

Für Mensch & Umwelt

Arbeitsgruppe Erneuerbare Energie-Statistik (AGEE-Stat)

Development of Renewable Energy Sources in Germany in the year 2024

Charts and figures based on statistical data from the Working Group on Renewable Energy-Statistics (AGEE-Stat)

Status: September 2025



Inhalt (I)

Anteilswerte Erneuerbarer Energien

Inhalt (II)

Erneuerbare Energien im Stromsektor

Inhalt (III)

Erneuerbare Energien im Wärmesektor

Inhalt (IV)

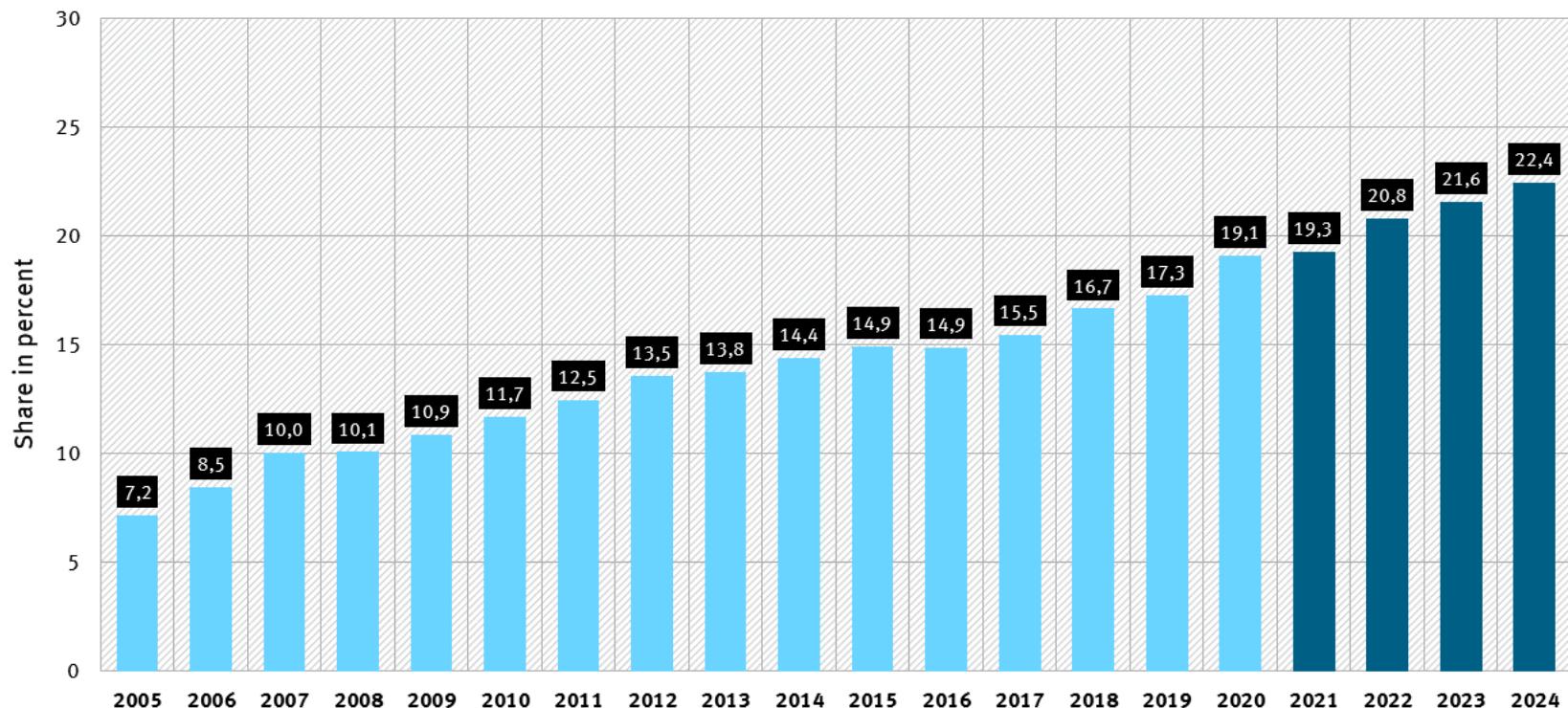
Erneuerbare Energien im Verkehr

Emissionsvermeidung und Wirtschaftliche Effekte aus Erneuerbaren Energien

Hinweise: In den Abbildungen sind Abweichungen in Summen durch Rundung möglich
Die wichtigsten Begrifflichkeiten sind im Glossar am Ende des Dokuments erläutert

Development of renewable energy share of gross final energy consumption in Germany

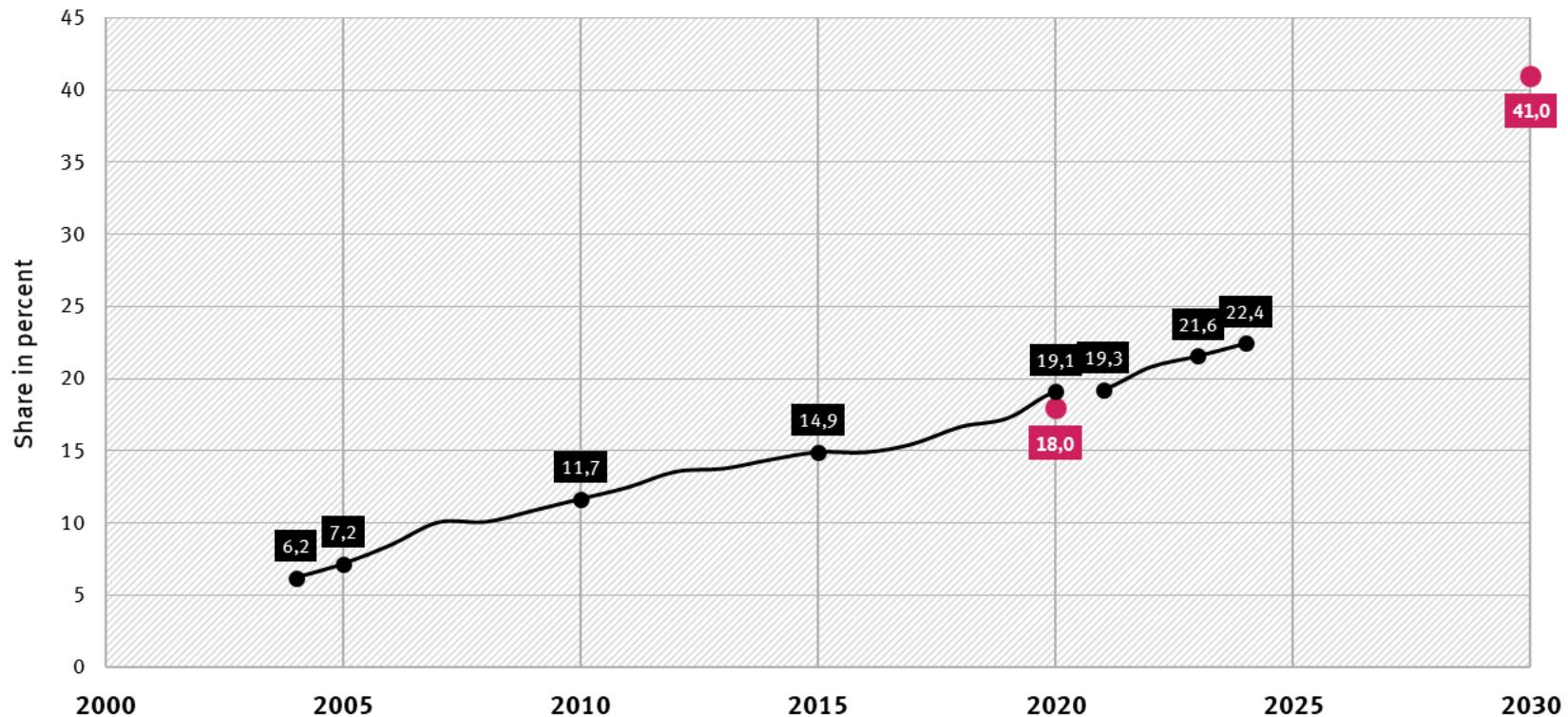
share according EU directive¹



¹ until 2020 according to EU-directive 2009/28/EG (RED I), from 2021 according to EU-directive (EU) 2018/2001 (RED II)

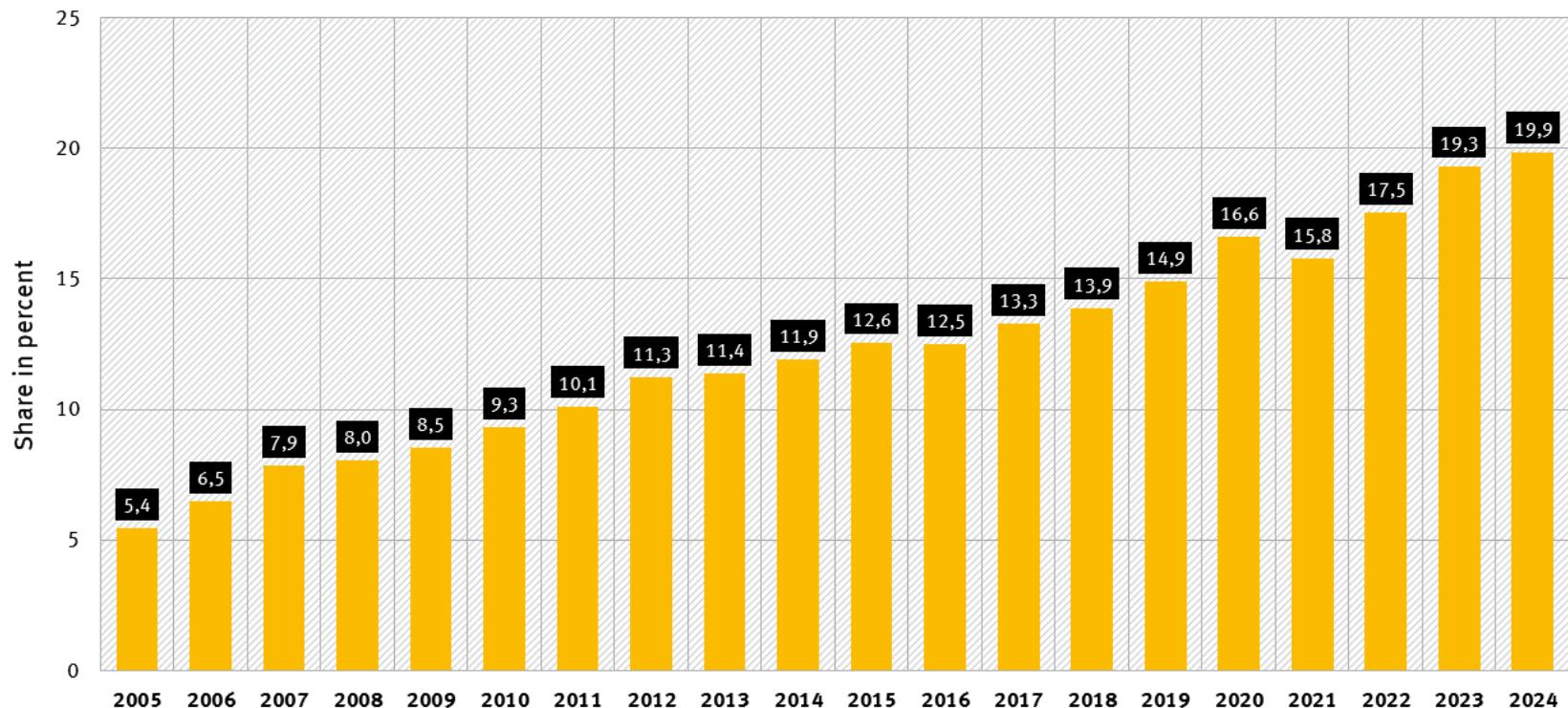
Development of renewable energy share of gross final energy consumption in Germany

targets according to EU renewable energy regulation¹



¹ until 2020 according to EU-directive 2009/28/EG, from 2021 according to EU-directive (EU) 2018/2001

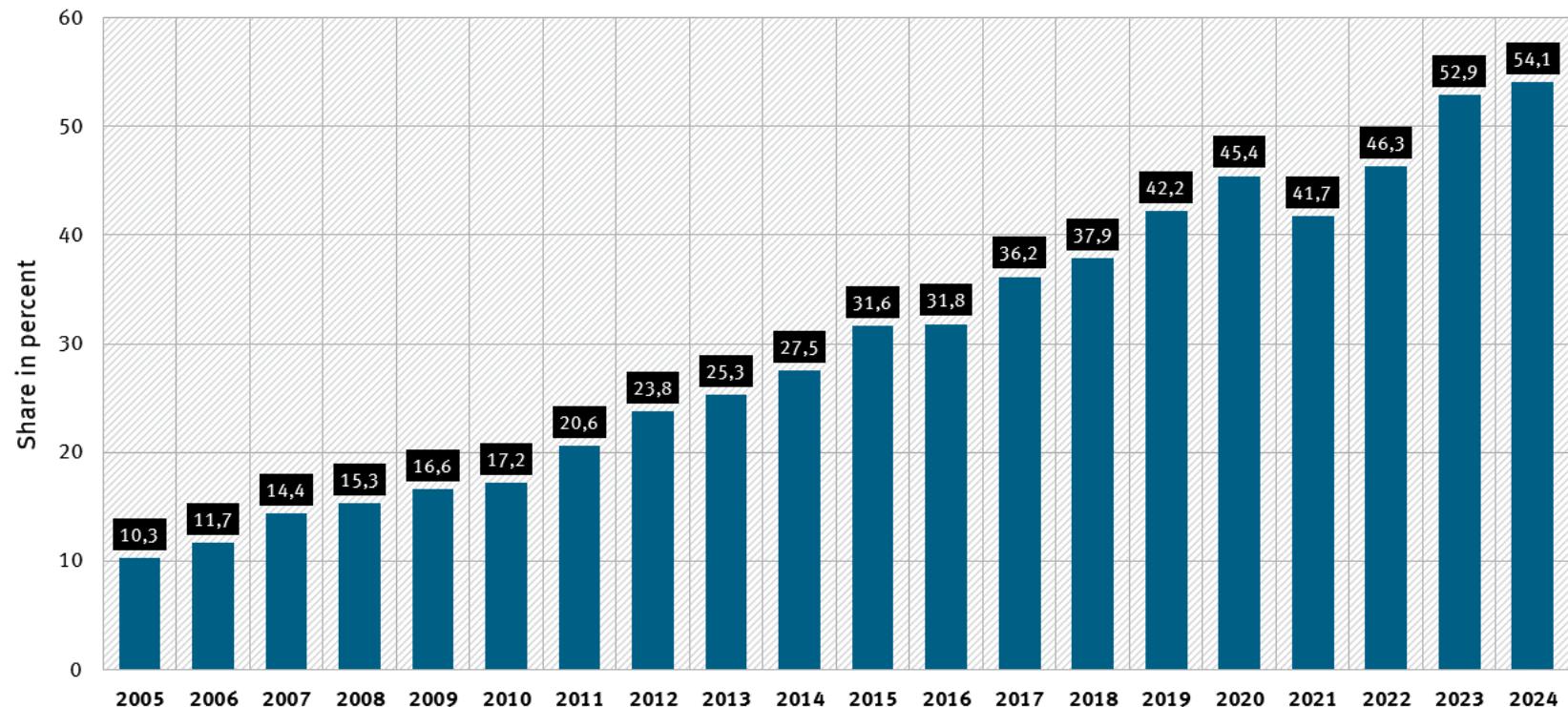
Development of renewable energy share of primary energy consumption in Germany



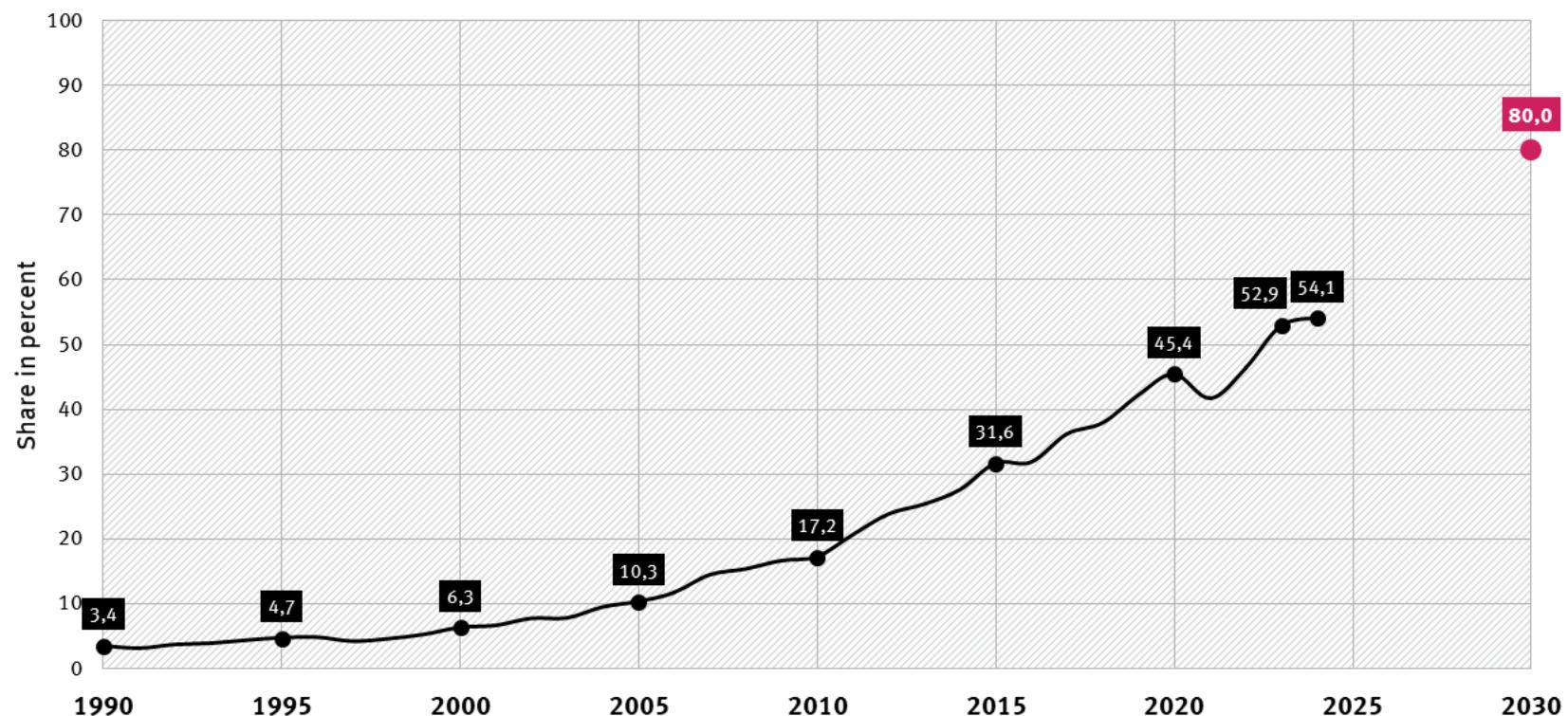
Notice: change in calculation methods from 2012 onwards, previous years not yet revised

Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

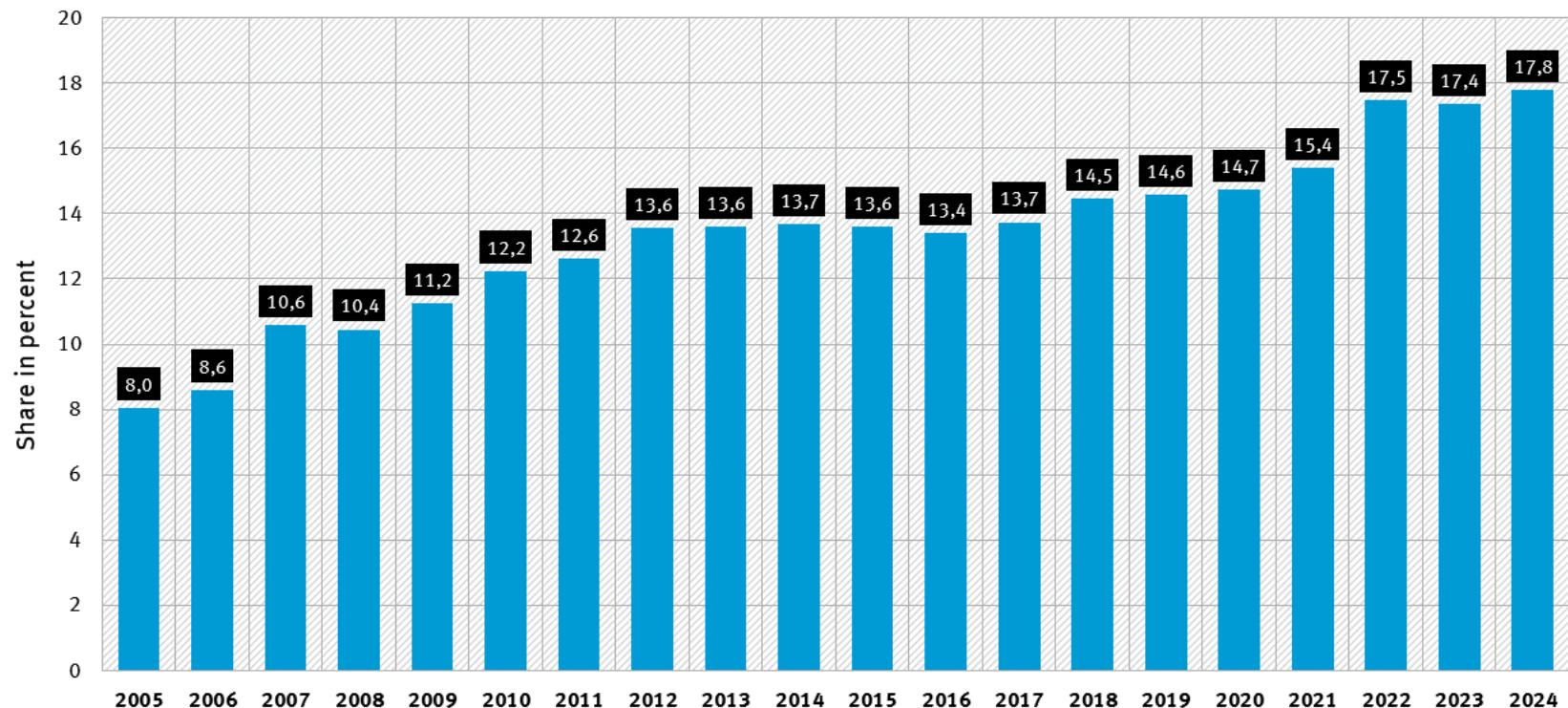
Development of renewable energy share of gross electricity consumption in Germany



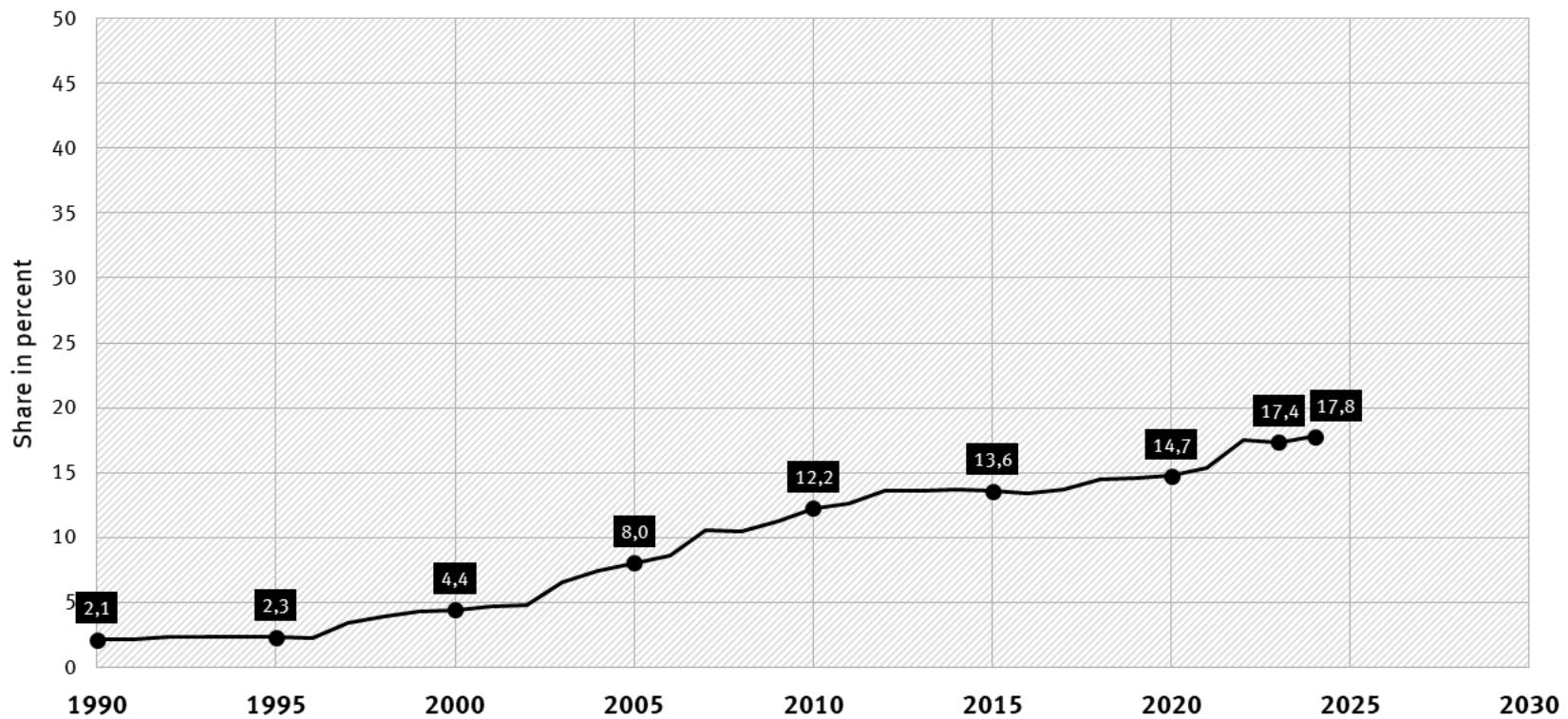
Development of renewable energy share of gross electricity consumption in Germany targets according to new renewable energy law (EEG 2023)



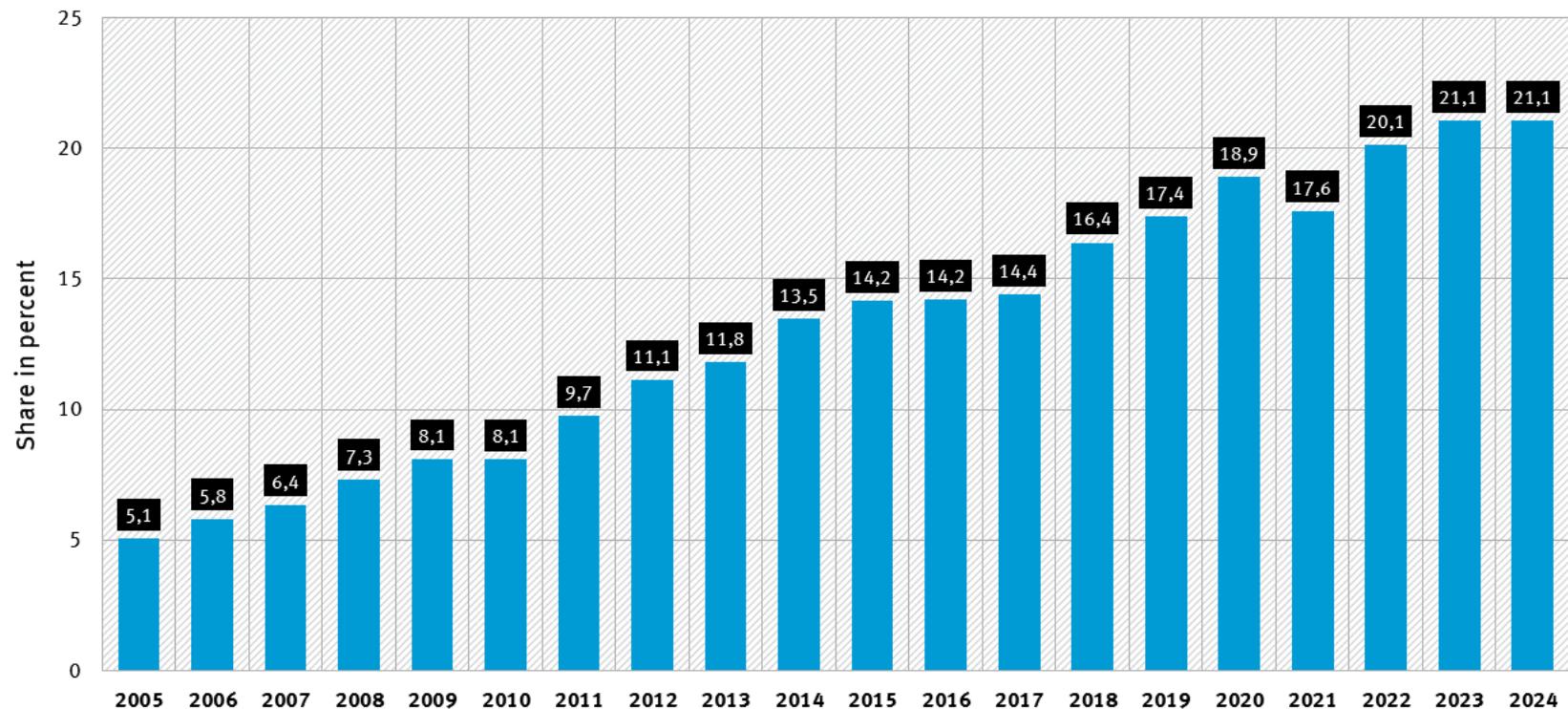
Development of renewable energy share of final energy consumption for heating and cooling in Germany



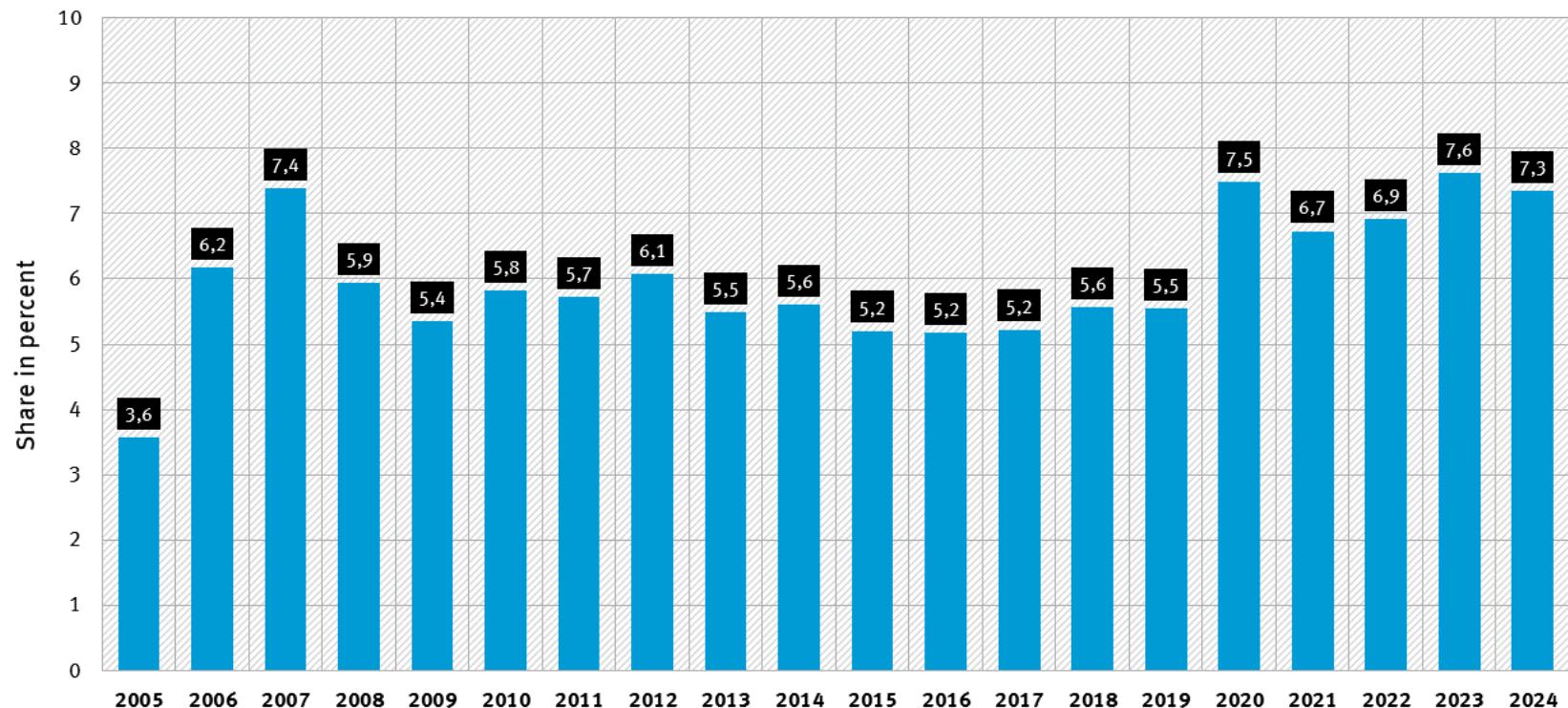
Development of renewable energy share of final energy consumption for heating and cooling in Germany



