

Understanding Climate Change in Turkey

A Policy in the Triangulation of National, International and Supranational Levels

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International Conference

20th REFORM Group Meeting “**On the Way to COP 21 in Paris: Climate Protection Policy, Carbon Markets and Sustainability Agenda**”

August 31 – September 4, 2015, Salzburg/Austria.

Organized by Berlin Centre for Caspian Region Studies and Environmental Policy Research Center of Free University of Berlin, Berlin Energy Consultants, German Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, and ENTRIA.

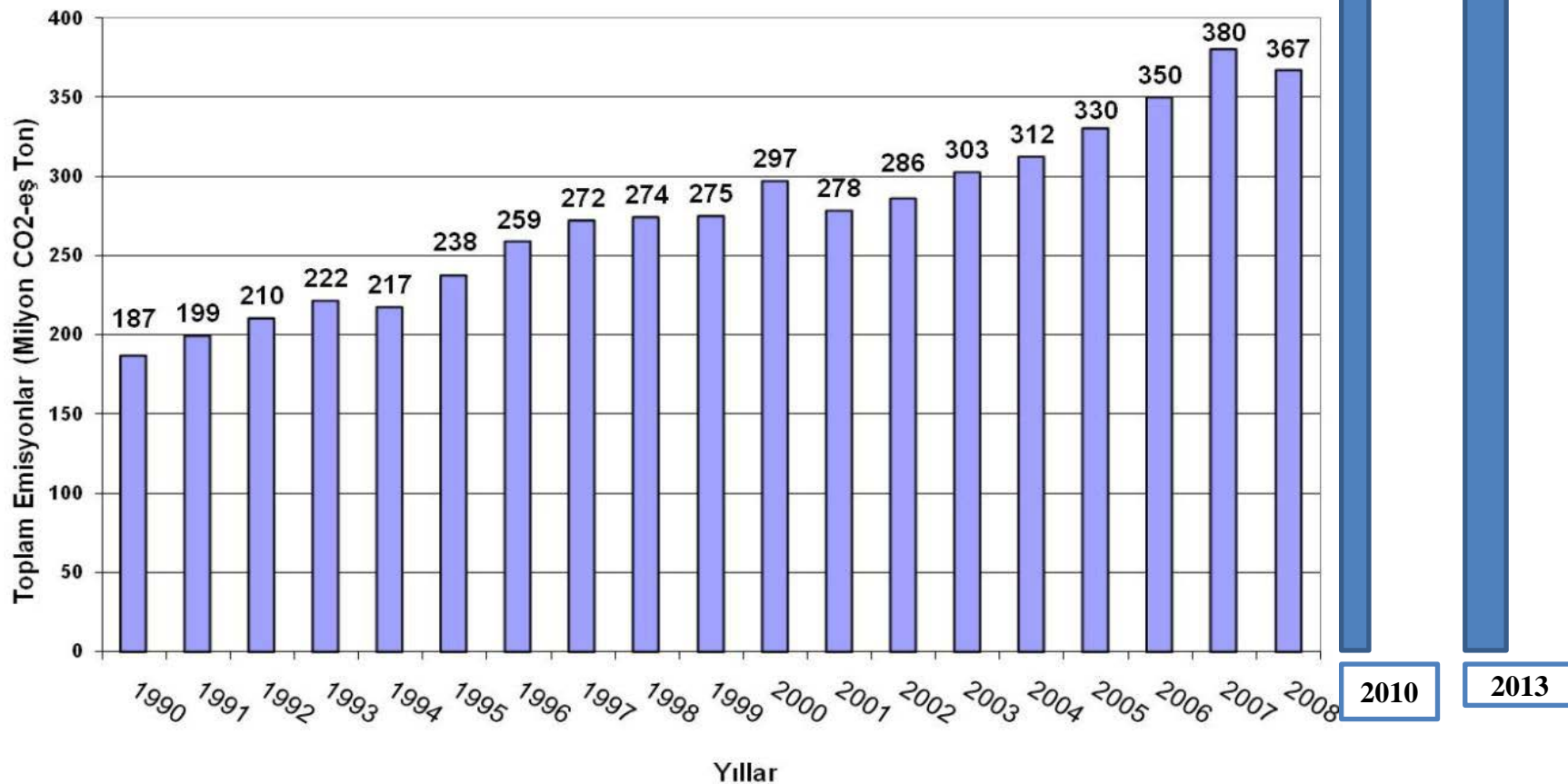
Turkey at a Glance

- **Geography of Climate:** Mediterranean Basin
- **Member of OECD, G20**
- **Candidate member of the EU**
- **Political System:** Parliamentary democracy
- **Population:** 78,1 million (2015); 88,4 million (2030) (TÜİK-1)
- **GDP growth (2015):** 3.1% (OECD 2015)
- **GDP per capita (2014):** US\$ 10,404 (TÜİK-2)
- **Unemployment rate (2015):** 10.3% (OECD 2015)



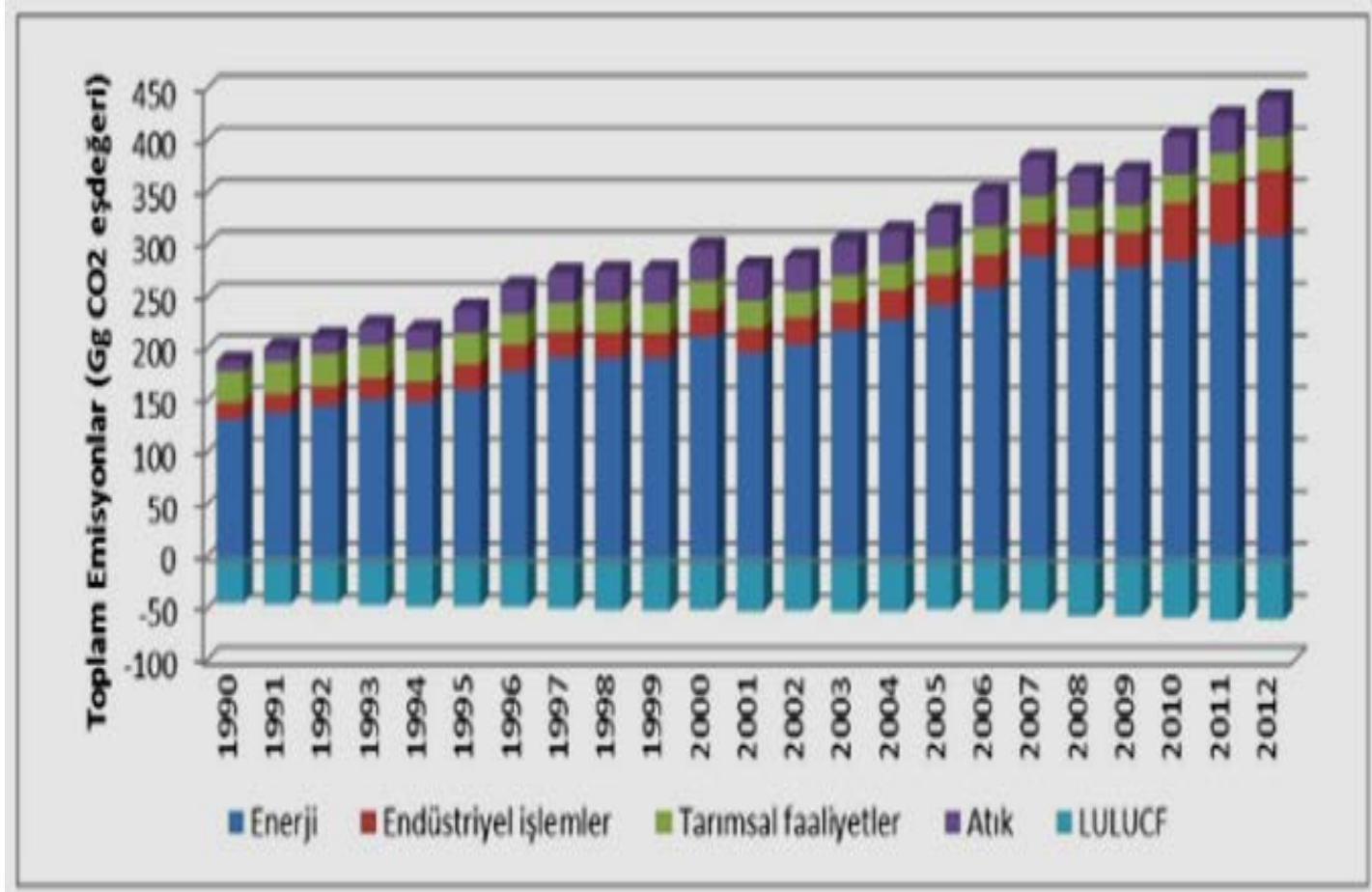
<http://geology.com/world/turkey-satellite-image.shtml> , Accessed Sept.2015

Turkey's total GHG emissions from 1990 to 2013 (million tonnes, CO2 equivalent)



Graph: Ministry of Environment, 2010; and data for 2010 and 2013 from TÜİK 2015 added by the author)

