2024 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: June, 2024

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Executive Summary: Air Quality in Our Area

Air Quality in South Norfolk and Broadland

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution[2].

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

In general, the measured air quality in both South Norfolk and Broadland is improving. Furthermore, there have been no recorded instances of air quality objectives being exceeded. The primary pollutant of concern is nitrogen dioxide (NO_2), mainly emitted from road vehicles. This is particularly noticeable in the suburban areas surrounding Norwich and our market towns. We are currently trialling monitoring for PM2.5 using indicative monitoring equipment. More information regarding this trial will be available after in the 2024 reporting year.

Neither district has any designated Air Quality Management Areas (AQMAs).

The levels of NO_2 are monitored using diffusion tubes, with 30 locations in South Norfolk and 29 in Broadland being monitored.

[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

We maintain close collaboration with colleagues in Public Health, the Norfolk Highways Sustainable Transport Team and the other Norfolk District Councils as part of the Countywide Air Quality Group. This group has the aim of providing a forum to discuss, plan and implement ways to improve air quality across Norfolk from a number of partners including transport and medical professionals.

South Norfolk and Broadland Councils consider the impact of existing local industrial processes through the Environmental Permitting system, as well as addressing the impact new developments might have on local air quality through the planning process.

Currently a detailed assessment for further pollutants is not deemed to be necessary. The Council will proceed to the next Annual Status report for 2024.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan[3] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, published in April 2023, provides more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[4] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

In an effort to further monitor and assess air quality and to meet the requirements of the National Air Quality Strategy, the Councils have initiated a trial involving the deployment of low cost indicative $PM_{2.5}$ monitors. It is hoped that information from these monitors will assist in better identifying potential areas of concern and give us significantly broader dataset. As of the reporting year 2024 2 Zephyr monitors and 3 Planetwatch monitors have been deployed with 2 further Praxis monitors planned to be deployed later this year.

South Norfolk and Broadland Councils take into account the potential consequences of existing local industrial processes by adhering to the LAPPC (Local Air Pollution Prevention and Control) and LA-IPPC (Local Authority Integrated Pollution Prevention and Control) regimes. These regulatory frameworks ensure that the impact of industrial activities on air quality is thoroughly assessed and managed. Furthermore, air quality concerns are a considered part of the planning process.

The Councils actively support and encourage grant applications from Norfolk County Council that aim to improve air quality across the region. While these grant applications rightly focus on Norwich City due to their AQMA, the proposals have the potential to yield positive outcomes within South Norfolk and Broadland as well. For instance, the introduction of cargo bikes for use by local businesses also many of the electric bus routes terminate within our districts. By supporting the facilitation of less polluting modes of transportation, the councils aim to reduce reliance on conventional vehicles and promote eco-friendly alternatives. This expansion not only contributes to reducing air pollution but

[3] Defra. Environmental Improvement Plan 2023, January 2023

[4] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

also encourages healthier and more active lifestyles among residents. A further grant application was made in 2023, however this was unsuccessful.

To summarise, through a combination of partnership working, robust industrial process regulations, implementation of indicative monitors, and support for grant applications to provide sustainable transport, the councils are actively working towards improving air quality.

Conclusions and Priorities

All our NO_2 results for both authorities are below the air quality objective thresholds. As such, a detailed assessment is not required for any pollutants and the Council will progress to the next Annual Status report for 2024.

Levels of NO_2 generally remain lower than before the Covid 19 pandemic and are overall still trending downwards.

The location of air quality monitoring points is continually being reviewed and tubes will be relocated as appropriate. In addition, further monitoring points will be added if required. The most recent review of diffusion tube locations resulted in the removal of several consistently low reading tubes and the introduction of a number of new locations. These locations will be detailed in the 2024 reporting year ASR.

Average background $PM_{2.5}$ concentration projections for each council continue to show that both councils are below the Environment Act 2021 annual mean concentration target for 2040.

Implementation of indicative monitors to continuously measure NO_2, PM_{10} and $PM_{2.5}$ is being trialled with a number of units currently deployed.

Since 2022 we have undertaken proactive education work focussing on the burning of wood as a secondary heating source and will continue to inform our residents about this. We will be looking to promote clean air night this year (an educational campaign focussing on the effects of domestic burning on air quality).

Air Quality is also identified in our Council's Environmental Strategies with the following actions identified:

- Proactive work with our partners and other stakeholders aiming to achieve a positive change to air quality, this could include, working with universities, bus, coach and taxi companies, haulage companies, schools and car sharing clubs.

- Raise awareness of air quality amongst our local businesses and residents.
- Pre-planning application support in more applications.
- Develop supplementary planning documents for air quality.

Local Engagement and How to get Involved

For further information on air quality please contact us at:

cpandeq@southnorfolkandbroadland.gov.uk

If the public would like to find out more about air quality in general, there are a number of resources available. These include:

https://uk-air.defra.gov.uk/ (UK government air quality)

www.airqualityengland.co.uk (A quick reference to air quality information for a variety of local authority areas across England)

www.metoffice.gov.uk/guide/weather/air-quality (Met Office air quality web page)

People can help improve air quality by:

- Walking and cycling or using public transport instead of driving where possible,
- If using a car don't leave the engine running in queues or while waiting for someone.
- Looking for sustainable home energy suppliers who don't use fossil fuel.
- Avoiding burning at home, when possible.
- Planting more trees and greenery

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Protection Department at South Norfolk and Broadland with the support and agreement Norfolk County Council Sustainable Transport Team and Norfolk Public Health as well as following officers:

Officers involved in the preparation of the ASR:

Will Gorrod - Environmental Management Officer

Alison Old – Senior Environmental Management Officer

This ASR has been approved by:

Alison Old – Senior Environmental Management Officer

This ASR has been signed off by a Director of Public Health.

