



# Scaling up climate action

Key opportunities for transitioning to a zero emissions society

## EXECUTIVE SUMMARY

CAT Scaling Up Climate Action series

# TURKEY

November 2019

## CAT Scaling Up Climate Action series

The Climate Action Tracker (CAT) strives to support enhancing climate action in the context of the Paris Agreement implementation. This analysis contributes to future revisions of mitigation targets, and aims at spurring an increase in climate mitigation actions, to close the gap between current emissions projections and required Paris-compatible pathways.

As part of this, we have been researching the potential for countries to scale up climate action in different focus areas. The analysis in this report is relevant to Parties considering revisions to their Nationally Determined Contributions (NDCs) to be submitted under the Paris Agreement by 2020 or thereafter, and also to their submission of long-term low greenhouse gas development plans, also due by 2020.

The result is our **Scaling Up Climate Action** country series, which identifies options for increased sectoral action that would move a country towards a pathway compatible with the Paris Agreement's long-term temperature limit and estimates the impact of those actions on emissions and other benefits.

The first round of our analysis covers **South Africa, the European Union, Argentina, Indonesia, Turkey, and Australia.**



The consistent method and similar structure for all six reports allows for country-specific insights, while enabling a cross-country comparison to draw general research findings and lessons learnt on global potentials.

## Executive summary

### Introduction and objectives

Under the Paris Agreement, governments have committed to limiting temperature increase to well below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5°C. Current efforts are insufficient: aggregate mitigation targets for 2030, according to Climate Action Tracker (CAT) estimates, result in global warming of about 3.0°C by 2100. Implementation of the targets is falling short, with greenhouse gas (GHG) emissions under implemented policies leading to an estimated warming of around 3.3°C.

To stay below the globally agreed limit, the IPCC Special Report on 1.5°C finds that an increase in efforts is required to peak global GHG emissions as soon as possible, reduce them by 45% compared to 2010 by 2030, and reduce CO<sub>2</sub> emissions to net-zero around 2050 and total GHG emissions by around 2070.

We no longer live in a world where climate change mitigation is a burden per se, but where it increasingly becomes the most feasible option when considering all socio-economic aspects. For cost-efficient global mitigation, it will be essential to make those mitigation actions accessible to, and overcome remaining barriers in, all countries.





In recent years, measures to reduce GHG emissions have, in many cases, become more attractive globally to policy makers and private investors, both because of falling technology costs, as well as increased awareness of the negative impacts to be avoided and other positive benefits of mitigation measures such as air quality improvement and job creation from zero-carbon technology and infrastructure development.

**This report, the fifth country assessment in the Climate Action Tracker's Scaling Up Climate Action Series, analyses three key areas where Turkey could accelerate its climate action: electricity supply, road and rail passenger transport and the residential buildings sector. The report illustrates GHG emissions reductions from such actions, along with other benefits for sustainable development.**

Our analysis begins with an in-depth review of Turkey's current policy framework and sectoral developments, comparing them with the policy packages and the sector indicators required under 1.5°C-compatible pathways.

We then focus on three areas we have identified that have a large potential to increase mitigation efforts: electricity supply, passenger road and train transport, and residential buildings. They were selected based on their share of GHG emissions while considering national and local circumstances, and the potential for scaling up climate action in these areas. The CAT emphasises that other sectors must also take similarly ambitious actions to decrease economy-wide emissions in line with the Paris Agreement.

Finally, we identify different scenarios of accelerated climate action in each sector:

Scenario categories	Definitions
1  <b>NATIONAL SCENARIOS</b>	Scenarios based on national research and country-specific studies
2  <b>BEST IN CLASS SCENARIOS</b>	Scenarios based on practices implemented by regional or international frontrunners
3  <b>1.5°C PARIS AGREEMENT COMPATIBLE SCENARIOS</b>	Scenarios based on sectoral developments in line with the Paris Agreement's temperature limit.
4  <b>CURRENT DEVELOPMENT SCENARIO</b>	Baseline scenario used for comparison purposes. The scenario is based on the continuation of current trends and policies until 2050.