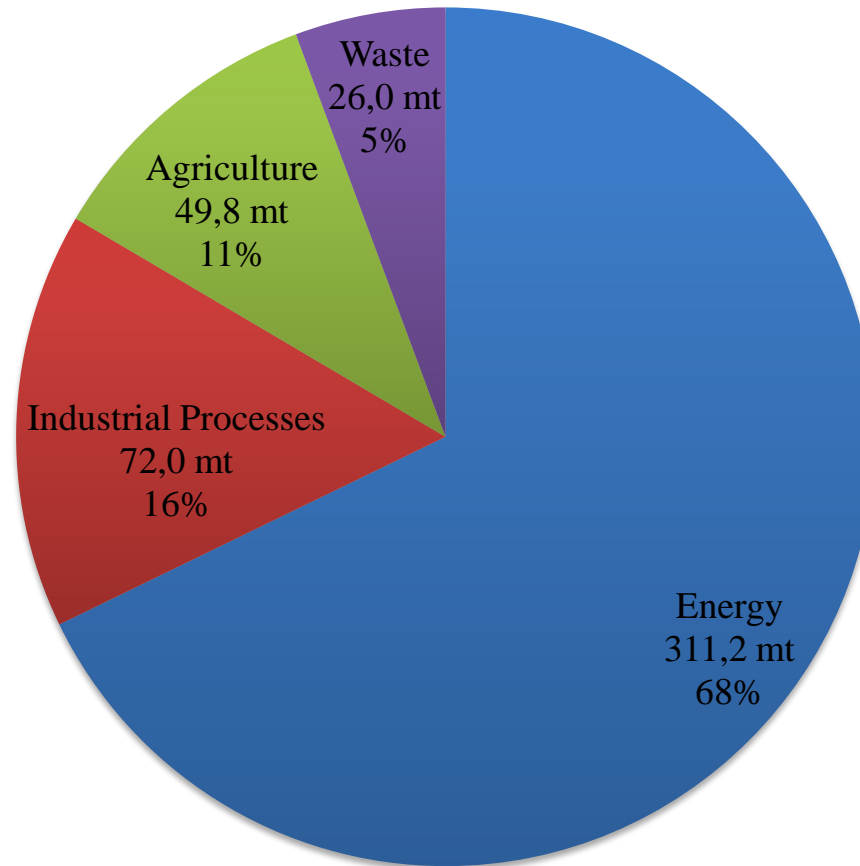
GHG Emissions by Sectors between 1990 and 2012 (million tonnes / CO2 equivalent)



YEGM, http://www.eie.gov.tr/iklim_deg/azaltim.aspx, Accessed Sept. 2015.

GHG Emissions by Sectors in 2013

(Million tonnes / CO2 equivalent)



Data: TÜİK (TurkStat) 2015 “Greenhouse Gas Emissions Inventory, 2013”

Overview of Turkish Energy Sector

- **Consumption pattern**

- 90% fossil fuels
- **10 % renewables**

Total energy consumption in 2012: 121 Mtoe

- **Power Generation**

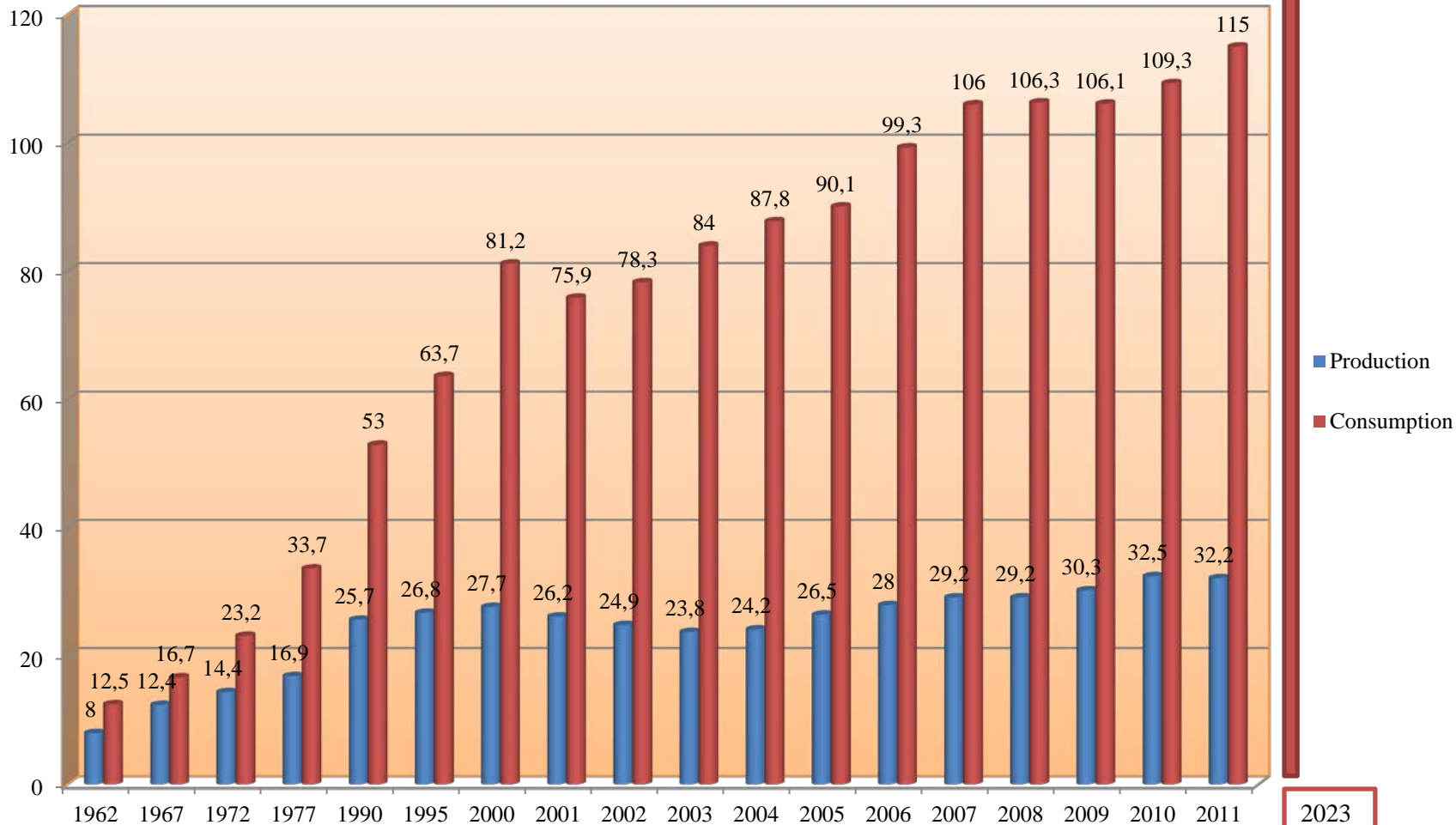
- 71 % fossil fuels
- **29 % RES** (25% hydro, 4 % wind and others)

Total power generation in 2013: 240,153 GWh

- **Supply Mix**

- 30% domestic
- 70% foreign

Primary Energy Production and Consumption between 1962-2023 (MTOE)



Prepared by the Author

Sources: Turkish Ministry of Energy 2010; Ministry of Development – 1979 -2007-8; TMMOB-MMO- 2008; TKİ 2010; BOTAŞ-2009; EÜAŞ-2010.; DEK-TMK-2013.)

The Background: Key Events in Turkey's Climate Change Policy

Adjustment with Global Climate Regime

- 2001: Removal from UNFCCC-Annex II (Decision of COP/7)
- 2004: Party to UNFCCC-Annex I
(,common but differentiated responsibility')
- 2009: Party to Kyoto Protocol
(no binding GHGE targets)
- 2010: Turkey's special position within Annex I was accepted (COP/16 Decision)
- 2012: Financial support from Annex I countries to Turkey was decided (COP/18 Decision)

Alignment with the EU Acquis

- 2005: Law on RES
- 2007: Law on Energy Efficiency
- 2009: Opening environment chapter to the negotiations

National (non-binding) Targets

- 2010: National Climate Change Strategy Document (2010-2020)
- 2011: National Climate Change Action Plan (2011-2023)

Understanding „special circumstances“ of Turkey

„**common but differentiated responsibility**“ in international climate regime
(party to the UNFCCC-Annex I).