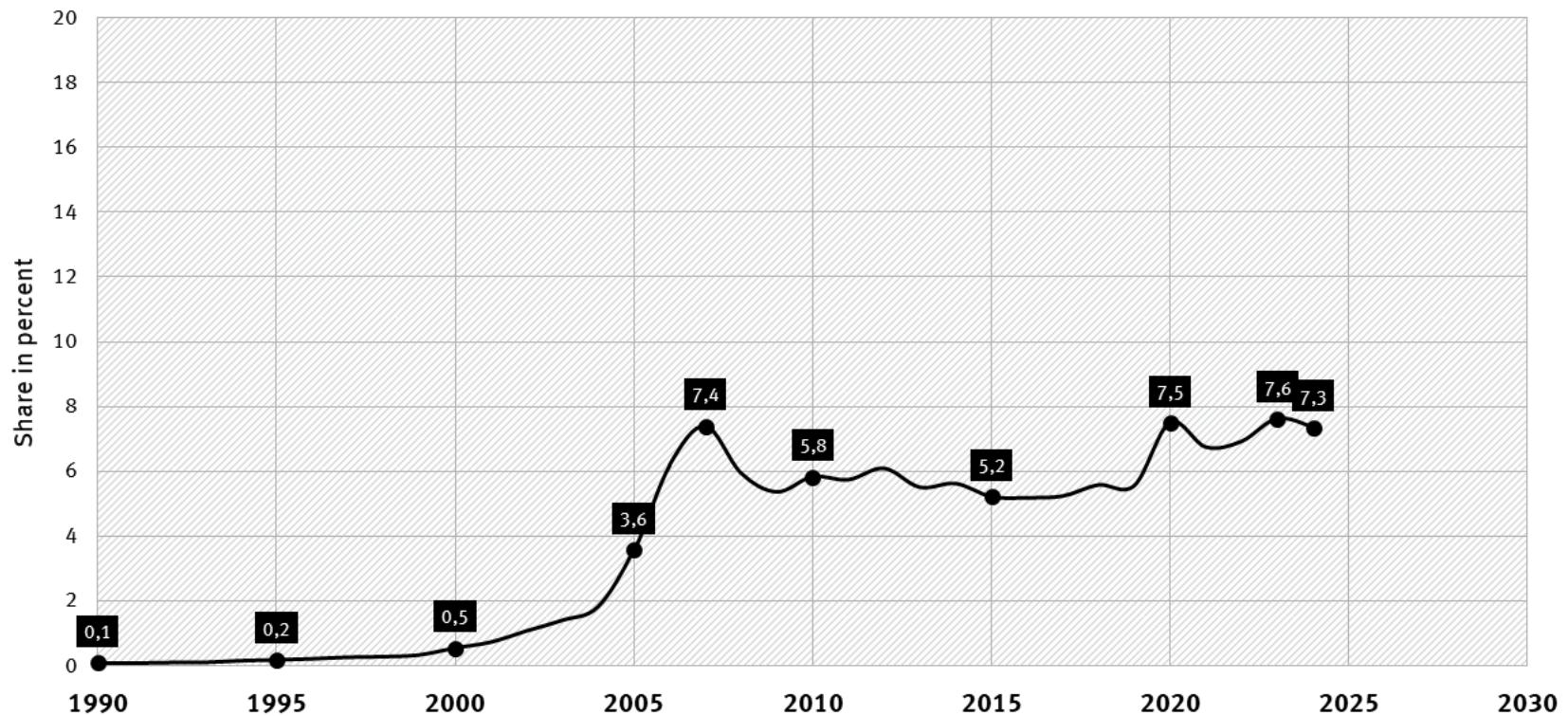
Development of the share of district heat produced from renewable energy sources in Germany



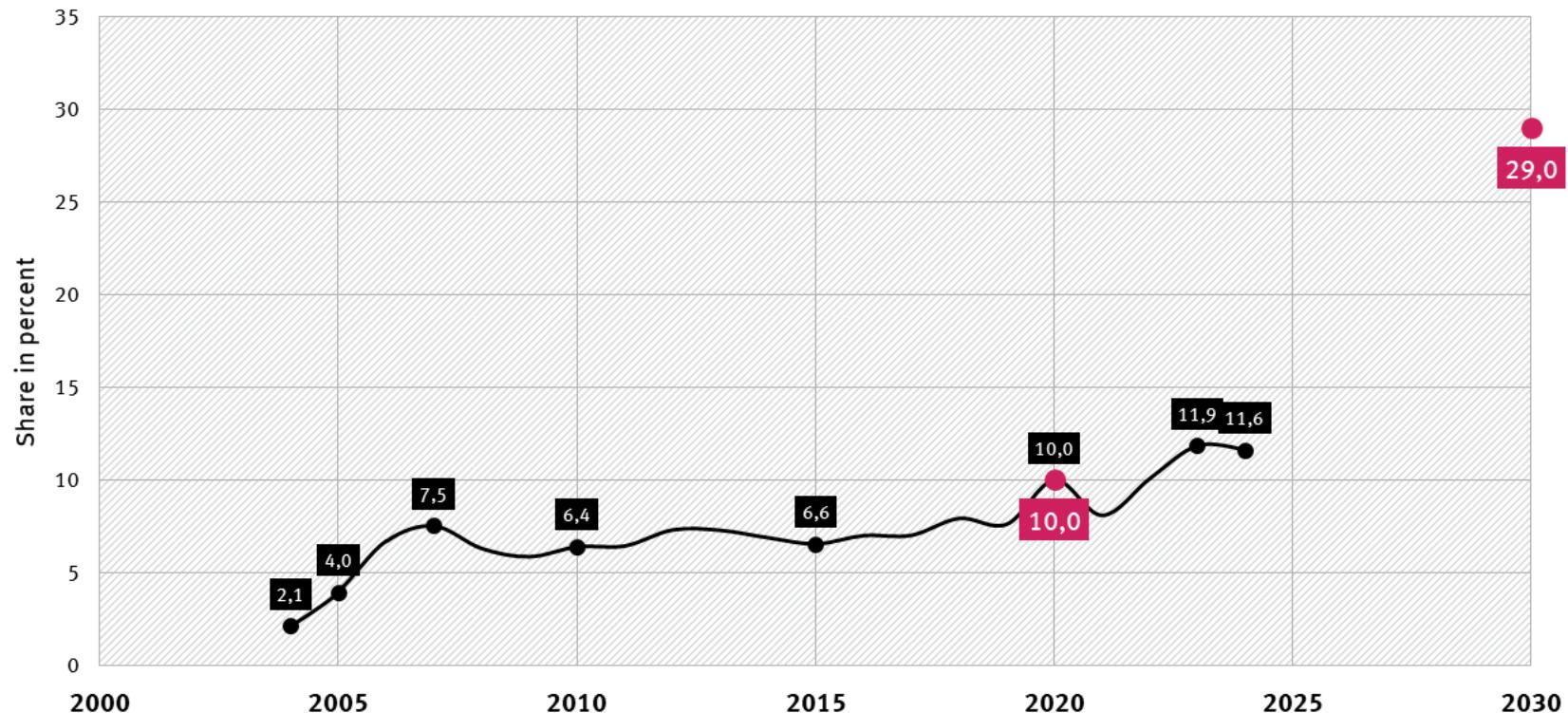
Development of renewable energy share of final energy consumption in the transport sector in Germany



Development of renewable energy share of final energy consumption in the transport sector in Germany



Development of renewable energy share of final energy consumption in the transport sector

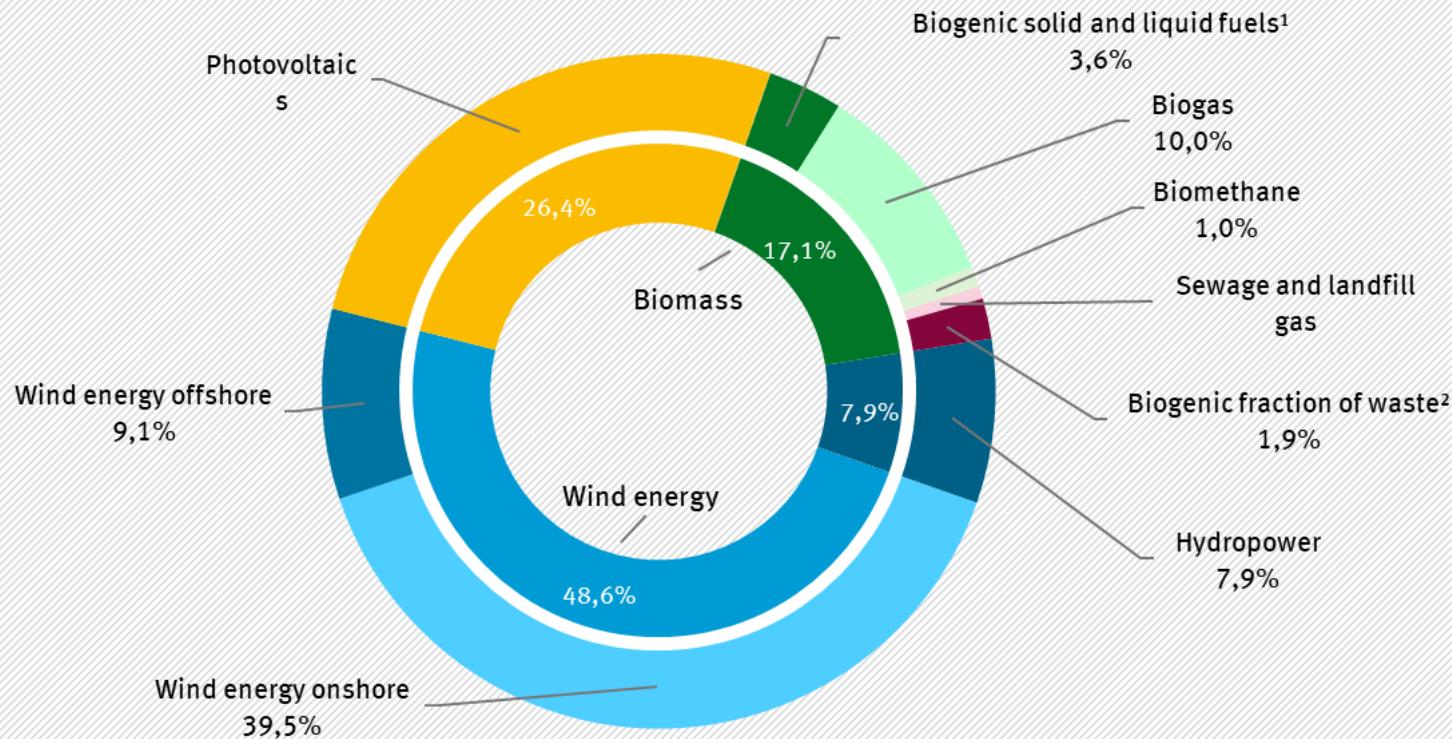


¹ until 2020 according to EU-directive 2009/28/EG (RED I), from 2021 according to EU-directive (EU) 2018/2001 (RED II), target value 2030 according to RED III

Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of February 2025

Gross electricity production from renewable energy sources in Germany in the year 2024

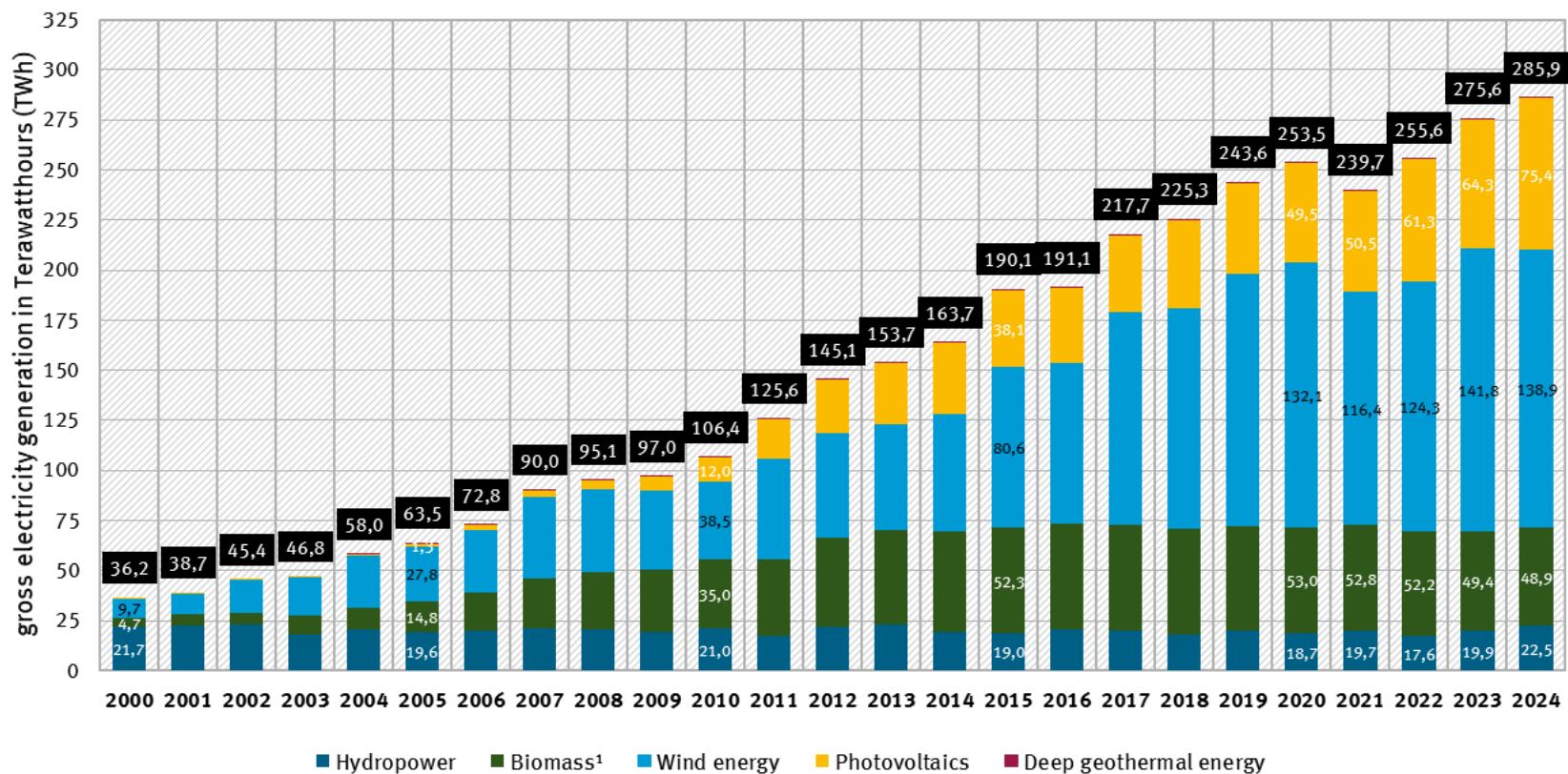
Total: 285,9 Terawatthours (TWh)



¹ incl. sewage sludge; ² biogenic fraction of waste in waste incineration plants estimated at 50 %

Notice: electricity production from geothermal power plants (0,1%) not shown because of very small share

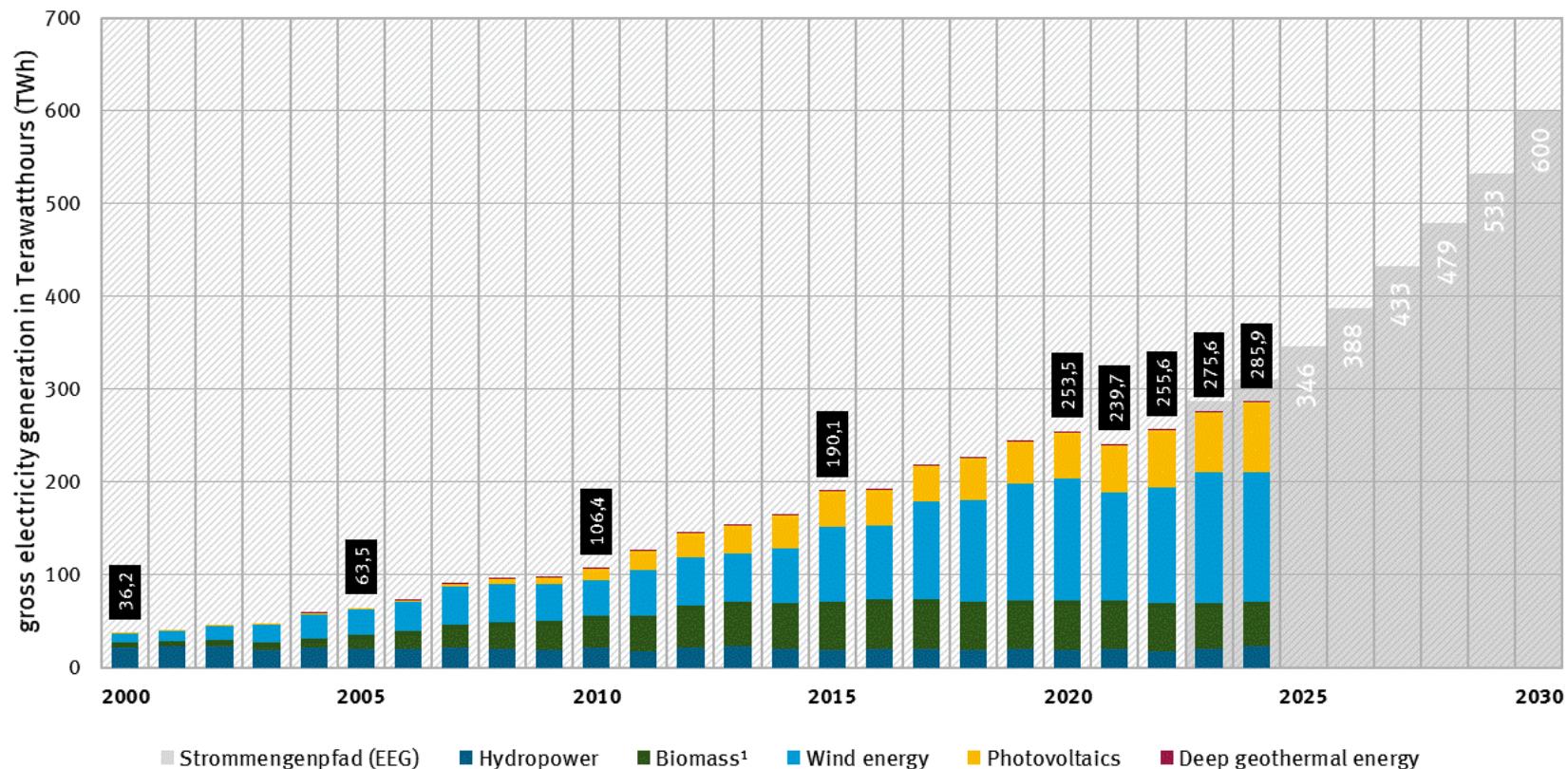
Development of gross electricity production from renewable energy sources in Germany



¹ incl. solid, liquid and gaseous biomass, sewage sludge

and the biologic fraction of waste (in waste incineration plants estimated at 50 %, from 2008 only municipal waste)

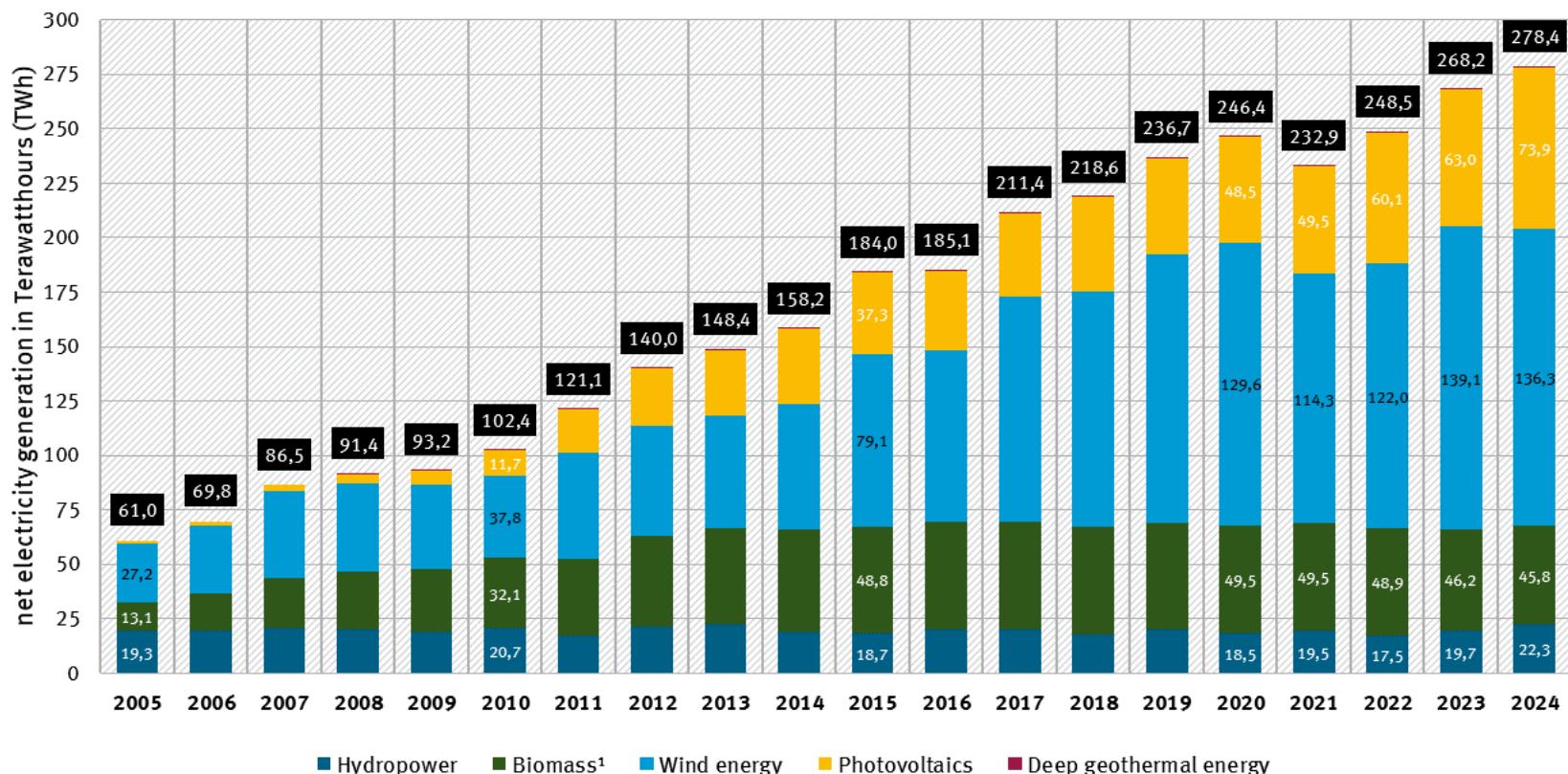
Development of gross electricity production from renewable energy sources in Germany



¹ incl. solid, liquid and gaseous biomass, sewage sludge

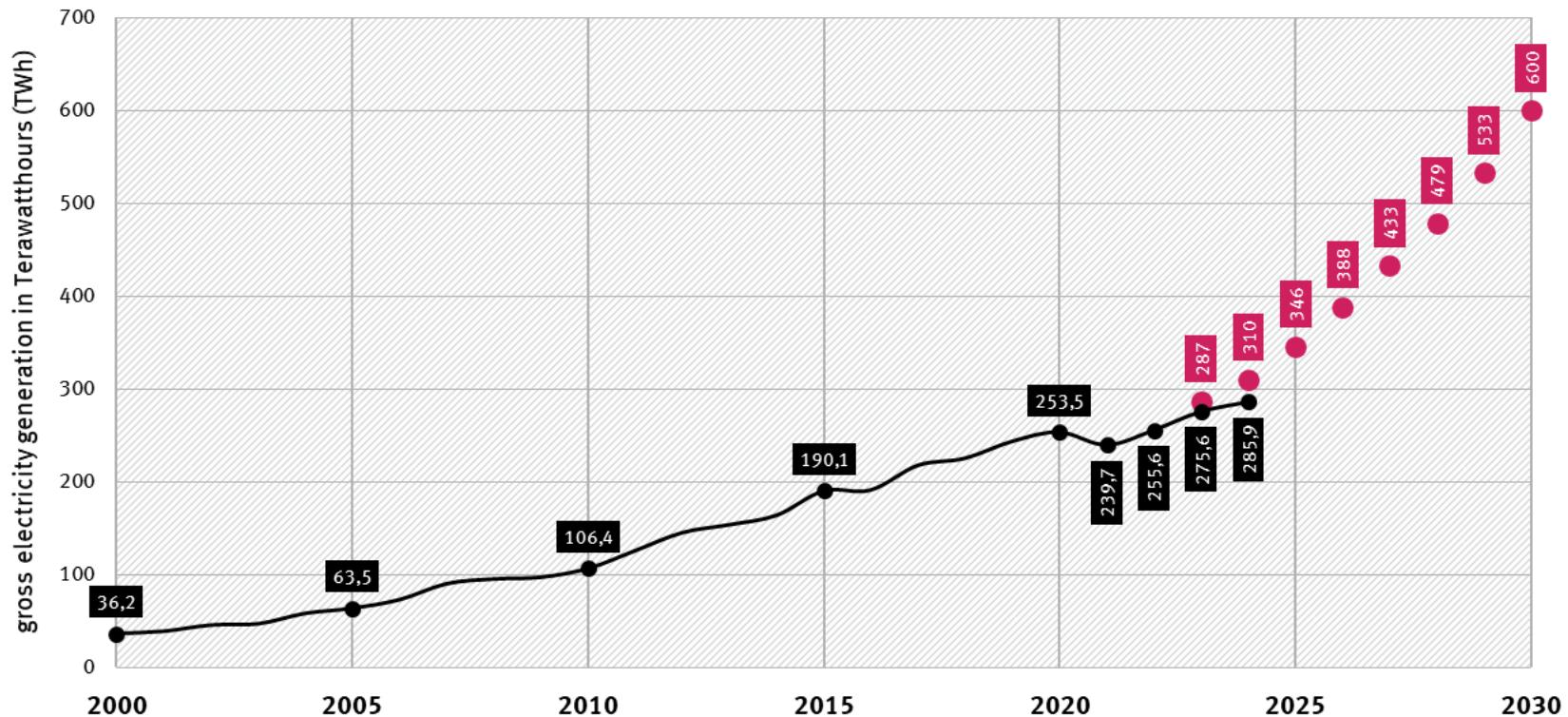
and the biologic fraction of waste (in waste incineration plants estimated at 50 %, from 2008 only municipal waste)

Development of net electricity production from renewable energy sources in Germany



¹ incl. solid, liquid and gaseous biomass, sewage sludge and the biologic fraction of waste (in waste incineration plants estimated at 50 %, from 2008 only municipal waste); data available from 2003

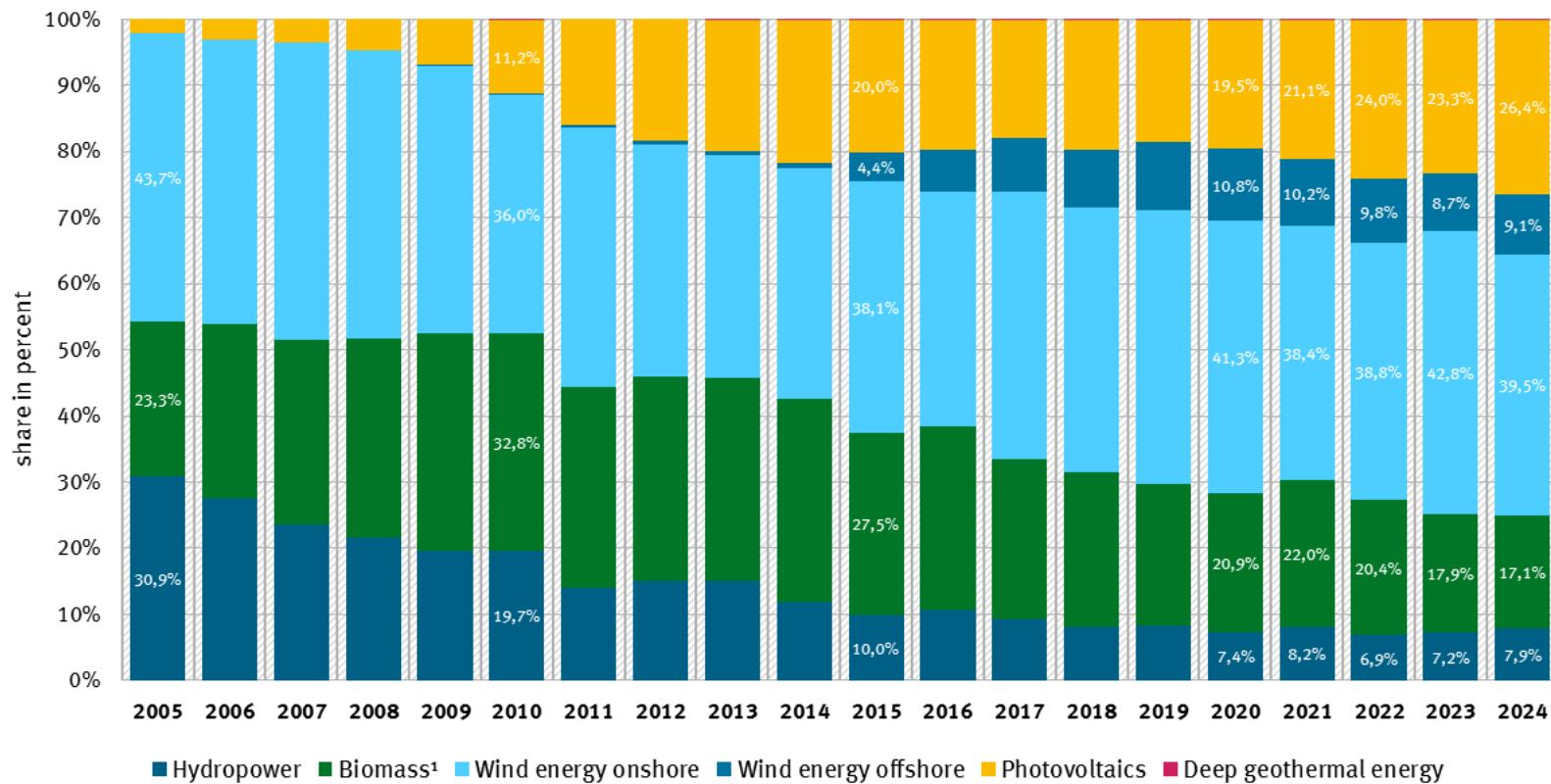
Gross electricity production from renewable energy sources in Germany and target values according to new renewable energy law (EEG 2023)



target values for the years 2021 and 2022 according to EEG 2021, target values for the years 2023 to 2030 according to EEG 2023

