

# GEORGIA'S ENERGY TRANSITION

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# INTRODUCTION

Climate change shapes all contemporary discussions of energy policy. An increase in the frequency of natural disasters and extreme weather events is causing significant damage in many countries, leading to a shared commitment by world's leaders to mitigate anthropogenic climate change.<sup>1</sup> *Energy transition* is the most important instrument to mitigate climate change. The concept refers to the shift from fossil fuels (coal, oil, natural gas) to renewable energy sources (solar, wind, hydro, biomass, and others) that emit fewer greenhouse gases and contribute less to climate change. Transforming the energy sector is a key component of green growth, as it is responsible for more than half of greenhouse gas emissions.

Energy transition is the main pillar of the European Union's energy policy. According to the EU Green Deal, Europe aims to become the first climate neutral continent by 2050.<sup>2</sup> Transitioning to renewable energy sources is also a part of the EU's plan to ensure its economic and energy security. The Russian invasion in Ukraine in 2022 and the subsequent energy crisis reaffirmed the need to reduce dependence on imported fossil fuels and diversify energy supplies. In May 2022, the EU Commission presented the RePowerEU plan, which proposes to accelerate the transition to clean energy, save energy and diversify energy supply.<sup>3</sup>

The revised Renewable Energy Directive, adopted in 2023, increases the EU's binding 2030 renewables target to at least 42.5%. (In 2021, the share of renewables in EU energy consumption was 21.8%).<sup>4</sup> The EU's energy efficiency target also increased from 9% to 11.7%.<sup>5</sup> As for the diversification of supply, among other initiatives, the EU signed bilateral agreements with several countries to purchase pipeline natural gas (including with Azerbaijan, Egypt and Israel) and invested in a joint purchase of liquefied natural gas (LNG). The EU also initiated strategic partnerships with multiple states to help develop the supply of renewable hydrogen. As a result, a year after the Russia's invasion of Ukraine, the EU decreased its demand for

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<sup>1</sup> United Nations Framework Convention on Climate Change (UNFCCC), 21st Conference of the Parties, Paris Agreement. [https://unfccc.int/sites/default/files/english\\_paris\\_agreement.pdf](https://unfccc.int/sites/default/files/english_paris_agreement.pdf)

<sup>2</sup> The European Green Deal. [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en)

<sup>3</sup> The European Commission, *REPowerEU*, 2022 [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en)

<sup>4</sup> [https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive\\_en](https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive_en)

<sup>5</sup> Compared to the 2020 baseline.

energy by 20% and replaced 80% of Russian pipeline gas. Additionally, up to 40% of electricity in 2022 came from renewables<sup>6</sup>.

Like the EU, the green transition is in Georgia's energy security interest, as Georgia does not have any significant fossil fuel resources. The development of local renewable energy sources and improvements in energy efficiency will allow Georgia to become less energy dependent and create a more resilient energy system.

The Georgian energy sector is currently in an active phase of reform. The main framework for the reform is defined by the EU Association Agreement and Georgia's Energy Community membership. The main objective of the reform is to ensure Georgia's energy security and, at the same time, as a potential member state, to align with EU legislation and the principles of green growth.

What does energy transition in the 21st century mean? Where does Georgia fit into the process? Is Georgia ready to transform its energy sector and why is it important for everyone to participate in the transition? By discussing these questions, we will try to highlight the main aspects of Georgia's energy transition and the challenges it poses. The purpose of this document is not to analyze and evaluate energy policies and their effectiveness. The document is intended to reach a wide audience and engage them in the discussion of the energy transition.