Stuart Lines – Director of Public Health, Norfolk County Council

If you have any comments on this ASR please send them to Will Gorrod at:

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1 Local Air Quality Management

This report provides an overview of air quality in South Norfolk and Broadland during 2023. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by South Norfolk and Broadland Councils to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out. South Norfolk and Broadland Councils currently do not have any declared AQMAs

2.2 Progress and Impact of Measures to address Air Quality in South Norfolk and Broadland

Defra's appraisal of last year's ASR concluded:

*"On the basis of the evidence provided by the local authority the conclusions reached are **accepted** for all sources and pollutants. Following the completion of this report, South Norfolk and Broadland Council should develop a local air quality strategy and submit an Annual Status Report in 2024".*

Comments:

1. Trend graphs have been provided for all monitoring data including diffusion tubes, which is commended.

2. The Councils have provided clear and accurate mapping of the diffusion tube network, which is commended.

3. Comments from last year's ASR have been mentioned and most have been addressed. For example: use of latest template and minor formatting issues. We highly encourage the Councils to continue to do this in future ASRs.

4. The NO_2 concentrations in BDC and SNDC have continued to be well below the annual mean objective for NO_2, which is very encouraging.

5. The Councils are commended for their approach to further improving Air Quality in the absence of a formal AQAP. However, as mentioned above, authorities without an AQMA are required to draw up a local Air Quality Strategy. This should be reported in next year's ASR.

6. The Councils have addressed previous year's comment regarding reference to the Public Health Outcomes Framework and their relevant local indicator for $PM_{2.5}$ for both BDC and SNDC. The fractions of mortality attributed to particulate air have been presented and these were lower than the national rate for both Councils.

7. The Councils have provided a discussion on the measures they are implementing to improve air quality in their areas in Table 2.1. This is to be commended as it demonstrates both Councils' continued commitment and engagement in improving air quality. It would be beneficial to quantify the progress wherever possible (e.g.- number of charging points installed, number of electric buses introduced, etc.) . This would help in tracking the progress year on year.

8. The ASR has been signed off by a Director of Public Health. This is encouraging to see as it shows support in improving the local air quality.

South Norfolk and Broadland councils have taken forward a number of direct measures during the current reporting year of 2024 in pursuit of improving local air quality. In particular, a local air quality strategy is now being developed and will continue to worked upon in a progressive manner, this document will be formally agreed by both authorities following the General Election and will then be published.

Measures in progress or planned are set out in Table 2.1. 14 measures are included within Table 2.1, with the type of measure and the progress South Norfolk and Broadland Councils have made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Energy Efficiency of New Build Properties	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2005	-	Property Developers	Property Developers				On going	N/A	Reduction of energy bills and energy use	Implemented	Reduction of energy bills and energy use
2	Energy efficiency information for residents	Public Information	Via leaflets	2001	2023	Broadland and South Norfolk DC's	Broadland and South Norfolk DC's				On going	N/A	Reducing emissions and energy use	Providing information when requested	Reducing emissions and energy use
3	authority for the E.C.O (Energy Company Obligation) scheme	Public Information	Other	2013	-	Broadland and South Norfolk DC's and All L.A's	Broadland and South Norfolk DC's and All L.A's		-		On going	N/A	Reducing emissions and energy use	Providing information when requested	Reducing emissions and energy use
4	Health Improvement Grants	Other	Other	2018	-	Broadland and South Norfolk DC's	Broadland and South Norfolk DC's				On going	N/A	Reducing emissions and energy use and improving residents health and well being	On going	Reducing emissions and energy use and improving resident's health and well being
5	Warm Homes Fund	Other	Other	2018	-	Broadland District Council and some housing associations	Broadland District Council and some housing associations				On going	N/A	Reducing emissions and energy use and improving residents health and well being	Planning	Reducing emissions and energy use and improving residents health and well being
6	Construction of the Long Stratton Bypass	Traffic Management	Strategic highway improvements,	2024	-	Norfolk County Council, Private Property Developers	Norfolk County Council, Private Property Developers				On Going	N/A	Reducing emissions and energy use and improving residents health and well being	On Going	
7	Community Rail Partnerships	Promoting Travel Alternatives	Promote use of rail and inland waterways	1997	-	Norfolk Community Rail Partnership	Norfolk Community Rail Partnership, Local Rail Operator				On going	N/A	Individual up take	On going	Reducing emissions and congestion
8	Norfolk Bus Passenger Charter	Promoting Alternatives to private vehicle use	Low Emissions Strategy	2018	-	Norfolk County Council	Norfolk County Council				On going	N/A	Collaborative working to improve air quality within the Greater	On going	Enhanced partnership in place between Norfolk County Council and local operators, as