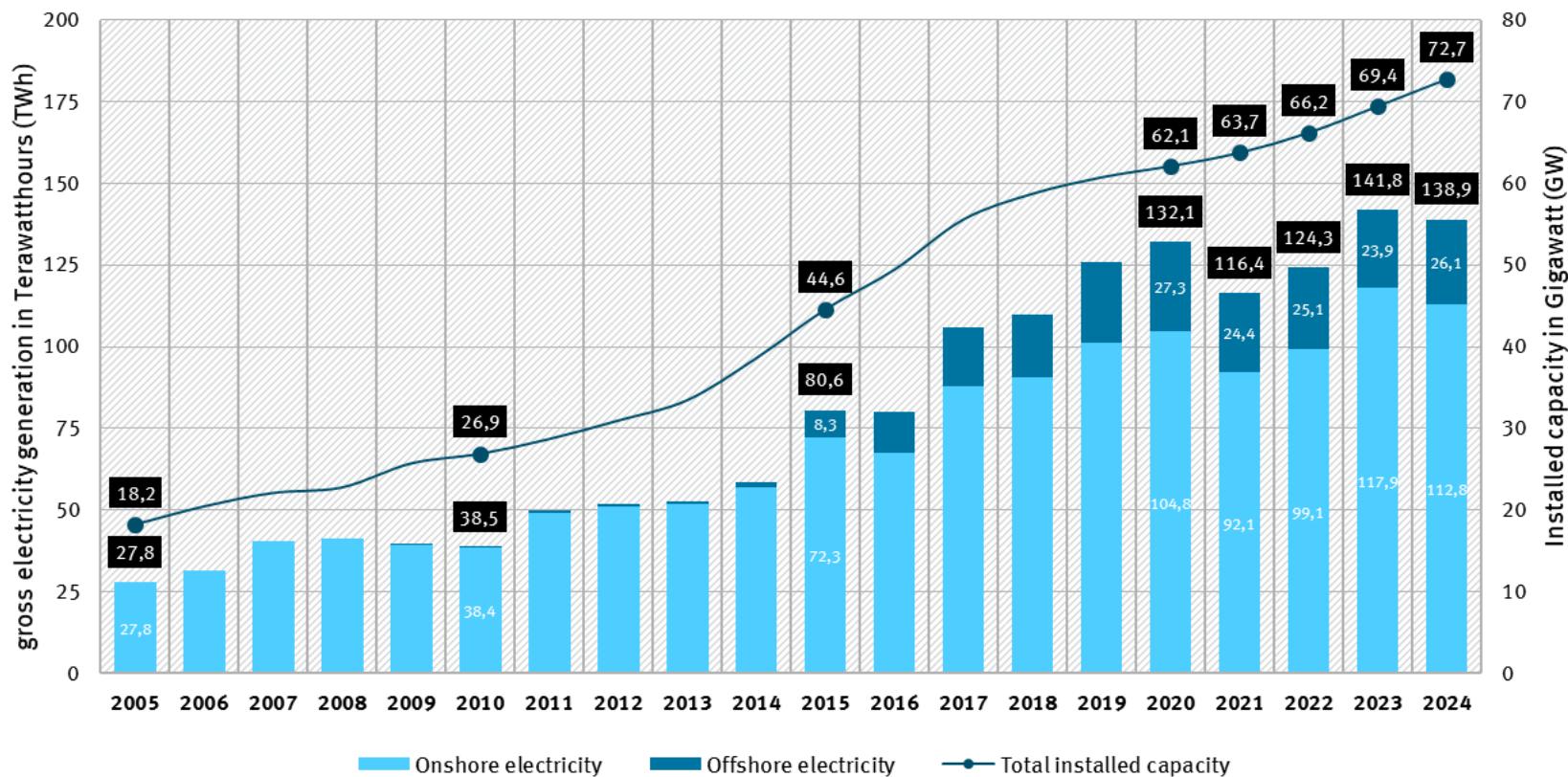
Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

Development of shares of electricity production from renewable energy sources in Germany

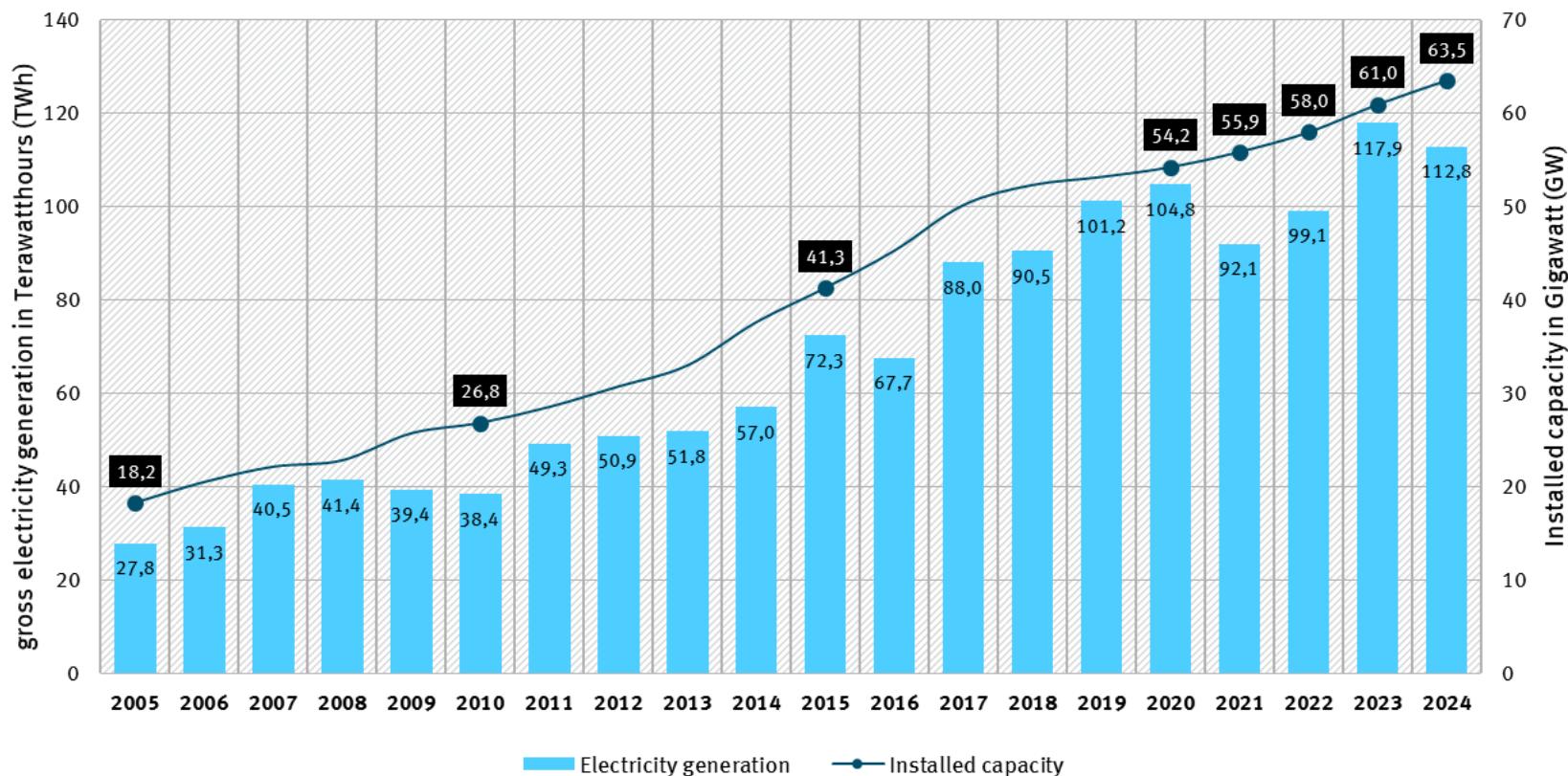


Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

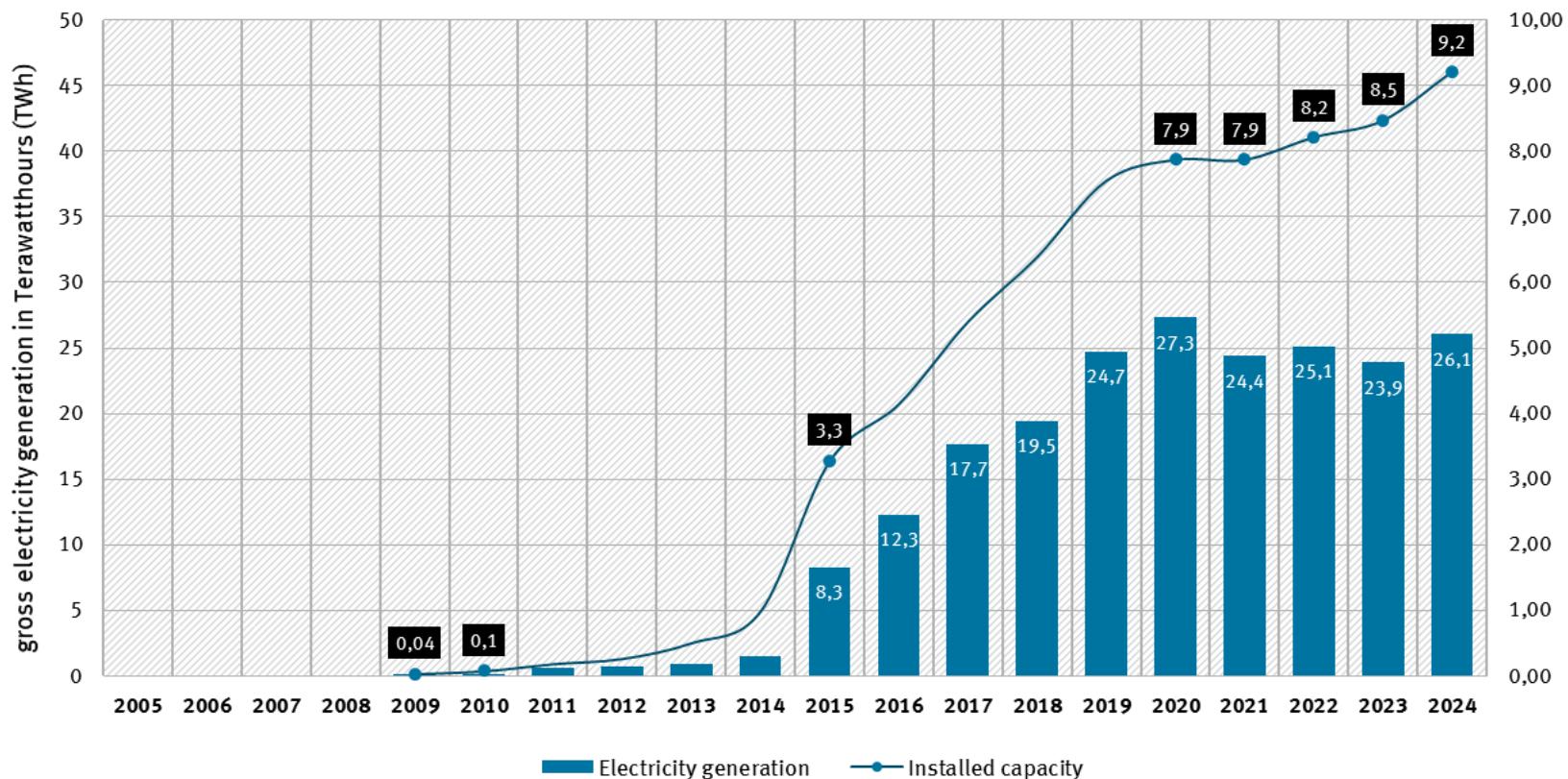
Development of gross electricity production and installed capacity of wind energy plants (onshore and offshore) in Germany



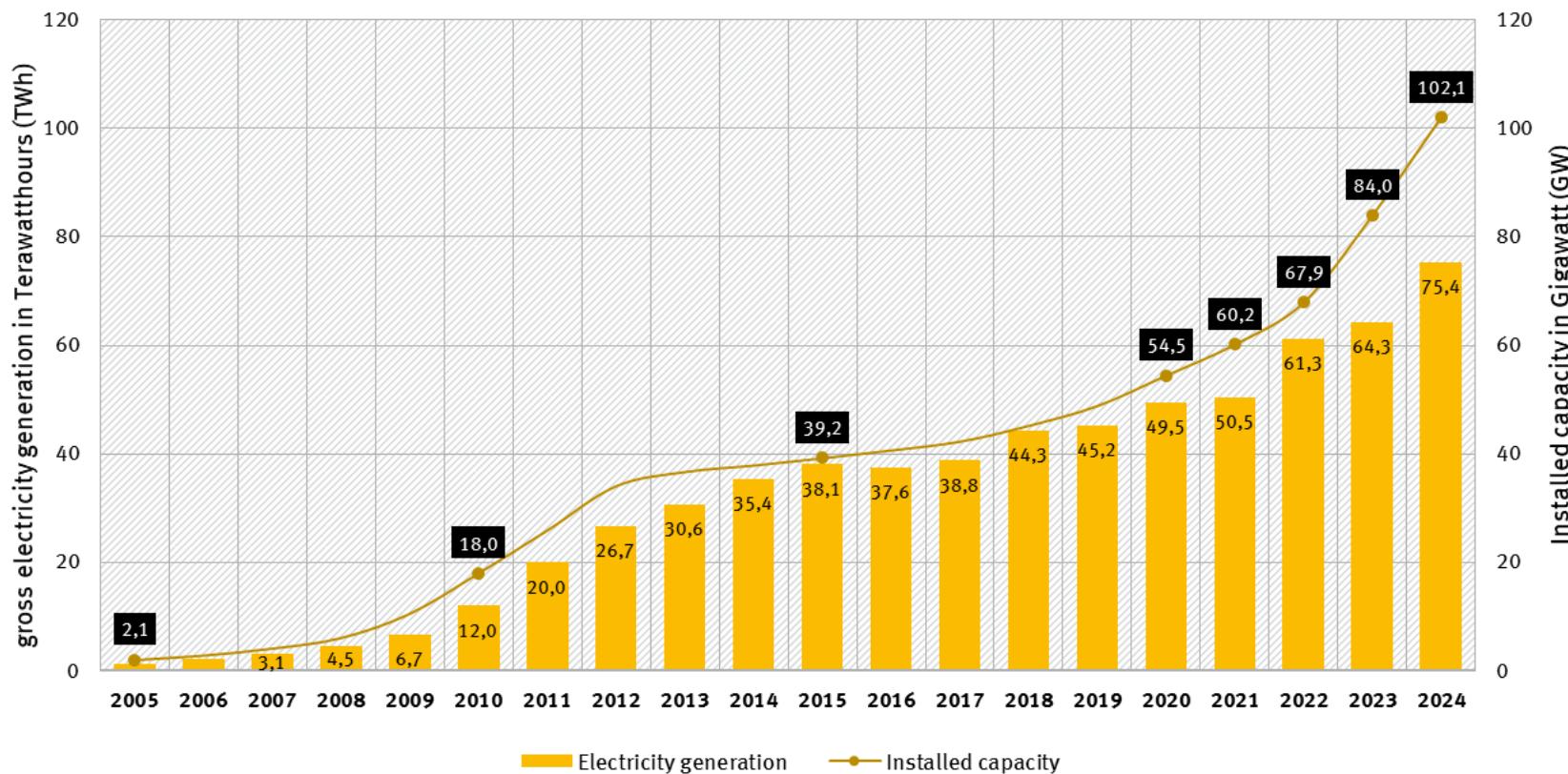
Development of gross electricity production and installed capacity of wind energy plants (onshore) in Germany



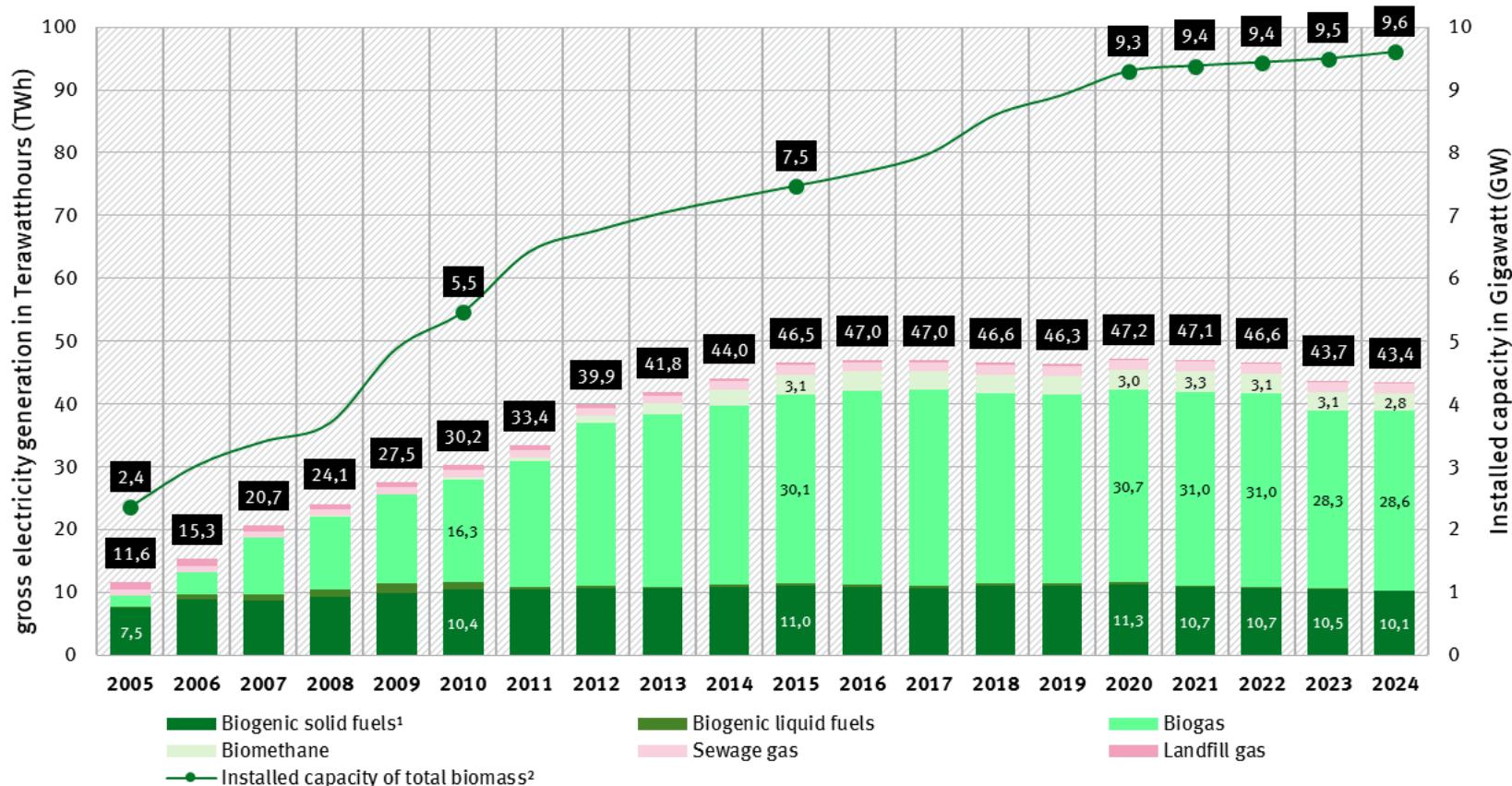
Development of gross electricity production and installed capacity of wind energy plants (offshore) in Germany



Development of gross electricity production and installed capacity of photovoltaic plants in Germany



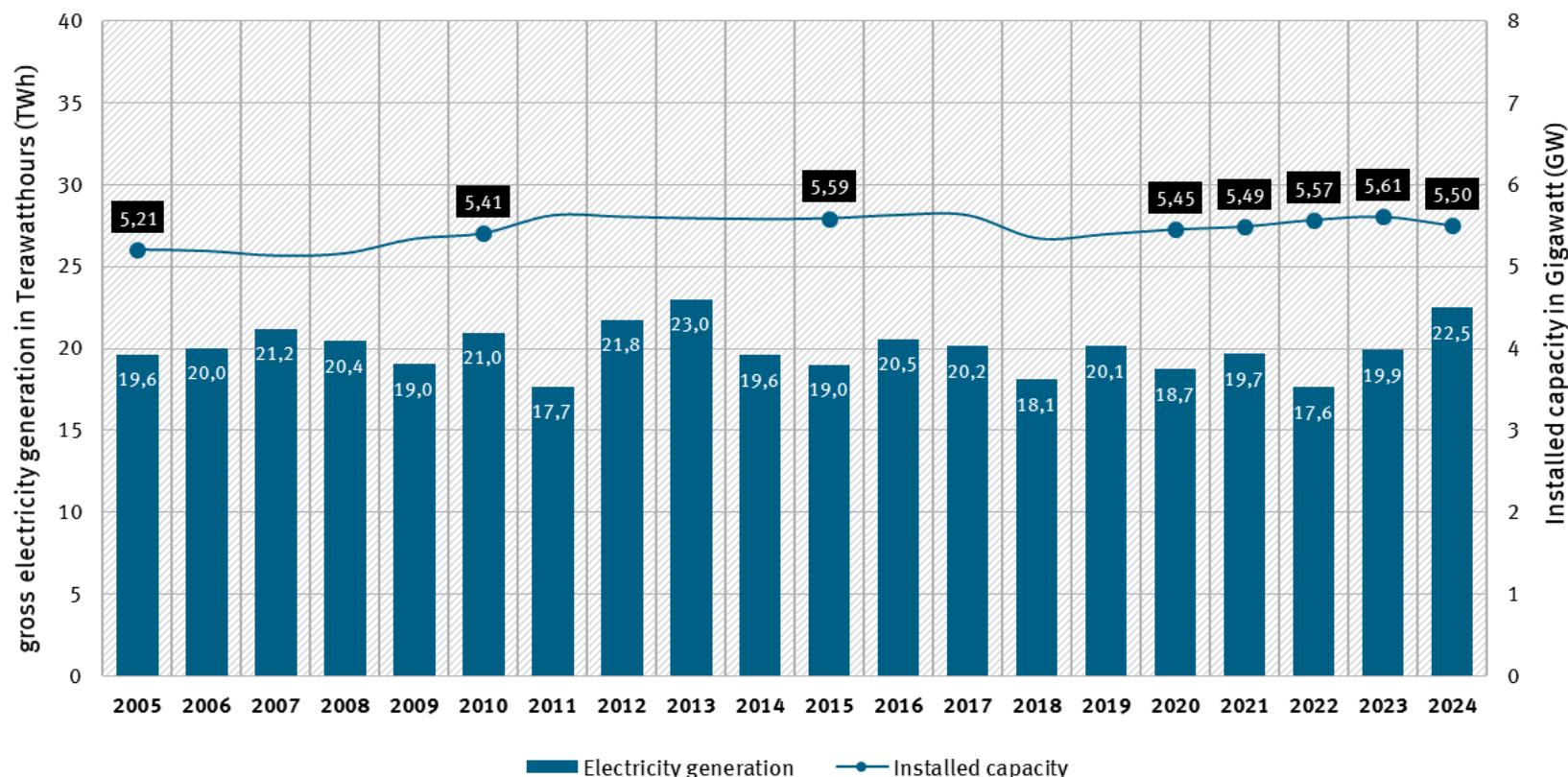
Development of gross electricity production and installed capacity of biomass plants in Germany



¹ incl. sewage sludge, without the biogenic fraction of waste in waste incineration plants;

² since 2013 including additional capacity for increased flexibility of electricity production

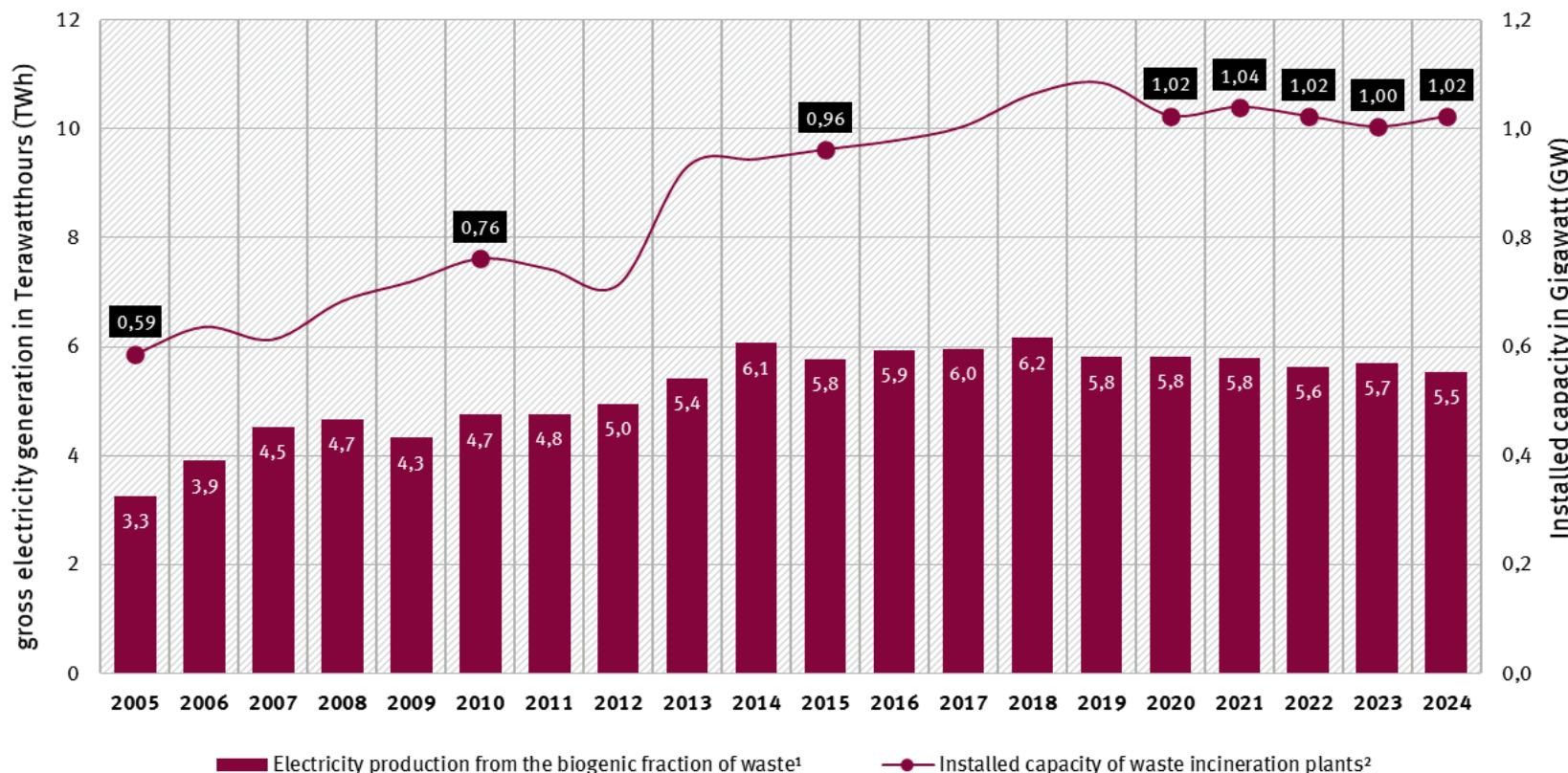
Development of gross electricity production and installed capacity of hydropower plants in Germany



Notice: shown are the totals of river and storage power plants including pump storage power plants with natural inflow

Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

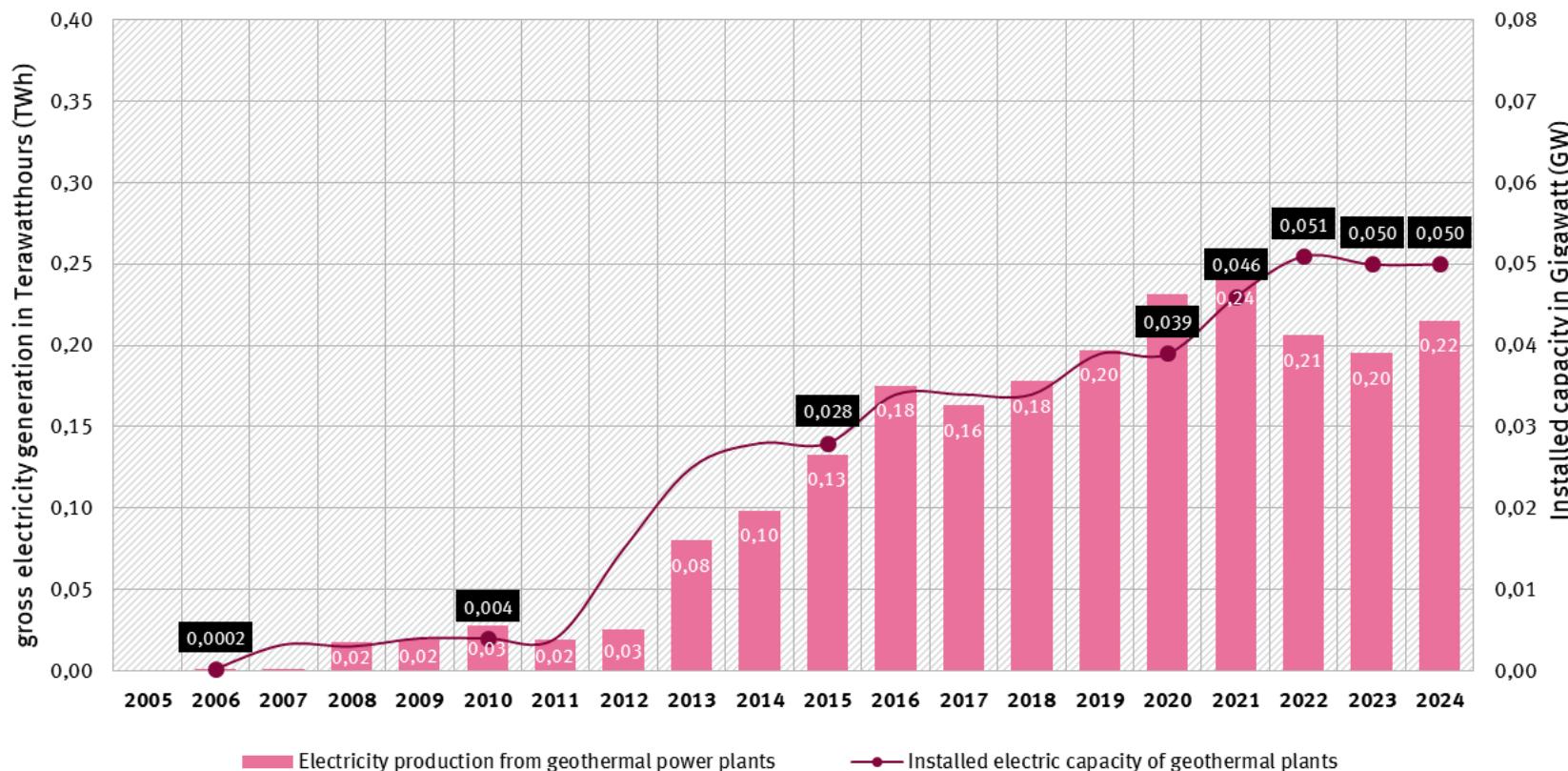
Development of gross electricity production and installed capacity of waste incineration plants



¹ biogenic fraction of waste in waste incineration plants calculated with 50%, from 2008 only municipal waste;

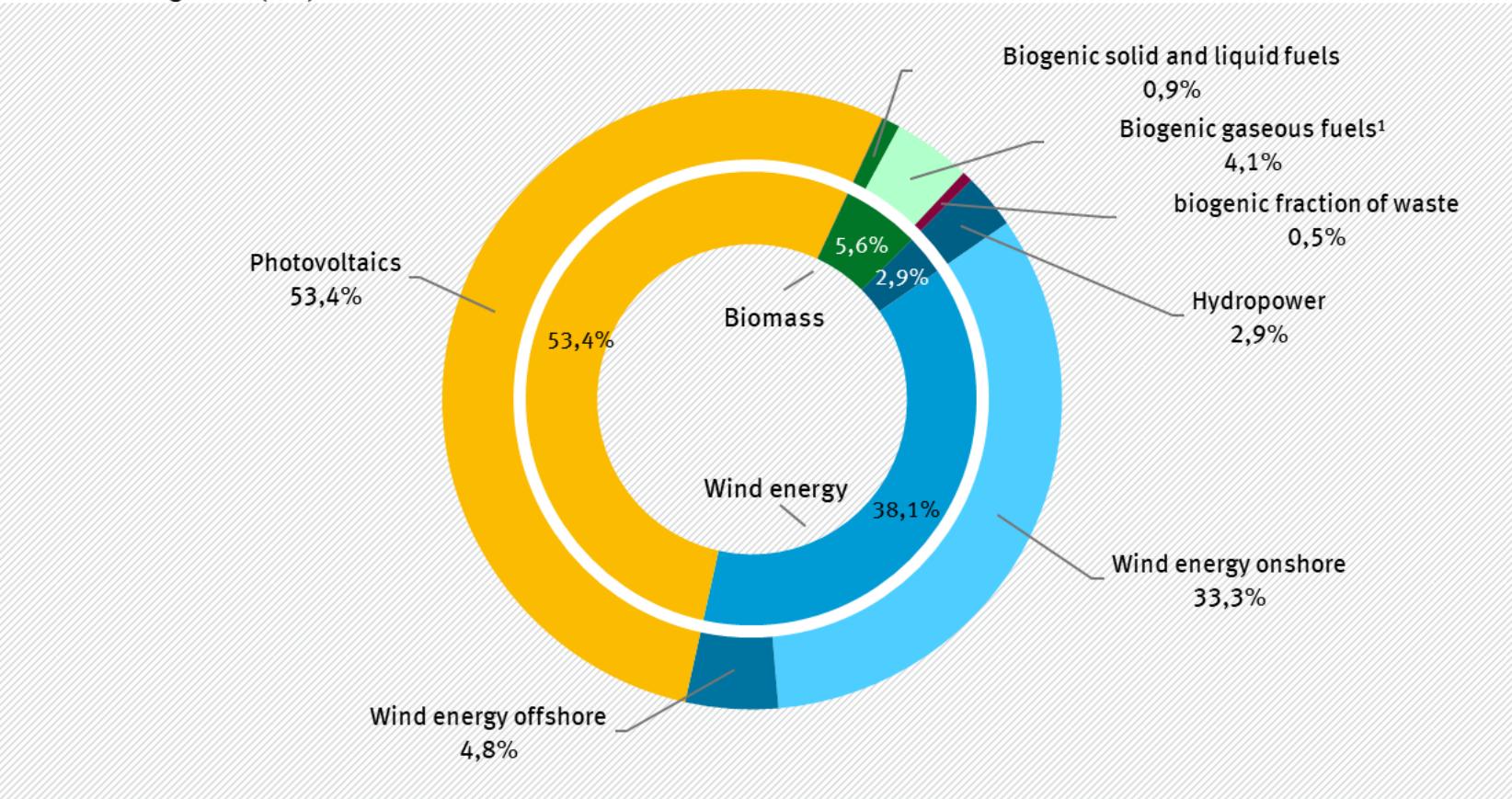
² calculated installed capacity of thermal combustion plants for renewable waste (renewable share assumed to be 50%)