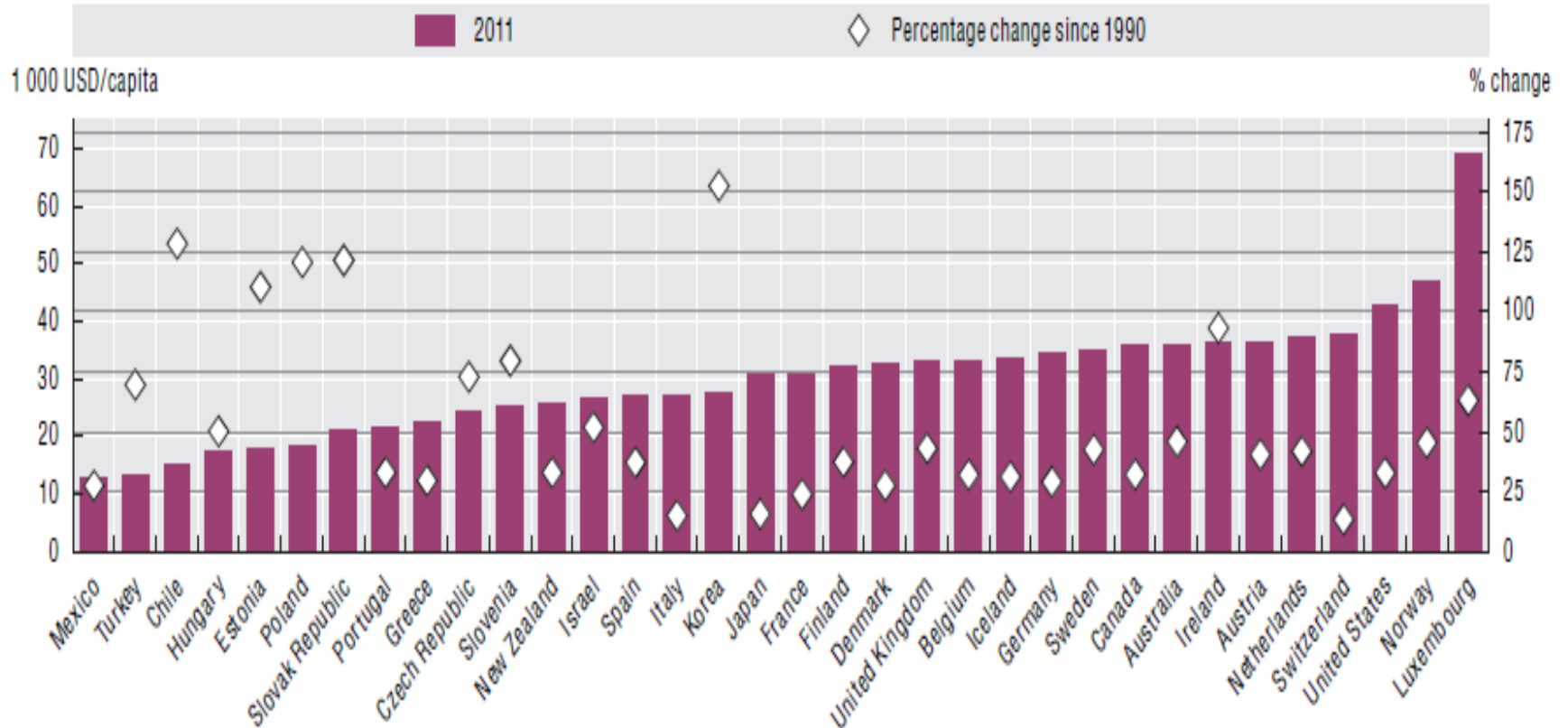
Why?

Socio-economic development level of Turkey

Having the **lowest level among OECD countries**, year 2011:

- GDP per capita (2nd one after Mexico)
- Private final consumption expenditure per capita
- Government final consumption expenditure per capita
- Motor vehicle ownership
- Energy Intensity per capita
- GHG emission intensities per capita (year 2010) (2nd one after Chile)
- Energy-related CO₂ emissions per capita (OECD and BRIICS) (between 2000 and 2008)

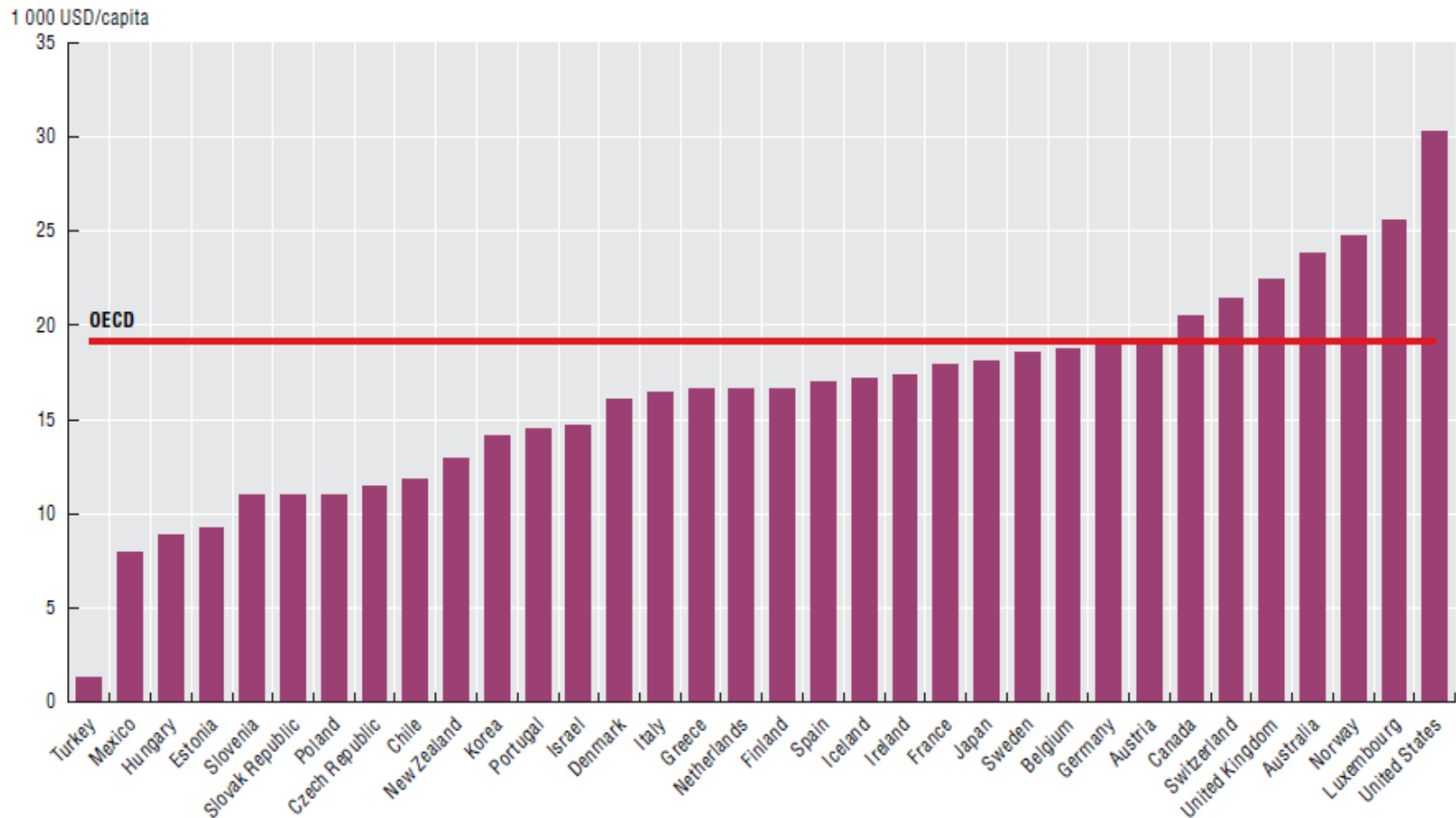
Gross domestic product (GDP) per capita, 2011



Original Graph: OECD (2013) "Environment at a Glance 2013 - OECD Indicators",
 available at: http://www.oecd-ilibrary.org/environment/environment-at-a-glance-2013_9789264185715-en

