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ECONOMY



MOSCOW DEPARTMENT  
FOR ECONOMIC POLICY  
AND DEVELOPMENT



城市创新  
Guangzhou Institute for  
Urban Innovation

# BRICS Urban Climate Agenda Report



August 2024





# Country Profiles







## Brazil

In 2023, Brazil submitted an updated Nationally Determined Contribution (NDC) to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), in which the country committed to reduce its annual greenhouse gas emissions by 53.1% by 2030 compared to the 2005 levels, and reaffirmed its commitment to **achieving carbon neutrality by 2050 [59]**.

The central element of Brazil's climate policy at the current stage is **combating deforestation in the Amazon**, the largest tropical rain forest on the planet, which occupies more than a third of the country's territory [60]. This issue is vital for Brazil due to the peculiarities of its greenhouse gas emissions structure. **In 2022, 48% of the country's total greenhouse gas emissions came from the land management and forestry sectors**, with almost three-quarters of this sector's contribution coming from deforestation in the Amazon [61].

The Amazon Region Protected Areas Program (ARPA) implemented by the Brazilian government since 2002, is the largest initiative of its kind in the world [62]. To date, **120 zones with a total area of over 62 million hectares have been granted protected status** under the program, representing **about 20% of the entire rainforest area** in the Brazilian part of the Amazon basin [63].

The guidelines of the national strategy to achieve carbon neutrality contain decarbonization targets in other sectors as well [64]. In particular, this document states the country's intention to increase the share of renewable energy sources in the energy balance. At the same time, **renewable sources already account for about 50% of total energy consumption and more than 90% of electricity production [65]**, which makes Brazil's energy matrix one of the cleanest in the world.

The share of renewable energy sources is also high in the transport sector, where **biodiesel and ethanol account for over 22% of the fuel consumed by transport [65]**. The process is facilitated by a state program to stimulate the production of biofuels through a combination of regulatory and market mechanisms [66].



## Best Practices



### Brasília

#### Biodiesel fuel [67]

Since 2018, Brasília has been implementing a program to collect and process cooking oil into biodiesel fuel. Anyone can bring used oil (for example, leftovers from cooking at home or in a restaurant) to one of the collection points, from where it is sent to a biodiesel plant. In turn, it is used not only as a green fuel for vehicles, but also to run generators responsible for wastewater treatment in the capital.

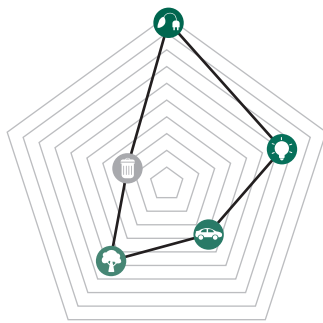


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#### Planting Day [68, 69]

Since 2023, Brasília has been holding an annual tree planting day in parks and other public spaces in the city. The seedlings come from the Cerrado ecoregion in eastern Brazil. In the 2023 event, about 10,000 trees were planted in the capital.



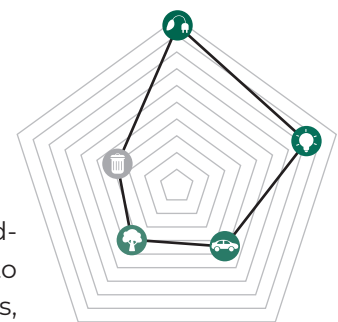
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### Rio de Janeiro

#### Purchasing clean energy for municipal buildings [70]

Since 2022, Rio de Janeiro has been steadily expanding the purchase of renewable energy directly on the free market to supply municipal buildings. Currently, the energy is purchased for the São Sebastião Administrative Center and the Operations Center, as well as 20 health facilities. In the future, the city plans to extend the practice to the entire network of its municipal buildings.



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### São Paulo

#### Solar energy used to heat water [71, 72]

Since 2008, São Paulo has had a regulation in place requiring that all new buildings install solar-powered water heating systems. The requirement applies to both residential buildings and various types of non-residential buildings: hotels, sports clubs, hospitals, schools, etc.