<

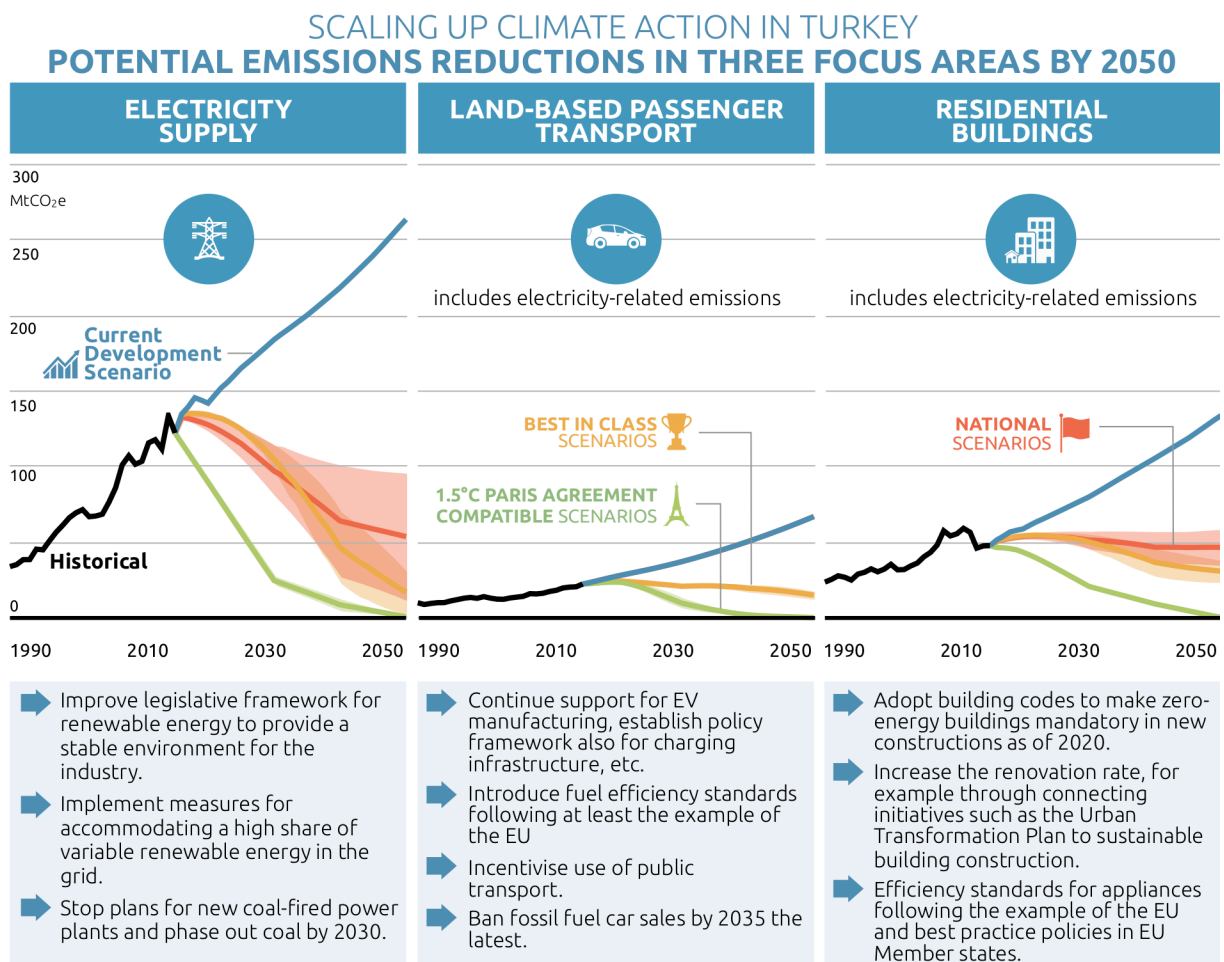


Figure 1: Overview of actions to manage the transition to a Paris-compatible pathway in three key sectors in Turkey