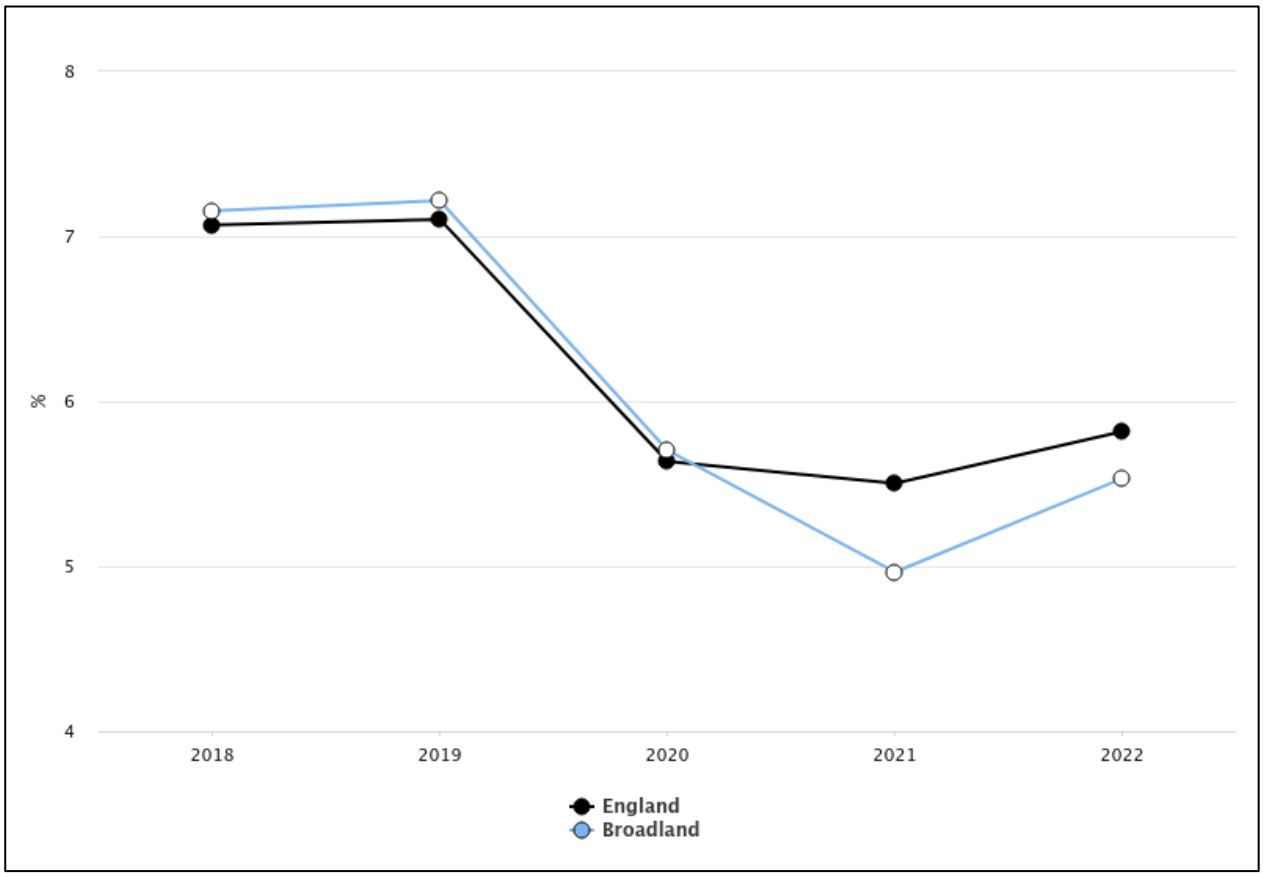
Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
													Norwich Area through various projects and initiatives		well as a Bus Service Improvement Plan
9	Air Quality Countywide Meetings	Other	Other	2023	-	Broadland District Council, South Norfolk Council, Norwich City Council, Norfolk County Council, Breckland Council, Great Yarmouth Council, West Norfolk Council	Broadland District Council, South Norfolk Council, Norwich City Council, Norfolk County Council, Breckland Council, Great Yarmouth Council, West Norfolk Council				On going	N/A	Collaborative working to improve air quality within Norfolk through various projects and initiatives	On going	Collaborative working to improve air quality within the Norfolk through various projects and initiatives including through joint bids for funding
10	Bike/Scooter/E-Bike Hire Scheme Introduction	Public Transportation	Other	2023	-	Norfolk County Council	Norfolk County Council				On going	N/A	Individual take up	On going	Reducing emissions and congestion
11	Cargo Bike Library for Businesses	Public Transportation	Other	2023	-	Norfolk County Council	Defra	Yes			On going	N/A	Business take up	On going	Reducing emissions and congestion, promoting healthier living
12	New Electric Bus Schemes	Public Transportation	Other	2023	-	Norfolk County Council	Norfolk County Council				On going	N/A	Number of Busses	On going	70 electric buses have now been added to the fleet in Norfolk and are running on a range of routes through Norwich and beyond
13	Cycling, walking and wheeling improvements	Public Transportation	Other			Norfolk County Council, South Norfolk and Broadland Councils	Norfolk County Council				On going	N/A	Individual take up	On going	Work to deliver the Greater Norwich Local Cycling and Walking Infrastructure Plan to improve cycling, walking and wheeling facilities
14	Electric vehicle charge points	Low Emission Technology	Other			Norfolk County Council, South Norfolk and Broadland Councils	Norfolk County Council				On going	N/A	Individual take up	On going	Increase availability of EV charge points across the area, to promote EV update and ensure EV charging is considered in relevant