Development of gross electricity production and installed electric capacity of geothermal plants



Installed capacity for renewables-based electricity generation in Germany in the year 2024

Total: 191 Gigawatt (GW)

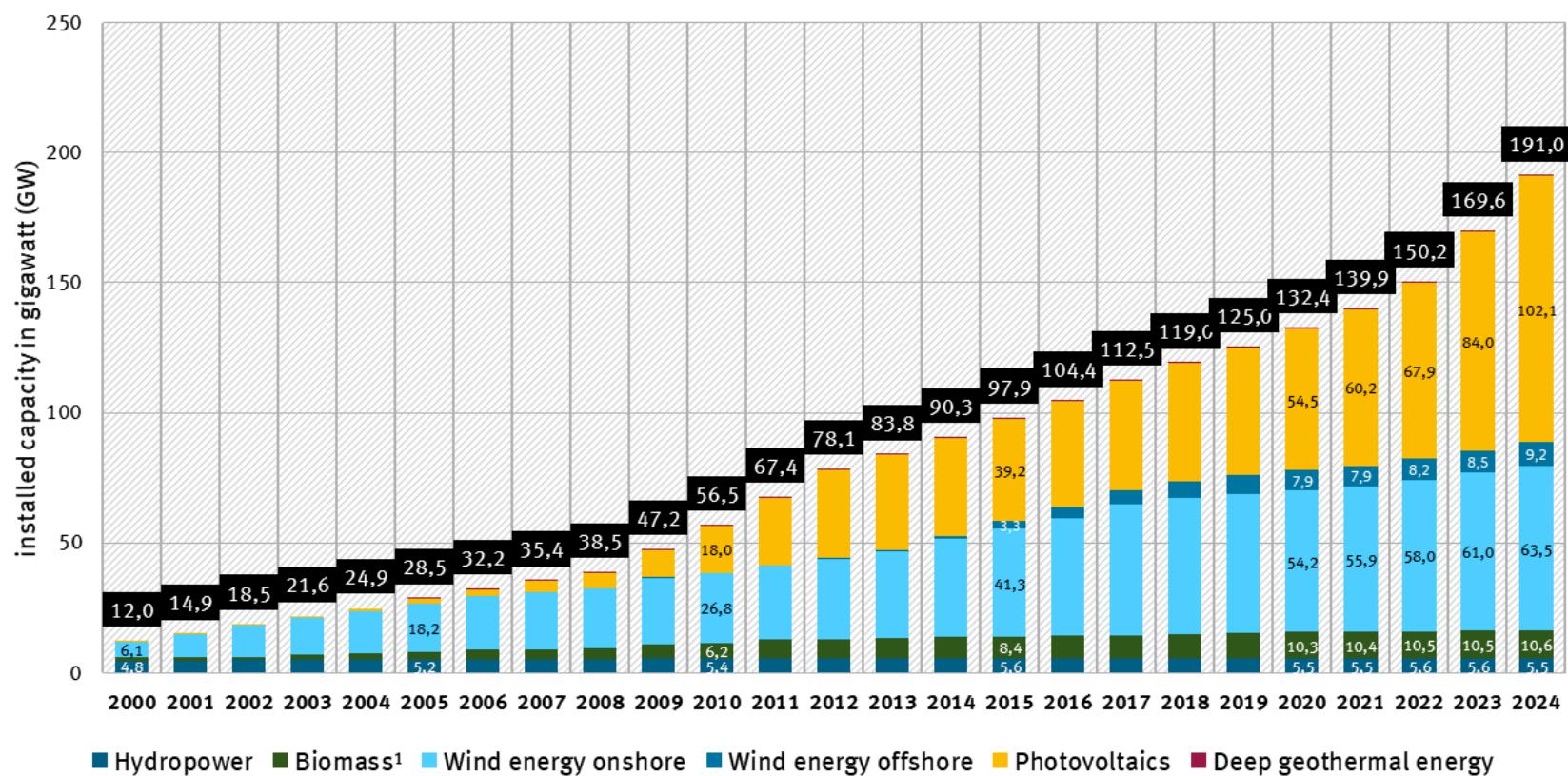


¹ Biogas, biomethane, landfill gas and sewage gas

Notice: geothermal power plants are not shown here because of their very small share (0,03%).

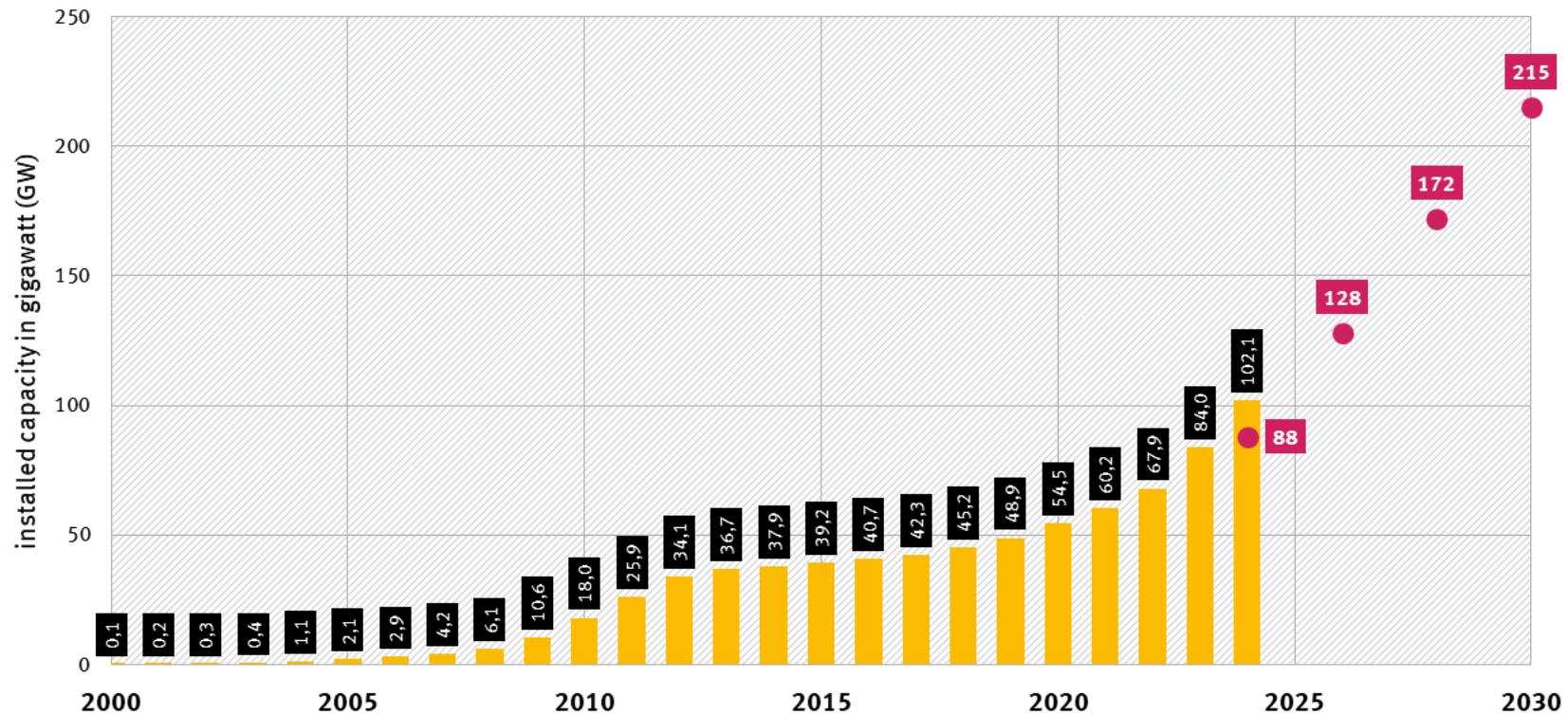
Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

Development of installed capacity for renewables-based electricity generation in Germany



¹ incl. solid and liquid biomass, biogas, biomethane, sewage gas and landfill gas and the biogenic fraction of waste

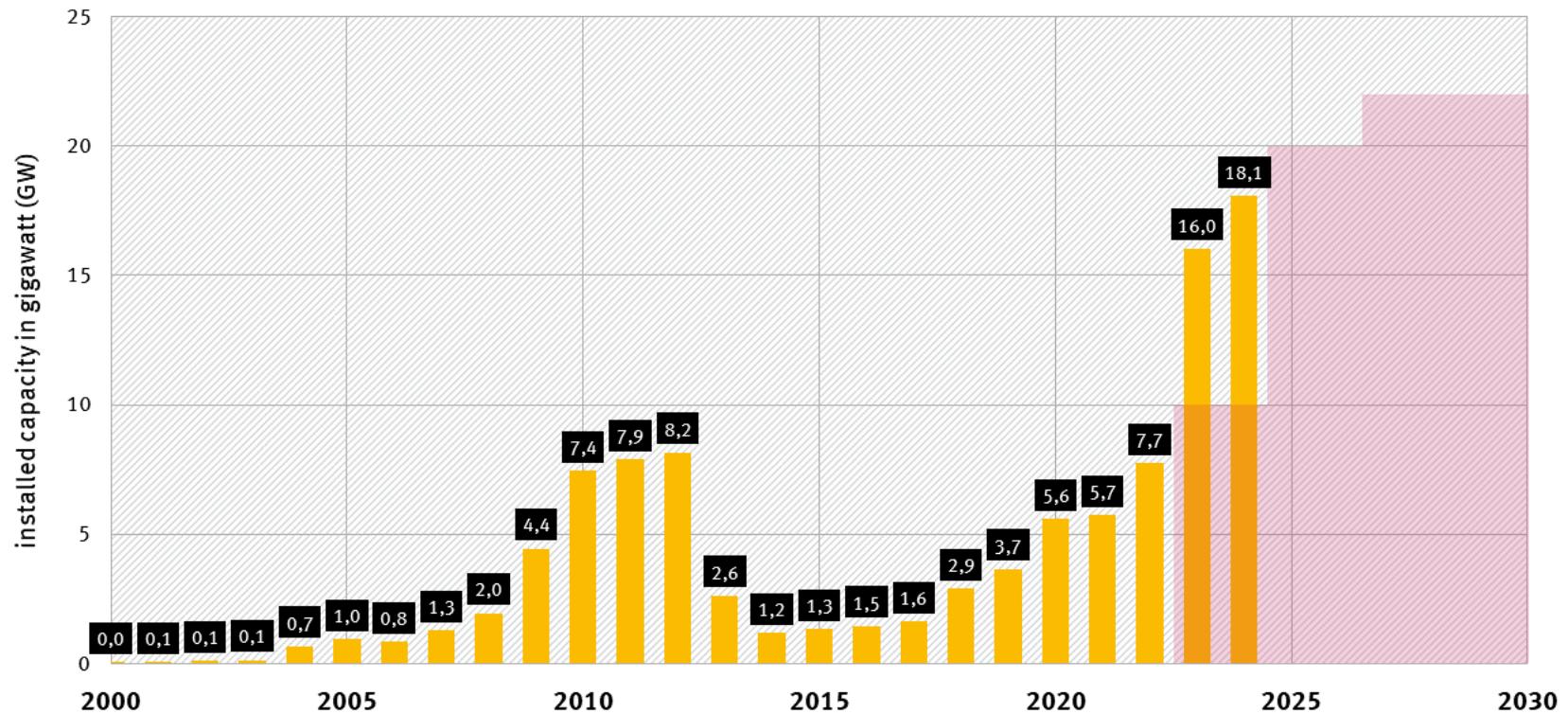
Development of installed capacity of photovoltaic plants in Germany as well as targets according to new renewable energy legislation (EEG 2023)



target values for the years 2024 to 2030 according to EEG 2023

Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

Development of capacity additions of photovoltaic plants in Germany as well as targets according to new renewable energy legislation (EEG 2023)

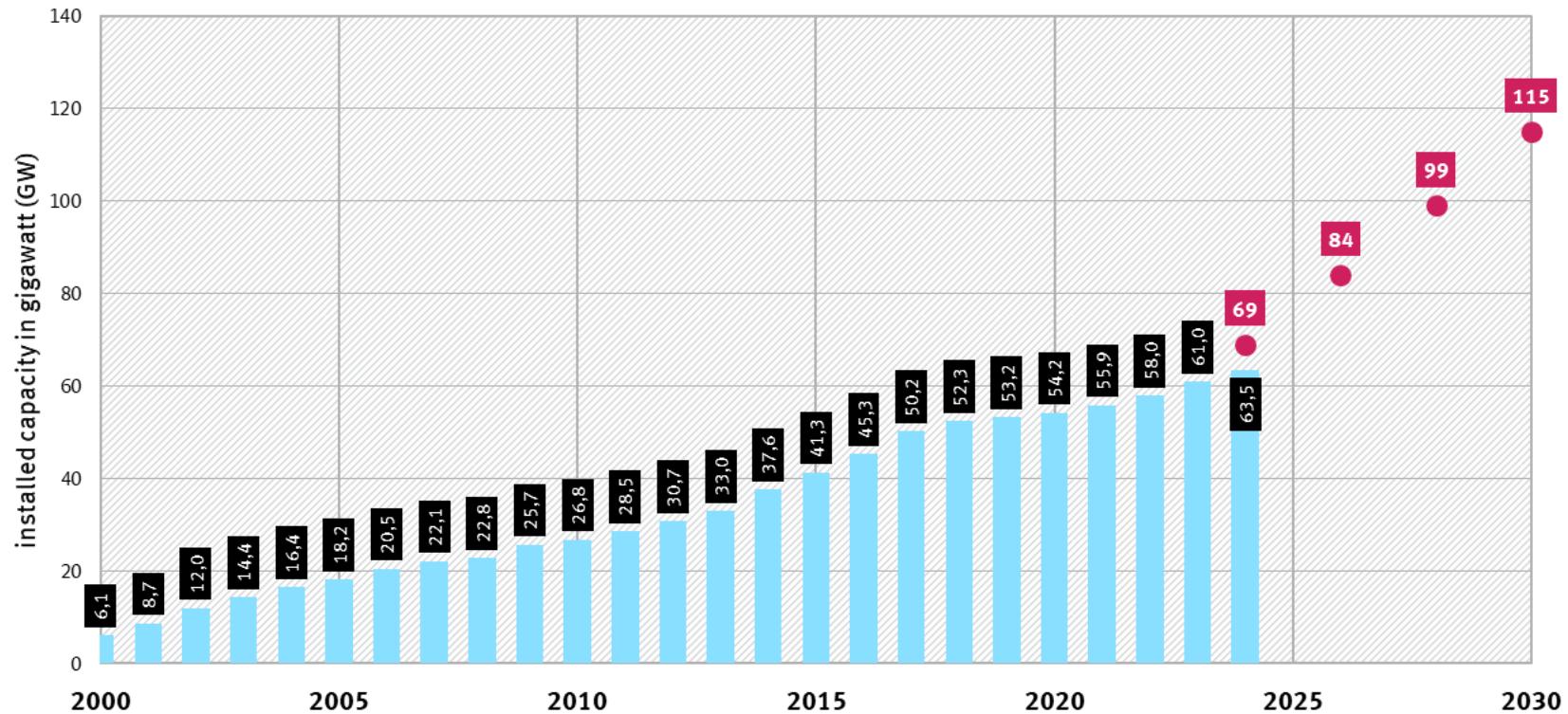


target values for the years 2024 to 2030 according to EEG 2023

Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

Development of installed capacity of onshore windpower in Germany

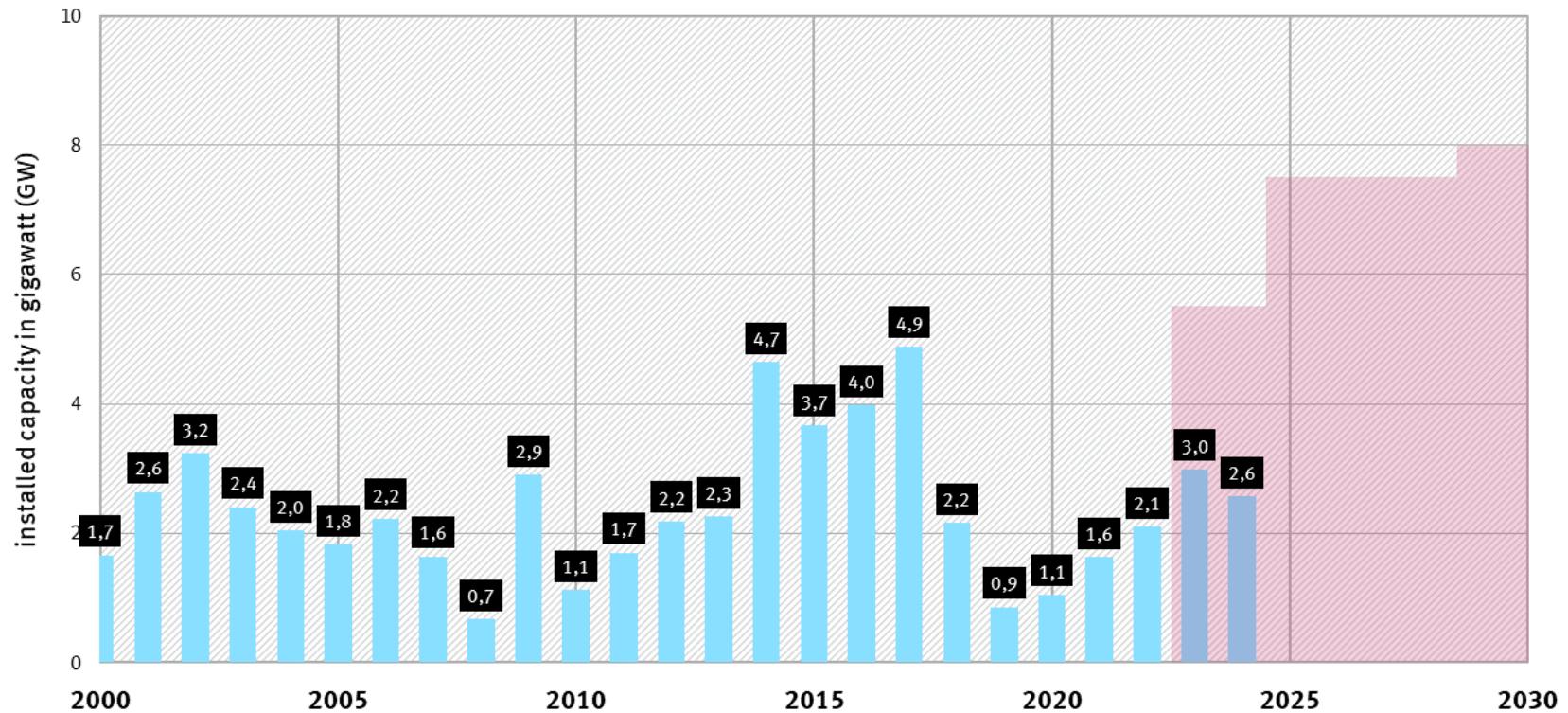
as well as targets according to new renewable energy legislation (EEG 2023)



target values for the years 2024 to 2030 according to EEG 2023

Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

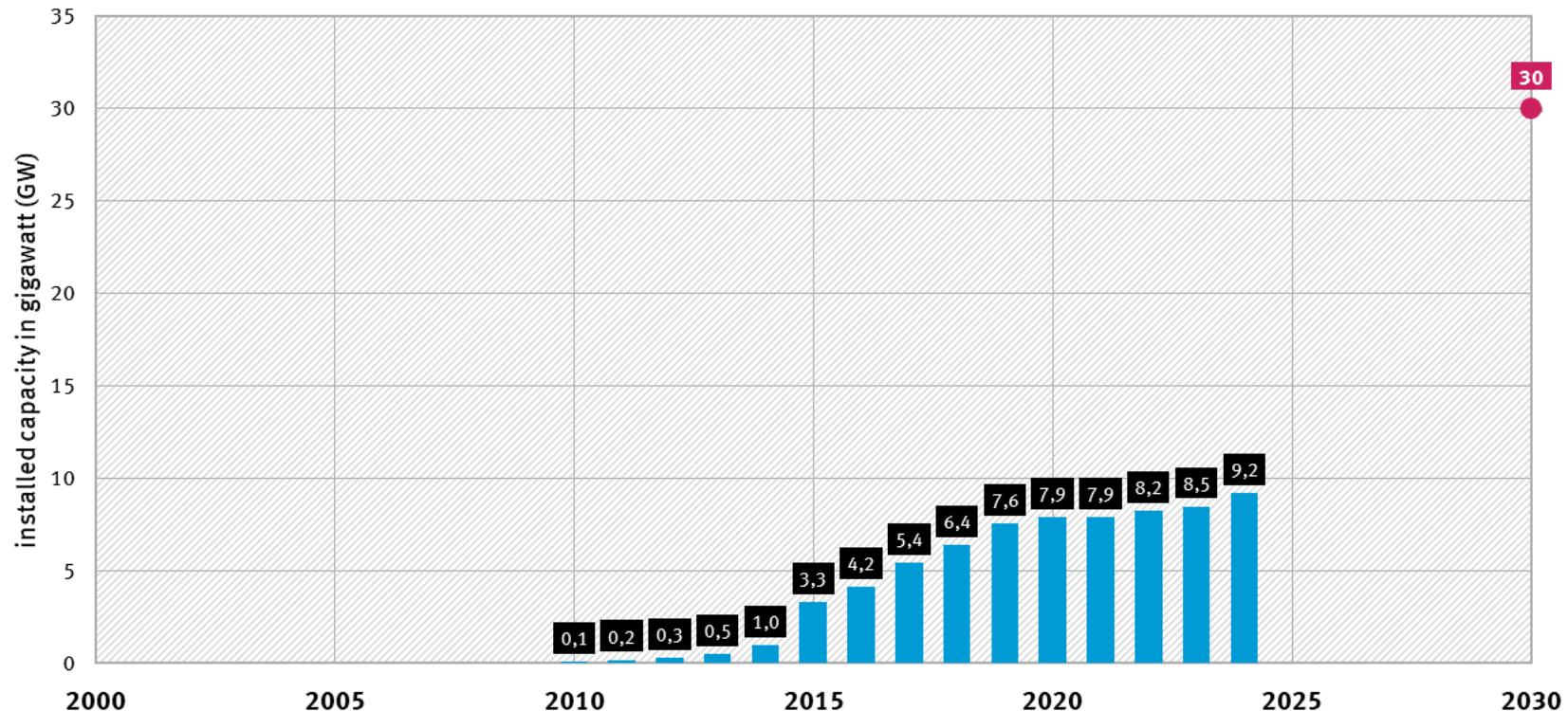
Development of capacity additions of photovoltaic plants in Germany as well as targets according to new renewable energy legislation (EEG 2023)



target values for the years 2024 to 2030 according to EEG 2023

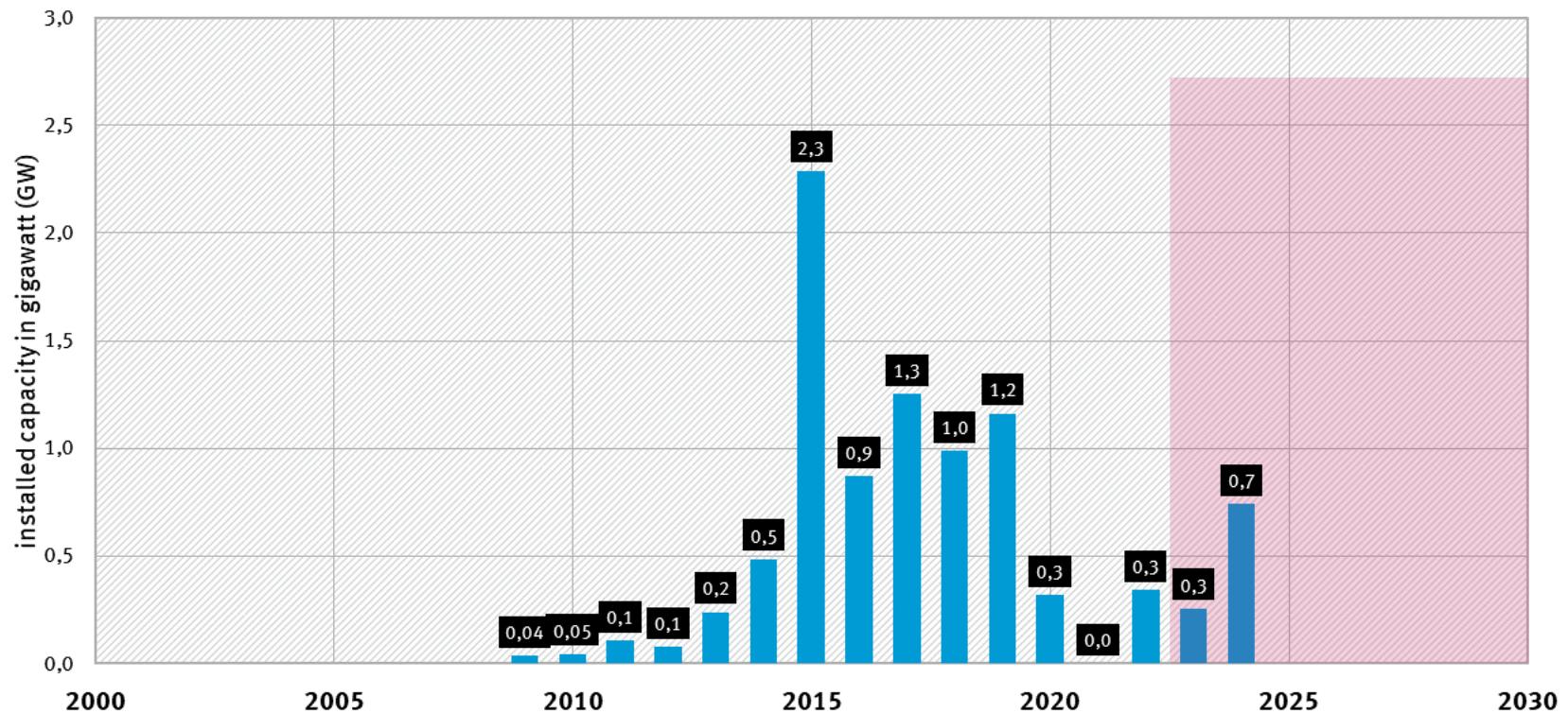
Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

Development of installed capacity of offshore windpower in Germany as well as target according to offshore support legislation (WindSeeG)

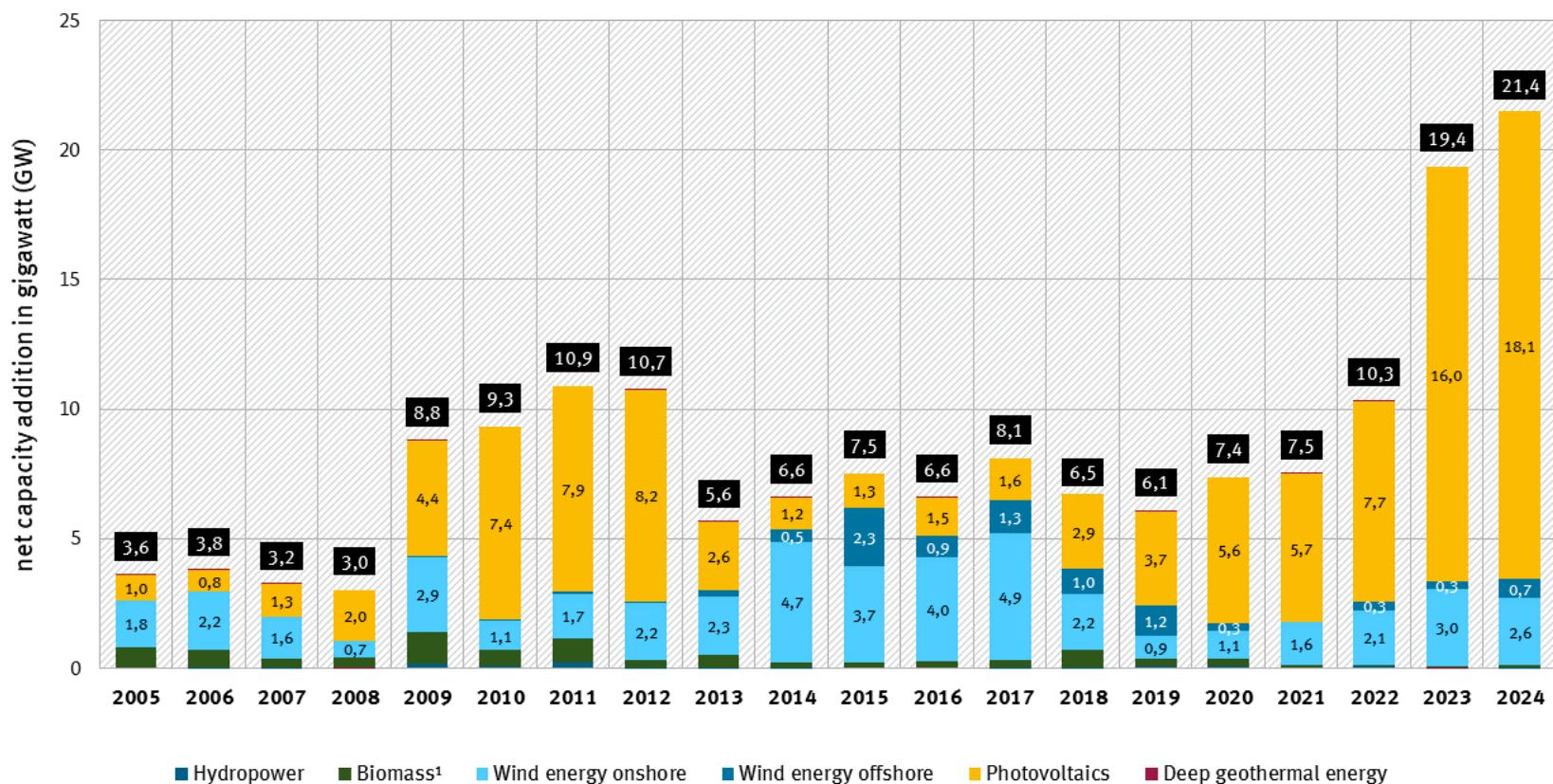


Development of capacity additions of offshore windpower in Germany

as well as indicative required additons according to offshore support legislation (WindSeeG)