#### Biogas plants [73, 74]

In the late 2000s, São Paulo implemented one of the first biogas energy projects in the country. After the decommissioning of the large Bandeirantes landfill, a biogas plant was built on the site, which captures and burns landfill methane to produce more than 170 thousand MWh of energy per year, the amount sufficient to serve a city of more than 400 thousand residents.





## Egypt

One of the fundamental objectives of Egypt National Climate Change Strategy is **to achieve sustainable economic growth and low-carbon development** across various sectors.

There is **particular focus on the energy sector**, which accounts for about 64.5% of total greenhouse gas emissions, due to the high proportion of natural gas and petroleum products in energy production [75].

Government measures have managed to improve the situation in recent years, and **the share of renewable energy sources in the energy balance has grown**. This has been made possible by both the construction of centralized energy supply systems based on clean sources (wind power plants, solar parks, bioenergy plants, etc.), and the promotion of distributed energy production from solar panels on the roofs of buildings in cities and the use of solar water heaters [75].

**There are also helpful initiatives to maximize energy efficiency** at the national and local levels that stimulate energy conservation, in particular, projects to modernize urban infrastructure [75].

**Other sectors** of the Egyptian economy **are also making efforts to reduce CO<sub>2</sub> emissions**. There is a project for a green upgrade of urban public transport with the introduction of electric buses, plans to expand the metro network [76] and a project to promote the use of electric vehicles, in particular, by opening new charging stations [77].

**Intensive work is also being carried out to create a comprehensive waste management system based on the principles of the 4R concept** (Reduce, Reuse, Recycle, Recover), which should ensure a significant reduction in waste generation and a high level of recycling [75].

# ~64.5%

of gas emissions in the country  
are accounted for by the  
energy sector



Best Practices



Cairo

Sustainable energy consumption [78-80]

Cairo is implementing projects to use solar power in buildings (in particular, government buildings), to upgrade city lighting by installing energy-efficient street lights, and to increase the efficiency of energy consumption in municipal buildings and facilities (energy-saving methods such as using LED lamps and switching off internal and external lighting in government buildings after business hours).



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## India

In 2022, India for the first time set **a strategic target of achieving carbon neutrality by 2070 [81]**. The interim **target of reducing the carbon intensity of GDP by 45% by 2030 compared to the 2005 levels** implies scaling up decarbonization efforts across all sectors of the economy in accordance with the action plan outlined in India's Long-Term Low-Carbon Development Strategy [82].

In the electric power sector, an ambitious **target has been set to increase the share of non-fossil sources in total installed capacity to 50% by 2030**. India has already made significant progress towards achieving this target: **as of mid-2023, renewable energy and nuclear energy accounted for 43% of its generating capacity**, including over 16% coming from solar generation [83].

This progress in the use of renewable energy is the result of a comprehensive government policy for the development of this sector, which includes **subsidies for individuals and organizations [84] and regulatory mechanisms** that establish obligations for market participants to purchase electricity from renewable energy sources and build generating capacity [85].

Energy efficiency measures apply to the construction and industrial sectors. **In 2007**, the Indian government developed **an energy efficiency standard for new commercial buildings**, which has now been adopted by most states, and, **in 2018, an energy efficiency standard for residential buildings** was also introduced [86]. In the industrial sector, there is a program setting targets for large energy consumers to reduce the energy consumption per unit of production [87].

Transport sector decarbonization is also one of the key priorities of the Low-Carbon Development Strategy. In this sector, the strategy envisages measures **to increase the share of biofuels and natural gas in the fuel mix, develop rail transport and stimulate the production and use of electric vehicles [82]**.

India's forest management policy includes a host of programs **to increase forest cover, green urban areas, and restore natural ecosystems**. The target is to increase forest absorption capacity by 2.5 billion tons of CO<sub>2</sub> equivalent [81].