Private final consumption expenditure, 2011 or latest available year

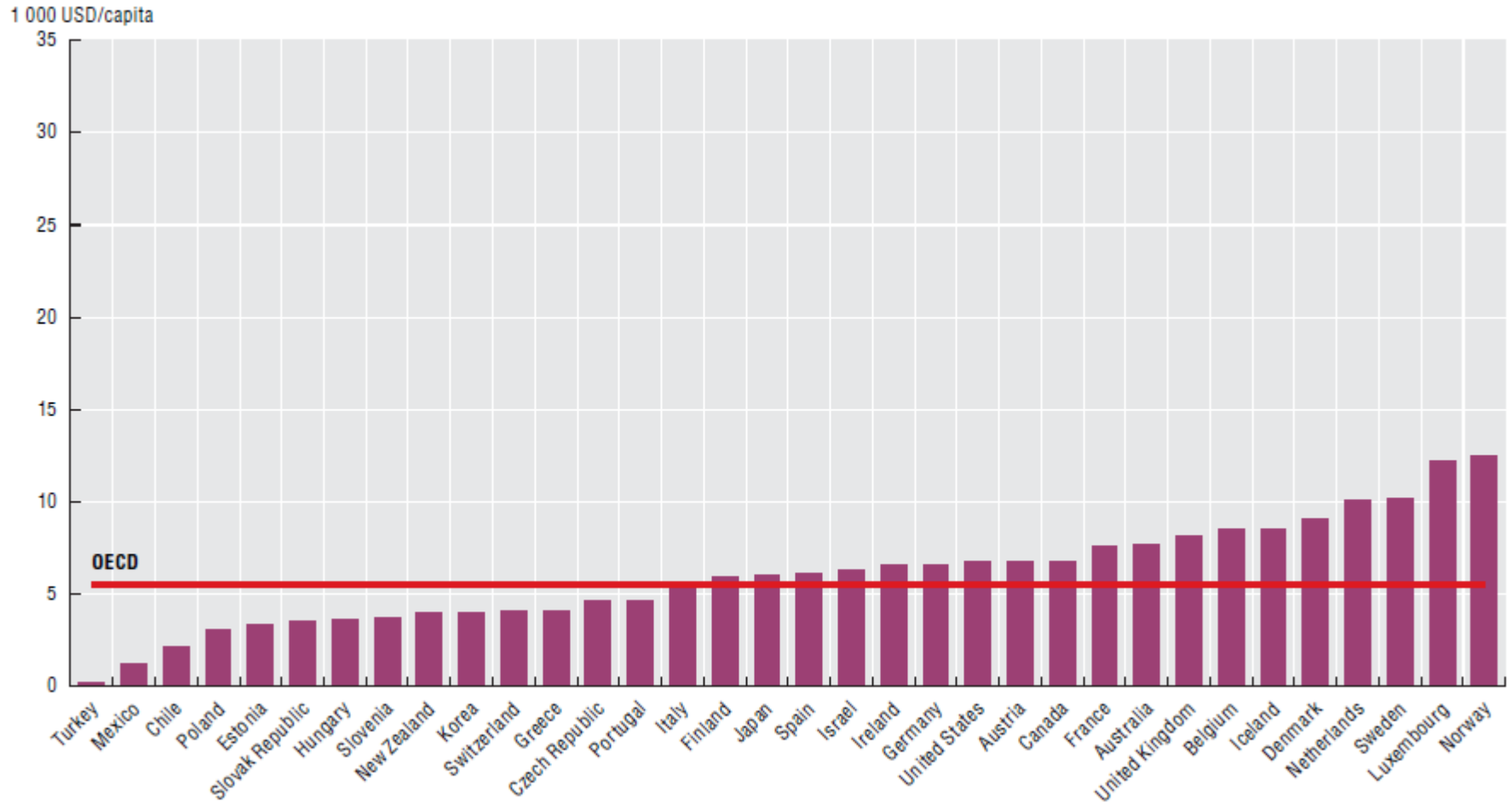
Per capita



OECD (2013) "Environment at a Glance 2013 - OECD Indicators",
 available at: http://www.oecd-ilibrary.org/environment/environment-at-a-glance-2013_9789264185715-en

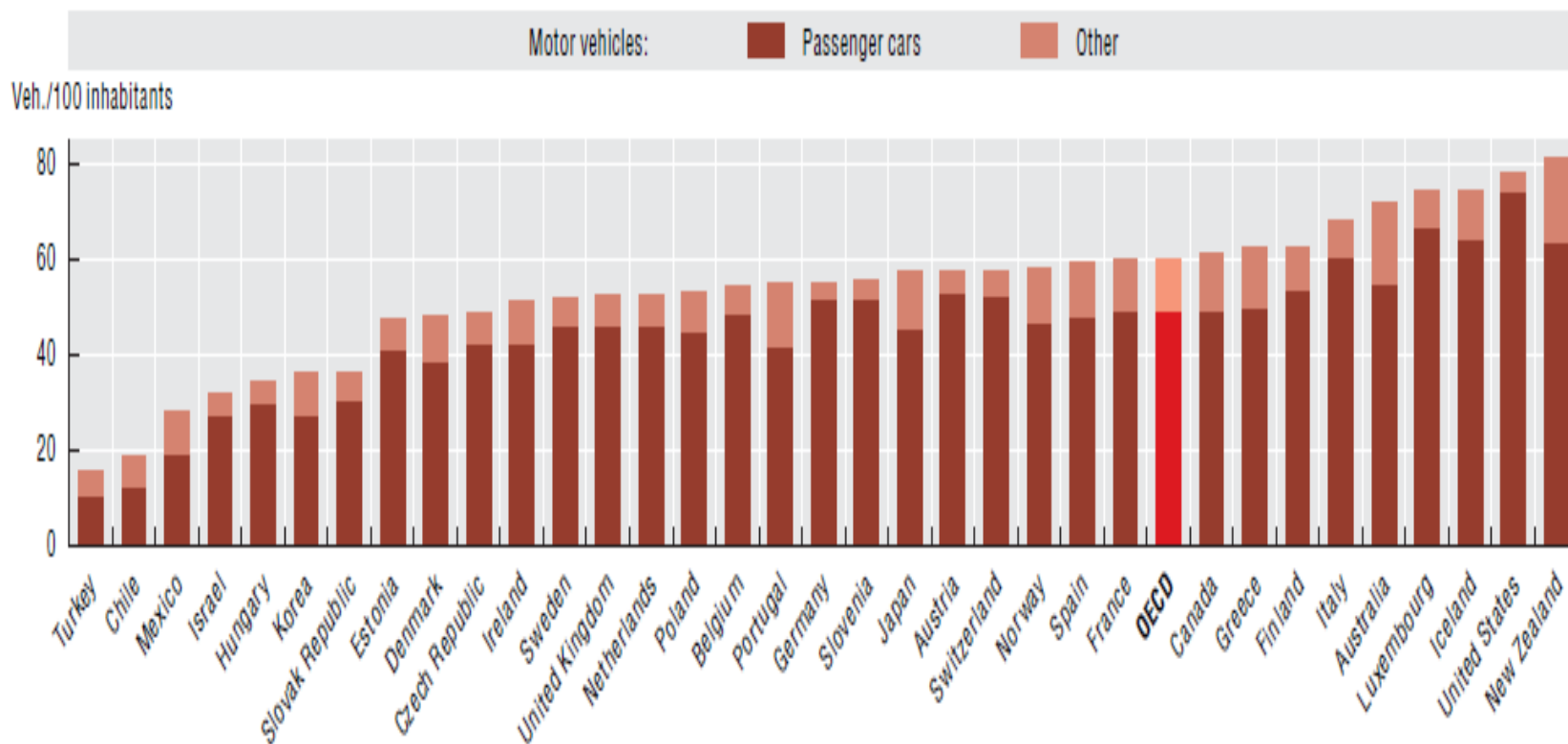
Government final consumption expenditure, 2011 or latest available year

Per capita



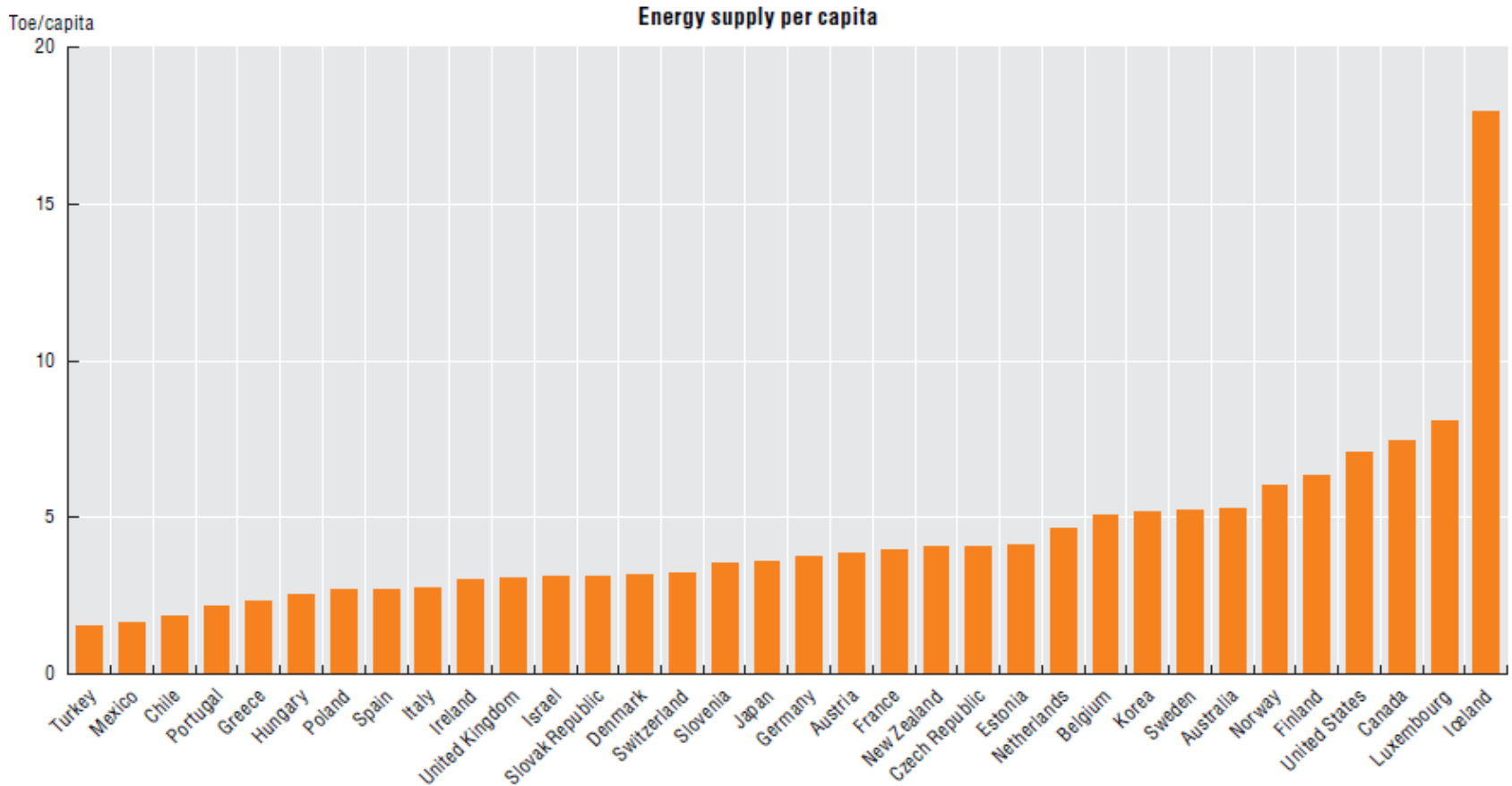
Original Graph: OECD (2013) "Environment at a Glance 2013 - OECD Indicators",
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Motor vehicle ownership, 2011 (or latest available)