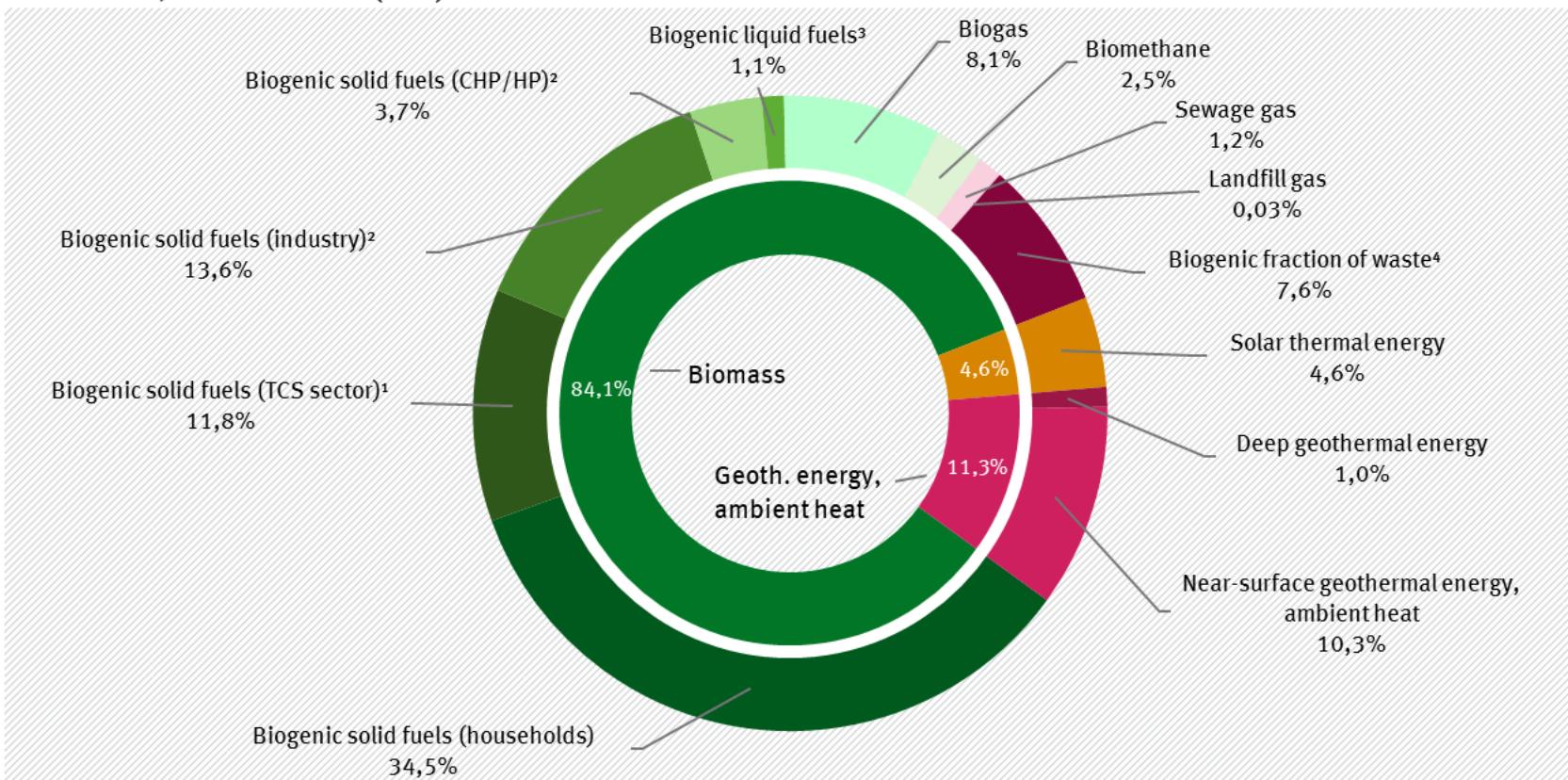
Development of net capacity addition of renewable power in Germany



¹ incl. solid and liquid biomass, biogas, biomethane, sewage gas and landfill gas and the biogenic fraction of waste

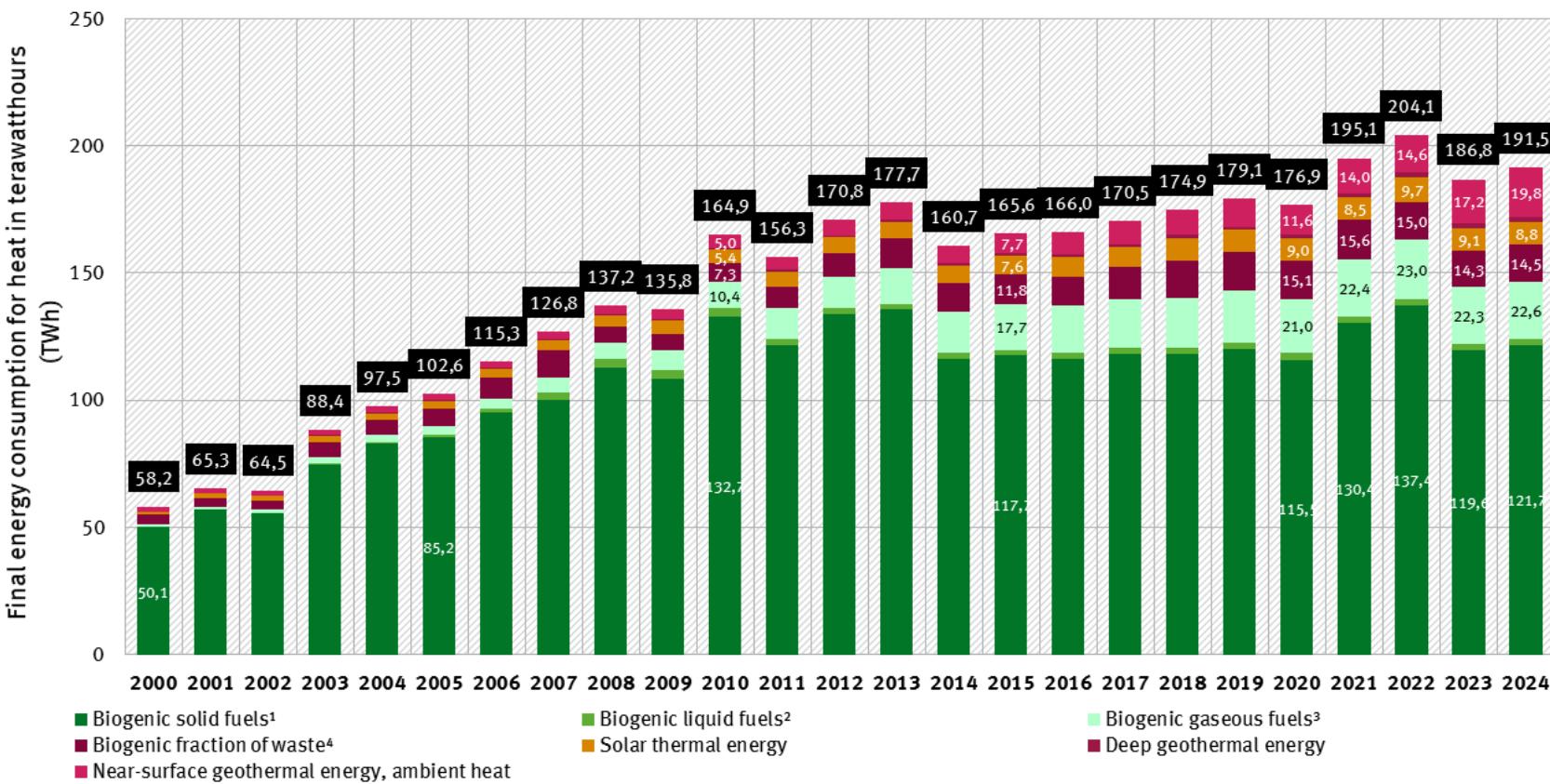
Final energy consumption from renewable energy sources for heating and cooling in Germany in

Total: 191,5 terawatthours (TWh)



¹ TCS corresponds to trade, commercial and service sector; ² incl. sewage sludge and charcoal; ³ incl. biofuels used in agriculture, forestry, construction and military;

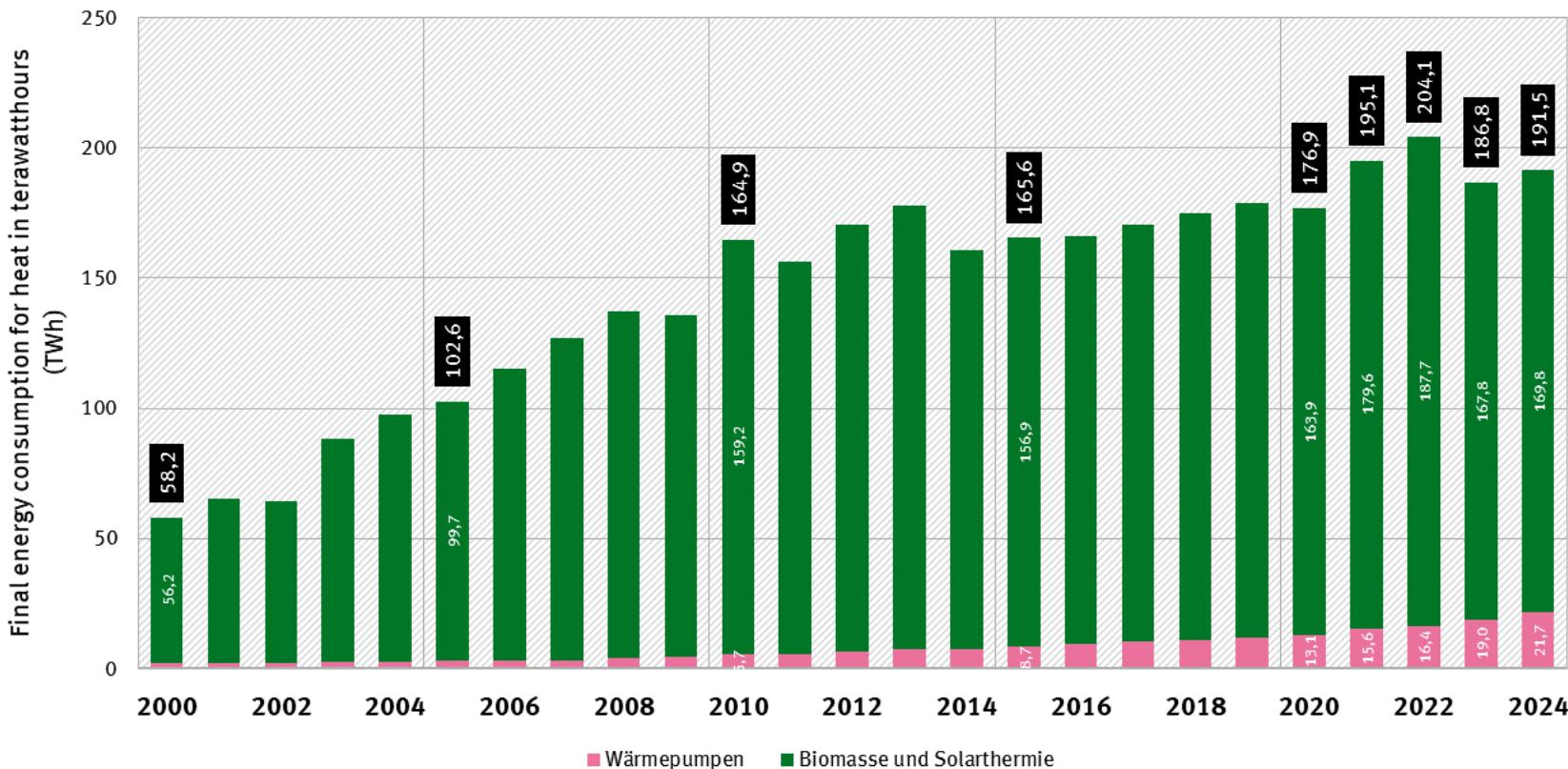
Development of final energy consumption from renewable energy sources for heating and cooling in Germany



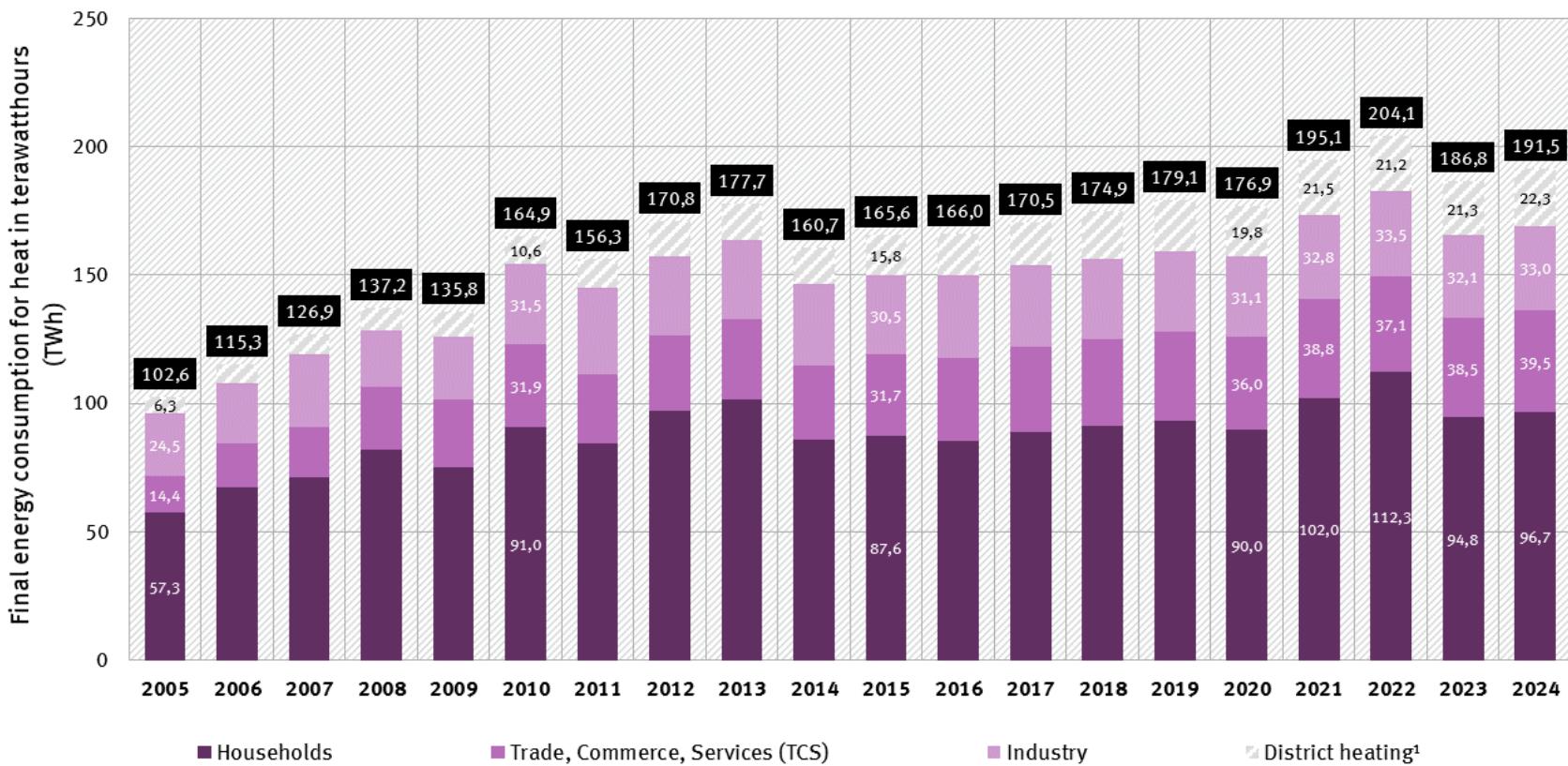
¹ incl. sewage sludge and charcoal; ² incl. biofuels used in agric., forestry, constr. and military; since 2010 incl. blended bioethanol

³ biogas, biomethane, sewage gas and landfill gas; ⁴ biogenic fr. of waste in waste incineration plants est. at 50 %,

Development of final energy consumption from renewable energy sources for heating and cooling in Germany

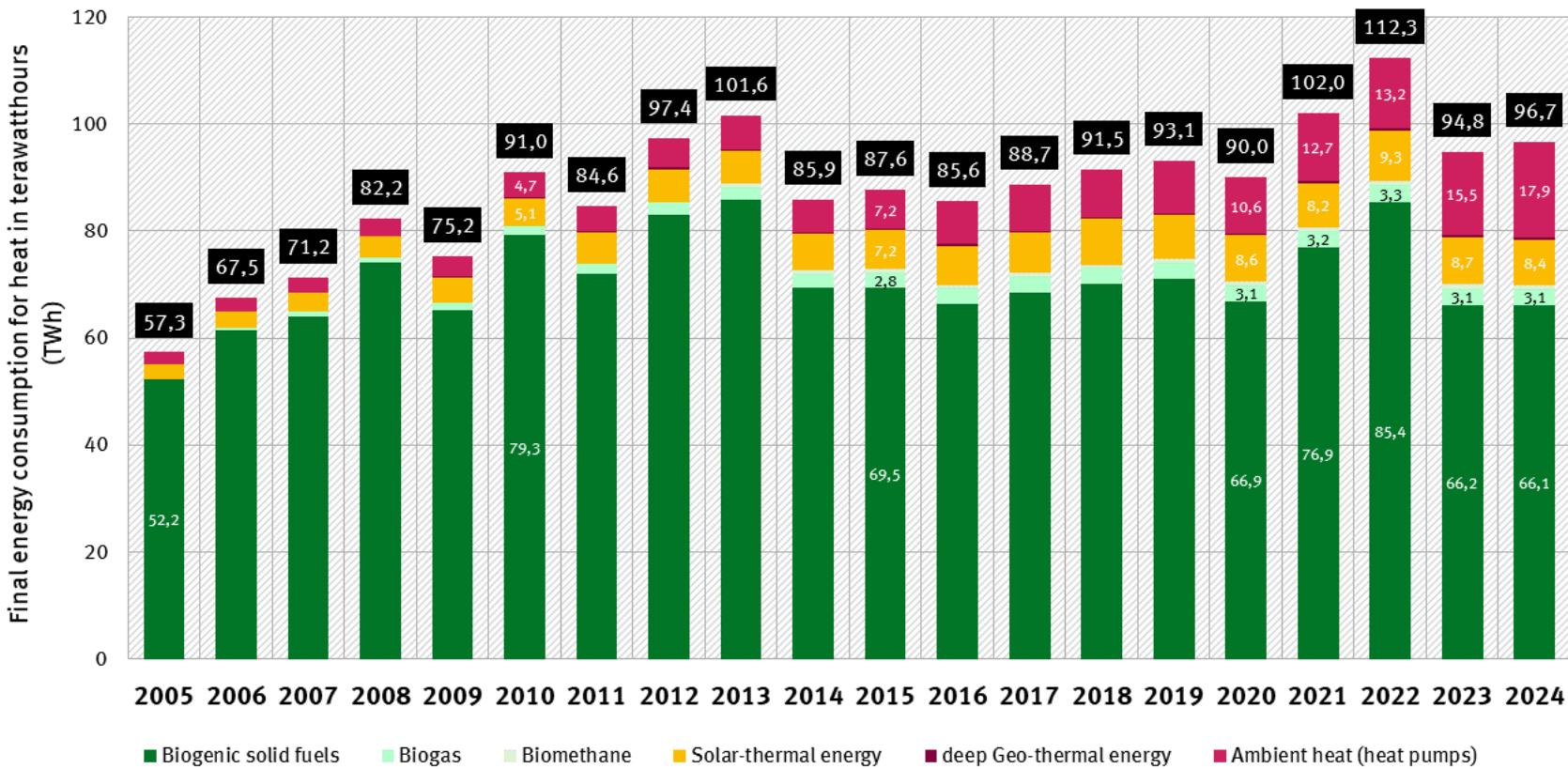


Development of final energy consumption from renewable energy sources for heating and cooling in Germany

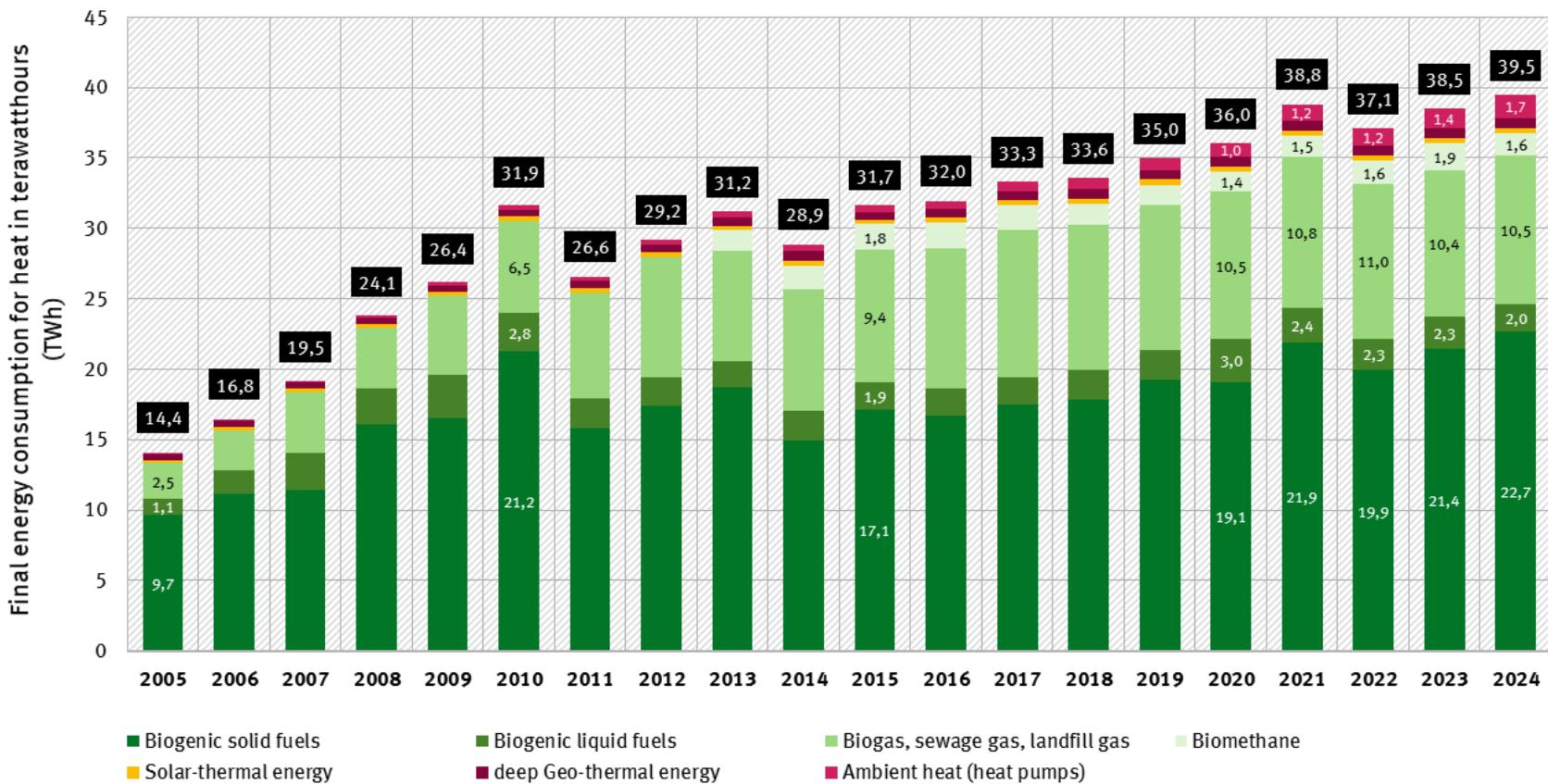


¹ district heat shown here separately and not attributed to any of the specific enduse sectors

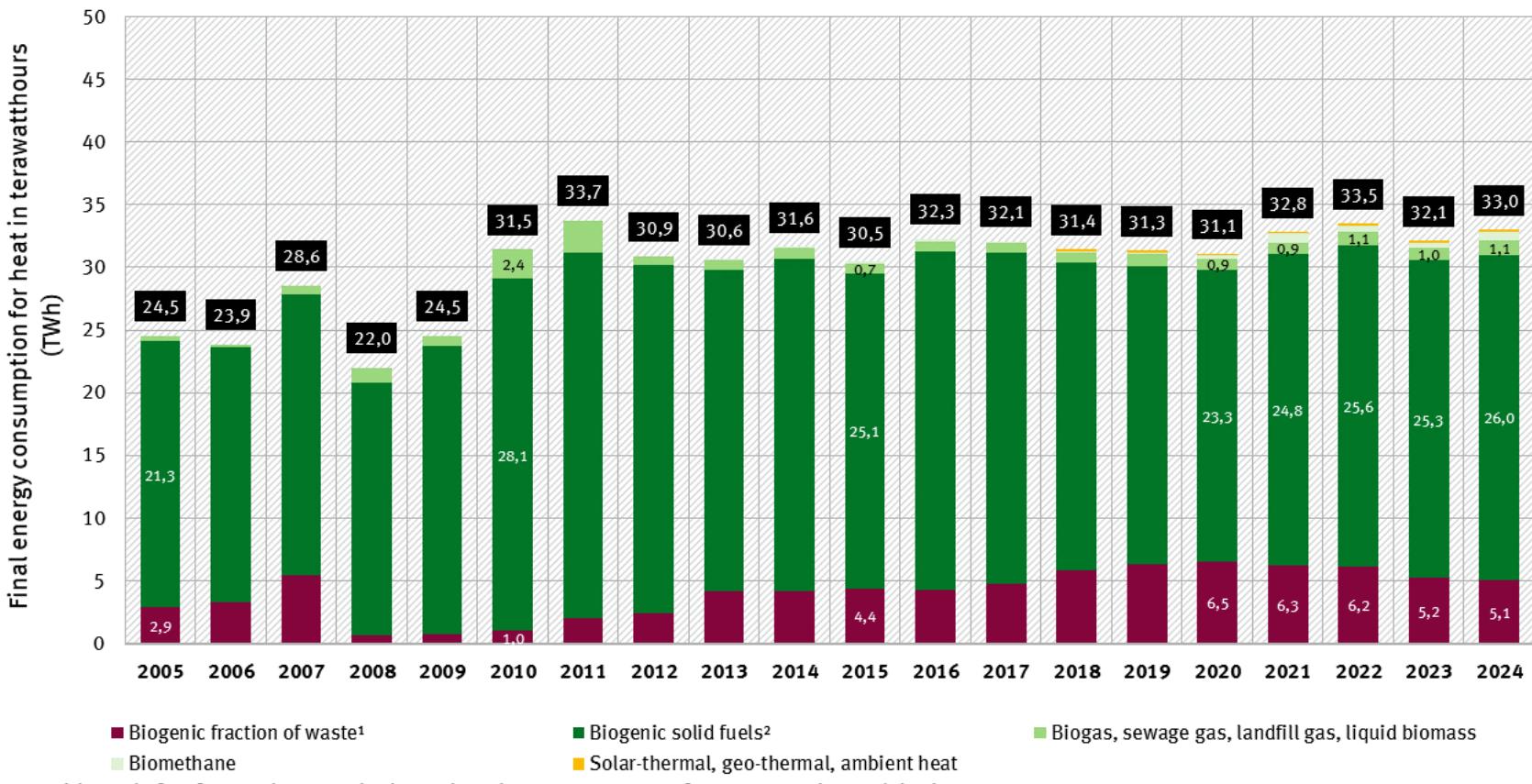
Development of final energy consumption from renewable energy sources for heating and cooling in the household sector in Germany



Development of final energy consumption from renewable energy sources for heating and cooling in the trade, commerce & service (TCS) sector in Germany



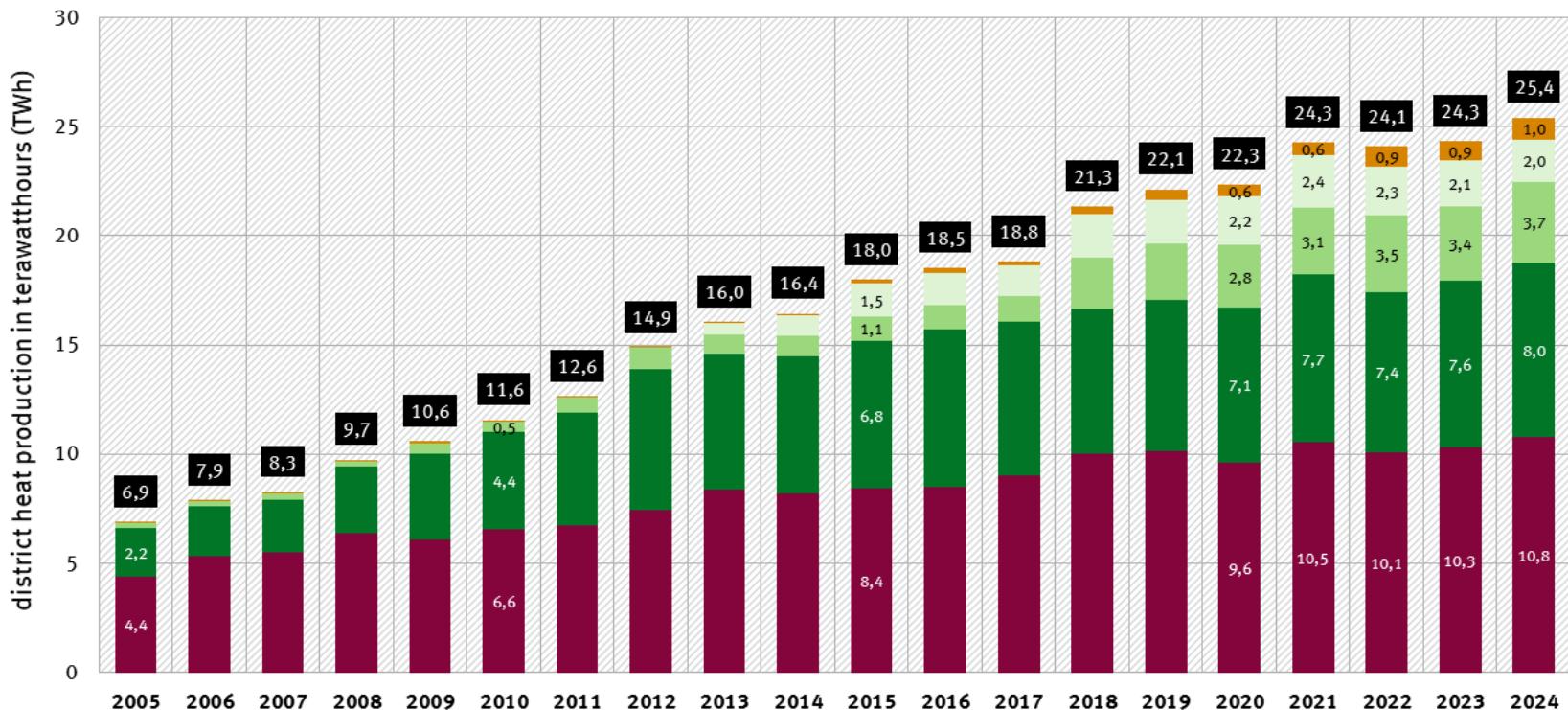
Development of final energy consumption from renewable energy sources for heating and cooling in the industry in Germany



¹ biogenic fr. of waste in waste incineration plants est. at 50 %, from 2008 only municipal waste;

² inkl. sewage sludge

Development of district heat production from renewable energy sources in Germany

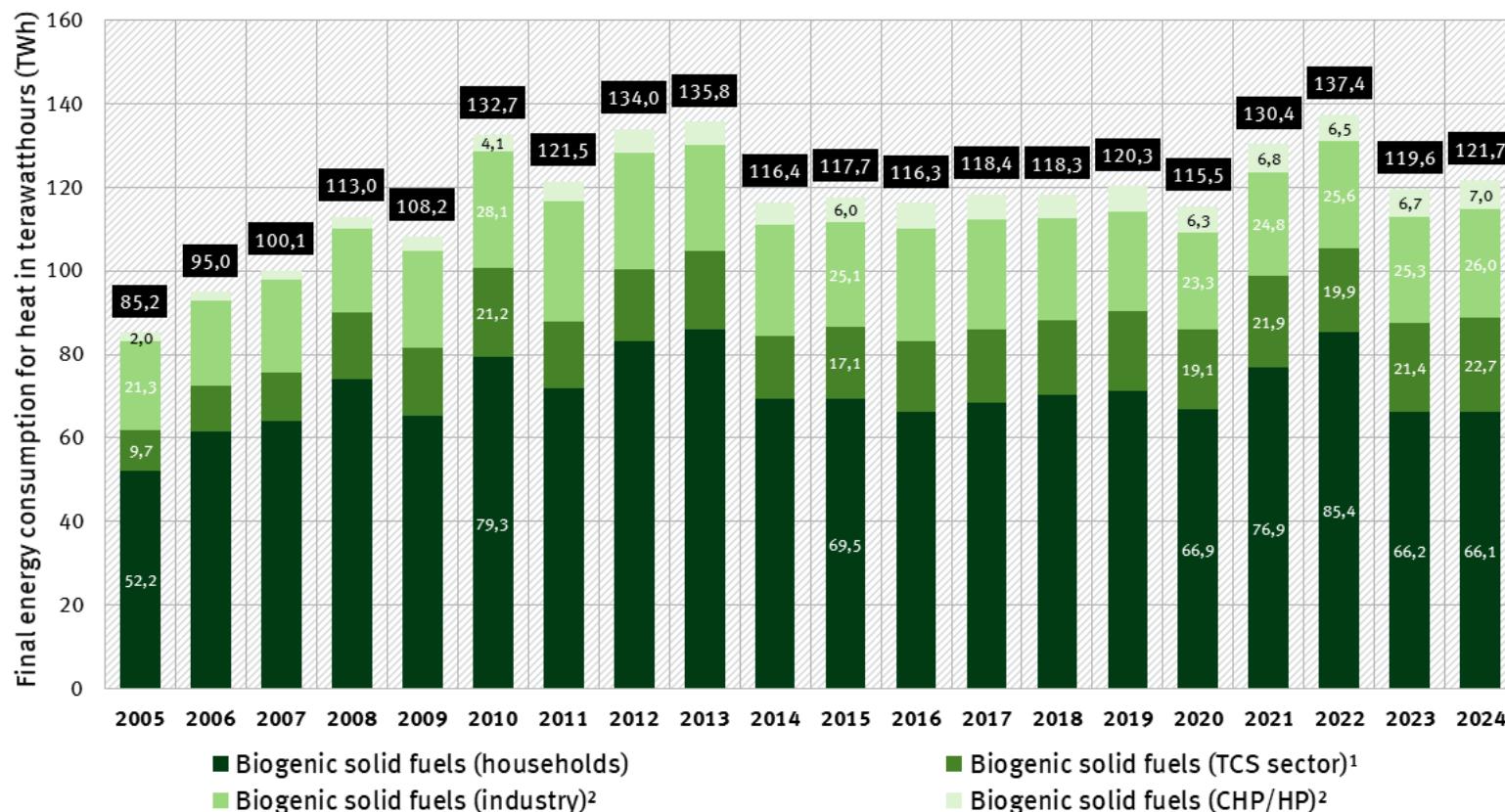


■ Biogenic fraction of waste¹ ■ Biogenic solid fuels² ■ Biogenic gaseous and liquid fuels without biomethane ■ Biomethane ■ Solar-thermal, geo-thermal, ambient heat