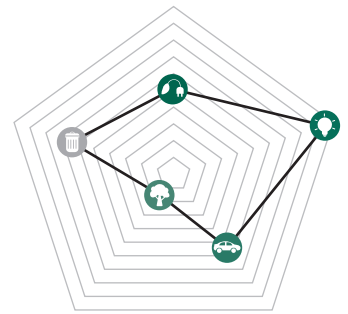
## Best Practices



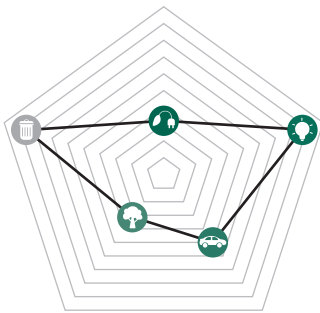
### Bengaluru

#### Solar roofs [88-90]

Bengaluru is promoting solar panel projects, installing them on the roofs of administrative buildings and in public spaces (city parks). Moreover, according to the current requirements, new residential buildings in Bengaluru will not be commissioned for operation unless they are equipped with solar water heaters and solar panels on the roofs.



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### Delhi

#### Energy efficiency projects [91-93]

The city is implementing a number of initiatives to improve energy efficiency and conservation:

- installing LED lamps in street lighting fixtures
- stimulating households to use LED lamps: one of the initiatives implied purchasing these lamps by residents at a reduced price
- conducting an energy audit of Delhi government buildings to identify areas of excessive energy consumption and find ways to minimize it



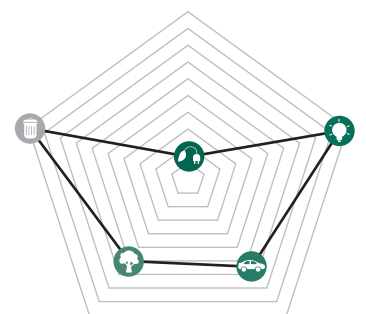
### Mumbai

#### Waste recycling [94, 95]

Most of the city's mixed municipal waste is delivered to the Mumbai municipality's large waste management complex, which includes:

- a bioreactor with an installed capacity of 3,000 to 6,500 tons per day, which, among other things, produces clean electricity
- a mechanized materials recovery facility (MRF)
- a composting facility with an integrated automated SCADA system that monitors the operating parameters

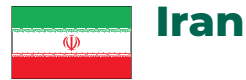
Also, the Mumbai municipality has a near-future project to build a waste-to-energy plant with a capacity of 600 tons per day.



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One of Iran's key sustainable development priorities is **the promotion of clean urban transport [96]**. There is an active process to electrify the transport system, with both modernization of the fleet of public vehicles and expansion of the infrastructure necessary for it.

There is also a drive **to transform the waste management system**. The authorities are reducing landfills, with their number going down by 80% over a 7-year period, and the ultimate goal being to completely eliminate them [97].

To process municipal waste into energy, it is planned to build more waste incineration plants in cities. Also, a number of rules limiting the use of single-use plastic items has recently been introduced in the country [97].

**Iran has a wealth of renewable energy resources**, the potential of which has not yet been fully tapped, and its energy balance is still dominated by natural gas [98].

However, in the future, the country is expected to accelerate the development of renewable energy sources, including wind and solar energy.

The number of  
landfills went down

**by 80%**

over a 7-year period



**Best Practices**



**Tehran**

**Improving the city's waste management system [97, 99]**

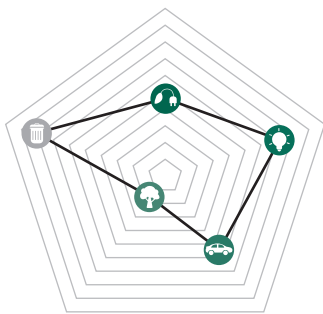
Tehran has a whole range of projects and initiatives, including:

- Installing containers for separate waste collection in residential complexes, offices, government buildings, public and shopping centers;
- Installing reverse vending machines, where people can return empty beverage containers;
- Building specialized materials recovery facilities (MRFs) in dedicated city areas

**Promoting clean transport [100, 101]**

In 2022 and 2023, about half of the municipal budget was allocated to the development of public transport, which involves the opening of three new metro lines, renewal and replacement of the bus fleet, and other initiatives.

Tehran is also in the process of electrifying its taxi fleet. Owners of taxis with the vehicle age more than 10 years will now be eligible for city support to exchange their vehicles for new electric vehicles, thanks to an agreement achieved with a car manufacturing company in 2024.