## KEY FINDINGS

- ⇒ Scaling up climate action in Turkey's electricity supply, passenger road and rail transport, and residential buildings sectors alone can reduce economy-wide emissions by 14% below 2017 levels by 2030, reversing the current upward trend. Together, these sectors account for about 50% of Turkey's national GHG emissions (excluding land use and forestry), which were at 526 MtCO<sub>2e</sub> in 2017.
- ⇒ Turkey is already overachieving its mitigation target set in its Paris Agreement pledge ("Intended Nationally Determined Contribution" or INDC) and should improve this target by 2020.
- ⇒ Ambitious decarbonisation efforts for these three selected sectors in Turkey would significantly reduce GHG emissions and foster co-benefits such as business opportunities for the construction and manufacturing industry, employment generation in the area of renewable energy, supporting sustainable development goals by reducing pollution from conventional modes of transport and electricity generation, and promoting modern housing facilities.
- ⇒ To support energy security, Turkey aims at increasing both the share of renewables as well as domestic coal in **electricity generation**. The prices for renewables from Turkey's renewable auction rounds are very low, which brings into question the economic attractiveness of further embarking on fossil energy. In fact, the plans for new coal fired power plants, while still among the world's largest, has decreased in recent years. For a Paris-compatible electricity sector, Turkey needs to phase out coal by 2030, significantly increase the role of renewables in its planning, and establish a sound legislative framework that should include allowing for a high share of variable renewables. Turkey's electricity generation needs to be fully decarbonised by mid-century. This is also key for decarbonising end-use sectors through electrification.
- ⇒ In parallel to decarbonising electricity, strong electrification of the passenger vehicle fleet is required to bring the Turkish **passenger transport sector** onto a pathway in line with the Paris Agreement. Other influencing factors, besides electrification, include a shift towards a higher share of public transport. In our Paris Agreement compatible scenarios, such actions reduce emissions in this sector by around a third in 2030 from today, and reduce them to zero by 2050.
- ⇒ Turkey is one of the largest automotive manufacturers for exportation. It is also aiming at producing electric vehicles domestically, which will be an important step in enabling such a transition in Turkey and improving global competitiveness.
- ⇒ A Paris-compatible **residential buildings sector** requires strengthened standards for new buildings towards near-zero energy, and a deep renovation of existing residential buildings. Heating and cooking need electrification and energy efficiency improvements, also required for lighting and other appliances. In our Paris-compatible scenarios, such actions can reduce emissions in this sector by 40% to 50% by 2030 from today, and to zero by 2050. This includes electricity-related emissions, under the assumption that the electricity sector decarbonises.

## Sector transitions towards zero-carbon

**In Turkey, there is tremendous potential to scale up climate action, including in the focus areas of this study, that is: electricity supply, road and rail passenger transport, and residential buildings. Increasing climate action now would initiate technically-feasible sectoral transitions towards a zero-emissions society while directly benefiting Turkey's sustainable development agenda.**

Our findings confirm that ambitious decarbonisation efforts for the selected sectors in Turkey are feasible. They would significantly reduce greenhouse gas (GHG) emissions and foster co-benefits such as low-carbon-oriented employment generation, supporting sustainable development goals by reducing the adverse pollution effects of conventional modes of transport and electricity generation, and promoting modern housing facilities.



### Electricity supply

---

To bring the electricity generation sector onto an emissions pathway in line with the Paris Agreement, an immediate and drastic reduction of today's emissions is required, as well as the full decarbonisation of the power sector by mid-century.

In our most ambitious Paris Agreement compatible scenario, Turkey needs to quickly ramp-up renewable electricity generation (up to 80% by 2030), exceeding the current renewable energy target. It also needs to decrease coal power by decommissioning current coal power plants and stop constructing new coal power plants, with the aim of phasing out coal-fired power generation by 2030.

Today, Turkey aims at increasing both the share of renewables as well as domestic coal to support energy security. The prices for renewables from Turkish renewable auction rounds are very low, which brings into question the economic attractiveness of further embarking on fossil energy. Turkey's coal pipeline, while still among the world's largest, has decreased in recent years.

For a Paris-compatible electricity sector, Turkey needs to significantly increase the role of renewables in its planning and establish a sound legislative framework to allow a high share of variable renewables. This way it can avoid risking stranded assets in the fossil energy industry.

Ambitious climate policy action in the electricity generation sector will bring other benefits beyond climate change mitigation, such as local employment. Between 2017 and 2018, employment in the renewable industry decreased because of uncertainties in the policy framework (Ferroukhi, Renner, García-Banos, & Khalid, 2019). A clear direction from the government towards renewables can provide investment security and lead to long-term sustainable employment. Turkey is a resource-rich country in terms of renewable energy resources. Most recent targets from the 11<sup>th</sup> Development Plan aim to reach a renewable energy share of 38.8% in 2023; however, there is no plan for renewables for the years beyond 2023 (SHURA, 2019). This is not enough to reach the required levels of 60% to 80% by 2030 as defined in our 1.5°C-compatible scenarios, and will underutilise Turkey's renewable energy potential. The realistic deployment potential of renewables is estimated at more than 1000 TWh per year, about double the demand forecast for 2030.