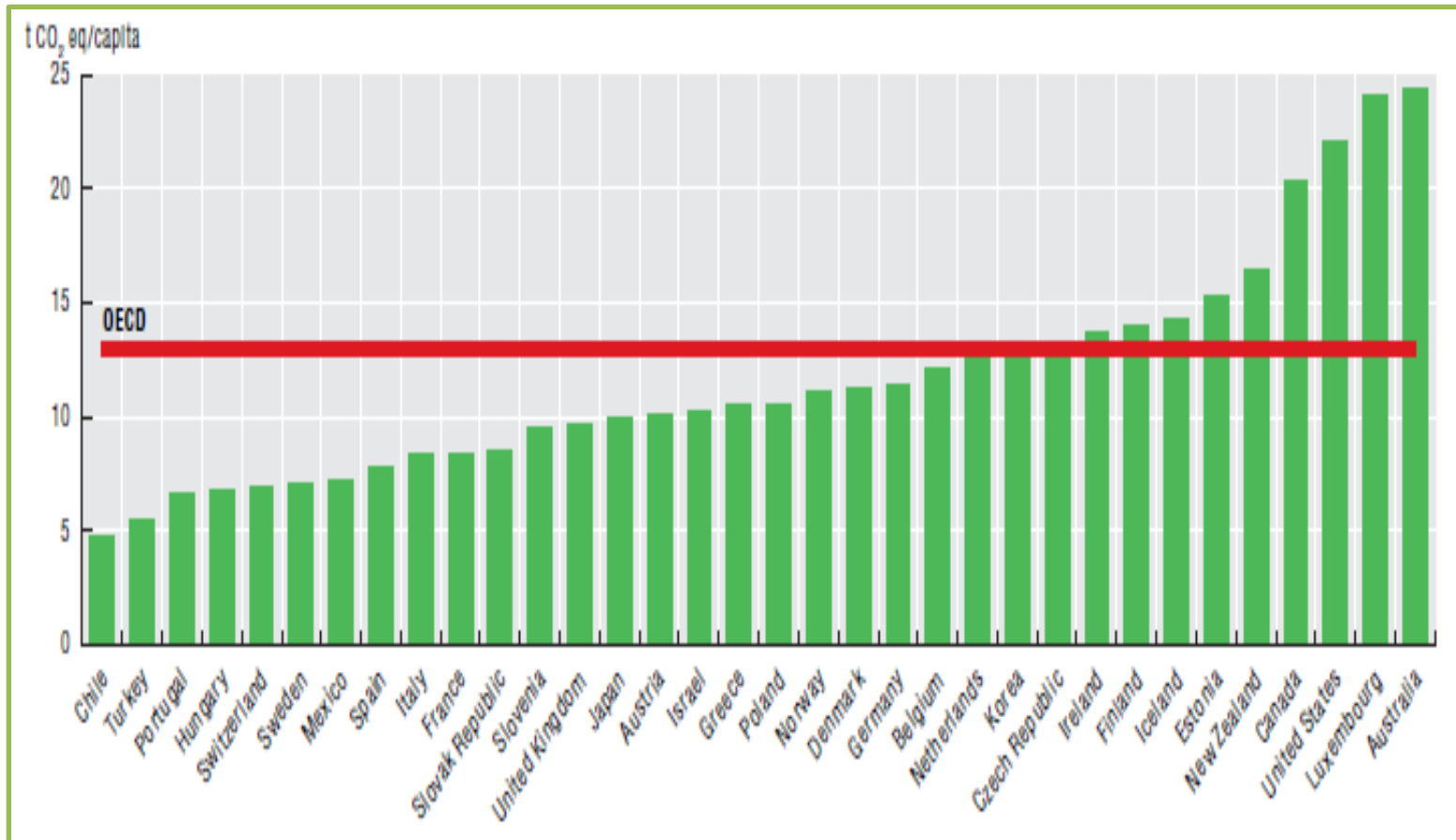
Original Graph: OECD (2013) "Environment at a Glance 2013 - OECD Indicators",
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Energy Intensity in OECD, 2011



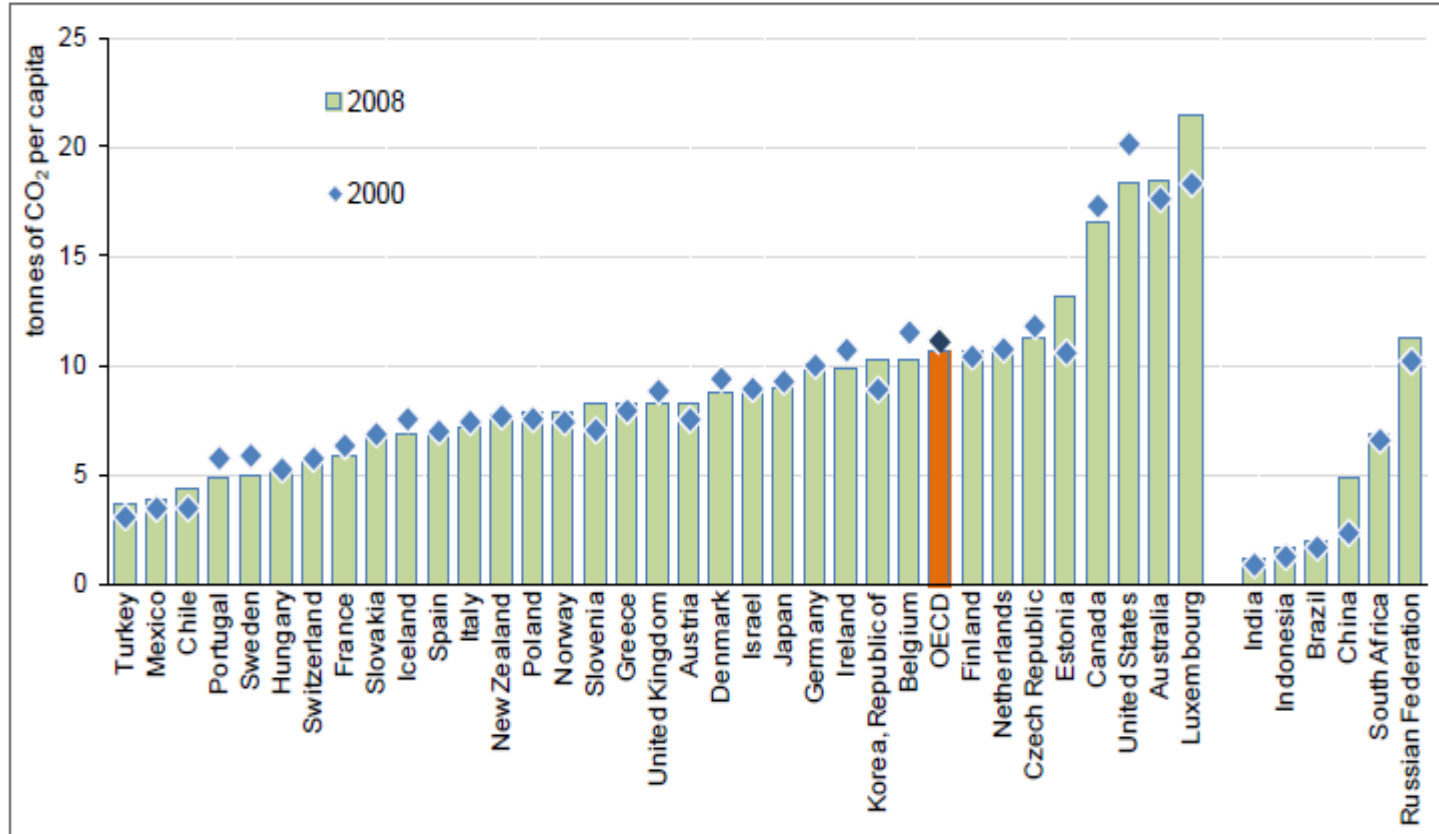
Original Graph: OECD (2013) "Environment at a Glance 2013 - OECD Indicators",
available at: http://www.oecd-ilibrary.org/environment/environment-at-a-glance-2013_9789264185715-en

GHG emission intensities per capita in 2010



Original Graph: OECD (2013) "Environment at a Glance 2013 - OECD Indicators",
available at: http://www.oecd-ilibrary.org/environment/environment-at-a-glance-2013_9789264185715-en

Energy-related CO₂ emissions per capita, OECD/ BRIICS: 2000 and 2008



Note: Production-based emissions, in tonnes of CO₂ per capita.

