this kind of subsidies is therefore in line with what a just energy transition should be.

Intensive fossil use in the transport sector also affects public health, through pollution. Pollution was responsible for 6,67 million deaths globally in 2015 (Fuller et al., 2022). The Organization for Cooperation and Economic Development (OCDE, 2016) states that, by 2060, air pollution will cause between 6 to 9 million premature annual deaths, cost USD\$2,6 billion due to increases in medical attention and lost workdays (OECD, 2016). In Colombia, it is the cause of 13,9% of deaths by ischemic heart disease and for 17,6% of deaths by chronic obstructive lung disease (INS, 2018). The sector's transformation will also have positive effects both on individual health and on the health system.

<sup>9</sup> Among the country's GHG emissions, the transport sector amounts to the third individual position after pastures and enteric fermentation associated with cattle raising (MINENERGIA, 2023).

### 2.2.2 Main policy measures for achieving the sector's decarbonization

For several years now, within the national and local frameworks, different policy strategies have been adopted to materialize transport sector decarbonization<sup>10</sup>, aligned with international climate commitments. According to the present administration's Just Energy Transition Roadmap (2023), it is important to promote the four proposed strategic axes to guide transport sector decarbonization, in general, working along the following lines:

Creation and promotion of public policies to accelerate passenger and freight transport transition achieved through measures such as (i) massive use of passenger public transport, improving aspects related to access, coverage, and size; the integration of 2.000 electric buses throughout the country is planned for 2023-2026 (Caldas, 2023). (ii) Promoting the electric powering of public and private motor vehicles; the Ministry of Transport has established the goal of moving from 11.700 current vehicles to 600.000 by 2030 (Caldas, 2023). (iii) Incentivize the conversion of fossil fueled motor vehicles and substitute energy by sources such as gas, liquified oil gas (GLP), green hydrogen and biofuels.

Promoting sustainable mobility and intelligent cities should be a task that aligns public policies in creating conditions to abandon motorized transports, by creating spaces for bicycles and rural and urban sidewalks. 35% of the current trips made by Bogotá's inhabitants are done walking

<sup>10</sup> UN Development Goals for Colombia (ODS 11): "Sustainable cities and communities". National Sustainable Mobility Strategy. National Electric Mobility Strategy 2050. Master Railroad Plan. Energy Transition Colombia 2050 Roadmap study. Colombia's long-term climate strategy E2050 to comply with the Paris Agreement. Hydrogen Roadmap in Colombia. Update of Colombia's determined contribution at the national level (NDC) (Government of Colombia, 2020a) (MINENERGIA,2023b. p. 30).

(Caldas, 2023). Thinking of a non-motorized mobility would contribute to decreased accidentality, improve health and productivity (Martínez, 2023).

In addition, it promotes a relocation of activities by planning 15-minute intelligent cities (MINENERGIA,2023b). This is essential given that, of the 1.200 municipalities in the country, less than 300 have public transport (Caldas, 2023).

The reindustrialization axes consider planning to optimize goods and people's mobility at the local, national, and international level, by re-establishing railroads and building international ports. It also considers developing technical knowledge aimed at source conversion, maintenance and spare parts supply needed for this kind of mobility.

Finally, multi-, and inter-modality considers the efficient enabling of conditions for distributing the road-railroad, maritime-fluvial transport of goods and people, by optimizing and integrating technology, and improving transport spaces such as rivers and freight corridors (MINENERGIA, 2023.b).



### 2.2.3 New local administrations' challenges for decarbonizing transport

The relationship between individual practices and transport modalities was examined above. However, it must be considered that these decisions are also driven by conditions created by different scaled territorial planning. Issues such as uncontrolled city growth make it impossible to centralize individual activities, forcing people to travel long distances to meet their labor health, or education demands, in addition to those travelled by value chains like food supplies, covering thousands of kilometers and adding to energy spending and GHG emissions.

An integral proposal for city construction must consider a sustainable transport model for decarbonization, including both technological integration and projects transporting the largest number of people in each trip, getting increased efficiency by potentializing public transport or active mobility, turning motorized transport into something additional. Designs must consider the most vulnerable population's conditions and provide transport solutions to the demands associated with individual labor realities (CCOO & Amigos de la tierra, 2022).