The Turkish government foresees that the country's energy demand will increase between 3.7% and 5.1% in the coming years, with the growth rate slowing down to between 2.7% to 3.8% in 2030 (*Türkiye Elektrik Enerjisi Talep Projeksiyonu Raporu*, n.d.). In spite of the projected growth, overcapacity in the power sector has caused restrictions for new power plants in recent years

(Saygın, Cebeci, Tör, & Godron, 2019). Turkey can cover up to 50% of electricity demand in 2026 through renewables (Godron, Cebeci, Tör, & Saygin, 2018), making investments in other technologies redundant.

Decarbonising electricity generation is essential in decarbonising other sectors. Electricity demand in Turkey will increase not only because of growing demand for traditional use of electricity but also because the electrification of demand is a key strategy in decarbonising the whole economy.

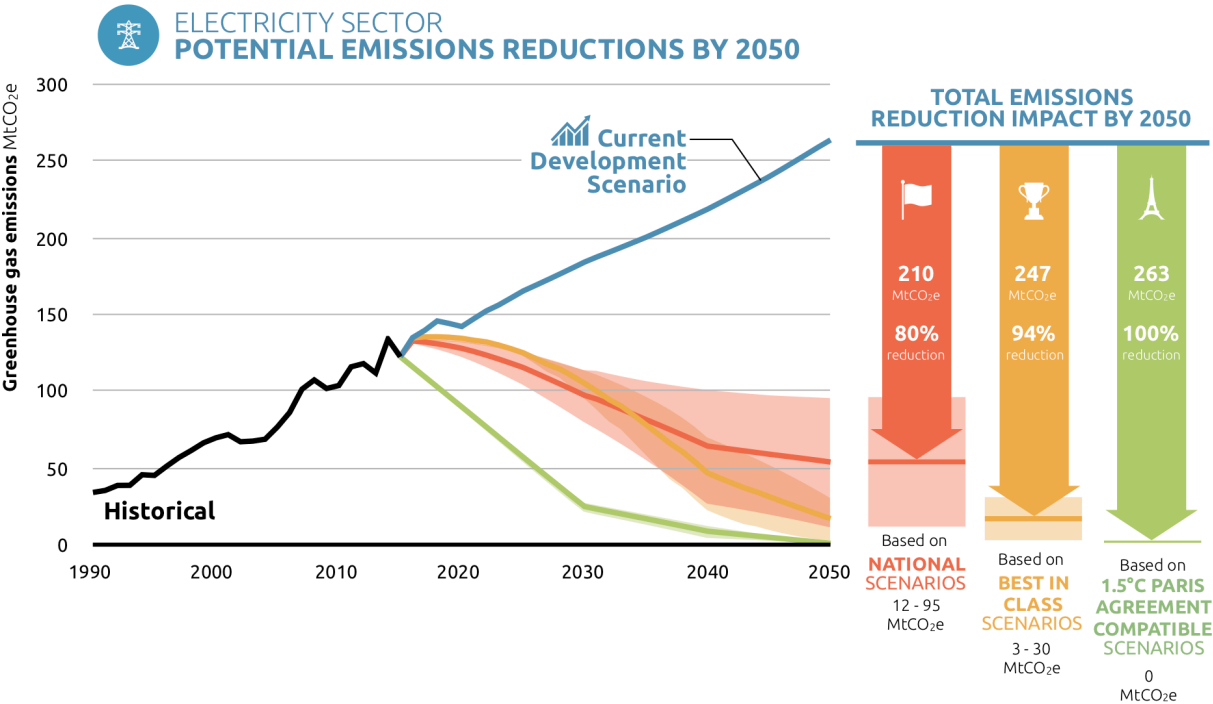


Figure 2: Overview of sectoral emissions pathways in the electricity sector under current policies and different levels of accelerated climate action. The projected electricity demand also considers accelerated climate action in the passenger transport and residential buildings sectors. All sectoral historical emissions and projections towards 2050 are analysed in the CAT PROSPECTS Turkey scenario evaluation tool. For more details on the scenario definition, see chapter 4 of the full report.



## Land-based passenger transport

In a country with a rapidly growing, increasingly urban population, there is a huge potential for national and sub-national actors to accelerate climate action by decarbonising road and rail passenger transport.

Road and rail passenger transport can be decarbonised through a combination of the electrification of the passenger vehicle fleet, a shift towards public transport and fuel intensity improvements of the remaining non-electric personal vehicles. Electrification of the passenger transport sector depends on the full decarbonisation of the electricity generation sector. In our Paris compatible scenario, such actions can reduce GHG emissions in these sectors by up to 40% in 2030 and 100% in 2050 compared to 2015.