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<sup>6</sup> The European Commission, [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en)

# ENERGY TRANSITION – TOWARDS GREEN DEVELOPMENT

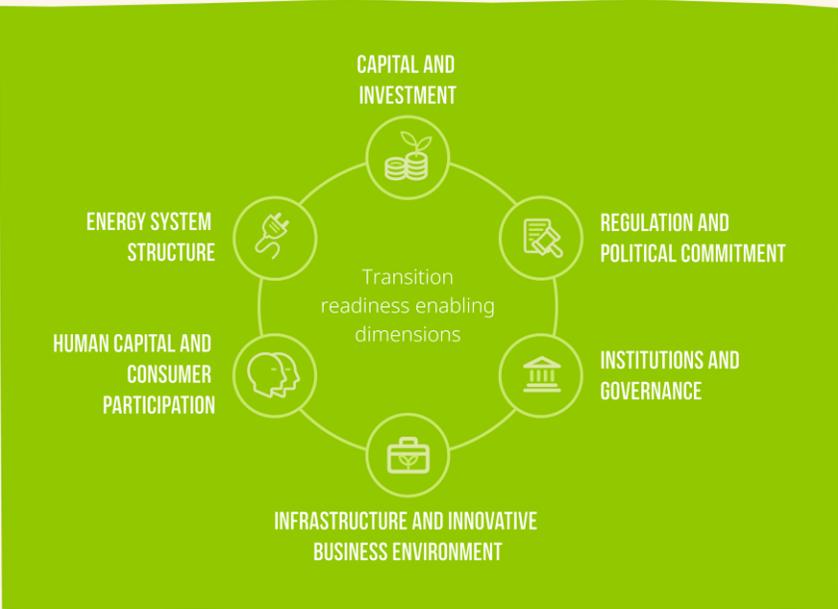
Energy transition is a multidimensional phenomenon. Replacing fossil fuels with renewable energy sources requires not only a transformation of energy production, but of the entire energy system:

- **Decentralisation** becomes an important issue - Decentralization refers to a shift to small-scale, renewable energy resources close to where the energy is needed, often on the same site. This includes a variety of solutions such as rooftop solar panels, small wind turbines, small-scale HPPs, etc. These would improve the security and reliability of energy supply, as well as energy access and affordability.
- **Digital technology** plays a major role in determining the success of energy transition. Smart meters, modern software, artificial intelligence, and other innovations provide new opportunities for optimising energy generation and distribution, as well as the efficiency of the grid.
- **Improving energy efficiency** is key to ensuring the energy transition. This means decoupling economic growth

from energy consumption and reducing energy consumption in all sectors of the economy, including buildings, transport, industry, etc.

- **Social justice** is given special attention. An energy transition should not be a burden for people and businesses. Governments must balance the goal of the transition to cleaner sources of energy with other economic needs. A successful energy

**Diagram 1**



*Source: World Economic Forum (adapted)<sup>7</sup>*

<sup>7</sup> [https://www3.weforum.org/docs/WEF\\_Fostering\\_Effective\\_Energy\\_Transition\\_2021.pdf](https://www3.weforum.org/docs/WEF_Fostering_Effective_Energy_Transition_2021.pdf)

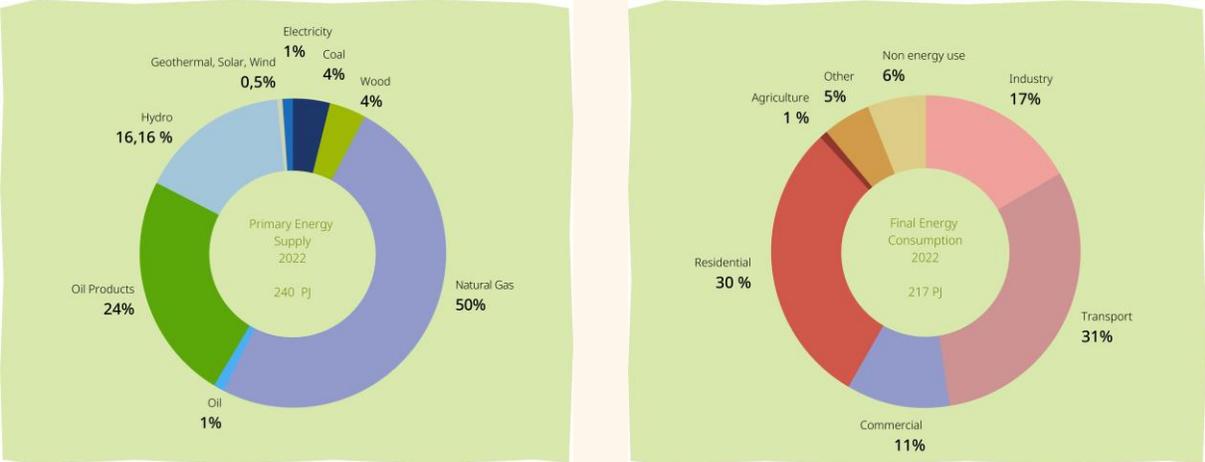
transition must protect the rights of consumers and ensure their participation in the decision-making process.