Likewise, the 'Avoid, Shift, and Improve,' theory has been designed to rethink the way mobility is conceived. The first indicates that trips should, as far as possible, be avoided. The second suggests that, if a trip is made, the most sustainable means of transport with no fossil fuels should be used. And the third, improve, is an invitation to improve the technology that cannot be replaced to use a low-emissions technology. In addition to the above, 10 general proposals, construed by mobility, justice, and transition expert organizations are presented: (i) legally supported public transport financing; (ii) corporate public and private policies aimed at reducing the need for transport; (iii) complex evaluations from public private companies of their energy flows, including workers and materials' transport costs to create proposals for their optimization; (iv) eliminate fossil fuels' subsidies; (v) development and research for transport in participation; (vi) guarantee safe mobility spaces through infrastructure building and design; (vii) promote the use of

railroads for freight transport; (viii) create short commercializing circuits; (ix) take into consideration the transport sector's workers in the transition processes (drivers, assembly companies); (x) organize urban merchandise distribution to reduce resource consumption, empty trips; (xi) promote policy design to encourage workers' use of sustainable transport practices in corporations with large numbers of personnel; (xii) affordable unified or equivalent fares for a diverse transport system, interconnected with mobility plans that avoid competition (CCOO & Amigos de la tierra, 2022).

There are different contributions from the private sector for the transport sector's decarbonization, integrating environmental variables with which international climate commitments are complied with, and other systemic issues associated with the current model (health, accidentality, exclusive transport) are addressed<sup>11</sup>.

Thinking of complex solutions for the sector entails clarity on each region's differences and needs, to design services and technologies tailored for these particularities. This implies different challenges for the private sector, for its investments may be impacted by factors such as exchange rates, operators' skepticism, strengthening of national production chains allowing for linking investment, government's commitment to promoting policies for the integration of research into new energy sources, and mobilizing resources for the consolidation of a financial model to enable the transition (Cano, 2023).

Actors like WRI Colombia have thus advanced in developing pilots for hydrogen-based buses and projects allowing electric powered vehicles for public services such as school buses and taxis; in addition, the homologation for local development of last-mile vehicles is soon to be approved (Cano, 2023).

<sup>11</sup> Triple Zero Mobility's vision by WRI Colombia. It contemplates a strategy to attain 0 deaths from traffic accidents, 0 emissions, and 0 exclusion (Cano, 2023)



## 2.2.4 Conclusion

Colombia's potential to significantly reduce its dependence on fossil fuel consumption, and hence production or import thereof, is directly related to the adoption of effective policies in the transport sector. Existing policies move in the right direction, but unprecedented work among multiple actors is needed to coordinate the promotion of zero and low-emitting transport means, as well as efficient use of energy. Disincentivizing individual use of internal combustion is key for the reduction of fossil fuels, emissions, traffic, inefficient use of energy, road accidentality, and respiratory diseases from pollution.

## 2.3 JUST ENERGY TRANSITION (JET)

### 2.3.1 Integrating Justice in Transition

Energy plays a key role in society's organization. From its availability and appropriation, dynamics that shape the populations and consumers' way of life are created at different levels and influence economic policies and resource distribution for a country's internal spending. Therefore, thinking of an energy transition entail transforming the energy policy and impacting the country's economy. Hence, clarity is needed on the scale, structure, emerging energy sources and the technology making these changes possible (UPME, 2023).

A Just Energy Transition (JET) makes the former idea more complex, because, in addition to a transformation of political and economic organization in structural terms, determined by fossil fuels' extraction, it must be guaranteed that this process includes the active participation of the population directly impacted due to their inhabiting of the territories where these common energy assets are located. Democratization of energy and minimizing the impacts in

energy management must be promoted (UPME, 2023). Even a wide interpretation of justice requires revindicating and recognizing the impacts created by energy projects operated in the past (Soler & Rankin, 2021).

The 4 axes proposed by the current administration to guide JET in the country, critical for the inclusion of justice in the transition, are: (i) equity and democratization; (ii) graduality, sovereignty and dependability; (iii) binding social participation (iv) intensive knowledge (MINENERGIA, 2023c, p 11).

### 2.3.2 JET beyond the renewables discourse

As has been mentioned throughout this report, less than a fifth of the energy demanded in the country is used for generating electric power. Therefore, efforts towards a real energy transition should be aimed at substituting fossil fuels, rather than being limited to the expansion of electric power supply through FNCER's integration (MINENERGIA, 2023c).