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
															Climate/Environmental strategies and policies
15	Park and Ride: Assess opportunity for a zero-emissions bus fleet to operate the Norwich Park & Ride service when the contract is renewed in 2024/25	Public Transportation	Other	2024	2024/5	Norfolk County Council	Norfolk County Council			£1-10 million	Planning	N/A	individual take up	On going	Park & Ride patronage continues to struggle post-COVID operating and 40-50% pre-COVID levels. Procurement approach is to aim for zero emission fleet but this will be dependent on the responses received. Procurement taking place in 2024 for implementation in 2025.
16	School Travel Plans	Promoting travel alternatives	School Travel Plans	2024	Ongoing	Norfolk County Council	Norfolk County Council				Ongoing	N/A	Individual take up	A review is being undertaken to identify whether a comprehensive programme of support can be offered to schools to support more pupils travelling to school actively	Norfolk County Council already funds access to Modeshift Stars software for all schools, enabling them to generate and manage their own travel plans, with the ambition to have the majority of schools with an up to date school travel plan

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

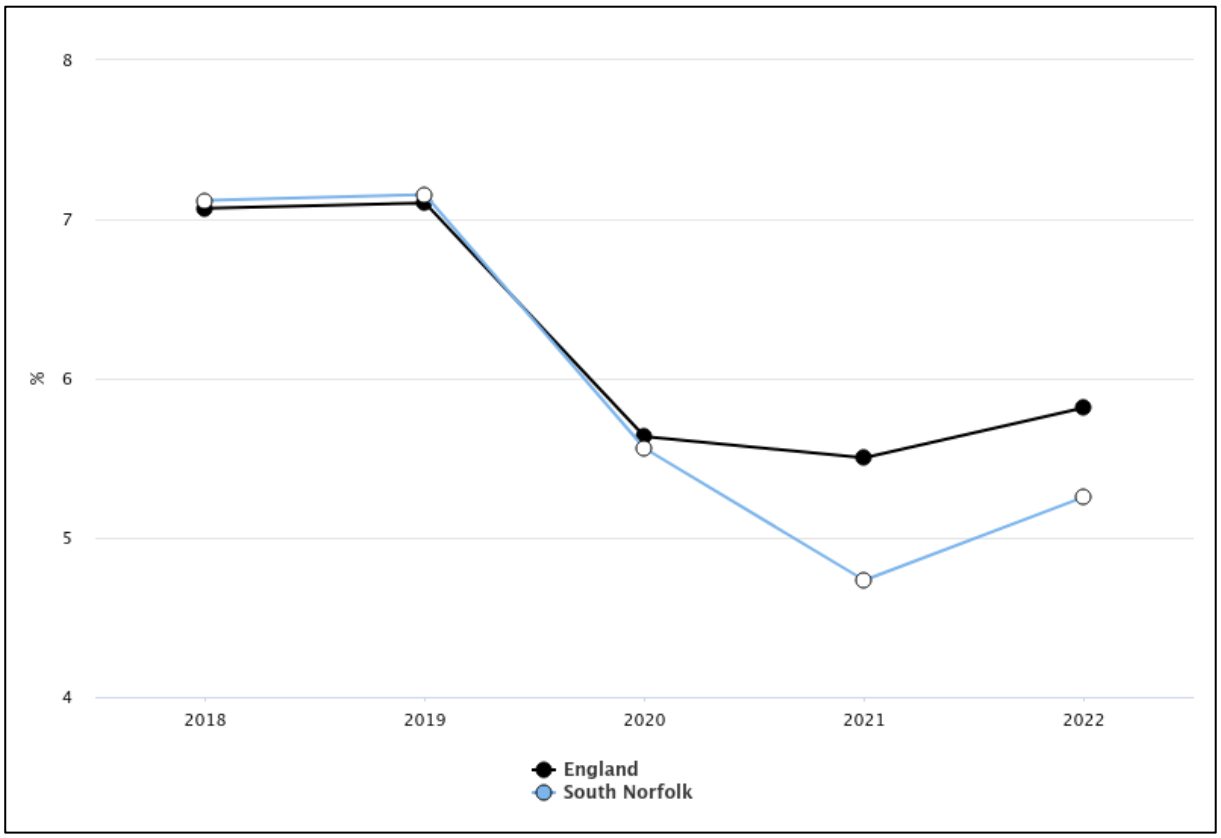
As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases. The latest data on the fraction of mortality attributed to particulate air pollution in South Norfolk and Broadland, and how this compares to the average for England can be seen in the charts below (Source: The Public Health Outcome Framework, 2023).

Plot A.1 – Fraction of Mortality Attributable to Particulate Air Pollution (Broadland)



Public Health Outcome Framework, 2024[5]. Background annual average $PM_{2.5}$ concentrations for the year of interest are modelled on a 1km x 1km grid using an air dispersion model, and calibrated using measured concentrations taken from background sites in Defra's Automatic Urban and Rural Network (https://uk-air.defra.gov.uk/interactive-map).