Given current developments and plans, Turkey has begun taking its first steps towards decarbonising both the road and rail passenger transport. Turkish climate policy includes the objective of developing and promoting alternative fuels and clean vehicle technologies. Turkey aims at manufacturing its own electric vehicle (EV) by 2022, which will be an important opportunity to boost EV sales in the country, but also to help make the automotive industry competitive internationally.

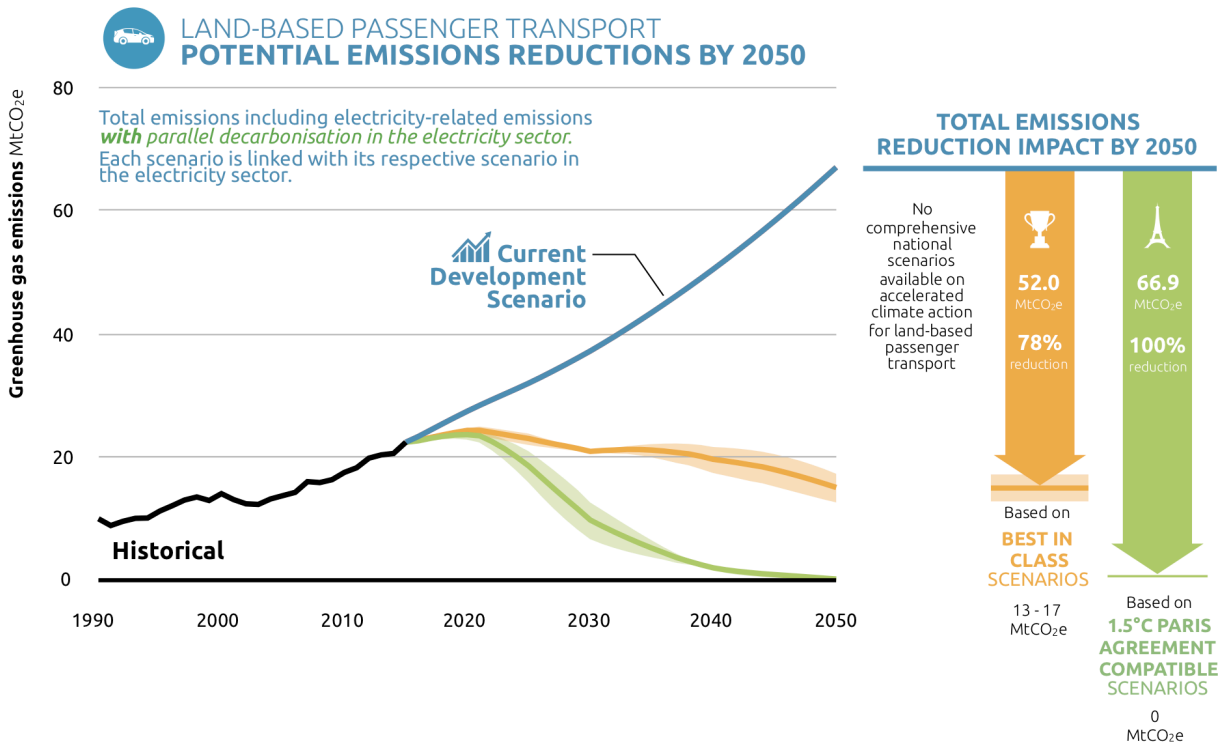


Figure 3: Overview of sectoral emission pathways under current policies and different levels of accelerated climate action in the road and rail passenger transport. All historical data and sectoral projections towards 2050 from the CAT PROSPECTS Turkey scenario evaluation tool. Data includes electricity related emissions. For more details on the scenario definition, see chapter 4 of the full report.





## Residential buildings

Decreasing the energy demand is at the core of Turkey's objective to reduce the dependency on energy imports from abroad, and the buildings sector is the country's largest final-energy consumer. The construction sector is an essential pillar of the Turkish economy, with a contribution of 6.6% of GDP (GIZ, 2018). There is large potential in improvements of the building envelope and the electrification of appliances for cooking and heating, in combination with the decarbonisation of the electricity sector.

Decarbonisation of residential buildings can be achieved by strengthening standards for new buildings to near zero energy buildings (NZEBs) and a deep renovation of the existing buildings stock. Turkey already undertakes measures in this direction in its National Energy Efficiency Action Plan (NEEAP) and could build on those to bring the policy framework towards a Paris-compatible pathway. In our Paris-compatible scenario, such actions can reduce GHG emissions in this sector by up to 41% in 2030 and 93% by 2050 compared to 2015.