This road has led to a moratorium for granting new hydrocarbon exploration agreements, in line with the need to dismantle the dependence on these energies in a gradual and orderly manner (Gómez, 2022). These actions should also be promoted by Colombia at the international level, aiming at an organized and fair dismantling of fossil fuel extraction. An initial approach has been to divide countries according to their higher or lower (GDP) dependence on oil and gas; having a "non-oil" GDP means a greater capacity to start a transition. Following this roadmap, the 19 countries with larger economic income, responsible for extracting 35% of global oil and gas, should reduce their extraction to levels close to zero to have a 67% chance of not surpassing 1,5°C by 2031. It is also suggested that the richest nations, with the largest emissions, should make substantial financial transfers to those with less income to facilitate their energy transition (Calverley & Anderson, 2022).

A fundamental aspect of justice is related to inequity in terms of emissions according to socio-economic status.

The wealthiest 10% of the world's population (approximately 630 million people) generated 52% of accumulated carbon emissions. The poorest 50% of the world's population (approximately 3.100 million people) generated only 7% of accumulated emissions (Ki-moon & Ibrahim, 2020). Figures are similar for our country and should be directly associated with wealth redistribution and consumption restriction policies, that would directly impact the country's emission generation.

The JET must also work on trust building among the different actors around an energy project, and actively include the communities as a proposals' co-developers. In addition to announcing carbon mitigation, ethical principles required for implementing an energy system should be included. Current transition discourses seem to have fairer notions, by emphasizing territorial agreements around energy issues (Jeong, Simcock & Walker, 2018), and, to some extent, considering the impacts they may have on the social fabric (Barney, 2023). However, it is

acknowledged that all this is done within an established system that blocks structural changes (Baigorrotegui & Parker, 2018) and conceives energy as a common good and not as merchandise.

Often, territories historically impoverished become visible when overlapping with extraction goals and are therefore subject to accelerated "modernization" processes that do not correspond to the community's cultural views. This creates rejection against extractive projects and against imposing environmental notions and practices that classify mineral or energy sources as potential objects of "public interest" (Toledo, Nain & Romero, 2018), focusing, not on vindicating past impacts or socio-environmental debts, but on potential investment areas. Regarding this issue, there is no difference between renewable energy or fossil fuel projects, if the same extractive patterns are maintained.

### 2.3.3 Cultural transformation as a basis for the JET

The transition impacts the way society thinks, conceives, and represents its relationship to nature, and therefore transforms the cultural and symbolic understanding of what a common good means. The just energy transition should be conceived within a context of socio-ecologic transition, rethinking issues such as energy decentralization, decarbonization, depatriarchalizing, and de-merchandising in which multiple relationships around energy beyond the notion of production sources are possible (Roa, 2013).

Within this framework, territories at different levels recognize the magnitude of the crisis resulting from a social metabolism that demands an increasing flow of matter and energy, to shape the prevailing development model, regardless of the real impact on planetary limits (Roa, 2013). Energy democratization is fundamental in opposing the operating energy model with attainable proposals, based on knowledge of daily demands, due to its widening of the scope of real social participation. Government's current action aligns the creation of energy policies with the promotion of sector policies for development (Chemes, Bertinat, SF).





The role of energy in this unhealthy organization of society is so important that it has led to collective debates translated in multiple resistance to technologies, extractive projects, and energy systems that create dependence and exclusion. At the same time, energy autonomy alternatives are offered, known in some places as “energy communities” (Baigorrotegui & Parker, 2023) or “communal energies” (Roa, 2023). These experiences prioritize energy production under collective welfare, through production promoted as means of reparation for territories impacted by past extractive projects, often because they have been victims of hydroelectric plants, mining, oil exploitation, among others (Roa, 2023).

What could be understood as energy communities in Latin America, in addition to their inclusion into the system as energy producers, turning themselves into “prosumers” mainly of photovoltaic production (Baigorrotegui & Chemes, 2023), turns them into energy producers in all its entirety, in such a way that, while self-generating their own demand, they find multiple relationships to mitigate the climate crisis, create conditions for a decent life, increase income, reduce family spending, and guarantee both rural and urban energy access (Soler, 2022).

These proposals do not create new generation needs. Therefore, they do not constitute a technological development disconnected from a previous prioritizing thereof; their energy autonomy is based on recognizing the energy available in the environment, which may be identified

in nature as water, sun, wind and biomass, sources that may be transformed by technologies such as biodigesters, solar panels, turbines, efficient stoves, among many others (Soler & Rankin, 2021). The energy waste created by producing and consuming unneeded energy is also recognized. Individual action is therefore demanded, without limiting the market by avoiding the promotion of uncontrolled consumerism and programmed obsolescence, directly linked to the energy transition, due to its recognition of the processes’ energy waste and questioning of unnecessary waste generation (Soler, 2022), that, despite their promotion, cannot be integrated from the standpoint of a circular economy.