OECD (2011) "OECD Environmental Outlook to 2050", available at: <http://www.oecd.org/env/cc/49082173.pdf>

Turkey is party to the Kyoto Protocol

- **Period 2008-2012:** no quantitative GHG emission reduction target
- **Post-2012 period:** no binding target

But the need for fund and high-tech from developed OECD countries (Annex II parties).

Post-2020 Regime (the Road towards Paris)

Discussions in Turkey: financial and technical support from international community will be decisive for COP/21.

National Climate Change Strategy (2010-2020)

- **Energy Sector:**

- Feasible renewable energy systems will be installed at new buildings
- By 2020, energy intensity shall be decreased with reference to 2004 levels.
- The share of renewable energy in total electricity generation shall be increased up to 30% by 2023 (hydro potential will be fully utilized, wind electricity generation capacity will be raised to 20,000 MW and geothermal electricity generation capacity will be raised to 600 MW)
- Greenhouse gas emissions from electricity generation are envisaged to be 7% less than BAU by 2020.

National Climate Change Strategy (2010-2020)

Transportation

- Short-distance maritime and lake transport shall be encouraged
- Public transportation systems by means of subways and light rail systems shall be expanded especially in metropolitan areas
- The use of alternative fuels and clean vehicle technologies in public transport vehicles will be expanded
- Smart transportation systems will be improved
- The use of alternative fuels, new technology engines and environmentally-friendly hybrid transportation vehicles will be expanded.

National Climate Change Strategy (2010-2020)

Industry

- The process of hiring energy managers in all industrial facilities with annual energy consumption of more than 1,000 toe shall be finalized
- All industrial facilities with annual energy consumption of more than 5,000 toe will conduct annual energy studies
- Incentive mechanisms will be introduced to promote cleaner production, climate-friendly and innovative technologies
- The determined saving potential shall be realized at maximum levels by the year 2020

National Climate Change Strategy (2010-2020)

Waste:

- The amount of waste reuse and recovery will be increased within the framework of the Waste Action Plan (2008-2012)
- 104 sanitary landfill facilities will be established and 76% of municipal waste will be disposed at such facilities by the end of 2012
- Waste management hierarchy of source reduction, reuse, recycling, and recovery shall be implemented more efficiently
- Landfill gas will be captured and used for energy generation

National Climate Change Strategy (2010-2020)

Land Use, Agriculture and Forestry:

- Strategies for mitigation and adaptation to climate change in settlements shall be developed together with procedures and principles for planning and housing
- Techniques will be developed to increase carbon absorption in soil; agricultural producers shall be encouraged to adopt such techniques
- 2.3 million hectares of land will be afforested and rehabilitated within the scope of National Afforestation Campaign between the years 2008 –2012

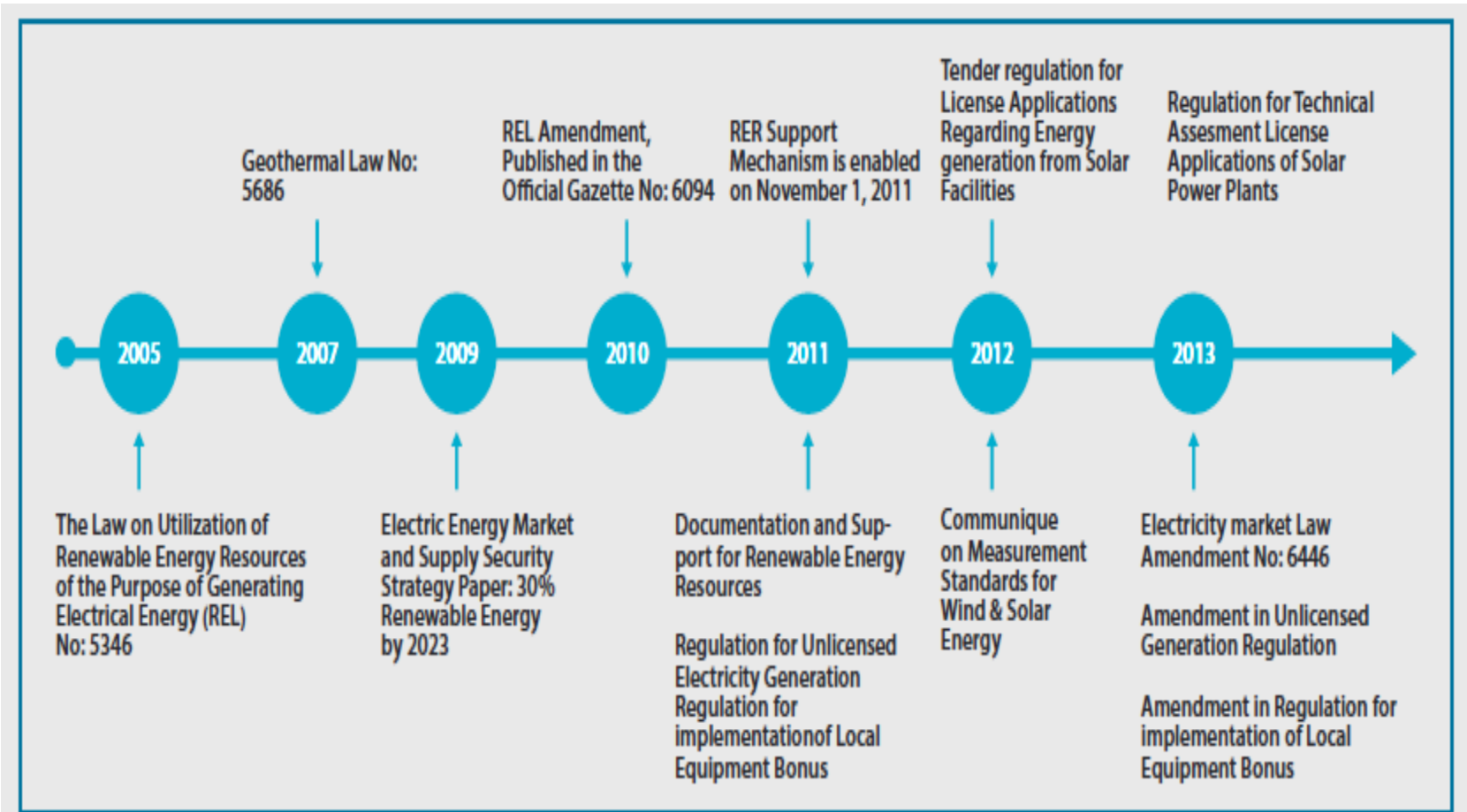
Turkey is Candidate Member of the EU since 1999

- **Hormonization with the EU Acquis**
 - *Party to international agreements*: ratifying UNFCCC and the KP
 - *Environmental Legislation*: air pollution control, waste management, EU ETS
 - *Energy Legislation*: Increasing RES use and improving energy efficiency