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## China

Key to China's low-carbon agenda are its two stated goals of **peaking carbon emissions by 2030 and achieving carbon neutrality by 2060 [102]**.

China has demonstrated significant progress in many sectors responsible for greenhouse gas emissions. **It has been the world leader in the production and sale of new energy vehicles for many years in a row [103]**.

The country is also active in the development of bicycle infrastructure, stimulates the use of electric vehicles, and invests heavily in the modernization of public transport systems (in some Chinese cities, the share of electric buses in the ground transport fleet exceeds 80%).

There are important initiatives to promote low-carbon awareness and behaviors among citizens. According to statistics, **the Chinese public's awareness of climate change and ways to reduce carbon emissions is very high, at over 80% [104]**.

Preservation and expansion of green spaces is an equally high priority area in China's climate policy. One of its main programs is the **construction of "forest cities"**, which involves the introduction of sustainable solutions into the urban landscape and massive greening of territories. Among other things, this program has contributed to an impressive achievement: the average share of green spaces in the total area of urban built-up areas across the country has reached 42.7% [105].

The country also continues to improve its waste management system, based, among other things, on further promotion of separate waste collection, and accelerated construction of integrated urban facilities for the processing of household waste [106].

At the same time, China is among the countries with the fastest growth rates of renewable energy capacity, with its large-scale projects to install **wind turbines, hydroelectric systems and solar panels [107]**.

## Best Practices

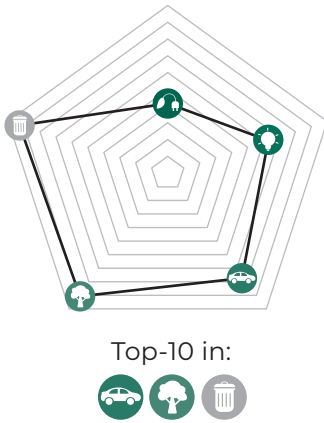
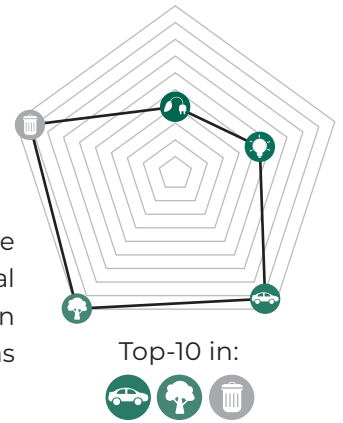


### Guangzhou

**0% of household waste goes to landfills [108, 109]**

Guangzhou’s zero household waste goal has been achieved through a comprehensive approach. It involves the reduction of total amount of waste promoted by a special citywide waste classification system, and a new waste management model with an emphasis on incineration as the primary method and biochemistry and recycling as complementary approaches.

For more than 20 years of active work, Guangzhou has built 7 circular economy industrial parks for processing household waste with a total of 24 treatment facilities and the design capacity of 39 thousand tons per day.



### Beijing

**National Forest City [105, 110]**

The city has been implementing greening activities since 2012. Thanks to large-scale afforestation projects, Beijing’s green and water areas have increased by 160 thousand hectares over a ten-year period, and the total number of parks has reached 1,065. For achieving the established national standards in the conservation and development of green spaces and the protection of biodiversity, Beijing was officially awarded the title of “National Forest City” in 2024.



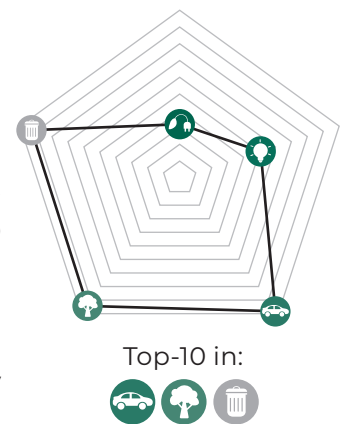
### Shanghai

**Developing electric vehicle infrastructure [111]**

Currently, there are about 770,000 charging stations in Shanghai, of which 180,000 are public. Shanghai is not stopping there, and plans to build more than 30,000 more public charging stations between 2024 and 2026.