Plot A.2 – Fraction of Mortality Attributable to Particulate Air Pollution (South Norfolk)



Public Health Outcome Framework, 2024[5]. Background annual average $PM_{2.5}$ concentrations for the year of interest are modelled on a 1km x 1km grid using an air dispersion model, and calibrated using measured concentrations taken from background sites in Defra's Automatic Urban and Rural Network (https://uk-air.defra.gov.uk/interactive-map).

South Norfolk and Broadland Councils are taking the following measures to address $PM_{2.5}$:

- The Councils continue to ensure regular two-way engagement with representatives of the Office for Health Improvement and Social Care, and the Director of Public Health at Norfolk County Council.
- The Councils are building stronger working relationships with Public Health including encouraging active travel (walking, cycling) to reduce local vehicle use.
- We work with local industrial processes as part of our duties under the Integrated Pollution Prevention and Control Regulations to ensure local air quality is safeguarded.
- Building a monitoring network.

[5] Public health profiles - OHID (phe.org.uk)

- We review planning applications for new developments to ensure local air quality is considered via the planning regime.

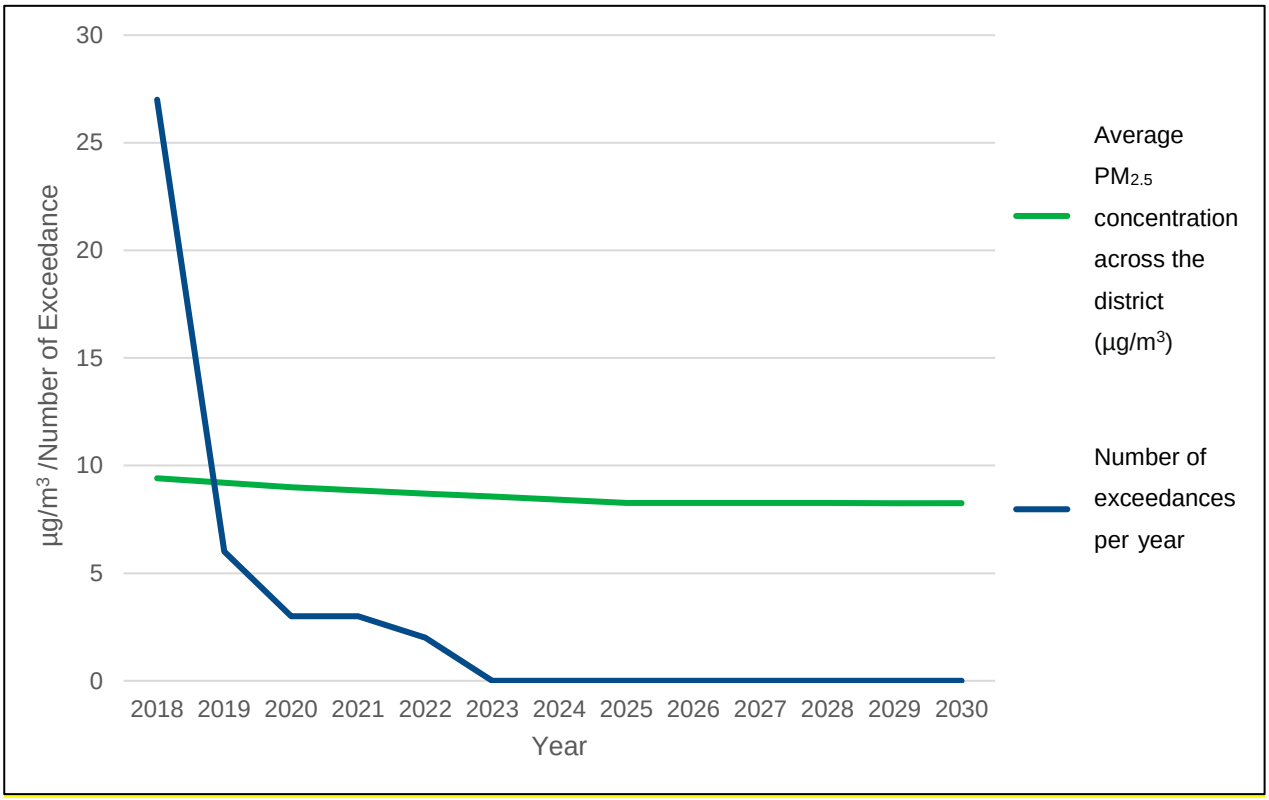
The Environment Bill was passed in 2020 and subsequent Environment Act 2021 has been published. The Environment Act 2021 establishes a legally binding duty on government to bring two new air quality targets into secondary legislation. This duty sits within the environmental target's framework outlined in the Environment Act (Part 1). The air quality targets set under the Act are:

- Annual Mean Concentration Target ('concentration target') - a maximum concentration of 10µg/m^3 to be met across England by 2040
- Population Exposure Reduction Target ('exposure target') - a 35% reduction in population exposure by 2040 (compared to a base year of 2018).