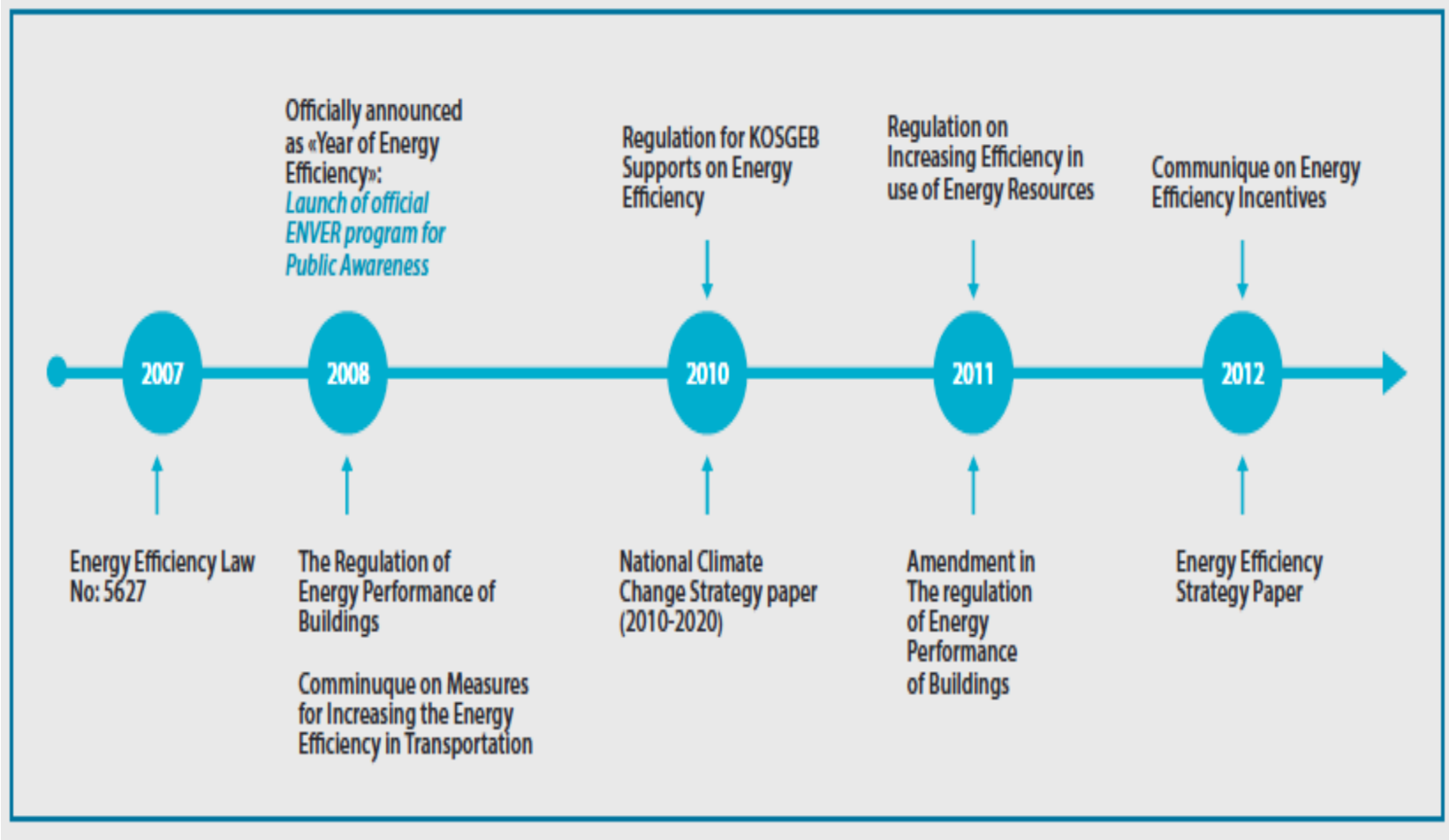
Alignment with EU ETS regime

- Regulation on ‘Monitoring of Greenhouse Gas Emissions’ in 2012 (Nr.28247) in alignment with the EU’s 2007/589/EC Decision, pursuant to Directive 2003/87/EC on EU-ETS, which established **guidelines for monitoring and reporting GHG emissions**.
- This Regulation aims to monitor GHG emissions derived from these sectors defined in Turkey’s national strategy document (that is, steam generation, cement, iron-steel, paper, glass and so on) (Turkish Ministry of European Union, 2013).

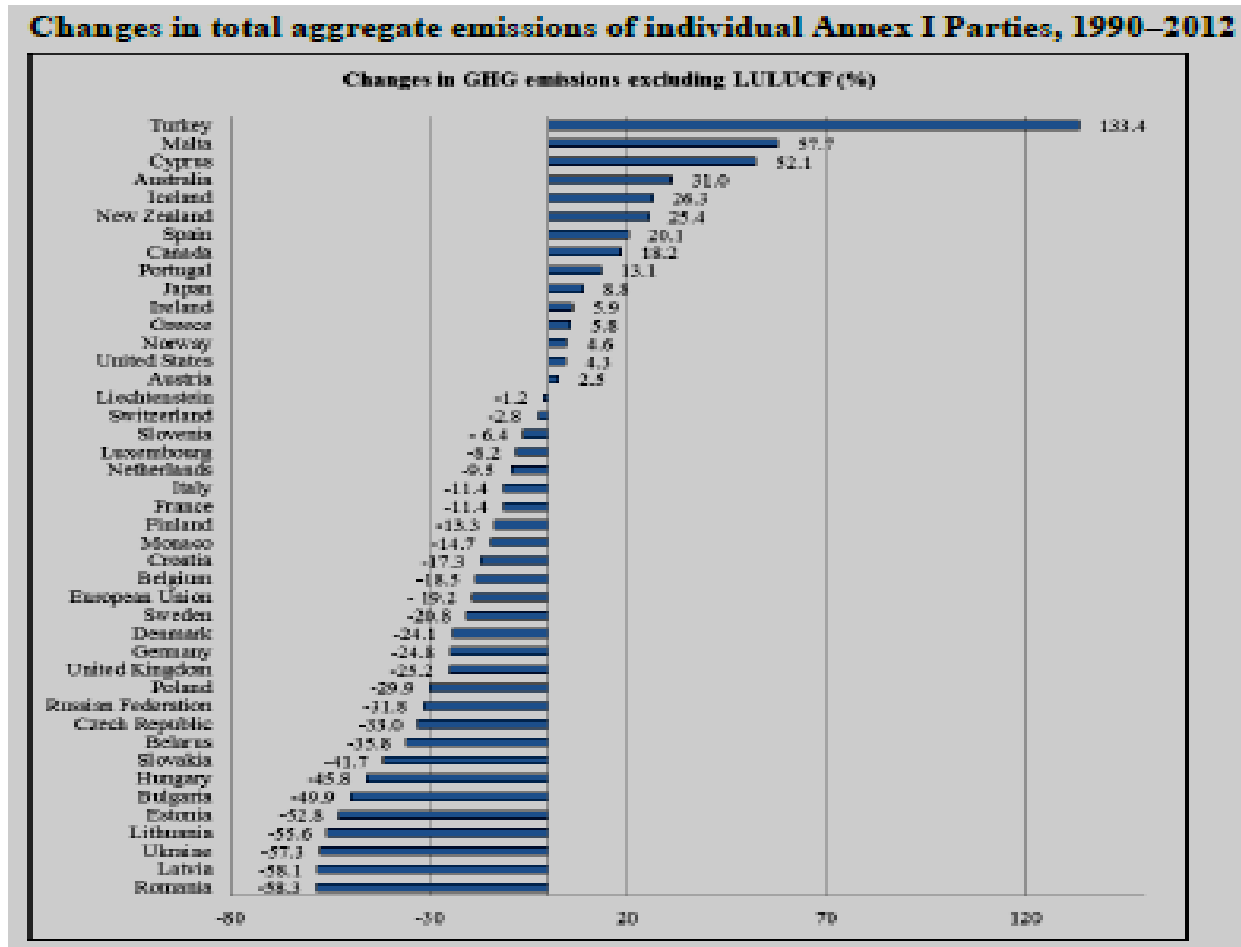
Evolution of renewable energy regulations and policies in Turkey



Evolution of energy efficiency regulations and policies in Turkey



Turkey within Annex I

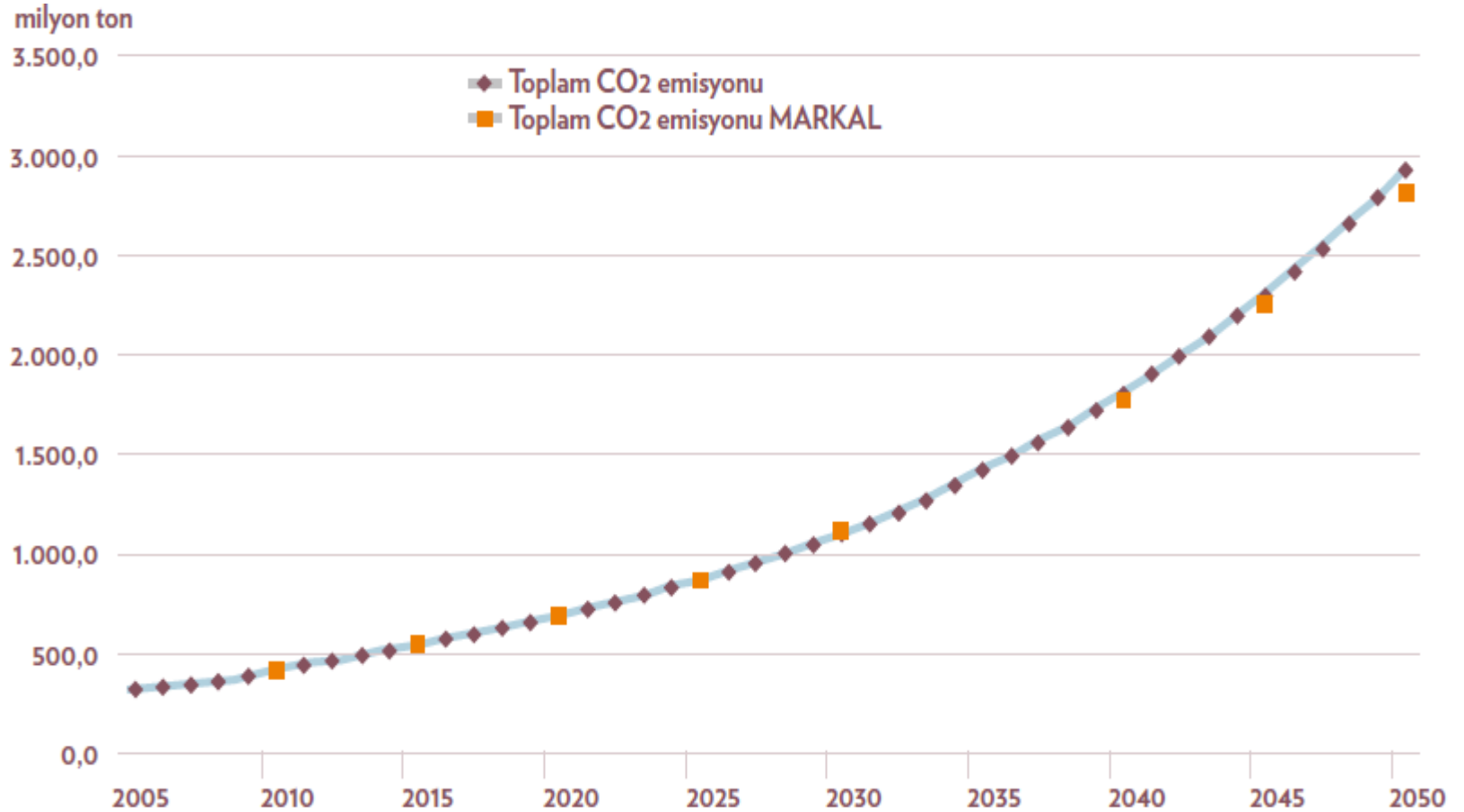


LULUCF = land use, land-use change and forestry.