The idea that the transition is not met solely by replacing energy sources is emphasized, for it must be accompanied by a political understanding of the current climate crisis’ causes, based on society’s consumption practices that respond to the needs of a few and is completely disconnected from nature’s flows and rhythms (Pluriverso, 2019).

#### **2.3.4 JET obstacles and challenges**

Colombia is a country with diverse ecosystems, with 26% of amphibian territory and 52,1% of forests; it holds the tenth place in the world on highest economic risk derived from two or more disaster threats, for 84,7% of the population and 86,6 % of the assets are in areas exposed to two or more natural threats. The planned transition must there-

fore consider the country's ecological and climate risk conditions. It is important to link the consequences of the current energy model with the climate crisis increase, given the more than 0.16% of the GDP that has been invested between 2011-2021 for its mitigation. However, real projections indicate that an investment of between 1,5% and 3% of GDP are what is needed for adaptation. Current debt payment is 7% yearly GDP (Carranza, 2023) so it is crucial to keep insisting in international negotiating scenarios, through groups of country's diverse voices or in treaties promoting fossil fuels' planned phase-out, on the importance of adopting financial alternatives that do not entail additional public indebtedment.

Given that the just transition entails the structural transformation of entire production sectors, territorial dynamics around the projects (Díaz, 2023) and reorganizing national internal and public expenditure historically based on revenues from extractive projects, it must also be considered as a multi-level economic transition. There are currently 180,000 workers in the country's energy sector who, in a transition and project shutdown scenario, must be guaranteed both labor rights and the income offered by present companies. This group must, therefore, participate in the diagnosis and dialogues undertaken together with the public, private, and community sectors, contributing to knowledge creation (Díaz, 2023).

On the other hand, justice in the transition and the arrival of new projects such as renewable energies must guarantee communitarian participation, starting with a real understanding of the projects proposed in territory and the creation of tools with appropriate languages that allow for the understanding of the impacts on social impact that the social fabric could have from the moment the expectation is created. To this effect, respect for the differential ways of participation from each community must be guaranteed, including legitimate authorities in each space. This situation may be intensified considering that the actors leading these new projects

are in many cases multinational corporations<sup>12</sup>, that do not understand the interculturality of a country like Colombia, and may put energy security at risk (Barney, 2023).

New projects arriving in the territories must avoid repeating patterns from fossil fuels' extractive projects. The loss of communities' autonomy and land rights caused by the State's historic abandonment must be prevented, when faced with corporations that promises what the State must deliver but has not provided for. Considering corporate leadership in the arrival of renewables, a structuring of the energy system that guarantees access to low prices for of the project's surrounding territories must be demanded, and State production should therefore be promoted (Barney, 2023).

Some figures indicate that, between 2012 and 2020, the presence of oil blocks in the Amazon region increased by 13% occupying 9,4% of the Amazon's surface, especially in 2020 in Bolivia, Colombia, Peru, and Ecuador. In the case of Colombia, 27,3% of the Amazon region is overlapped by oil blocks (RAISG, 2020) and most of them in connection to the Andes, with a biological and eco systemic incalculable value threatened by hydrocarbon extraction operations.

According to a survey by the NGO Ambiente y Sociedad (2023), the gas and oil industry has been contaminating the soil, water, air, and fragmenting ecosystems in the Amazon. Also, hydrocarbon companies have contributed to destabilize indigenous peoples and their socio-cultural dynamics. It has been proven that this process has caused the infringement of 9 basic and collective rights of the communities that are currently protecting the Amazon region. The possible expansion of the extractive frontier in the Amazon must be urgently stopped, including that of the so-called "transition minerals" such as copper, that could cause the above-described impacts again. The decision to create a "fossil fuel non-proliferation area" in the Amazon region would integrate the two greatest mitigation challenges faced by the country: deforestation and fossil fuel extraction.

<sup>12</sup> In Guajira of the 19 projects to be implemented, 17 are from foreign multinational companies and only 2 are national.

### 2.3.5 Conclusion

The just energy transition will inevitably bring some reconfigurations on how Colombians are organized around energy. Economic and social transformation processes must therefore include notions of justice, and the State must be the guarantor of the most historically impacted populations, that hold a central role in the way in which energy is produced and consumed in the territories. Justice depends on Colombia's international context, but also on local actions. The JET in Colombia must avoid repeating fossil fuel system's extractive models and guarantee that strategic ecosystems of global and national interest, such as the Amazon region are not threatened by the expansion of a hydrocarbon extraction frontier, or by new projects related to "transition materials".