- **Innovation and technological advancement** are a necessary precondition of a transition to green energy. International cooperation is similarly crucial. Overcoming global energy challenges requires a strengthening of cooperation between countries and an exchange of knowledge, resources, and best practices.
- Building new generation facilities and resilient energy grid infrastructure requires major **investments**. Even when the necessary financial means exist, qualified personnel is a big challenge.

# GEORGIA'S ENERGY SECTOR

Georgia's energy production covers about one-fifth of its energy demand (21.1% in 2020). Most of Georgia's domestic energy production comes from hydro and bioenergy. Almost all fossil fuels (95%) are imported from neighbouring countries. Georgia's energy security is constrained by the low level of supply diversification and the seasonality of imports. Energy imports are especially high in winter when consumption increases and production from local hydropower plants falls (HPPs with no reservoir generate less electricity due to reduced water flow).

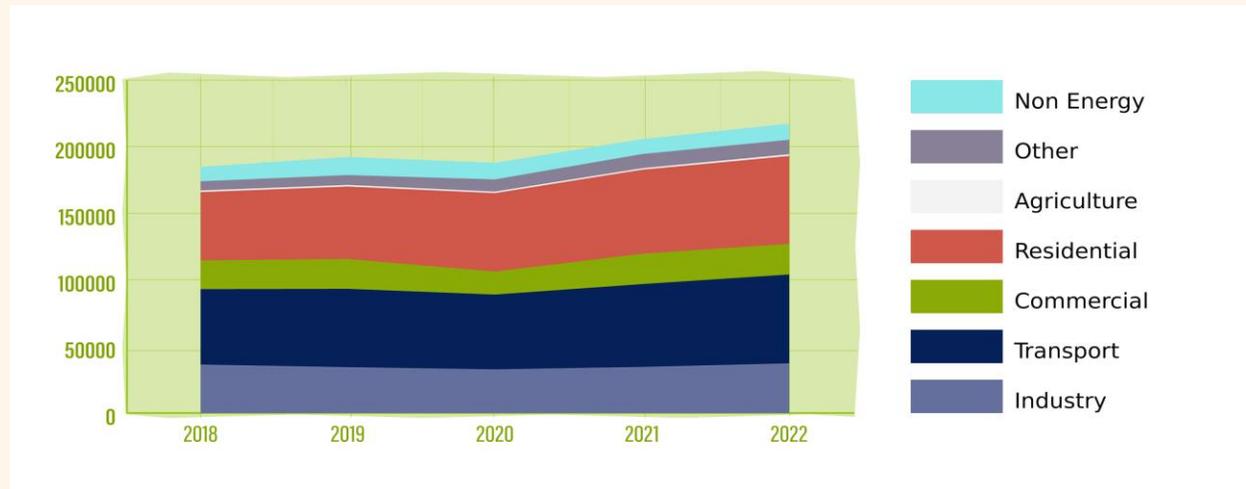
**Figure 1: Primary Energy Supply and Final Energy Consumption**



Source: Georgia's Energy Balance, GeoStat, 2022.

On average, Georgia's energy consumption is increasing by 3.3% per year (data from 2018-2022). Several factors are contributing to this trend. A significant portion of the Georgian population lives in energy poverty, meaning that they are unable to adequately heat their homes. At the same time, only 10% of the population can afford air conditioning (Geostat, 2022). Improving living conditions and addressing energy poverty means increasing energy demand.