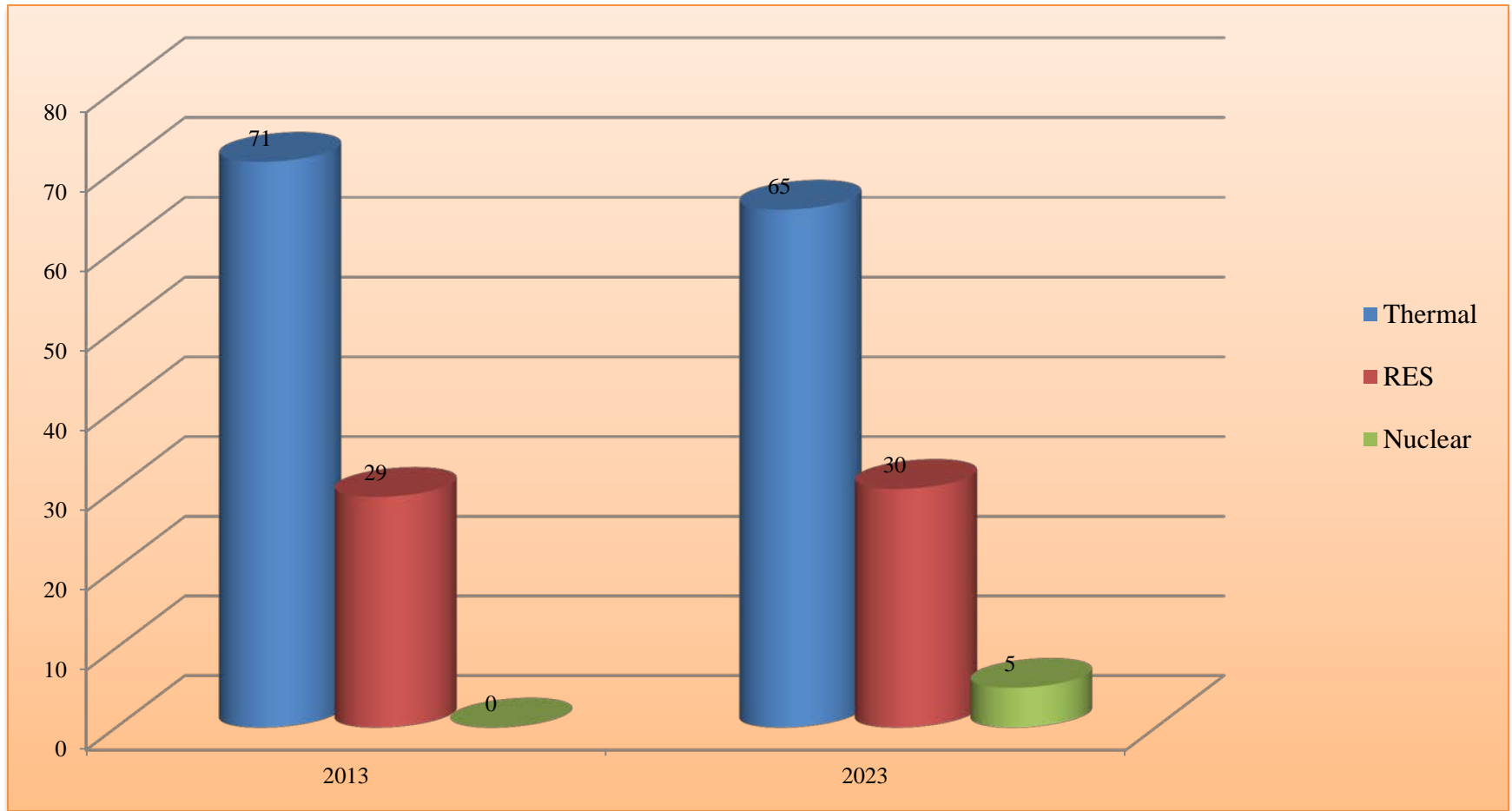
Graph: UNFCCC, 2014 “UNFCCC, 2014, National greenhouse gas inventory data for the period 1990-2012”, available: http://maindb.unfccc.int/library/view_pdf.pl?url=http://unfccc.int/resource/docs/2014/sbi/eng/20.pdf

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Total GHG Emission Projections for Turkey by 2050

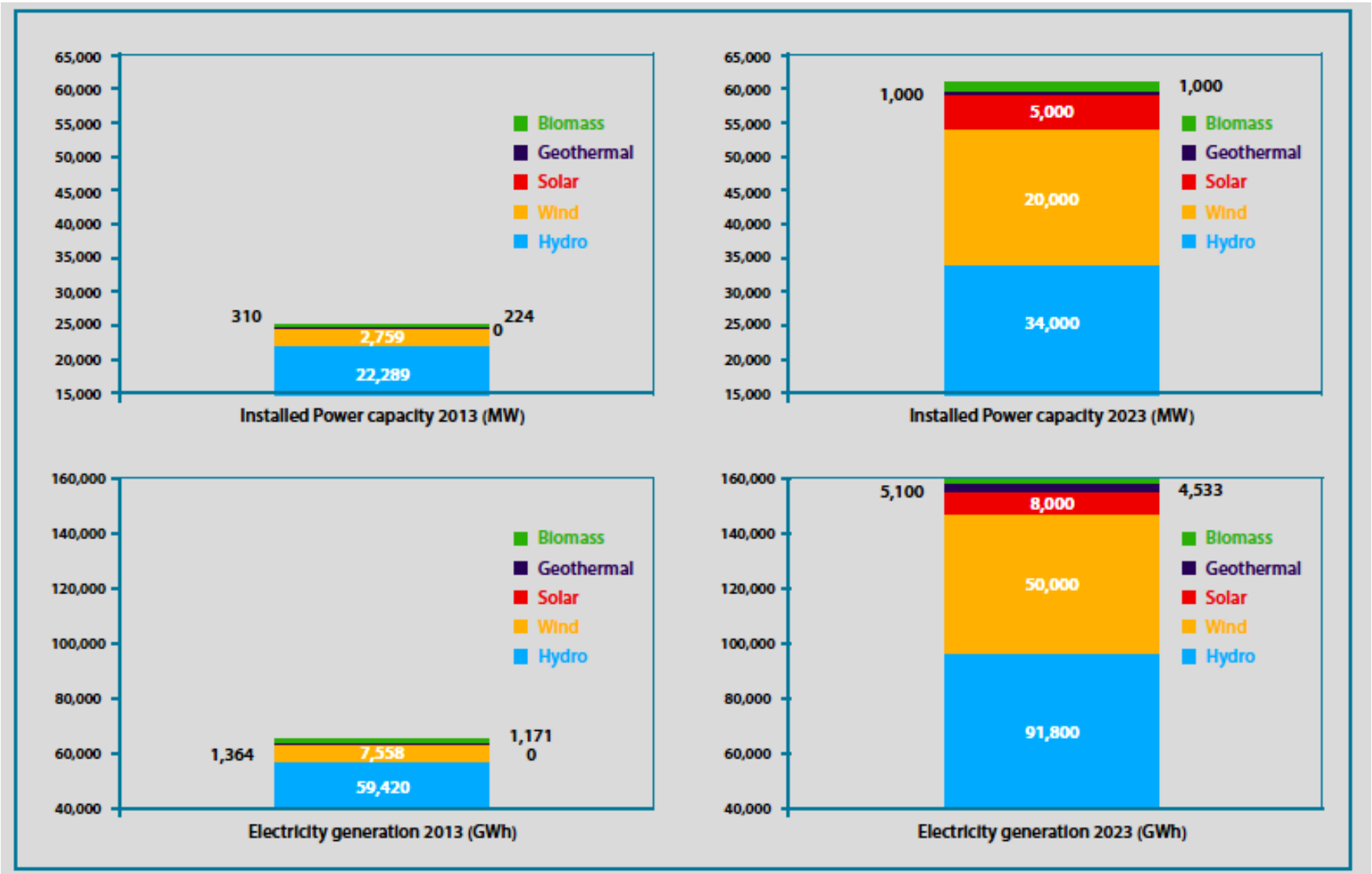


National Targets for RES and Nuclear in Power Generation by 2023 (%)



Electricity Consumption
2013: 246 TWh
2023: 424 TWh

Renewable Sources in 2013 and Targets for 2023 their installed capacity and share in power generation



Thank you!!!

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