¹ biogenic fr. of waste in waste incineration plants est. at 50 %, from 2008 only municipal waste;

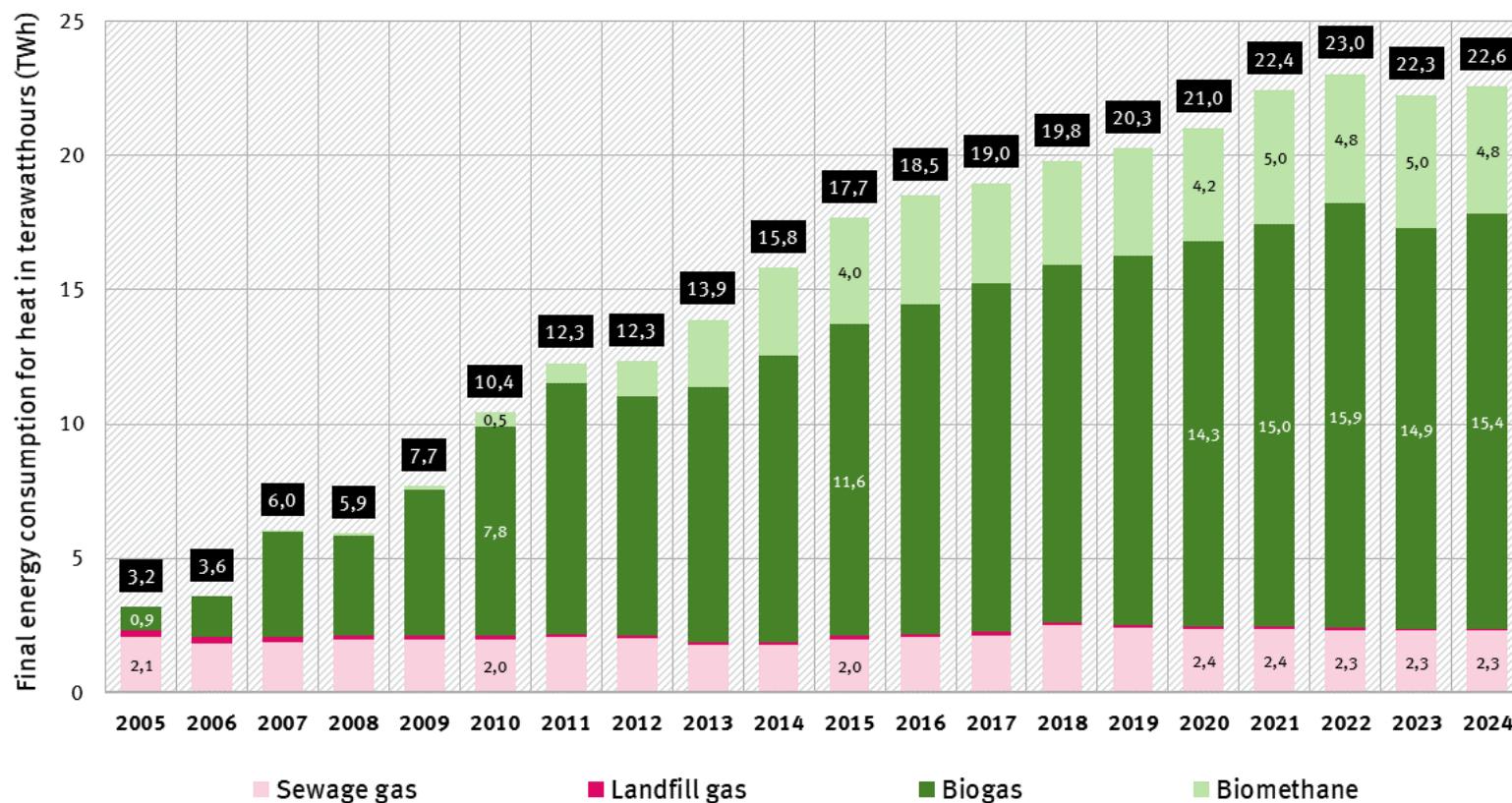
² inkl. sewage sludge;

Development of final energy consumption from solid biomass for heating and cooling in Germany

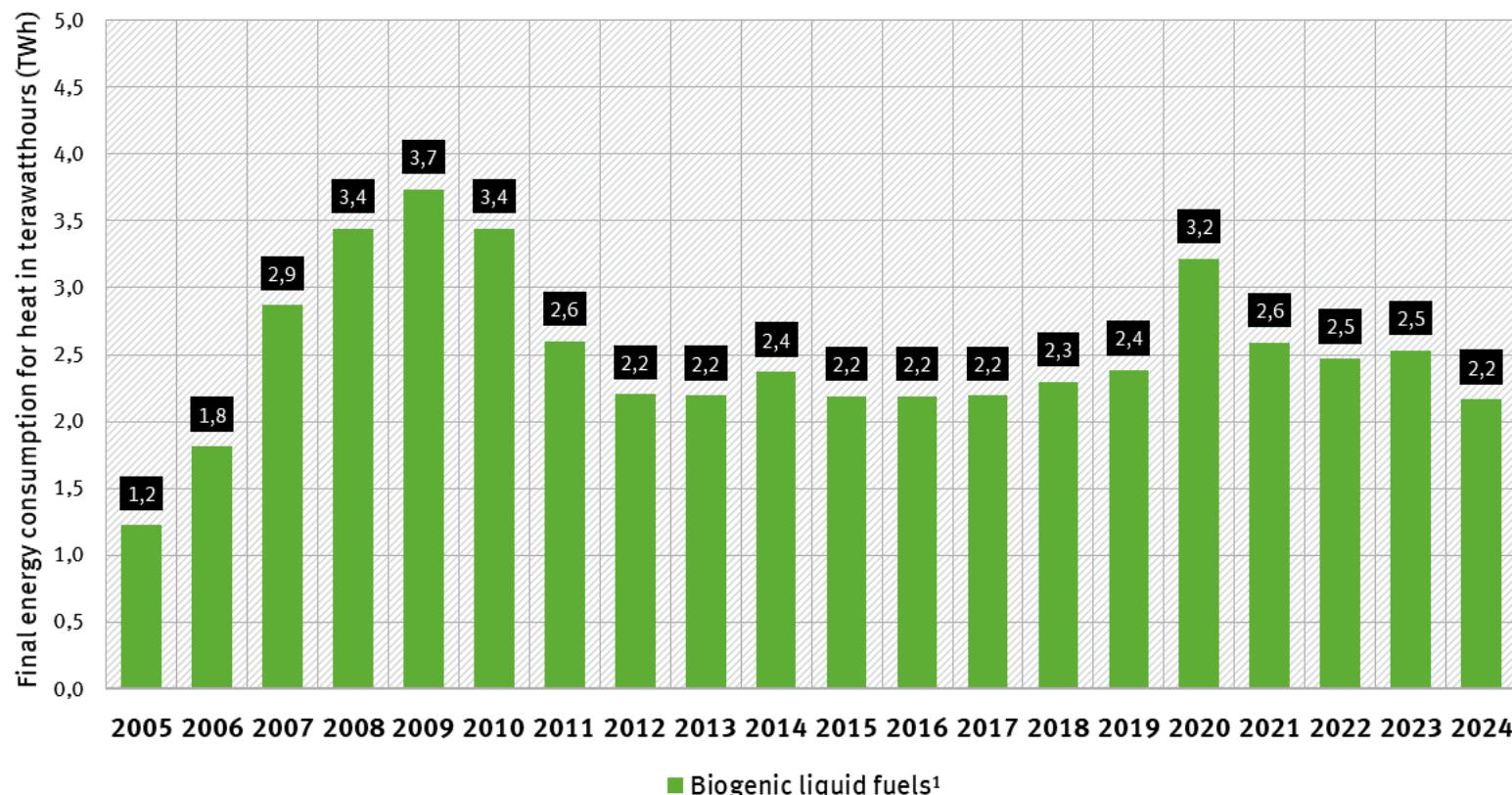


¹ TCS corresponds to trade, commercial and service sector; ² incl. sewage sludge and charcoal

Development of final energy consumption from gaseous biomass

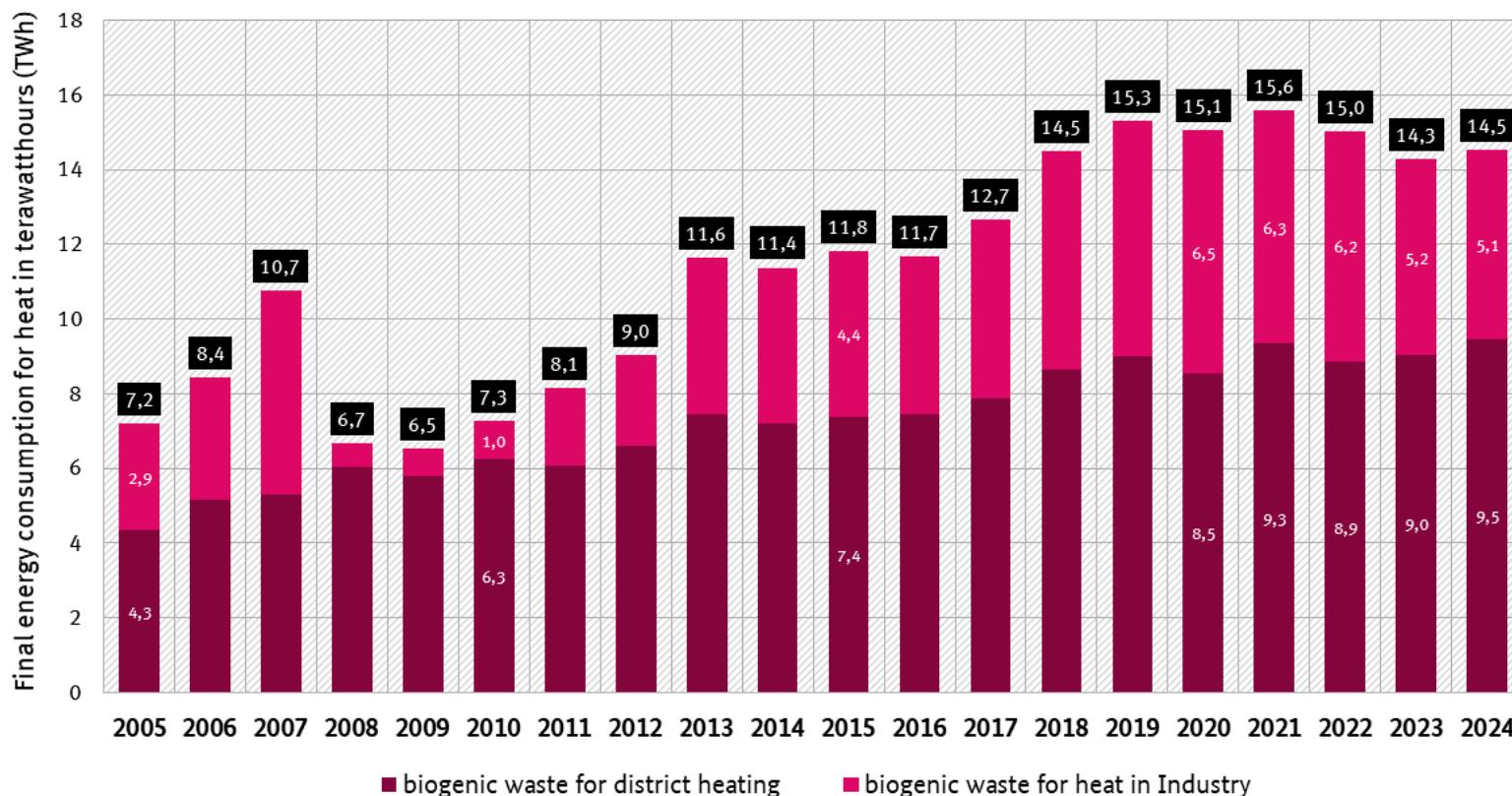


Development of final energy consumption from liquid biomass for heating and cooling in Germany



¹ incl. biofuels used in agriculture, forestry, construction and military

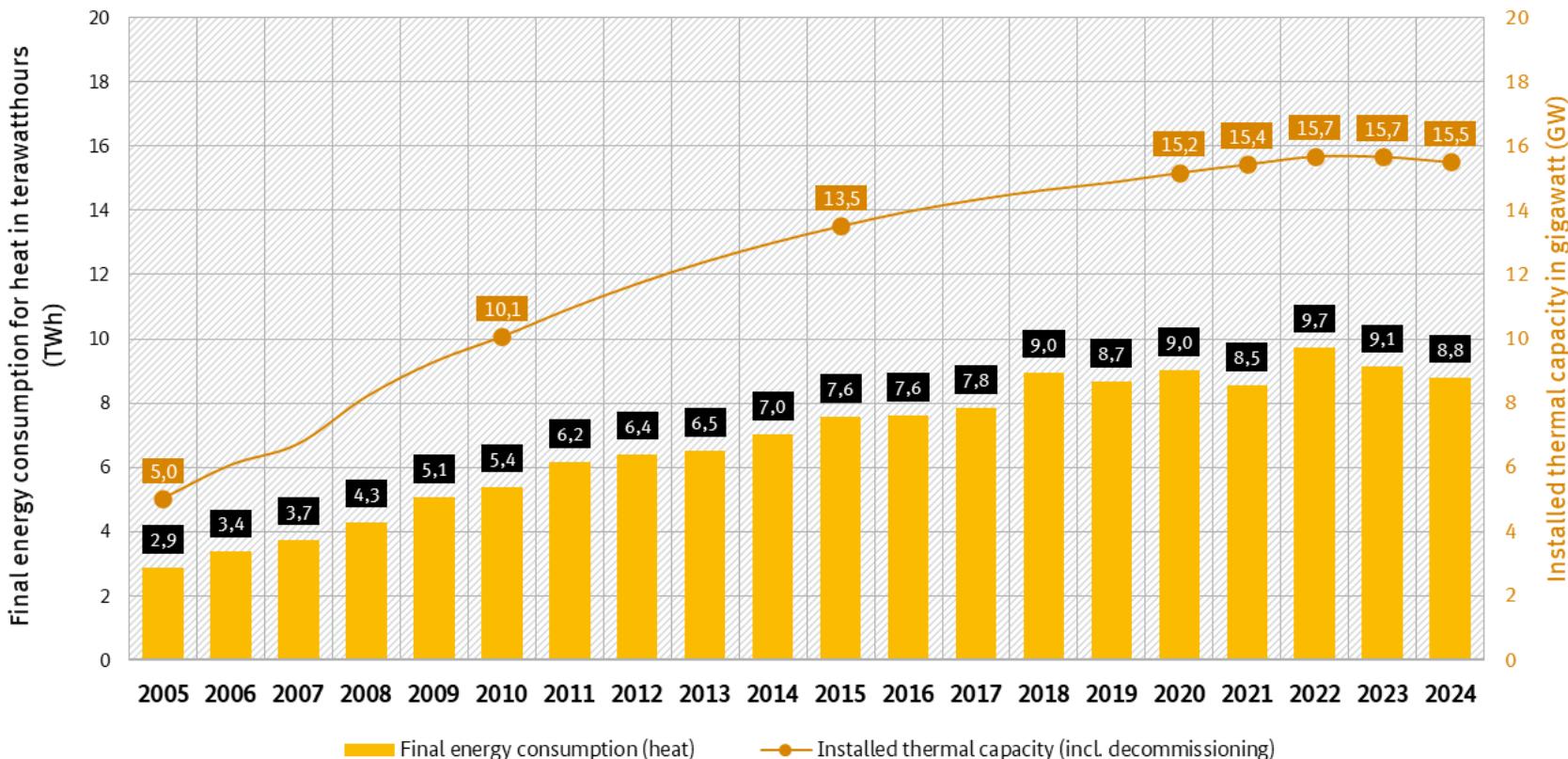
Development of final energy consumption from biogenic waste for heating and cooling in Germany



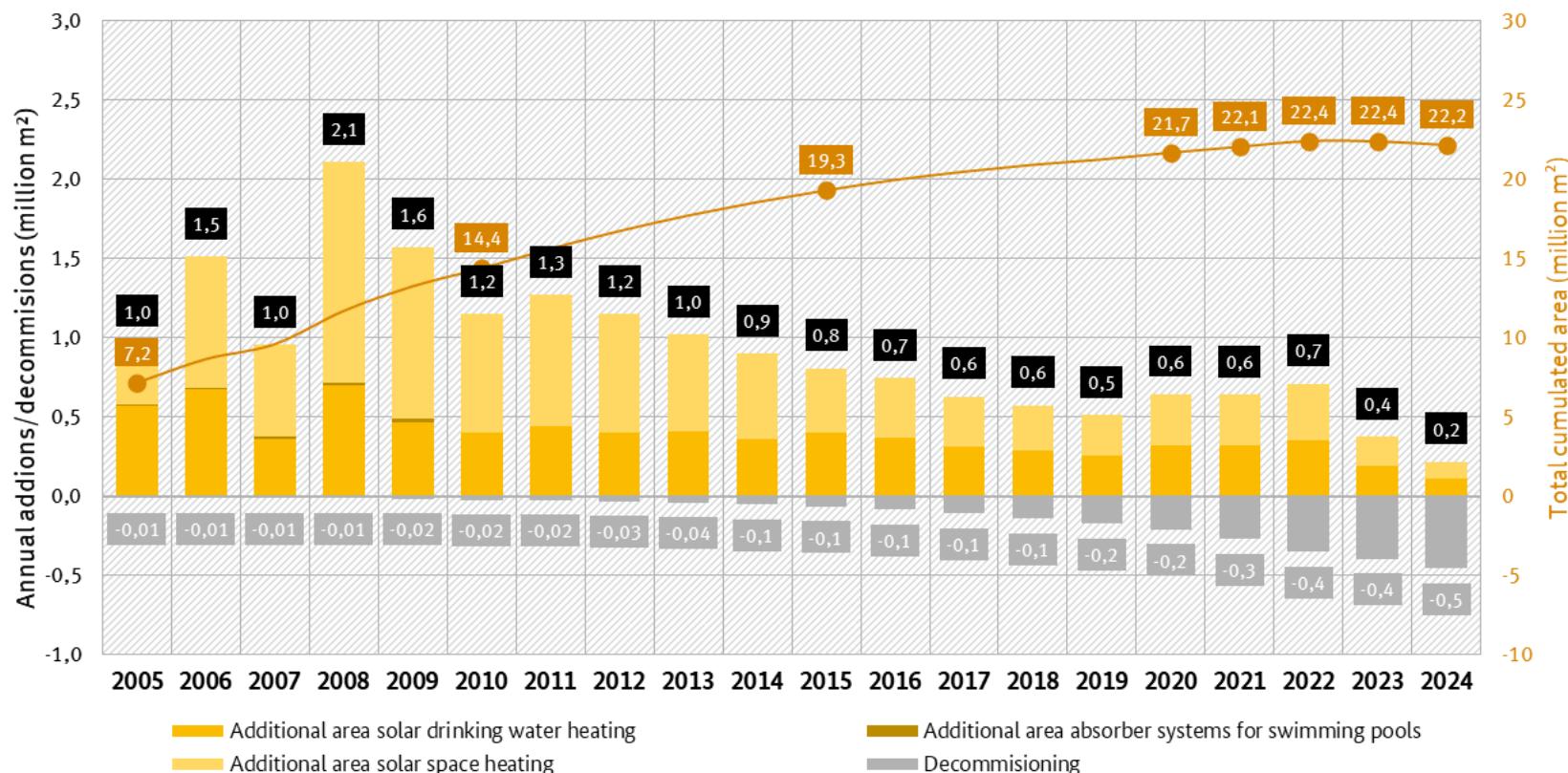
Notice: biogenic fraction of waste in waste incineration plants estimated at 50 %, since 2008 municipal waste only; decrease 2008 due to first-time inclusion of newly available data (statistical adjustment)

Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

Development of final energy consumption from solar thermal energy for heating and cooling



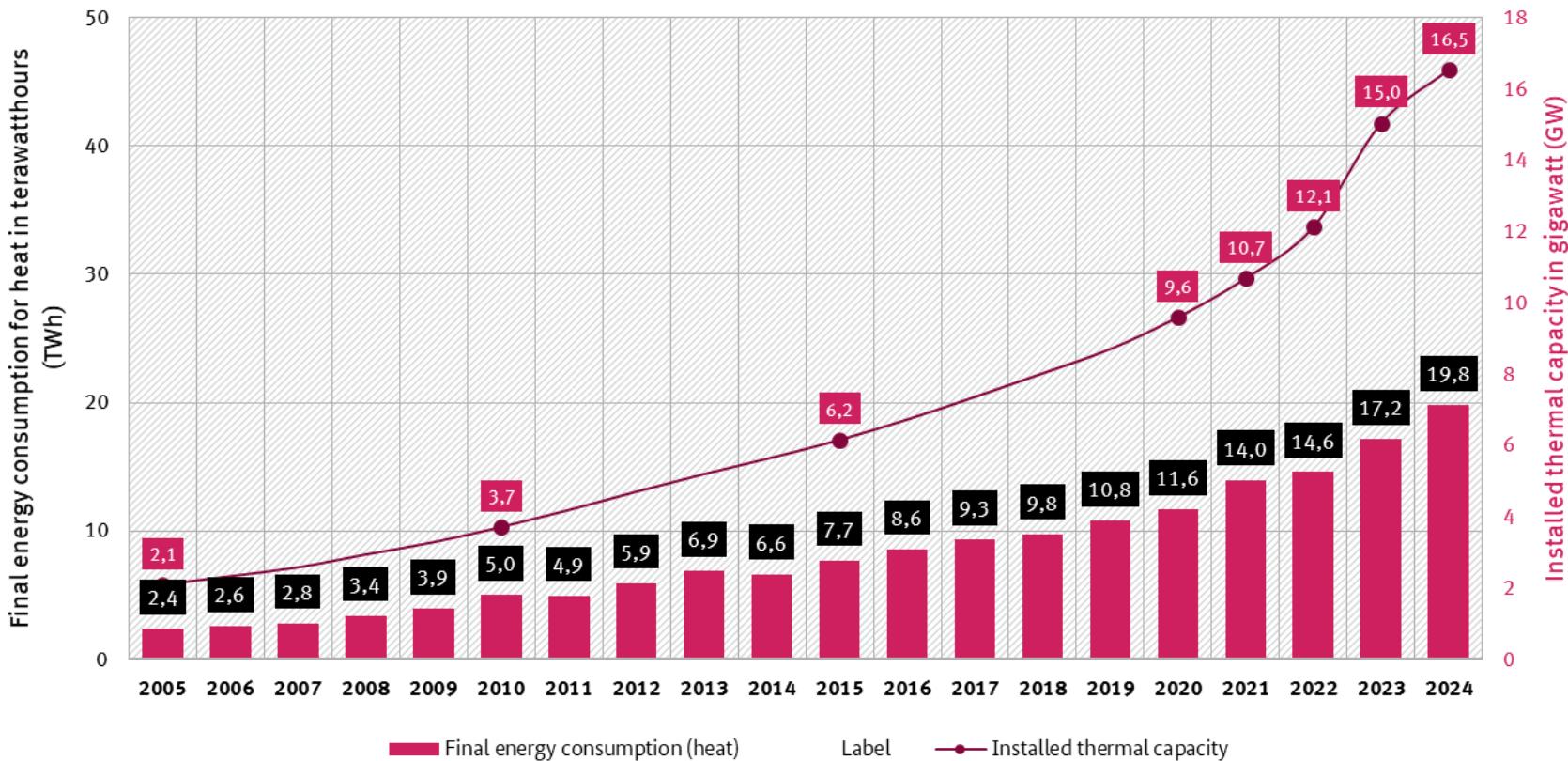
Additions and Decommissioning of solar thermal plants in Germany



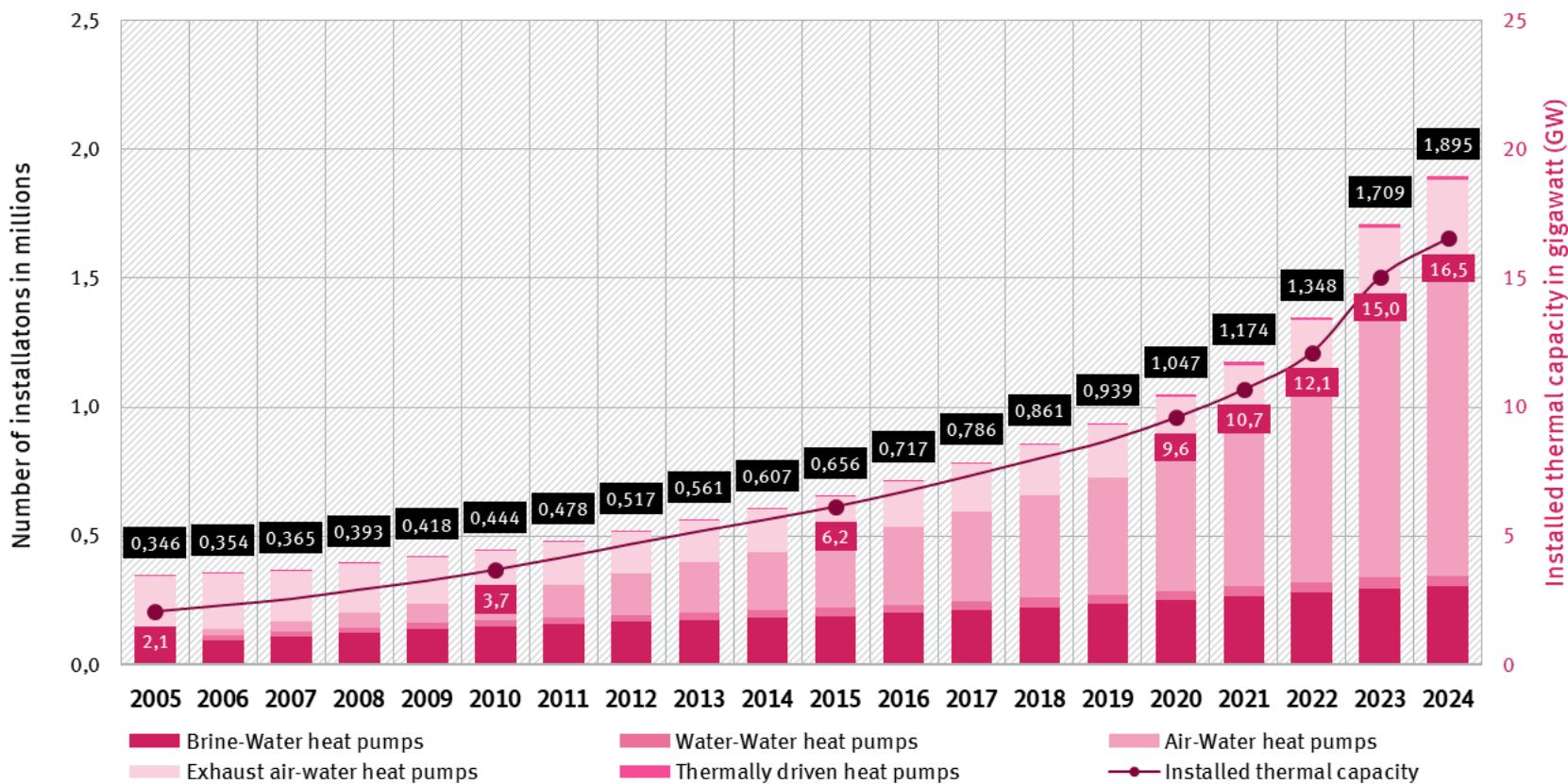
Notice: the figure comprises combined solar thermal systems as well as solar thermal support for heating and service water heating; in all categories decommissioning of systems is taken into account

Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

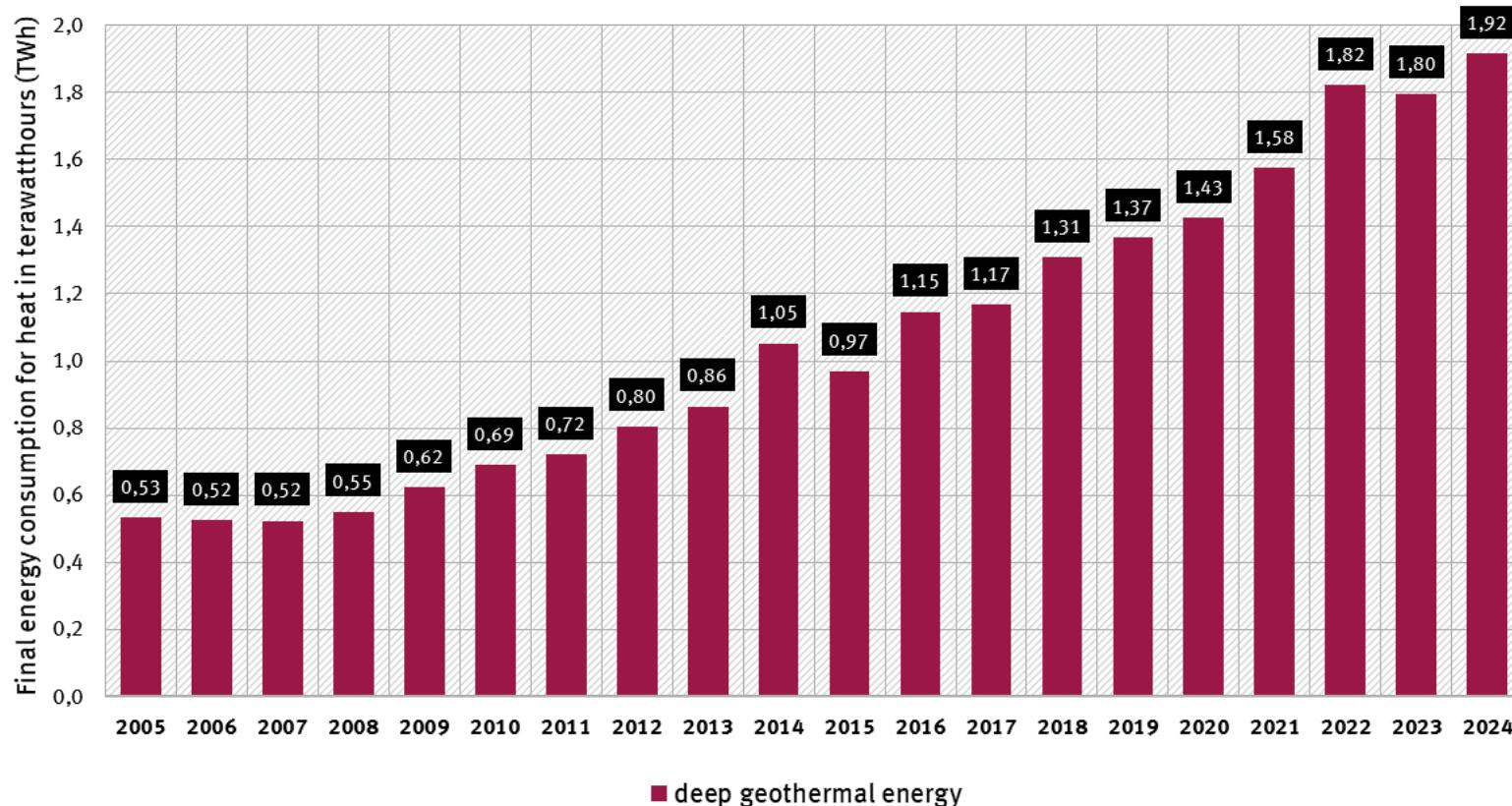
Development of final energy consumption from near-surface geothermal energy