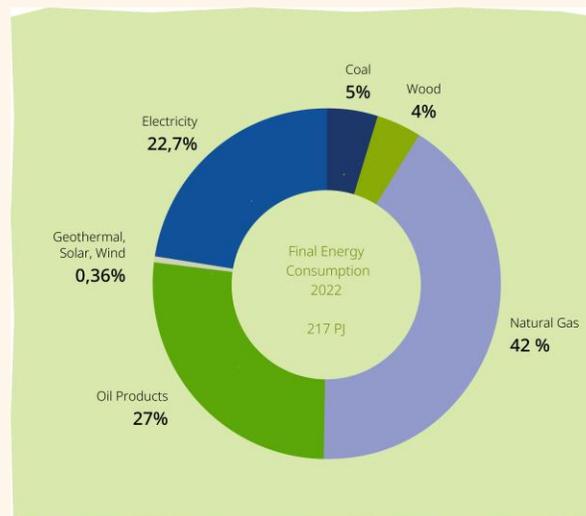
**Figure 2: Energy Consumption by Sector, 2018-2022, GeoStat**



Source: Georgia’s Energy Balance, GeoStat, 2022.

Commercial and transport sectors also contribute to the overall rise in demand. Energy efficiency can help offset some of this increase, but the overall trend of rising demand is a significant challenge. According to the Georgian State Electrosystem, consumption forecast annual growth rate varies from 3% to 5% annually.<sup>8</sup>

**Figure 3: Final Energy Consumption by Source**



Source: Georgia’s Energy Balance, GeoStat, 2022.

<sup>8</sup> Ten-Year Network Development Plan of Georgia 2023-2033  
[https://www.gse.com.ge/sw/static/file/TYNDP\\_GE-2023-2033\\_ENG\\_corr.PDF](https://www.gse.com.ge/sw/static/file/TYNDP_GE-2023-2033_ENG_corr.PDF)

Energy consumption is primarily dominated by natural gas (42%), followed by oil products (27%) and electricity (22%), with biomass, coal, and geothermal energy accounting for about 9%. Energy transition implies increasing the share of renewables in residential, commercial, transport and other sectors. The country has significant hydro, solar, wind and geothermal energy potential, which, if properly utilized, would allow Georgia to limit its dependence on imported electricity and natural gas.

# ENERGY TRANSITION IN GEORGIA: VISION, FIRST STEPS AND CHALLENGES

## DEVELOPING RENEWABLE SOURCES

The draft National Energy Policy Document and the Integrated National Energy and Climate Plan (NECP) discuss key issues related to Georgia's energy transition. According to the draft NECP, Georgia intends to increase the share of renewable energy sources in final energy consumption up to 27.4% by 2030. This implies the construction of new hydropower plants, as well as new wind and solar power plants, and the development of geothermal and modern biofuels.

According to the Georgian State Electrosystem, 1332 MW of wind and 520 MW of solar capacity can be integrated into the grid by 2030 if (1) new generation facilities (hydropower plants and thermal power plants) provide reserve capacity and (2) the transmission system is strengthened, preventing overloading of transmission lines and transformers.<sup>9</sup>

## CHALLENGES

- **New Generation facilities and Transmission lines**

The capacity of HPPs in the country is up to 3500 MW and the total installed capacity of wind farms in Georgia is only 21 MW, solar power plants are not yet operational, and the construction of the main reservoir HPPs (Khudoni, Nenskra, Namakhvani HPPs) is suspended. Under these circumstances, the achievement of the 2030 renewable energy target is uncertain.

The development of renewable energy sources, and HPPs in particular, is a subject of ongoing public debate in Georgia. The debate reflects different perspectives on the environmental, social, and economic impacts of HPP projects, and goes deeper into criticism of energy governance and decision-making processes. As a result of the protests, the construction of major power generation facilities has been suspended.