#### Apps to encourage the use of public transport [112]

To encourage residents to use public transport more often, Shanghai uses city transport apps: when registering for a ride on the subway or bus, a certain amount of so-called “green credits” is added to a special passenger account, which they can then use for various purposes. For example, users of the Shanghai Public Transportation Card app can exchange their accumulated credits for digital yuan.







## United Arab Emirates (UAE)

The UAE's transition to a green economy is marked by large-scale renewable energy projects [113].

One of the most significant initiatives to achieve the country's target of producing 100% of its energy from clean sources by 2050 is **the Mohammed bin Rashid Al Maktoum Solar Park**, considered to be one of the largest solar energy projects in the world [114]. **By 2030**, after the completion of all phases of construction, **the park is expected to have a capacity of 5,000 MW and reduce CO<sub>2</sub> emissions by 6.5 million tons per year** [115].

Promoting distributed solar power production in cities is another way to expand the use of renewable energy sources.

**Energy efficiency is also on the UAE's agenda:** some of the measures to significantly reduce energy consumption include **green construction programs, wastewater reuse, standards for lighting systems**, etc. [113]

**The UAE's urban transport sector is set to undergo intensive electrification** in the coming decades, with plans to stimulate the use of electric vehicles and increase the number of charging stations by many times [116], upgrade the bus fleet and switch to hybrid vehicles and electric buses [117].

A lot is being done **to preserve and expand green spaces**, and such projects are particularly important amid the continuous threat of desertification [118].

# 100%

of energy in the UAE is going to be produced from clean sources by 2050

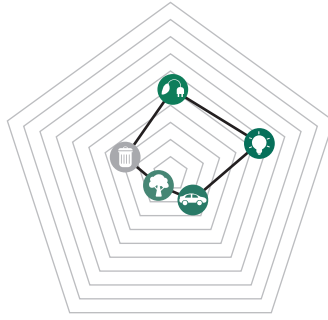


**Best Practices**



**Abu Dhabi**

**Sustainable urban lighting**  
[119, 120]



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The Abu Dhabi municipality is using sustainable solutions in urban design. In one of such projects completed in December 2023, it installed solar-powered decorative lighting along the Corniche pedestrian walkway.

Following a comprehensive assessment of the project’s results, the city intends to extend the use of solar batteries to other public spaces, sites and attractions in Abu Dhabi.



**Dubai**

**Green solutions in urban development**  
[121, 122]



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In 2021, Dubai opened its first green parking zone, with solar panels installed on its roof to generate the energy needed for the building’s operation. The installed solar energy system has a capacity of 500 kW and comprises 1,530 panels covering an area of about 2,500 m<sup>2</sup>.

The Blossoms City Park is also designed with sustainability in mind: solar panels have been installed as leaf-shaped “umbrellas” on the open central area and children’s playgrounds. These panels create shaded areas and provide 85% of the park’s electricity needs.







## Russia

Reducing greenhouse gas emissions has become an increasingly important objective for Russia in recent years. The country currently ranks fourth in the world in terms of annual emissions [123], and is actively working to reduce its carbon footprint.

**In 2021, the country adopted the Strategy of Socio-economic Development of the Russian Federation with a Low Level of Greenhouse Gas Emissions until 2050 [124],** which defined a target scenario for achieving zero emissions, and in 2023, it set the goal of achieving carbon neutrality by 2060 [125].

**The carbon intensity of electricity in Russia is already lower than the world average,** largely due to a considerable proportion of generation at nuclear and hydroelectric power plants, which are usually located outside large cities [126]. In the cities of the European part of Russia analyzed in this report, generation is carried out at thermal power plants that use natural gas as the main fuel, which is the cleanest of fossil fuels [127].

**An important objective to achieve carbon neutrality is to decarbonize the transport sector.** Russia has a leading position in the world in terms of the use of rail transport in the structure of freight transportation, which helps reduce greenhouse gas emissions and improve environmental performance in logistics [124]. For large cities, passenger transport plays an important role: in this area, Russian cities can boast a well-developed public transport system, including low-emission types of transport - metro, electric buses, trolleybuses and trams.