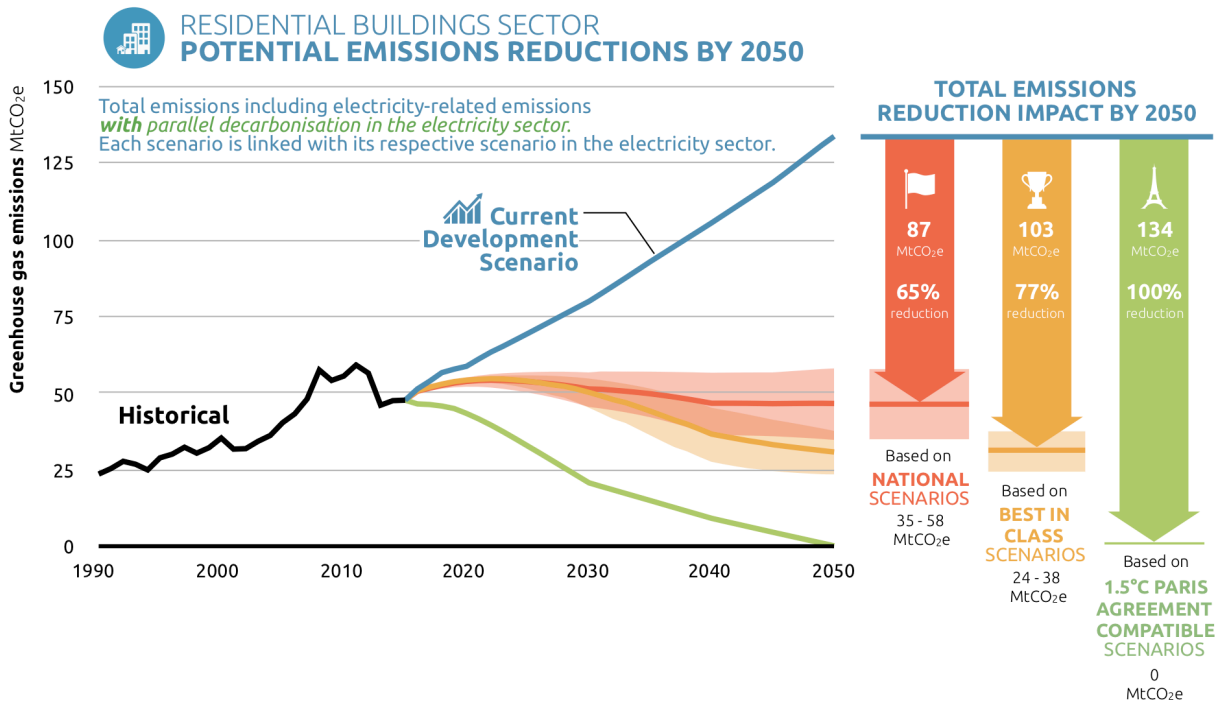


Figure 4: Overview of sectoral emission pathways under current policies and different levels of accelerated climate action in the residential buildings sector. All historical data and sectoral projections towards 2050 from the CAT PROSPECTS Turkey scenario evaluation tool. Data includes electricity related emissions. For more details on the scenario definition, see chapter 4 of the full report.

## Accelerated climate action and Turkey's emission reduction targets

Scaling up climate action in Turkey's electricity supply, ground passenger transport, and residential buildings sector alone can reduce Turkey's total greenhouse gas emissions by up to 14% below 2017 levels by 2030, reversing the current upward trend.

This is 30% below where current developments are heading, and far below the emissions levels resulting from Turkey's (non-ratified) Paris Agreement target (INDC), which would result in an increase of emissions of 90% from 2017 levels. The CAT rates this target "Critically insufficient".

Turkey easily overachieves its INDC with its currently implemented policies, so there is huge potential for increasing its level of ambition. If Turkey were to increase its target to the level resulting from scaled-up climate action in the three target sectors we have identified, the CAT would increase Turkey's rating by two grades—to "Insufficient."

While our analysis focuses on three sectors covering about 50% of emissions today, Figure 5 also shows the remaining emissions in others sectors not addressed here. For Paris-compatibility it will be essential to implement climate action to effectively address emissions in all sectors.