## 2.4 LEGISLATIVE ROLE IN DRIVING THE JET

### 2.4.1 Institutional and Implementation Framework

According to the recently published MINENERGIA JET Roadmap (2023) Colombia has an energy transition legal framework, based first and foremost in the articles of Colombia's Political Constitution, as the rule of rules, (from art. 365 onwards). Secondly, it is also found in laws and decrees, such as Laws 142 and 143 of 1994 that establish the public domiciliary services' regime, and regulate national energy from generation to commercialization; Law 629 of 2000 that adopted the Kyoto Protocol, Law 1715 of 2014 that regulated the integration of non-conventional renewable energies into the National Energy System, Law 1844 of 2017 through which the Paris Agreement was adopted and Law 2099 of 2021 where measures are taken related to the energy transition and dynamizing the energy market. In third place, presidential executive decrees and directives. In fourth place, decisions from national authorities and finally judicial decisions.

Although Colombia is renowned for its legal framework and the efforts undertaken to promote FNCER and efficiently manage energy, there are yet many questions to be answered regarding the JET, and so the public policy

platform must still be strengthened to promote the entry of renewables, phase-out fossil fuels and provide social and environmental guarantees to carry out these processes in an orderly manner to prevent social unrest.

Public spending and tax policies created to finance and promote Colombia's JET, which will enable compliance with climate change goals, must determine new ways for finding funding, since debt exchange is not the only mechanism and is an uncertain source. Alliances and cooperation that help finance the JET through different sources must be sought, for example: private, public, and international funds through donations and fair credits. Said alliances must allow for the creation of products consistent with the JET's implementation, going beyond products focused on diagnosis and projections, directing them to concrete actions that make the energy transition a reality.

### 2.4.2 Legislative and Executive branch's joint activities for the next 20 years

From the creation of this report, it is clear there is a need to articulate the legislative and executive powers in three main tasks that must be carried out continually through-



out the following decades to support the implementation of a Just Energy Transition.

First, coordination between state institutions, private actors, and civil society for the creation of new policies, aligned with existing laws, that meet the energy transition goals set for Colombia. A good example thereof is that of the SISCLIMA commission, created by decree 298 de 2016 and in charge of articulating policies, mechanisms, and institutions for fighting climate change. Understanding the energy transition as an action complementary to the policy to fight climate change, may allow for the proposal to create an additional committee, part of SISCLIMA and in addition to the other four existing committees, to work on issues related to the energy transition. In second place, the need to monitor policy implementation through the mechanisms provided for in the laws that support the energy transition and climate action is emphasized. This is the case of article 45 of Law 1715 of 2014 or “Renewables Law” which, created a mechanism through the national government to carry out a periodic follow-up on the implementation of this Law and Law 20299 of 2020’s “Energy Transition Law” provisions. Climate action policies, article 7 of Law 1931 of 2018 and articles 23, 24, and 25 of Law 2169 of 2021, create the mechanism titled “Implementation and Monitoring Plan for the country’s low carbon development, carbon neutrality and climatic resilience”. These monitoring mechanisms must be urgently implemented, for there is currently no official report showing the progress of such measures’ implementation. If necessary, recommendations on actions undertaken must be issued and roadmaps corrected in accordance with scientific demands, through the Intergovernmental Panel on Climate Change’s reports and international agreements.

Finally, in third place, given that the energy transition and climate action must be taken as long-term State policies, efforts from internal and external State institutions are needed. The energy and climate diplomacy must continue, in order to participate in international discussions and negotiations that may support or hinder Colombia and the Latin American region on these two issues. AN



internal effort must be undertaken to enact some laws that may shield current efforts regarding the energy transitions. Some Laws proposed for enactment by Congress are the following: **A new mining code that includes new social and environmental safeguards for transition minerals** and does not repeat extractivism’s mistakes; a **Law to regulate the fair phase-out of fossil fuel generating plants** with special emphasis on workers and environmental protection measures; a **Law to limit extractive frontiers** specially in the Amazon region aimed at the permanent protection of that natural resource; a **Law on the moratorium of signing new hydrocarbon exploration agreements** based on the stagnated asset risk mentioned in other chapters; the **Anti-fracking** and unconventional deposits **Law** already presented before Congress; a **Law to ban carbon open-air mining** based on some of the provisions included in the current National Development Plan; and the **Law to gradually and fairly eliminate fossil fuel’s subsidies**

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