The goal of achieving

**carbon  
neutrality  
by 2060**

was set in 2023

**Best Practices**



**Moscow**

**Electric river trams [128, 129]**

In 2023, Moscow launched a regular electric river tram service, opening two all-seasonal routes which employ 50 seater vessels.

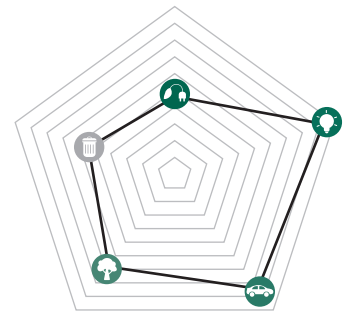
The project has improved the accessibility of public transport for residents of 18 districts of Moscow, taken the load off the ground transport network, and reduced harmful emissions.

**Green bonds [130]**

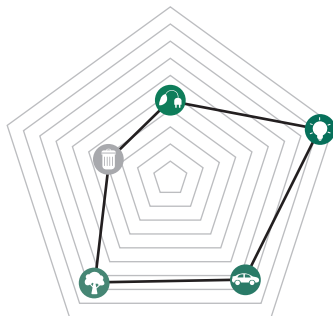
In 2021, the green bonds worth RUB 70 billion were issued on the Moscow Exchange, and the 2023 issue was RUB 2 billion. The raised funds were used to:

- purchase more than 450 electric buses; and
- build new and rebuild some existing facilities of the Big Circle Line of the metro.

This project alone helps reduce emissions of pollutants by almost 1 thousand tons per year, and greenhouse gas emissions, by 42 thousand tons per year.



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**Saint Petersburg**

**Stimulating the use of electric vehicles [131-133]**

As is the case with Moscow, Saint Petersburg is quickly expanding the infrastructure for electric vehicles: in 2023, the number of charging stations in the city exceeded 200.

The city also stimulates the process with regulations: since 2016, owners of electric vehicles have the right to place their vehicles for free in the parking lot (including on paid parking lots - subject to obtaining an appropriate parking permit).

Saint Petersburg also offers a tax benefit to owners of electric vehicles: they are exempt from the payment of transport tax during the first five years of owning an electric vehicle.



**Kazan**

**Sustainable urban space [134]**

Kazan has built a 16.3-hectare park with areas for active recreation on the site of a littered and insufficiently maintained embankment of the Noksa River.

Among other things, the project involved:

- landscaping, with 88.5 thousand square meters of lawn sown and 1,480 trees and 1,300 shrubs planted.
- removing and disposing of more than 4 thousand tons of waste.



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## Ethiopia

Renewable energy plays a key role in Ethiopia's energy mix. **The country's power system is almost completely decarbonized**, with hydroelectric power generating more than 90% of the country's electricity [135].

The use of other alternative sources like **wind and solar** is also expanding that helps to address the country's need to increase the level of electrification [136].

In addition, Ethiopia's sustainable development policy places emphasis on measures to promote energy efficient technologies that help reduce energy consumption and carbon footprint [136].

In the waste management sector, **Ethiopia seeks to create a comprehensive sustainable management system that will ensure lower waste generation and higher recycling rates.**

This includes both specialized regulations, such as restrictions on the use of single-use items, and various programs to increase processing capacity [136]. In the future, Ethiopia also intends to build more waste-to-energy plants in major cities across the country.

Ethiopia has plans to modernize its transport system in the coming years: it implies **the significant increase in the length of its railway network** (by more than 4.5 times) [137], **development of urban cycling infrastructure, and promotion of the use of ground electric transport** [136].

# >90%

of the country's electricity is produced with hydroelectric power



**Best Practices**



**Addis Ababa**

**Low-carbon buildings**  
[138, 139]

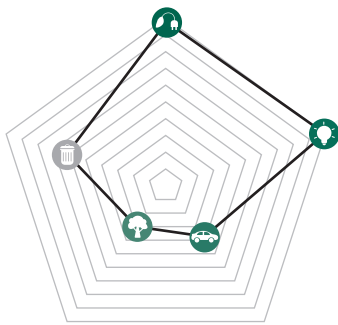
Due to rising population and relatively low housing affordability, the city has become increasingly plagued by slums. To address the problem, the Addis Ababa City Administration has taken the initiative to promote low-carbon building projects to provide energy-efficient, sustainable housing to various groups, including low-income people.