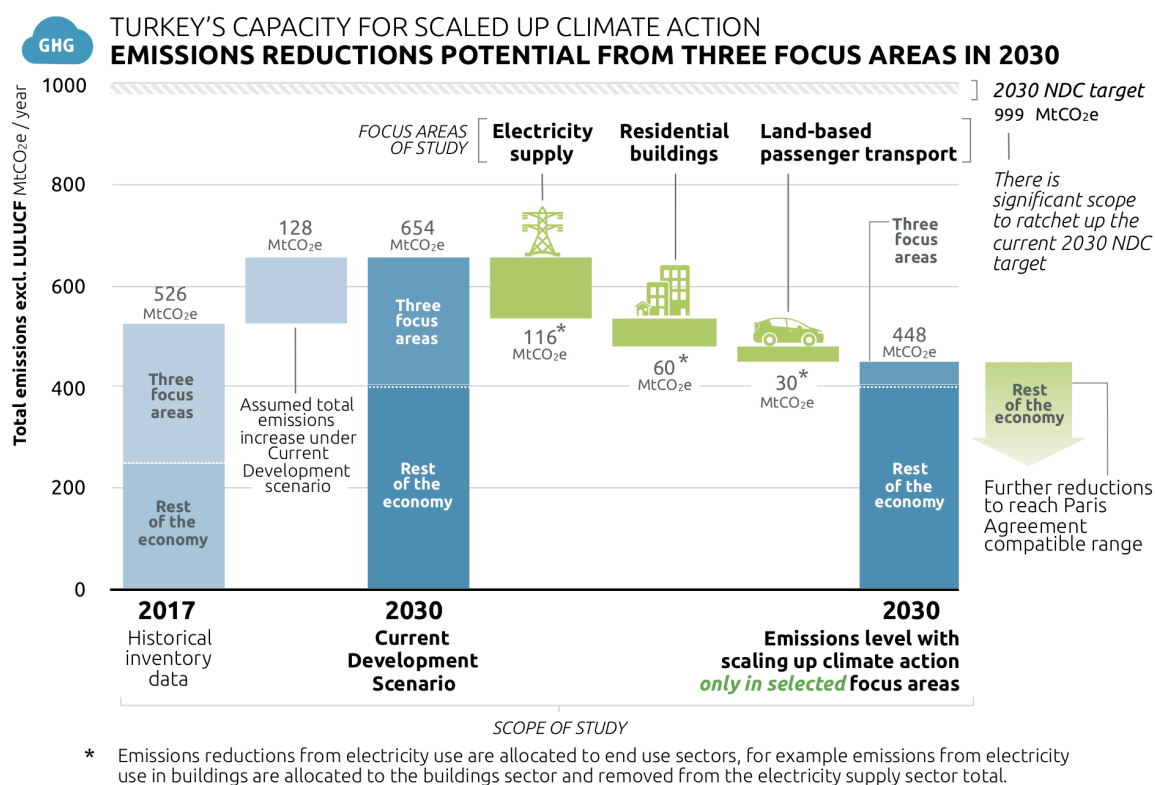










Figure 5: Overview of total emission levels (excl. LULUCF) under historical inventory data in 2017 (left bar), under a current development scenario in 2030 (middle bar), and most ambitious levels of accelerated climate action by 2030 in the electricity supply, the residential buildings sector, and the passenger transport (right bar). All electricity-related emission reductions from the residential buildings and passenger transport sectors are allocated as emissions reductions under these two end-use sectors.

# The status of sectoral transitions: opportunities for accelerating climate action

The transitions towards zero-emissions in the Turkish electricity supply, rail and road passenger transport, and residential buildings sectors have all shown slow progress or have barely begun. Given the status of the policy activities in the three focus sectors, more accelerated and stringent climate action is required to initiate meaningful sectoral transitions.

Table 1 is an overview of this study’s evaluation of the current state of policy action for the three sectors compared with sector-specific benchmarks. These benchmarks represent the most important short-term steps for limiting global warming to 1.5°C identified by the Climate Action Tracker. The full results of this analysis for all sectors are detailed in Chapter 2 of the report.