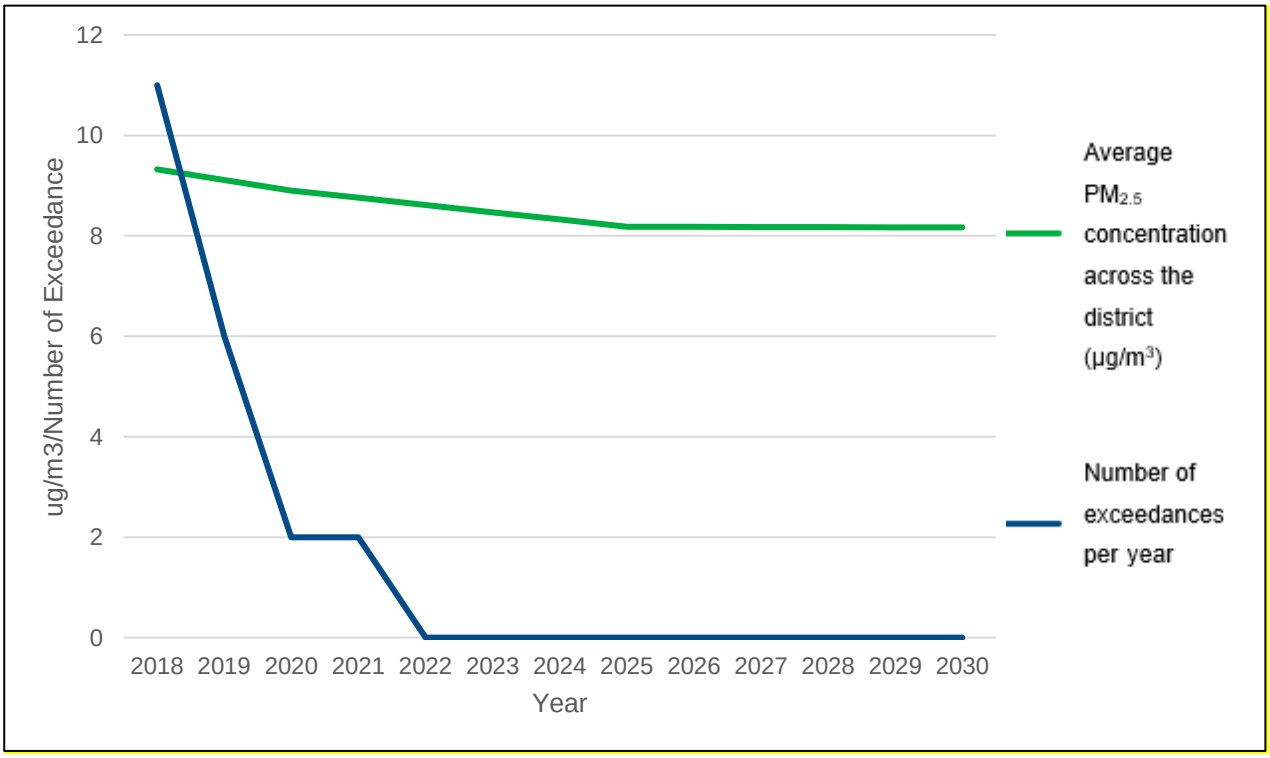
Broadland District Council and South Norfolk District Council have both referred to the DEFRA background concentration data[6] to consider $PM_{2.5}$ across the districts. Data has been used to assess if the background concentrations are above the relevant air quality targets. Average background concentration projections for both councils show that both councils are already below the Environment Act 2021 annual mean concentration target.

[6] Background Mapping data for local authorities - Defra, UK

Plot A.3 - Projected South Norfolk $PM_{2.5}$/Modelled Exceedances 2018-2030



Plot A.4 - Projected Broadland $PM_{2.5}$/Modelled Exceedances 2018-2030



In 2023 South Norfolk and Broadland Councils made a bid for funding from the DEFRA Air quality grant. This funding bid was to facilitate the purchase of low cost monitors that could measure. $PM_{2.5}$. Unfortunately, the Councils were unsuccessful in the funding bid. Whilst low cost monitors do not have the accreditation necessary to use the data for regulatory purposes, they have been identified as a valuable tool for indicative monitoring. Indicative monitoring would increase capability within the councils and provide valuable insight into future monitoring opportunities.

In 2022 South Norfolk Council partnered with the environmental monitoring and technology company “PlanetWatch” to launch a new pilot project initially focussing on Long Stratton and the bypass development. PlanetWatch has provided the council with several of its innovative low cost monitors, each capable of providing “near-live” data about the amount of Nitrogen Dioxide and Particulate Matter in the air (including $PM_{2.5}$). As of 2024 South Norfolk and Broadland Councils have additionally purchased two ‘Earthsense Zephyr’ indicative $PM_{2.5}$ and NO_2 monitors, which are currently deployed in both districts. These units are currently being deployed to assess $PM_{2.5}$ and NO_2 levels at the locations where we have historically recorded the highest NO2 diffusion tube concentrations in either district. Two further ‘Praxis’ monitors have also been purchased are a due to be deployed later in 2024. The overall aim of this equipment is to help provide more in depth knowledge regarding air pollution in both districts. We are currently working on a monitoring schedule focussing on our highest risk locations using available health data to prioritise sites.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2023 by South Norfolk and Broadland Councils and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Non-Automatic Monitoring Sites

South Norfolk and Broadland Councils undertook non- automatic (i.e. passive) monitoring of NO_2 at 59 sites during 2023 (30 in South Norfolk and 29 in Broadland).

Table A.11 and A2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A3 and Table A4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 and Table B.2 includes distance corrected values, only where relevant.