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<sup>9</sup> Ten-Year Network Development Plan of Georgia 2023-2033  
[https://www.gse.com.ge/sw/static/file/TYNDP\\_GE-2023-2033\\_ENG\\_corr.PDF](https://www.gse.com.ge/sw/static/file/TYNDP_GE-2023-2033_ENG_corr.PDF)

- **Attracting Investment and Liberalising the Energy Market**

Attracting investment is a major challenge for the development of renewable energy in Georgia.

The opening of the day-ahead and the intraday energy markets were postponed several times. According to the latest changes, the energy market is planned to begin operation on July 1, 2024. Energy Market liberalisation is a central component of the reform.

The Georgian government offers investors various instruments to support the development of renewable energy sources. One such mechanism was Power Purchase Agreements (PPAs), which was discontinued in 2017. PPAs were signed by the Electricity Market Operator (ESCO) and electricity producers. Under the agreement, producers were granted a licence to construct and operate a plant, while ESCO committed to purchasing specified amounts of electricity at a predetermined price. In 2017, following recommendations from the International Monetary Fund, the PPA mechanism is no longer applicable to new projects. Regarding previously signed PPAs, a Ministry of Finance report (2019-2023) indicates that, under current laws, the associated fiscal risks are low.<sup>10</sup> Although more than one hundred PPAs have been signed, construction progress lags significantly behind the projected schedule.

To support the development of renewable energy, in December 2019, the Parliament adopted the Law of Georgia on Promoting the Generation and Consumption of Energy from Renewable Sources.<sup>11</sup> After the adoption of the law, the Government approved a new support scheme<sup>12</sup> for renewable energy projects - an auction-based contract for differences (CFD).<sup>13</sup>

Investments are also necessary for developing Georgia's transmission lines. Overloading strains the current transmission system, threatening its reliability. Delivering electricity to consumers and integrating intermittent supply from solar and wind-based sources are complex objectives that require sophisticated technological

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<sup>10</sup> The Ministry of Finance of Georgia, Fiscal Risk Analysis 2019-2023

[https://www.mof.ge/images/File/publications/FRS\\_2019\\_ENG.pdf](https://www.mof.ge/images/File/publications/FRS_2019_ENG.pdf)

<sup>11</sup> The Law of Georgia on Promoting the Generation and Consumption of Energy From Renewable Sources.

<https://www.matsne.gov.ge/en/document/view/4737753?publication=1>

<sup>12</sup> In this scheme, the government sets up an auction for a predetermined capacity. The winner of the auction signs a 15-year Contract for Difference (CfD) agreement with the government (and with ESCO). The government plans to hold auctions for 1500 MW of installed capacity over the next three years. For details, see:

<https://api.galtandtaggart.com/sites/default/files/2022-12/report/electricity-market-watch-10m22-eng.pdf>

<sup>13</sup> <https://matsne.gov.ge/ka/document/view/4914589?publication=0>

solutions. At the same time, adding smart technology and automation systems to an ageing infrastructure makes it more vulnerable to cyberattacks.

- **Energy Communities and Net Metering**

Decentralized energy systems and energy communities are an important part of the energy transition. Through the Clean Energy for All Europeans package adopted in 2019, the EU has introduced the concept of energy communities into its legislation, specifically as citizens' energy communities and renewable energy communities. When organized as an energy community, citizens can collectively build small power plants (solar, wind and hydro) to meet their own needs and sell the surplus. In Georgia, the first steps are being taken to create a legal framework for the establishment of energy communities.

In addition, natural and legal persons in Georgia can participate in the net metering scheme, i.e. they can be owners of solar, wind, hydro and/or other renewable energy micro-generators with a capacity below 500 kW and apply for connection to the electricity distribution network and provide the excess electricity to the distribution company. Net metering exists since 2016, but its adoption and efficacy has improved with the legislative and regulatory changes introduced in the following years. In 2020, the upper limit of micropower plant's installed capacity was raised from 100 kW to 500 kW. In 2022, 723 subscribers were enrolled in the net metering system, adding a total installed capacity of 36,375 kW to the grid. In 2022, the number of subscribers and total installed capacity both doubled.<sup>14</sup> On January 1, 2021, electricity tariff in Georgia increased (the increase was more pronounced for legal persons),<sup>15</sup> which made net metering more attractive.