Development of heat pumps in Germany

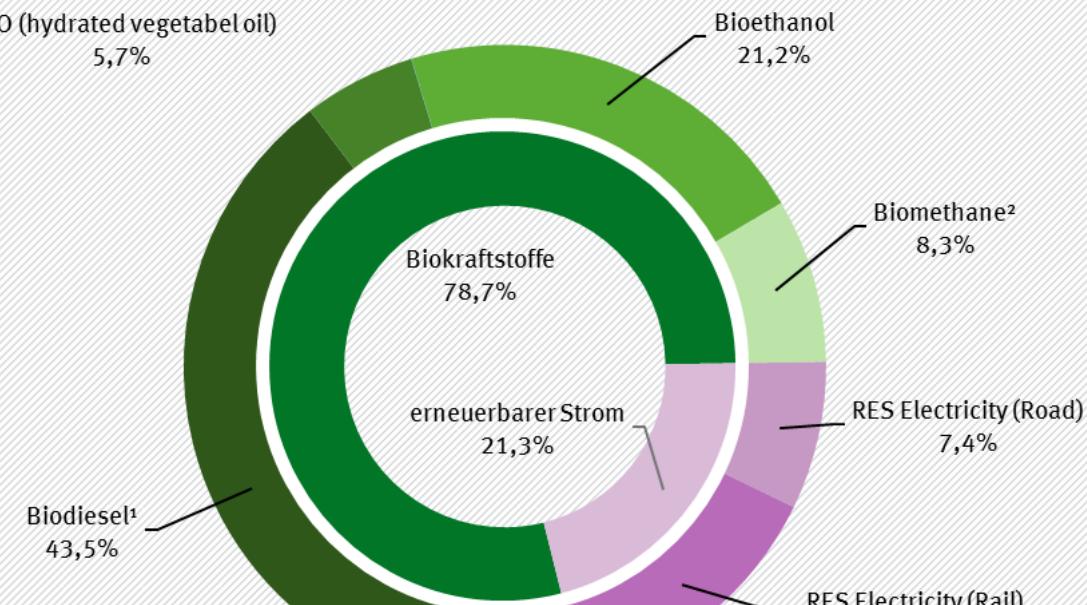


Development of final energy consumption from deep geothermal sources



Final energy consumption from renewable sources in the transport sector¹ in Germany in the year

Total: 43 terawatthours (TWh)



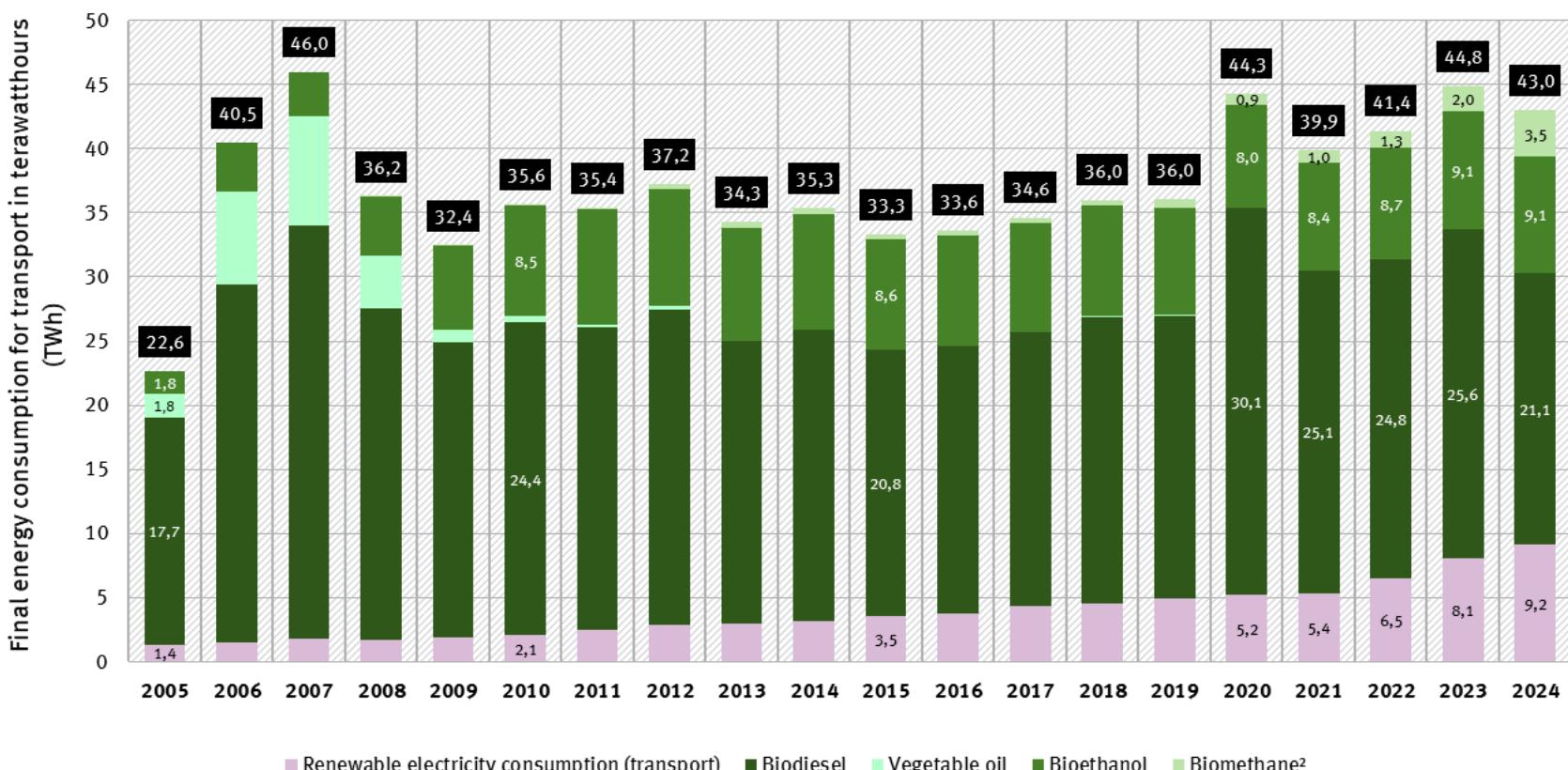
¹ consumption fuel in the transport sector (excl. agriculture, forestry, construction and military), plus electricity

² based on heating value, from 2023 incl. Bio-LNG

Notice: share of vegetable oil and RFNBO not shown because of very small contribution

Source: Working Group on Renewable Energy-Statistics (AGEE-Stat); as of September 2025

Development of final energy consumption from renewable sources in the transport sector in Germany¹

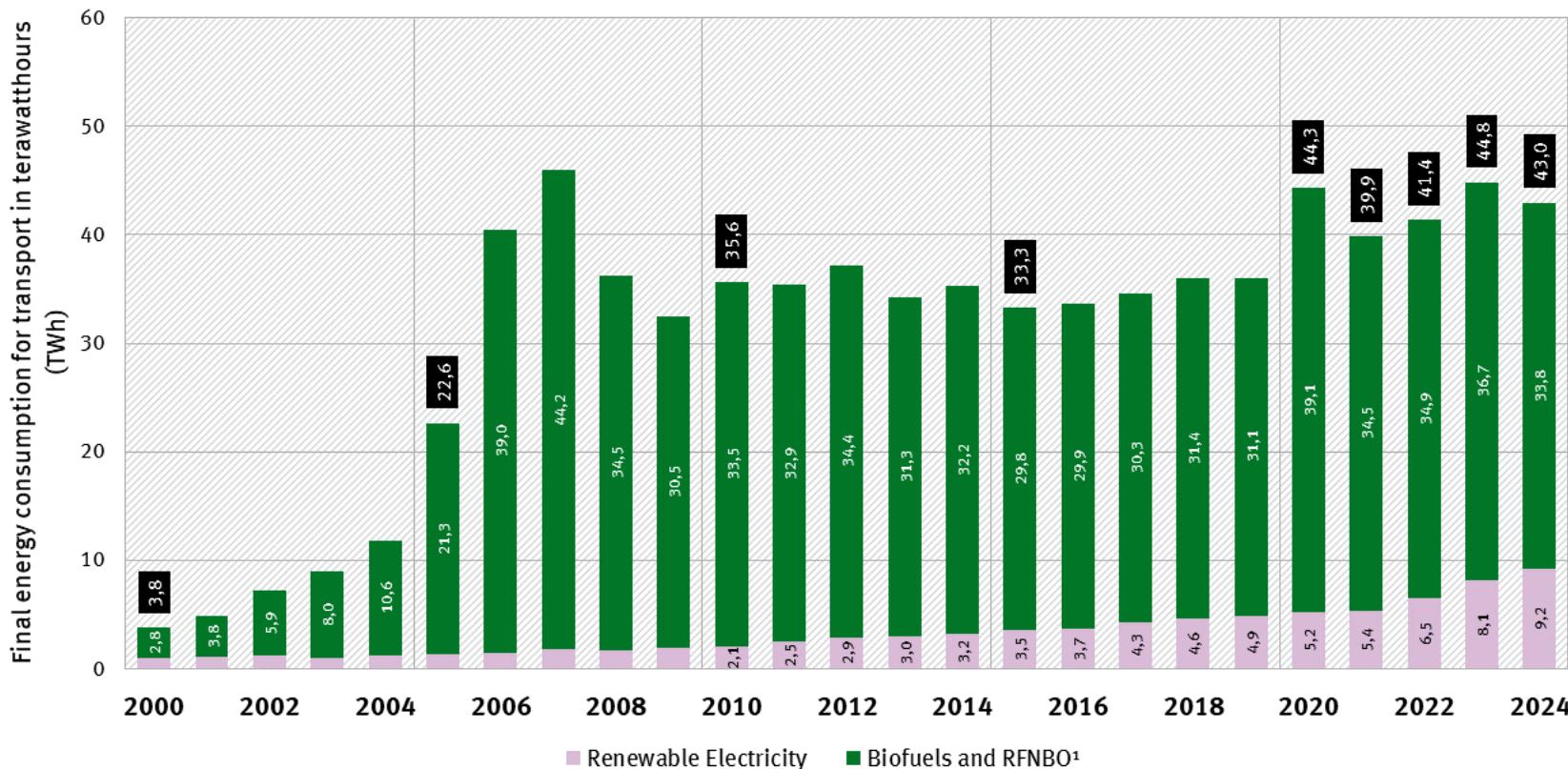


¹ consumption of biodiesel (including HVO) in the transport sector (excluding consumption in agriculture, forestry, construction and military)

² based on heating value, from 2023 incl. Bio-LNG

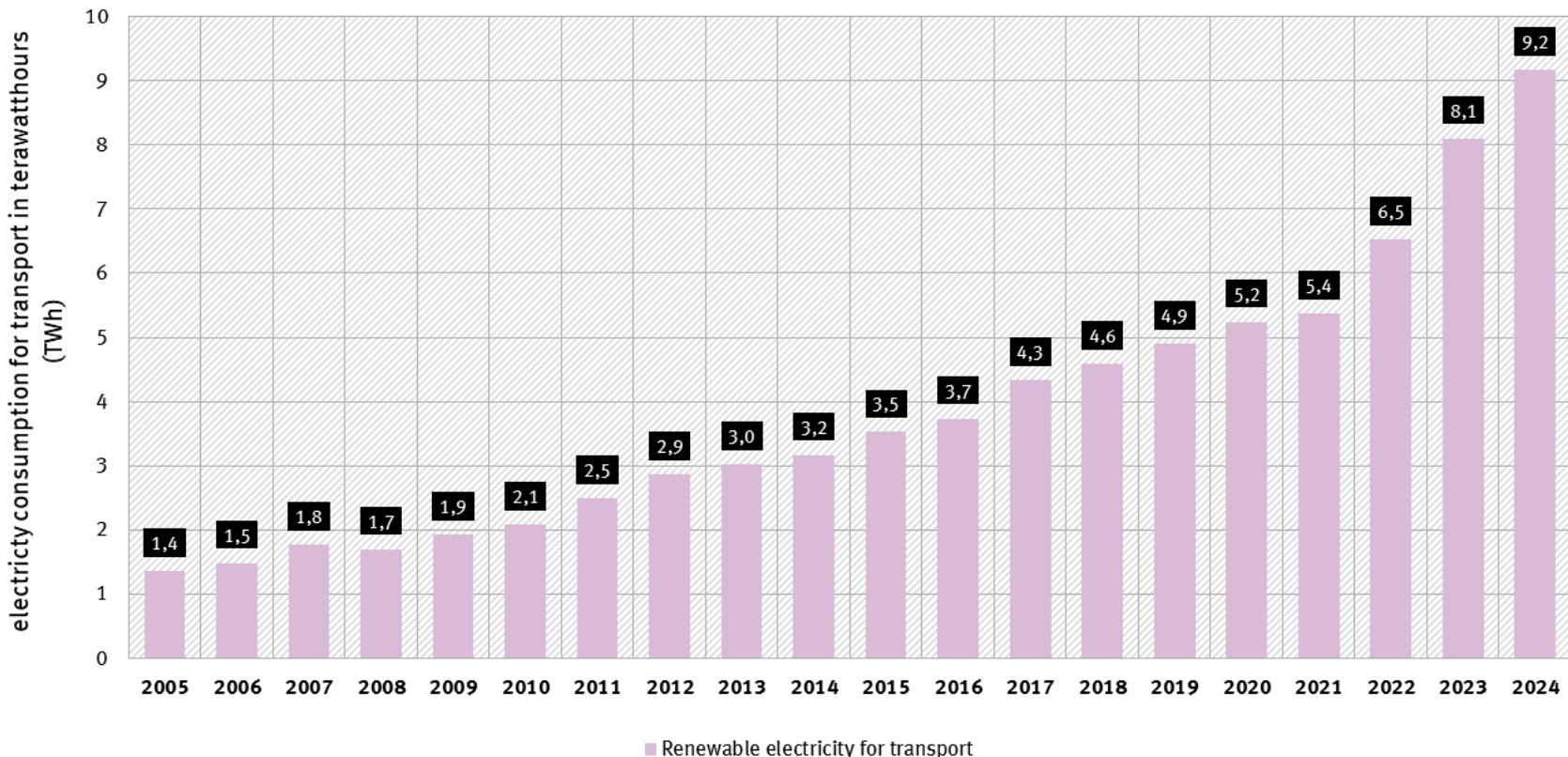
Development of final energy consumption from renewable sources in the transport sector

Renewable Electricity and Renewable Fuels

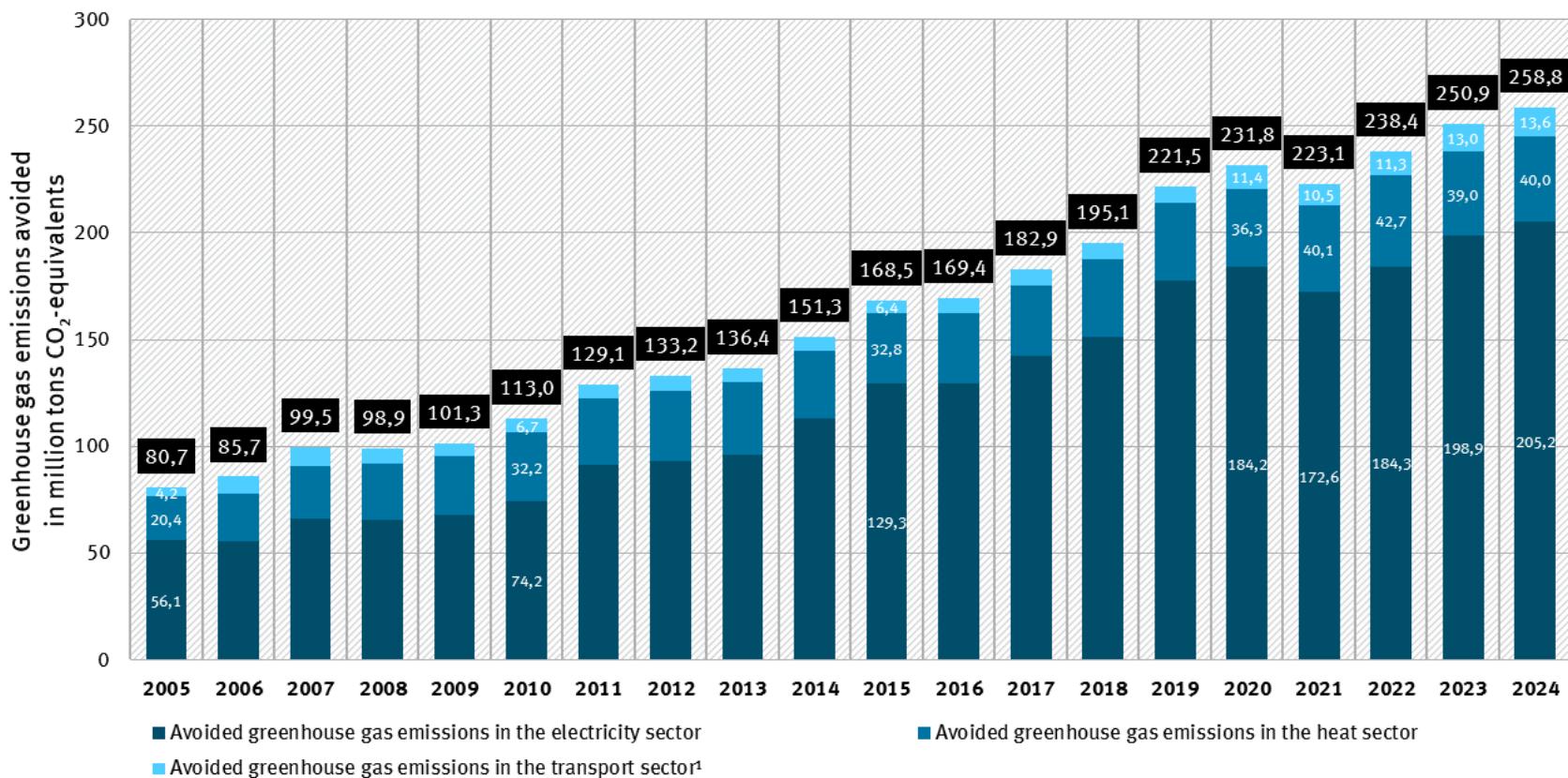


¹ RFNBO = Renewable Fuels of Non-Biologic Origin (e-Fuels) - due to low amounts not separately visible

Development of the use of renewable electricity in the transport sector

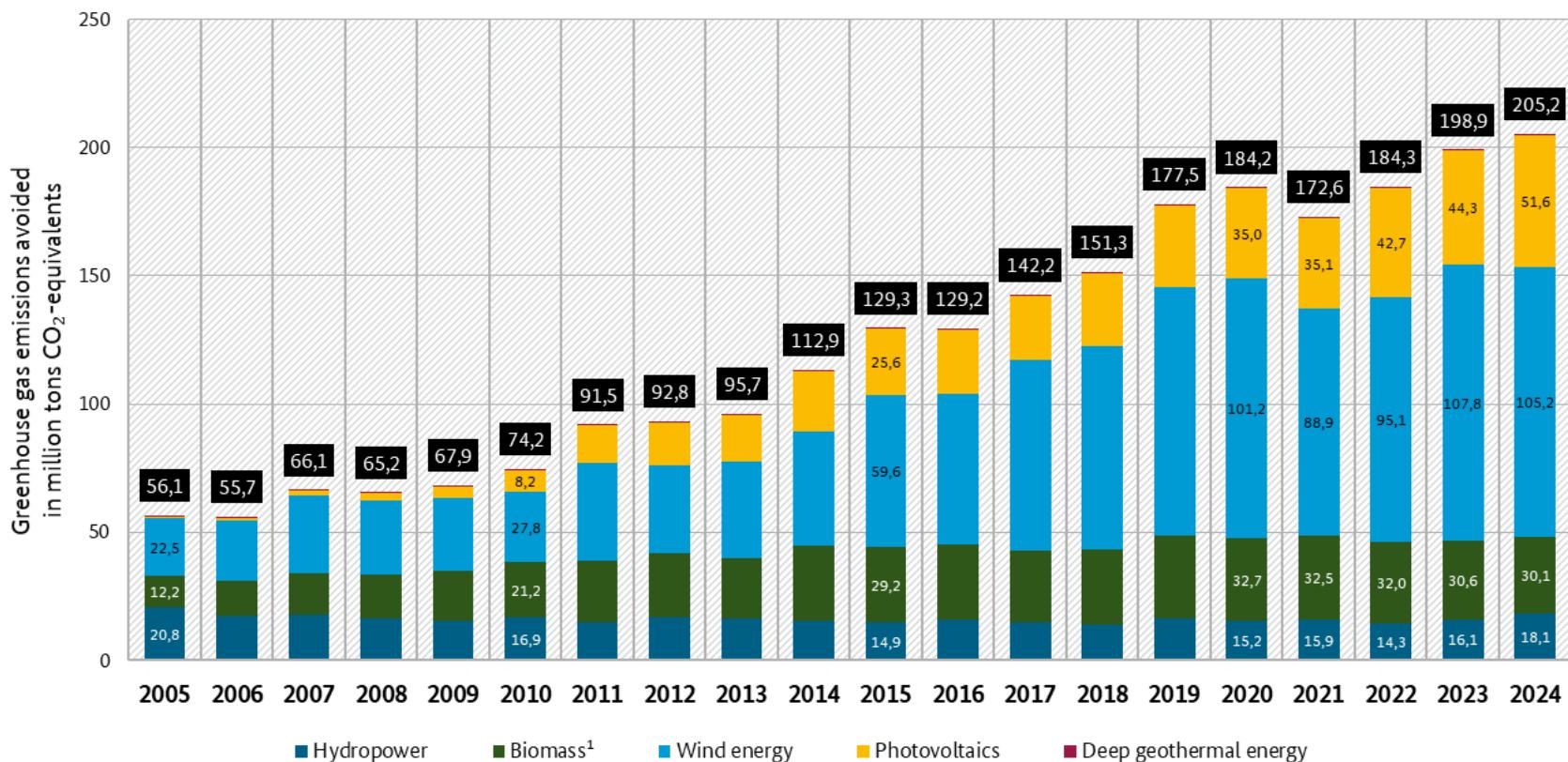


Development of greenhouse gas emissions avoided through the use of renewable energy sources in Germany by sectors



¹ Emissions reduction in the transport sector through the use of biofuels and electricity (based on the actual electricity mix)

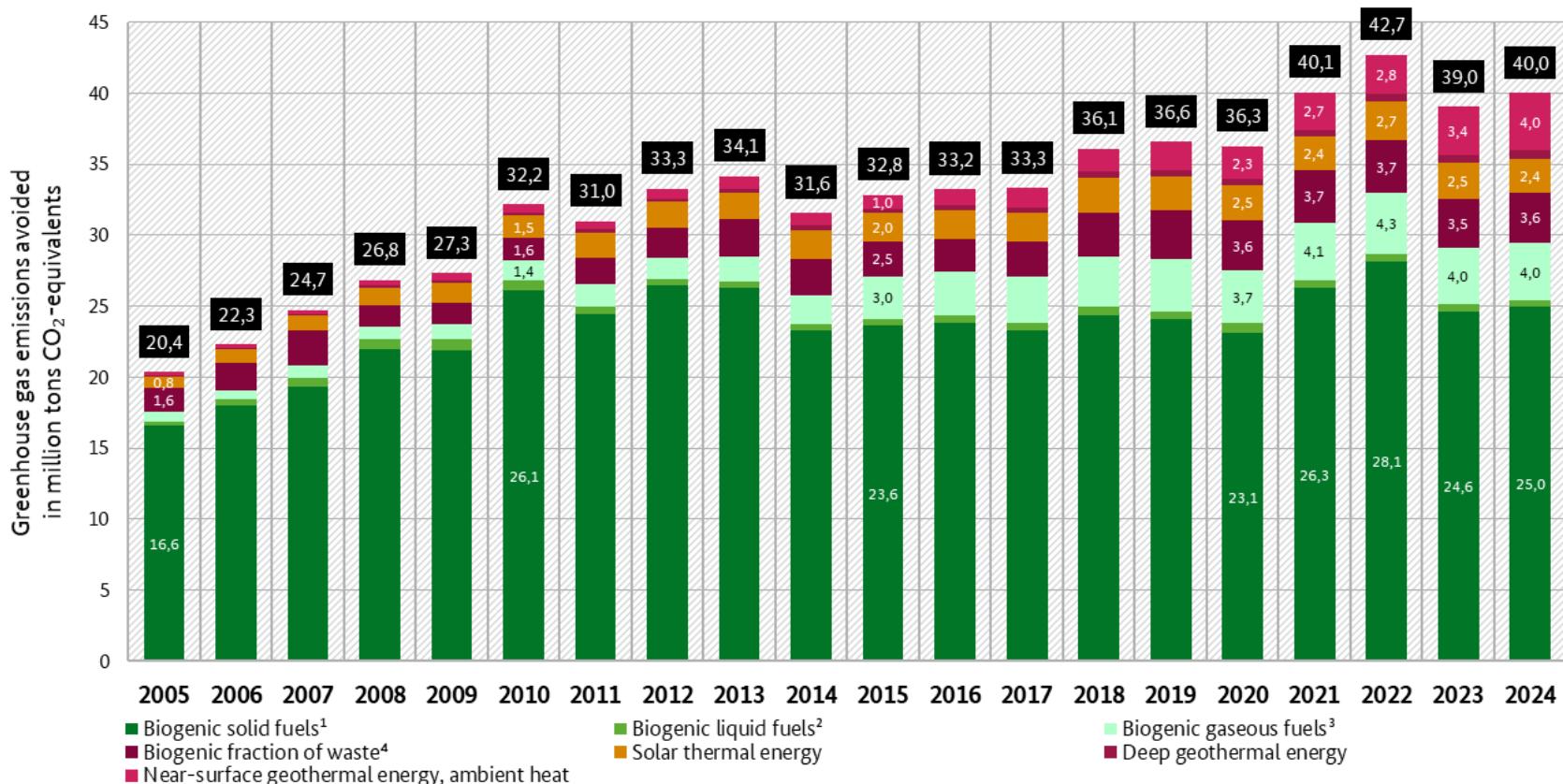
Development of greenhouse gas emissions avoided through the use of renewable energy sources in the electricity sector in Germany



¹ incl. solid, liquid and gaseous biomass, sewage sludge

and the biologic fraction of waste (in waste incineration plants estimated at 50 %, from 2008 only municipal waste)

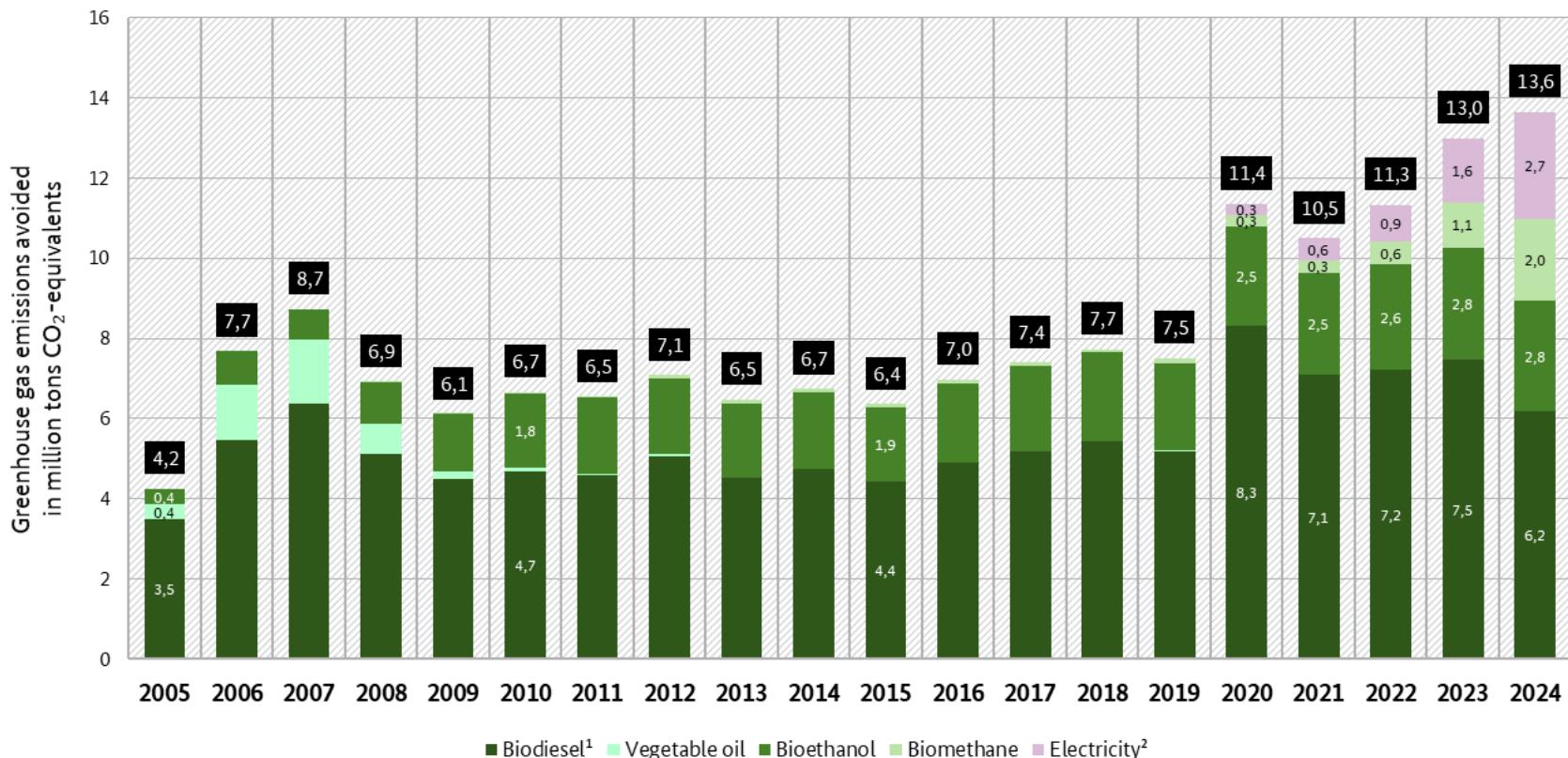
Development of greenhouse gas emissions avoided through the use of renewable energy sources in the heating sector in Germany



¹ incl. sewage sludge, without charcoal; ² incl. biofuels used in agric., forestry, constr. and military;

³ biogas, biomethane, sewage gas and landfill gas; ⁴ biogenic fr. of waste in waste incineration plants est. at 50 %, from 2008 only municipal waste