There are no exceedances of the air quality objectives. Almost all annual mean concentrations in both districts are lower than in 2019 (before the Covid-19 pandemic). In the vast majority of monitoring locations concentrations are also below 2022 levels.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites – Broadland

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
BN4	BN4 Hillside Avenue, Thorpe St Andrew	Suburban	626918	308740	NO2	No	11.0	1.0	No	3.0
BN6	BN6 Breck Road, Sprowston	Suburban	626317	311012	NO2	No	1.0	4.0	No	2.5
BN10	BN10 Yarmouth Road, Thorpe St Andrew	Roadside	625369	308438	NO2	No	13.0	1.0	No	3.0
BN11	BN11 Reepham Road, Hellsdon	Suburban	621651	311632	NO2	No	3.0	4.0	No	2.0
BN12	BN12 10 Boundary Road, Hellsdon	Suburban	621698	311569	NO2	No	1.0	6.0	No	2.0
BN13	BN13 214 Milecross Lane, Hellsdon	Suburban	621814	311648	NO2	No	1.0	1.0	No	2.0
BN15	BN15 Norwich Road, Wroxham Library Wroxham	Roadside	630114	318015	NO2	No	16.0	2.0	No	2.0
BN18	BN18 Middletons Lane, Hellsdon	Roadside	620186	311834	NO2	No	4.0	1.0	No	3.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
BN19	BN19 187 Yarmouth Road/Pound Lane, Thorpe St Andrew	Suburban	627490	308775	NO2	No	1.0	6.0	No	2.0
BN20	BN20 The Street, Acle	Kerbside	640166	310354	NO2	No	1.0	1.0	No	3.0
BN21	BN21 Plumstead Road, Thorpe End	Roadside	627743	310905	NO2	No	21.0	1.0	No	2.0
BN22	BN22 Wroxham Road, Sprowston	Suburban	624065	311161	NO2	No	35.0	1.0	No	3.0
BN24	BN24 127 Fifers Lane, Hellsdon	Suburban	621465	312666	NO2	No	15.0	1.0	No	1.5
BN25	BN25 Market Place, Aylsham	Kerbside	619321	326913	NO2	No	1.0	8.0	No	1.5
BN26	BN26 172 Plumstead Road East	Suburban	626308	310096	NO2	No	1.0	19.0	No	1.5
BN27	BN27 300 Wroxam Road, Sprowston	Suburban	625504	312473	NO2	No	1.0	18.0	No	3.0
BN28	BN28 73 Holt Road, Hellsdon	Suburban	621212	312970	NO2	No	1.0	21.0	No	1.5
BN29	BN29 27 High Street, Cawston	Roadside	613459	323916	NO2	No	1.0	1.0	No	2.5
BN30	BN30 Salhouse Road, Sprowston	Roadside	626171	311059	NO2	No	13.0	1.0	No	3.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
BN31	BN31 Chartwell Road, Old Catton	Roadside	623069	311327	NO2	No	8.0	1.0	No	2.0
BN32	BN32 Longfields Road, Thorpe St Andrew	Roadside	627038	309912	NO2	No	7.0	1.0	No	2.0
BN33	BN33 Beighton White House, Beighton	Roadside	637749	309865	NO2	No	21.0	2.0	No	2.0
BN34	BN34 Cromer Road, Hellsdon	Kerbside	621713	311699	NO2	No	6.0	1.0	No	2.0
BN35	BN35 373 Drayton High Road, Hellsdon	Suburban	620205	311723	NO2	No	1.0	8.0	No	2.0
BN36	BN36 Norwch Road, Wroxham	Kerbside	629892	317484	NO2	No	16.0	1.0	No	2.0
BN37	BN37 Vane Close, Thorpe St Andrew	Kerbside	627597	309179	NO2	No	5.0	1.0	No	2.0
BN38	BN38 60 HOLT ROAD, HORSFORD	Suburban	619440	315702	NO2	No	5.0	1.0	No	2.0
BN39	BN39 Market Place, Reepham	Kerbside	609932	322874	NO2	No	2.0	1.0	No	2.5
BN41	BN41 High Street Coltishall	Kerbside	626804	319855	NO2	No	20.0	1.0	No	2.5

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Details of Non-Automatic Monitoring Sites – South Norfolk