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<sup>14</sup> GNERC: <https://gnerc.org/files/Annual%20Reports/Reports%20English/2022%20Activity%20Report%20-%20Eng.pdf>

<sup>15</sup> <https://civil.ge/ka/archives/389393>

## ENERGY EFFICIENCY

Improving energy efficiency is the second crucial component of an energy transition. In Georgia, as in the European Union, buildings account for the largest share of energy consumption (up to 40%). The buildings sector is the most important target for energy efficiency; however, energy efficient interventions also target industry, transportation and the generation and distribution of natural gas and electricity. Georgia adopted two main laws: (1) the Law of Georgia on Energy Efficiency; and (2) the Law of Georgia on the Energy Efficiency of Buildings. As a result, from July 2023, new construction must comply with minimum energy efficiency requirements. The law covers all new buildings exceeding 50 square meters in floor area.

### CHALLENGES

- A lack of investment and subsidized energy tariffs are the main barriers to improving energy efficiency in Georgia. In addition, energy transition implies the creation of thousands of new employment opportunities, but filling these jobs with qualified professionals is a major challenge. A lack of training programs for energy efficiency specialists, technicians, engineers, energy auditors and others is especially problematic. Academic and applied research is similarly lacking, hindering the dissemination of modern technology.

Other challenges are related to institutional and coordination related challenges and Public Participation and Awareness. A successful energy transition must be based on a broadly participatory process. Saving energy, developing renewable sources, decentralising the energy system and other major objectives require active participation of citizens. Therefore, raising public awareness regarding energy transition is of critical importance.

## CONCLUSION AND RECOMMENDATIONS

Energy Transition energy will improve people's quality of life, reduce energy poverty and create new jobs, which is an important precondition of Georgia's economic development. However, to ensure an effective and smooth energy transition, it is recommended to:

- Support the development of renewable sources and energy efficiency through adopting a robust regulatory and legislative framework; strengthen mechanisms of enforcement and supervision.
- Improve coordination among key stakeholders involved in the energy transition (policy-makers, businesses, research institutions etc.).
- Increase efforts to add new generation facilities and expand existing grids.
- Develop regulatory and economic instruments to make investment in renewable energy and energy efficiency more attractive; improve the availability of targeted finance, credit, and grants for businesses and households.
- Limit energy subsidies and set energy prices according to market principles. At the same time, it is important for the government to protect vulnerable consumers and reduce energy poverty. It is recommended to direct savings from decreased subsidisation towards improving the energy efficiency of buildings and other long-term interventions aimed at reducing energy consumption.
- Develop campaigns to raise public awareness around developing renewable sources of energy and improving energy efficiency, paying special attention to the benefits these could generate for addressing energy poverty, economic development, and Georgia's energy security.
- Ensure more effective public participation in the decision-making process regarding new power plants and dedicate more resources to strategic communication; improve the enforcement of environmental standards.
- Enhance academic research in energy-related fields and create and improve accredited certification programs to address unsatisfied demand for energy auditors and other specialists.

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## AUTHORS

**TUTANA KVARATSKHELIA** is a senior energy policy analyst with more than 7 years of experience in energy policy research and analysis. During her career, she has focused on energy poverty and energy transition in Eastern Partnership member countries, including challenges related to access to clean, secure, and affordable energy sources, protection of consumer rights, and related issues in the broader context of transition to a green economy. She has worked on the draft National Energy Policy Document of Georgia, the Regulatory Impact Assessment of the new Energy Law of Georgia, etc.; she is actively involved in awareness-raising activities on reforms in the energy sector and policies related to EU integration.

Tutana holds a B.A. in Social and Political Sciences and an M.A. in Public Administration. She is a certified national security and public policy analyst and an alumna of the 5<sup>th</sup> Energy Community Summers School held at the University of Vienna in 2021. Tutana is a recipient of the 3<sup>rd</sup> Lights on Women scholarship from the Florence School of Regulation at the European University Institute, where she completed the course on the EU Green Deal.

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