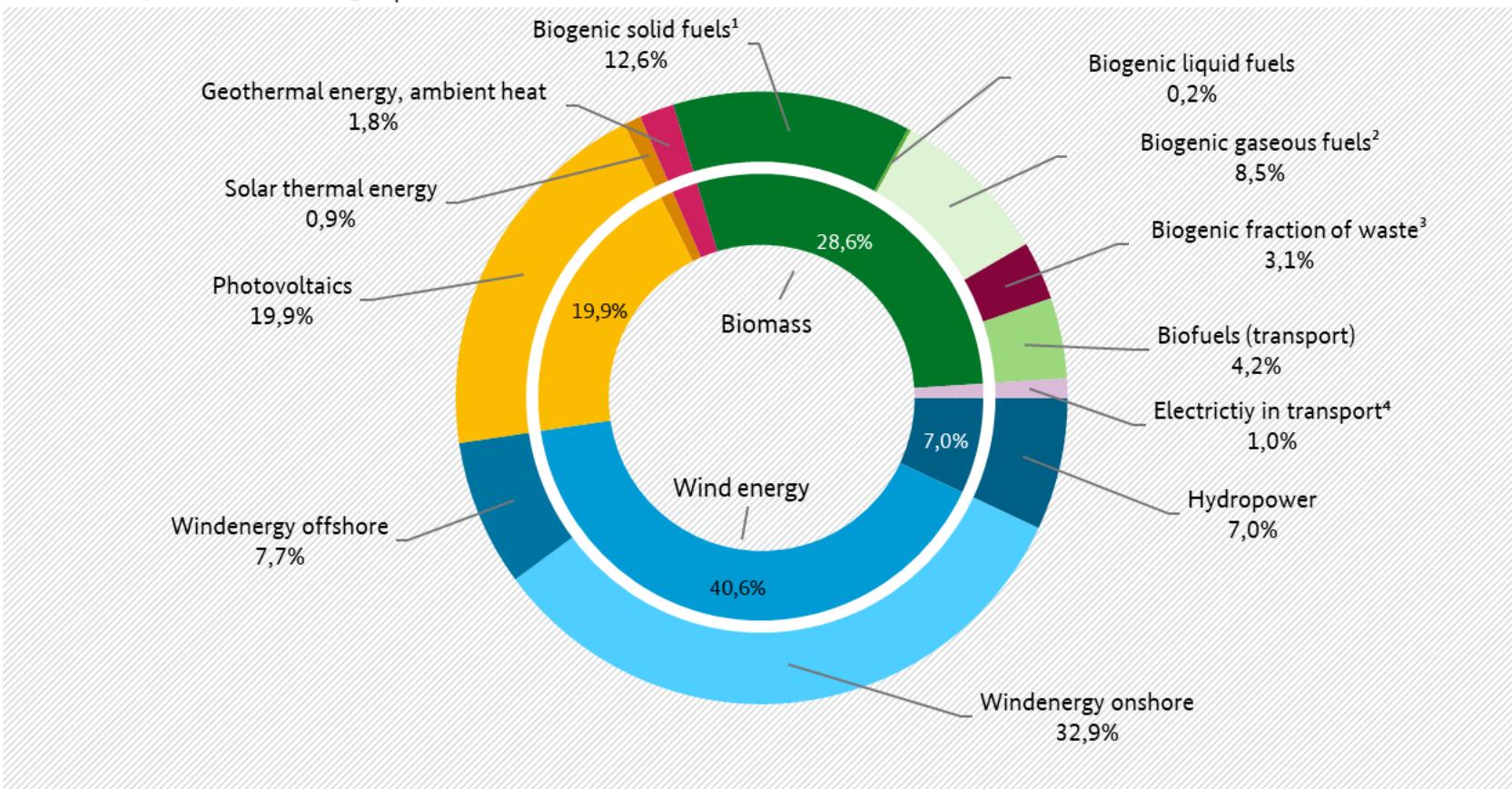
Development of greenhouse gas emissions avoided through the use of renewable energy sources in the transport sector in Germany



¹ cons. of biodiesel (incl. HVO) in the transport sector (excl. cons. in agriculture, forestry, constr. and military); ² electricity demand according to german electricity mix; Notice: all biofuel figures based on preliminary data of BLE for the year 2023,

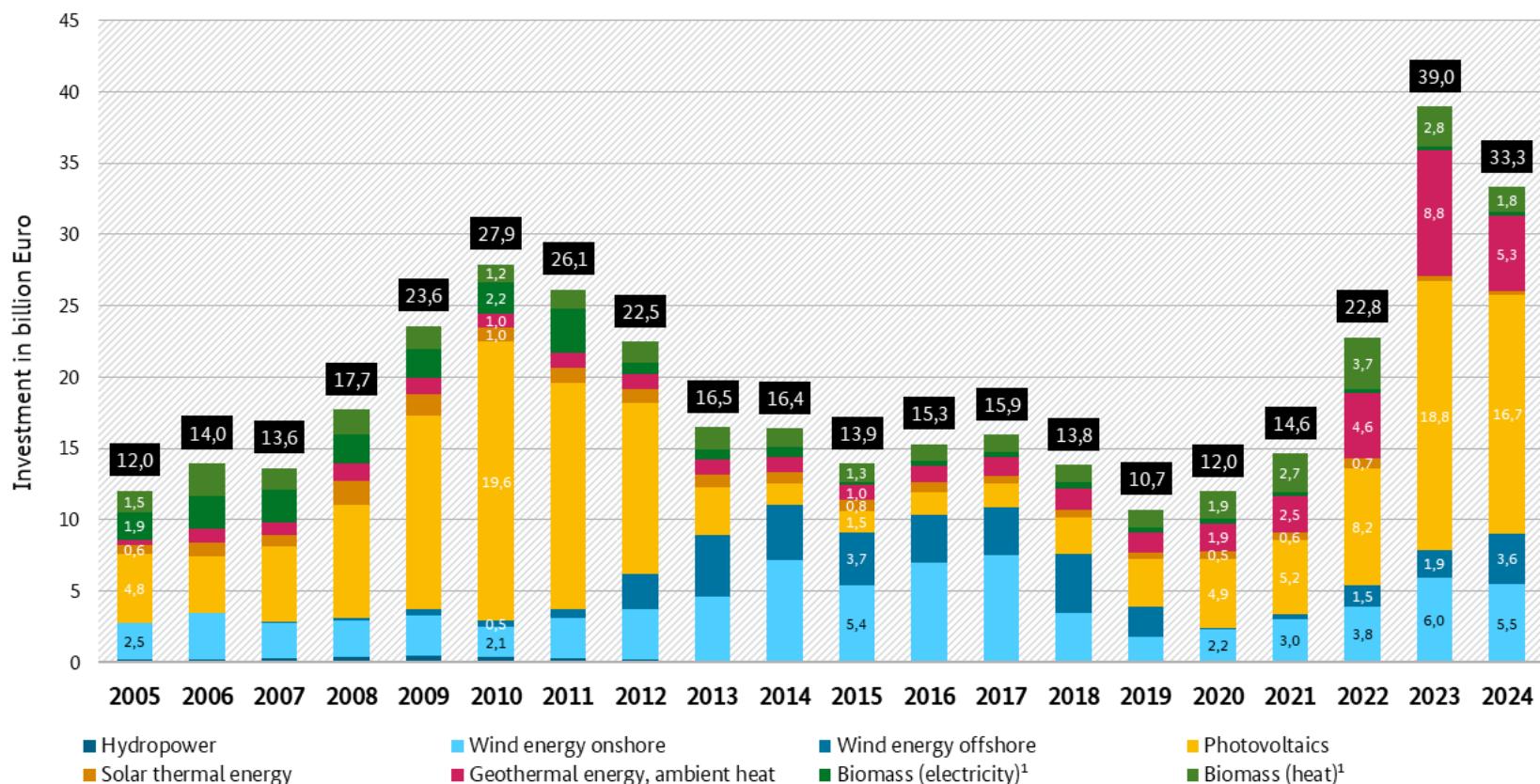
Greenhouse gas emissions avoided through the use of renewable energy sources in the year 2024

Total: 258,8 million tons CO₂-equivalents



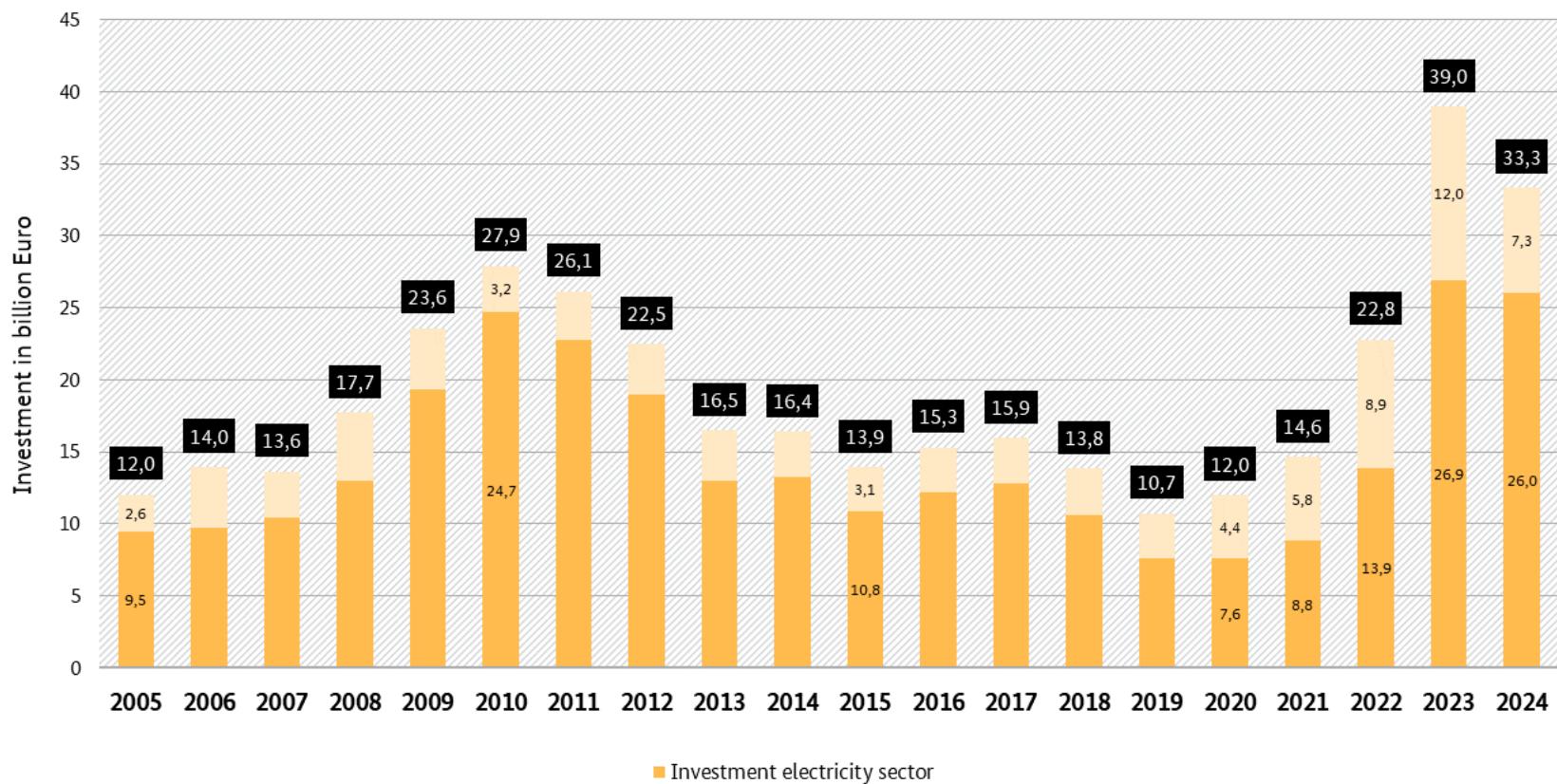
¹ incl. sewage sludge, without charcoal; ² biogas, biomethane, sewage gas and landfill gas; ³ biogenic fraction of waste in waste incineration plants estimated at 50 %; ⁴ electricity consumption in the transport sector according to German electricity mix

Development of investment in construction of renewable energy plants in Germany



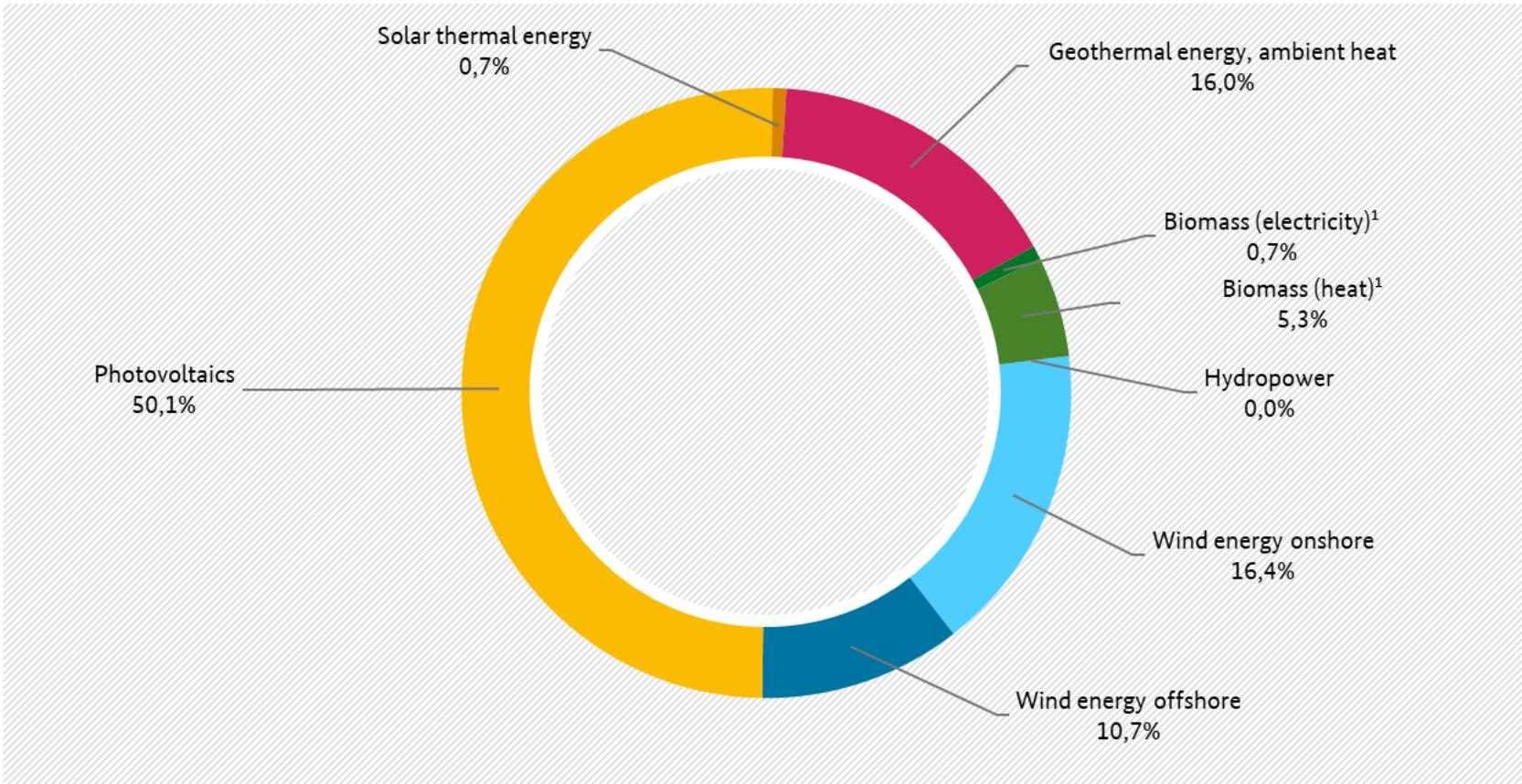
¹ Solid, liquid and gaseous biomass

Development of investment in construction of renewable energy plants in Germany (by electricity and heat)



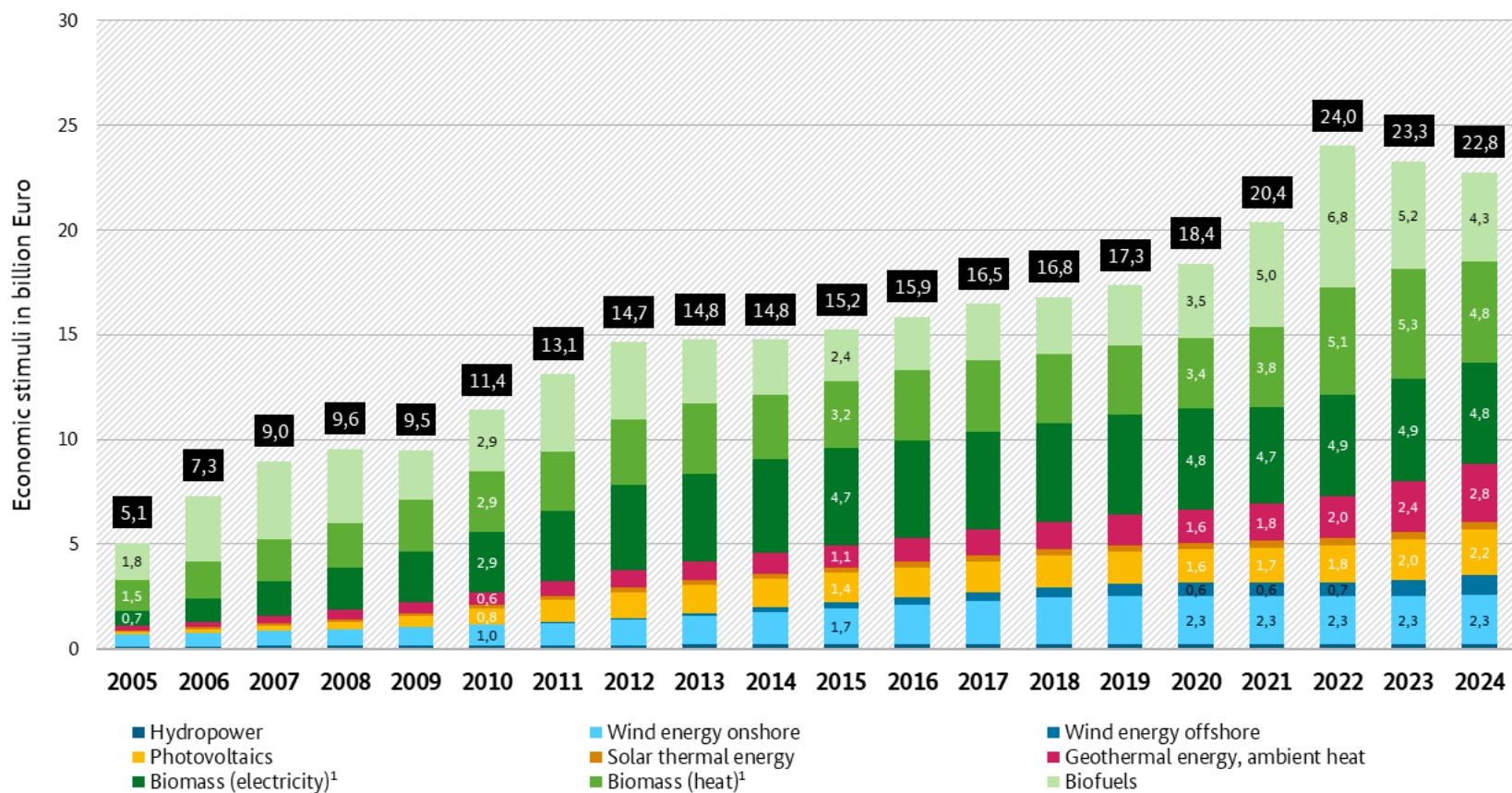
Investment in construction of renewable energy plants in Germany in the year 2024

Total investment: 33,3 billion Euro



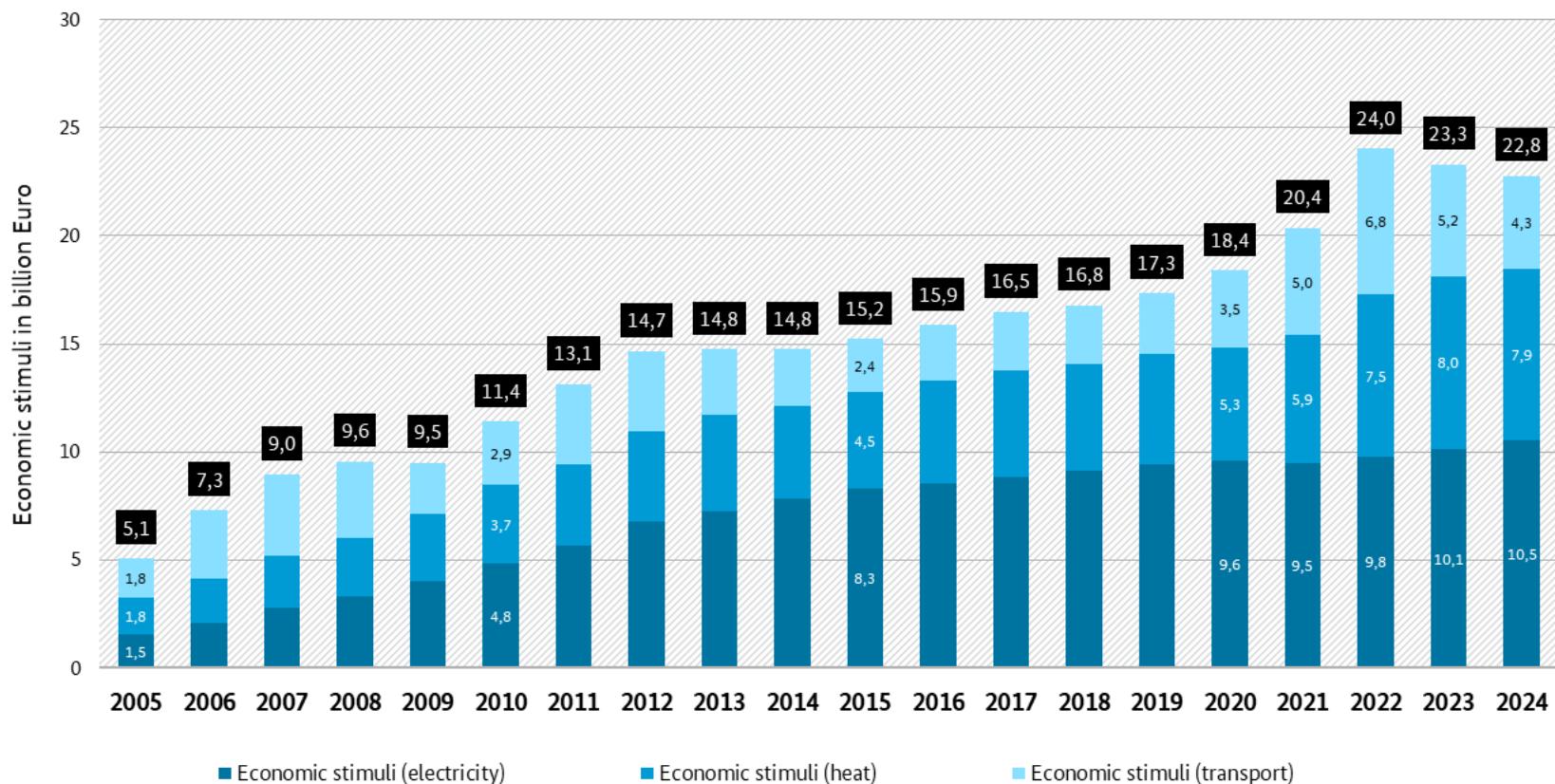
¹ Solid, liquid and gaseous biomass

Development of economic stimuli from the operation of renewable energy plants in Germany



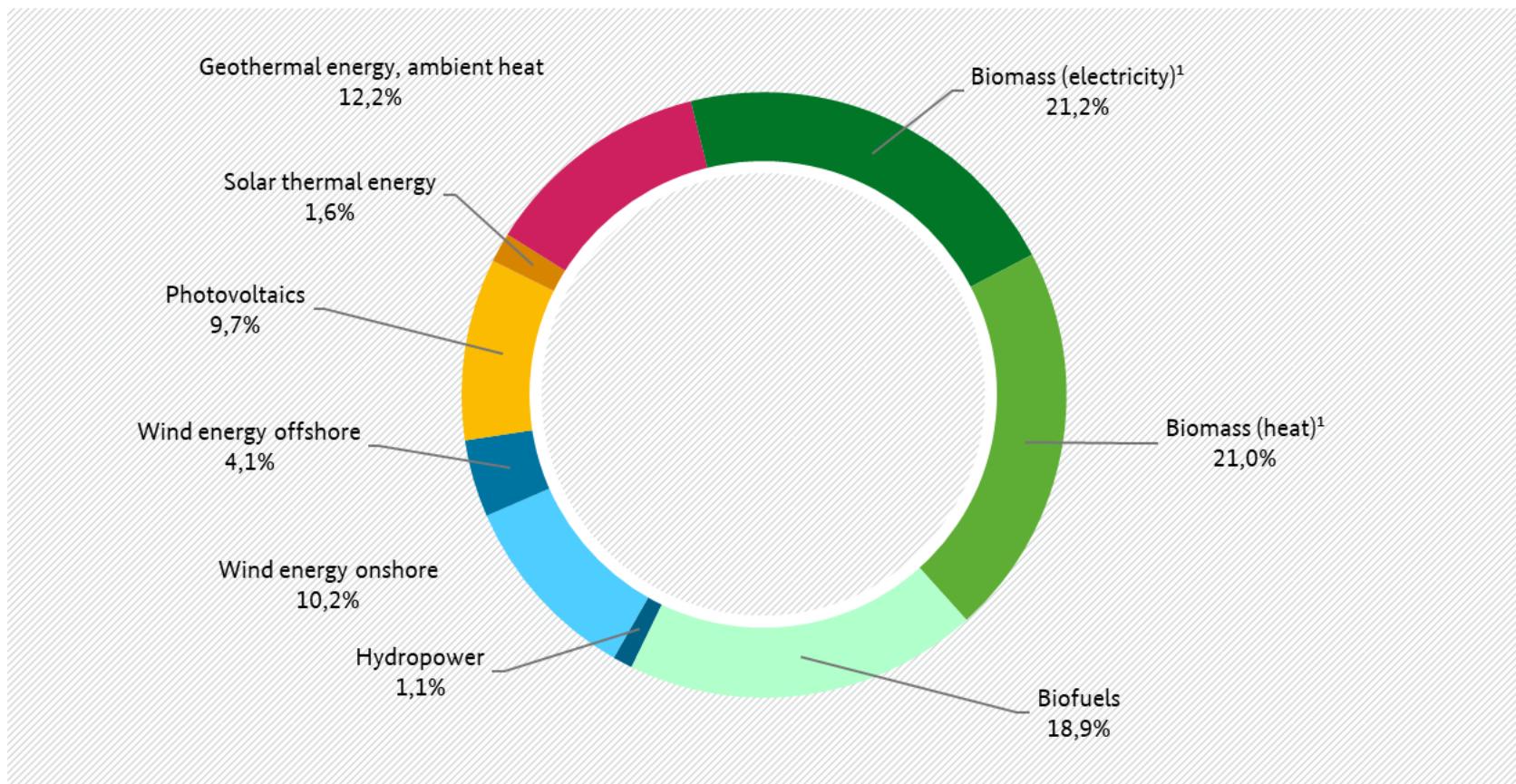
¹ Solid, liquid and gaseous biomass

Development of economic stimuli from the operation of renewable energy plants in Germany (by electricity, heat and transport)



Economic stimuli from the operation of renewable energy plants in Germany in the year 2024

Total: 22,8 billion Euro



¹ Solid, liquid and gaseous biomass

Glossar (I)

Bruttoendenergieverbrauch

Der Bruttoendenergieverbrauch umfasst den Endenergieverbrauch beim Letztverbraucher und die Verluste in den Erzeugungsanlagen und beim Transport. Der Bruttoendenergieverbrauch für erneuerbare Energien ergibt sich aus dem Endenergieverbrauch der Haushalte, des Verkehrs, der Industrie und des Gewerbe, Handel Dienstleistungen (GHD) zuzüglich des Eigenverbrauchs des Umwandlungssektors sowie der Leitungs- und Fackelverluste.

Bruttostromverbrauch

Der Bruttostromverbrauch entspricht der Summe der gesamten inländischen Stromgewinnung (Wind, Wasser, Sonne, Kohle, Öl, Erdgas und andere), zuzüglich der Stromflüsse aus dem Ausland und abzüglich der Stromflüsse ins Ausland. Der Nettostromverbrauch ist gleich dem Bruttostromverbrauch abzüglich der Netz- bzw. Übertragungsverluste.

Endenergie

Endenergie ist der Teil der Primärenergie, der den Verbraucher nach Abzug von Übertragungs- und Umwandlungsverlusten erreicht und der dann zur weiteren Verfügung steht. Endenergieformen sind zum Beispiel Fernwärme, elektrischer Strom, Kohlenwasserstoffe wie Benzin, Kerosin, Heizöl oder Holz und verschiedene Gase wie Erdgas, Biogas und Wasserstoff.

Endenergieverbrauch (EEV)

Als Endenergieverbrauch wird die Verwendung von Energieträgern in einzelnen Verbrauchssektoren bezeichnet, sofern sie unmittelbar zur Erzeugung von Nutzenergie oder für Energiedienstleistungen eingesetzt werden.

Glossar (II)

Erneuerbare Energien

Energiequellen, die nach den Zeitmaßstäben des Menschen unendlich lange zur Verfügung stehen. Nahezu alle erneuerbaren Energien werden letztendlich durch die Sonne gespeist. Die Sonne verbraucht sich, ist also im strengen Sinne keine „erneuerbare Energiequelle“. Die nach dem derzeitigen Stand der Wissenschaft absehbare Lebensdauer der Sonne liegt aber bei mehr als einer Milliarde Jahre und ist aus unserer menschlichen Perspektive nahezu unbegrenzt. Die drei originären Quellen sind Solarstrahlung, Erdwärme (Geothermie) und Gezeitenkraft. Diese können entweder direkt genutzt werden oder indirekt in Form von Biomasse, Wind, Wasserkraft, Umgebungswärme sowie Wellenenergie.

Primärenergie

Primärenergie ist der rechnerisch nutzbare Energiegehalt eines natürlich vorkommenden Energieträgers, bevor er einer Umwandlung unterworfen wird. Zu den Primärenergieträgern zählen erschöpfliche Energieträger wie Stein- und Braunkohle, Erdöl, Erdgas und spaltbares Material wie Uranerz sowie erneuerbare Energien (Sonnenenergie, Windkraft, Wasserkraft, Erdwärme und Gezeitenenergie). Die Primärenergie wird in Kraftwerken oder Raffinerien in eine weiterführende Stufe der energetischen Reihe umgewandelt. Dabei kommt es zu Umwandlungsverlusten. Ein Teil der Primärenergieträger wird auch dem nicht-energetischen Verbrauch zugeführt (zum Beispiel Rohöl für die Kunststoffindustrie).

Primärenergieverbrauch

Primärenergieverbrauch (PEV) ist das saldierte Ergebnis aus inländischer Produktion, dem Außenhandelssaldo bei Energieträgern unter Abzug der Hochseebunkerungen sowie unter Berücksichtigung der Lagerbestandsveränderungen.

Hinweis: Weitere Erläuterungen zu Begriffen rund um das Thema Energiewende finden sich im Glossar auf den Internetseiten des BMWE unter: https://www.bundeswirtschaftsministerium.de/Navigation/DE/Service/Glossar-Energiewende/glossar_success.html

Quellen

- Arbeitsgruppe Erneuerbare Energien-Statistik (AGEE-Stat)
- Arbeitsgemeinschaft Energiebilanzen e.V. (AGEB)
- Bundesamt für Wirtschaft und Ausfuhrkontrolle (BAFA)
- Bundesverband der Energie- und Wasserwirtschaft e. V. (BDEW)
- Bundesanstalt für Landwirtschaft und Ernährung (BLE)
- Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz (BMUV)
- Bundesministerium für Ernährung und Landwirtschaft (BMEL)
- Bundesministerium für Wirtschaft und Klimaschutz (BMWK)
- Bundesnetzagentur (BNetzA)
- Bundesverband Solarwirtschaft (BSW)
- Bundesverband WindEnergie e. V. (BWE)
- Bundesverband Wärmepumpe e. V. (BWP)
- Deutsches Biomasseforschungszentrum (DBFZ)
- Deutsche Energie-Agentur GmbH (DENA)
- Deutscher Energieholz- und Pellet-Verband e. V. (DEPV)
- Deutsches Institut für Wirtschaftsforschung (DIW)
- Fachagentur Nachwachsende Rohstoffe e.V. (FNR)
- Internationales Geothermiezentrum Bochum . (GZB)
- Leibnitz-Institut für Angewandte Geophysik: Geothermisches Informationssystem für Deutschland (LIAG)
- Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI)
- Statistisches Bundesamt (StBA)
- Thünen-Institut für Internationale Waldwirtschaft und Forstökonomie (TI)
- Umweltbundesamt (UBA)
- UL International GmbH, DEWI (UL)
- Informationsplattform der Deutschen Übertragungsnetzbetreiber (ÜNB)
- Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW)

Redaktion und fachliche Bearbeitung:

Bundesministerium für Wirtschaft und Energie (BMWE)
Umweltbundesamt (UBA), Fachgebiet V 1.8

**Geschäftsstelle der
Arbeitsgruppe Erneuerbare Energien-Statistik (AGEE-Stat)
am Umweltbundesamt**

E-Mail: AGEE-stat@uba.de

Umweltbundesamt
Wörlitzer Platz 1
06844 Dessau-Roßlau
Deutschland

Internet: <https://www.umweltbundesamt.de/themen/klima-energie/erneuerbare-energien/erneuerbare-energien-in-zahlen>