**Waste-to-energy plant [140, 141]**

Addis Ababa became the first city in Africa to build a waste-to-energy plant in 2018.

The plant uses modern flue gas treatment technology, which significantly reduces emissions of heavy metals and dioxins from incineration.

The plant has a significant cross-sectoral impact, as the green energy generated from the city's waste (with its capacity of 1,400 tons of waste per day, the plant burns a large proportion of waste produced in the city) is used to meet a considerable portion of household electricity needs



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## Republic of South Africa (RSA)

South Africa aims to achieve net zero emissions by 2050 [142], and the government is consistently developing policies, implementing initiatives and supporting projects in the various sectors responsible for the majority of the country's greenhouse gas emissions.

There is much focus in South Africa to improve the energy efficiency and reduce the carbon footprint of new buildings, with special **national standards for energy efficiency and energy consumption in buildings introduced [143]**.

One of the key priorities of South Africa's climate policy is **to preserve carbon-absorbing green spaces**. There are **programs to create and restore eco-friendly recreational parks, and build tree nurseries and plant trees [144]**. Municipal authorities also involve residents in their projects to plant greenery and protect biodiversity and have environmental awareness programs for the people.

In the coming years, **the energy sector of South Africa will undergo a significant transformation**, which will also have an impact on the transport sector [145].

The strategic plans call for **a transition from the** predominant use of **coal to renewable energy** (with investments in the development of solar, wind and other alternative forms of energy [146]), where South Africa has great potential [145]. This process is also expected to support the electrification of urban transport systems [146].

South Africa aims to achieve

**net zero  
emissions**

by 2050

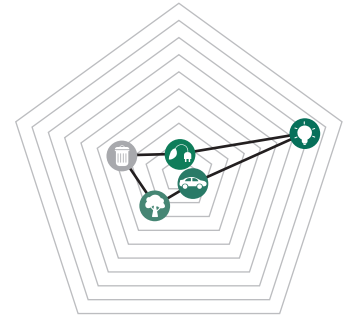
**Best Practices**



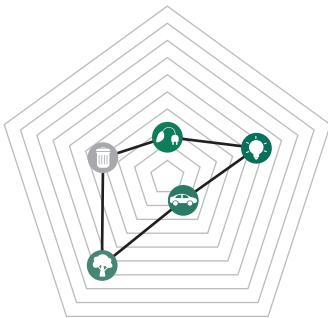
**Johannesburg**

**Various energy efficiency and energy saving initiatives [147-149]**

- Replacement of lighting in municipal buildings with energy-efficient systems
- Arrangement of courses for building maintenance personnel to train green skills
- Audit of compliance with the rules for mandatory provision and display of energy efficiency certificates in municipal buildings



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**Cape Town**

**BioNet biodiversity plan [150, 151]**

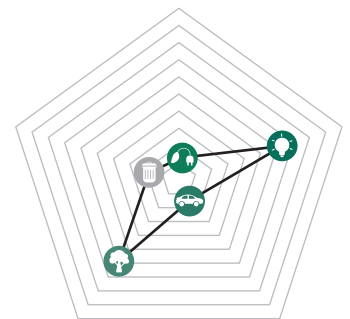
The BioNet is a spatial representation of the network of sites needed to meet the national conservation targets of the terrestrial vegetation and wetland ecosystems in Cape Town. This requires the establishment of a special legal protection regime for these areas in accordance with national legislation. Currently, over 55,000 hectares (over 65% of BioNet) are already protected (including through conservation agreements with private land-owners).



**Pretoria**

**Expanding tree planting areas [152]**

As part of the initiative to green urban spaces, the Tshwane Municipality is donating trees to public schools, communities and non-profit organizations for planting. The city had a target of donating 8,000 tree seedlings for the 2022/23 financial year.



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Interested parties may apply for plants once per financial year and must provide transport and labor for the collection of plants.