**Table 1: Summary table for sectoral policy activity and gap analysis in Turkey for the electricity supply, rail and road passenger transport, and residential buildings sectors. 1.5°C-consistent benchmarks relate to most important short-term steps for limiting global warming to 1.5°C (Kuramochi et al., 2017).**

Sector	1.5 °C-consistent benchmark	Overall evaluation based on policy activity and gap analysis	Policy rating
 Electricity supply	<i>Sustain the global average growth of renewables and other zero and low-carbon power until 2025 to reach 100% by 2050</i>	<ul style="list-style-type: none"> <li>Targeted share of renewable electricity generation of 38.8% by 2023, however there are no targets beyond.</li> <li>Significant untapped potential for renewable power, especially solar power.</li> </ul>	 Getting Started
	<i>No new coal plants, reduce emissions from coal power by at least 30% by 2025</i>	<ul style="list-style-type: none"> <li>0.3 GW of coal plants under construction and 33.8 GW in the pipeline either being permitted, pre-permit or announced. While the pipeline is shrinking, Turkey still pursues new plants and is not considering phasing out coal.</li> <li>For a Paris Agreement compatible pathway, coal would need to be phased out by 2030. Therefore, early retirement of current capacity and cancellation of planned capacity is required.</li> </ul>	 No Action
 Land-based Passenger transport	<i>Last fossil fuel car sold before 2035</i>	<ul style="list-style-type: none"> <li>Turkey’s national action plans on climate change and energy efficiency address the switch to alternative fuels and clean vehicle technologies. However, the objectives stay qualitative (e.g. development of legal arrangements, capacity building and promotion activities).</li> <li>Unclear whether the intended development and promotion of alternative fuels and clean vehicle technologies can be realised in the near to medium term.</li> </ul>	 Getting Started
 Residential buildings	<i>All new buildings fossil free and near zero energy by 2020</i>	<ul style="list-style-type: none"> <li>Limited short-term target set by the government: 20% of energy demand of new buildings must be met by renewable energy sources as of 2017 and GHG emissions of new settlements must be reduced by at least 10% compared to existing settlements until 2023.</li> <li>These targets do not appear to be supported by concrete policies and are unlikely to be achieved.</li> <li>No long-term target or strategy in place.</li> </ul>	 Getting Started
	<i>Increase building renovation rates from &lt;1% to 5% by 2020</i>	<ul style="list-style-type: none"> <li>The government has stated the objective of raising awareness of, supporting directly or indirectly, and imposing obligations on end-users to improving energy efficiency in the existing buildings stock.</li> <li>Unclear whether this objective will be supported by concrete policies, and unlikely that a renovation rate of 5% by 2020 will be achieved.</li> </ul>	 Getting Started

## Authors



### NewClimate Institute

Hanna Fekete  
Frederic Hans  
Takeshi Kuramochi  
Niklas Höhne  
Nicolas Fux



### Climate Analytics

Tina Aboumahboub  
Ursula Fuentes Hutfilter  
Michiel Schaeffer  
Bill Hare  
Matt Beer



### Ecofys

Thibaud Lemerrier  
Wieke Hofsteenge  
Yvonne Deng  
Tom Berg  
Kornelis Blok

The team would like to thank Deger Saygin from SHURA Energy Transition Centre for his valuable comments and suggestions that helped us shape this report.

The Climate Action Tracker is made possible due to generous support from the ClimateWorks Foundation and the German Ministry for Environment, Nature Conservation and Nuclear Safety (BMU) via the International Climate Initiative. The content of this report is the responsibility of the authors only.



The Climate Action Tracker (CAT) is an independent scientific analysis produced by three research organisations tracking climate action since 2009. We track progress towards the globally agreed aim of holding warming well below 2°C, and pursuing efforts to limit warming to 1.5°C.

## The Consortium



NewClimate Institute is a non-profit institute established in 2014. NewClimate Institute supports research and implementation of action against climate change around the globe, covering the topics international climate negotiations, tracking climate action, climate and development, climate finance and carbon market mechanisms. NewClimate Institute aims at connecting up-to-date research with the real-world decision making processes.

[newclimate.org](http://newclimate.org)



Climate Analytics is a non-profit climate science and policy institute based in Berlin, Germany with offices in New York, USA, Lomé, Togo and Perth, Australia, which brings together interdisciplinary expertise in the scientific and policy aspects of climate change. Climate Analytics aims to synthesise and advance scientific knowledge in the area of climate, and by linking scientific and policy analysis provide state-of-the-art solutions to global and national climate change policy challenges.

[climateanalytics.org](http://climateanalytics.org)

## Technical contributions



Ecofys, a Navigant company, a leading international energy and climate consultancy focussed on sustainable energy for everyone was founded in 1984. The company has been a trusted advisor to governments, corporations, NGOs, and energy providers worldwide. In 2016, Ecofys joined Navigant and is now integrated in this global consultancy.

[ecofys.com](http://ecofys.com)