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT1	1- 46a OLD NEWMARKET RD,CRING	Suburban	619245	305653	NO2	No	1.0	12.0	No	1.5
DT2	2- 131 LONGWATER LANE,COSTESSEY	Suburban	616934	310462	NO2	No	1.0	23.0	No	1.5
DT3	3- 90 THE STREET,PORINGLAND	Suburban	626790	302088	NO2	No	1.0	9.0	No	1.5
DT4	4-87 DENMARK ST,DISS	Suburban	611943	279567	NO2	No	1.0	2.0	No	1.5
DT5	5-131 VICTORIA RD,DISS	Suburban	611943	279567	NO2	No	1.0	3.0	No	1.8
DT6	6-21 CHURCH PLAIN, LODDON	Suburban	636210	298771	NO2	No	3.0	2.0	No	1.5
DT7	7- A140 LONG STRATTON	Roadside	619725	292748	NO2	No	1.0	1.0	No	2.1
DT8	8- FAIRLAND ST,WYMONDHAM	Kerbside	611100	301436	NO2	No	26.0	1.0	No	2.1
DT9	9- KIRBY BEDON ROAD, BIXLEY	Kerbside	625438	306163	NO2	No	1.0	23.0	No	2.1
DT10	10- 209 NORWICH RD,WYMONDHAM	Suburban	612514	302653	NO2	No	1.0	22.0	No	1.5
DT11	11- 2 THICKTHORN COTTAGES	Rural	618138	305619	NO2	No	13.0	1.0	No	1.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT12	12- RIGHTUP LANE,WYMONDHAM	Suburban	611529	300995	NO2	No	1.0	19.0	No	2.1
DT13	13-233 NORWICH RD,WYMONDHAM	Suburban	612704	302788	NO2	No	1.0	6.0	No	1.5
DT14	14- 28 NORWICH RD,WYMONDHAM	Suburban	611367	301622	NO2	No	1.0	3.0	No	1.5
DT15	15- HARLESTON (HOTEL)	Roadside	624476	283267	NO2	No	17.0	1.0	No	2.1
DT16	16- DISS ROAD,SCOLE	Roadside	614902	278861	NO2	No	18.0	1.0	No	1.8
DT17	17-LONGWATER LANE (NEAR TO SCHOOL)	Roadside	616984	311560	NO2	No	2.0	1.0	No	2.1
DT18	18- LS CHINESE	Roadside	619714	292717	NO2	No	2.0	1.0	No	2.1
DT19	19- LS TRAFFIC LIGHT EAST	Roadside	619731	292745	NO2	No	1.0	8.0	No	2.1
DT20	20- LS FUNERAL DIRECTORS	Suburban	619643	292348	NO2	No	1.0	2.0	No	1.5
DT21	21- LS SOUTHBOUND 60 MTRS	Suburban	619685	292629	NO2	No	3.0	1.0	No	1.5
DT22	22- LS SWAN LANE CO-OP CHEM	Roadside	619711	292720	NO2	No	1.0	15.0	No	2.1
DT23	23- 3 NORWICH ROAD,COSTESSEY	Suburban	618991	309891	NO2	No	1.0	8.0	No	2.1
DT24	24- 14 STATION RD,WYMONDHAM	Suburban	611325	301191	NO2	No	8.0	1.0	No	2.1

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT25	25- BUS STOP,NWH RD, STRATTON	Roadside	619821	293028	NO2	No	18.0	1.0	No	2.1
DT26	26- NEWMARKET ROAD,CRINGLEFORD	Roadside	619772	305851	NO2	No	1.0	20.0	No	1.5
DT27	27-THE ROUND HOUSE, COSTESSEY	Roadside	616852	310342	NO2	No	1.0	2.0	No	1.5
DT28	28- 10 WEST END,COSTESSEY	Suburban	617170	311659	NO2	No	1.0	1.0	No	1.5
DT29	29- 25 BROAD ST,HARLESTON	Suburban	624633	283505	NO2	No	1.0	7.0	No	1.5
DT30	30 - Morrisons/Parsons Diss	Roadside	611785	279593	NO2	No	2.0	1.0	No	1.5

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3) – Broadland

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
BN4	626918	308740	Suburban	100	99.7	12.9	9.4	9.9	10.1	9.3
BN6	626317	311012	Suburban	100	99.7	14.4	8.6	10.0	10.4	9.8
BN10	625369	308438	Roadside	100	99.7	21.4	16.5	19.3	18.4	18.9
BN11	621651	311632	Suburban	100	99.7	28.0	21.0	25.0	23.7	20.1
BN12	621698	311569	Suburban	100	99.7	29.6	19.7	21.6	20.7	17.7
BN13	621814	311648	Suburban	100	99.7	24.0	15.8	18.8	17.7	15.7
BN15	630114	318015	Roadside	100	99.7	22.0	14.3	15.7	17.3	14.7
BN18	620186	311834	Roadside	100	99.7	23.8	12.4	14.1	13.5	13.6
BN19	627490	308775	Suburban	100	99.7	26.3	16.7	19.0	18.6	18.1
BN20	640166	310354	Kerbside	100	99.7	21.1	15.5	16.9	16.8	16.4
BN21	627743	310905	Roadside	100	99.7	18.2	10.2	11.6	12.5	10.9
BN22	624065	311161	Suburban	75	75.0	32.4	21.7	26.3	27.9	25.0
BN24	621465	312666	Suburban	100	99.7	18.7	12.2	13.8	13.0	12.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
BN25	619321	326913	Kerbside	91.7	92.0	16.8	9.6	10.8	10.6	9.9
BN26	626308	310096	Suburban	100	99.7	15.1	10.8	12.2	11.5	10.2
BN27	625504	312473	Suburban	100	99.7	24.4	19.5	20.4	21.2	21.7
BN28	621212	312970	Suburban	100	99.7	16.2	9.5	11.4	11.6	11.0
BN29	613459	323916	Roadside	100	99.7	17.1	12.5	14.5	13.9	12.2
BN30	626171	311059	Roadside	100	99.7	22.9	15.2	16.7	17.4	18.0
BN31	623069	311327	Roadside	100	99.7		24.0	28.4	26.2	23.9
BN32	627038	309912	Roadside	100	99.7		8.8	10.6	10.0	9.1
BN33	637749	309865	Roadside	100	99.7		14.7	17.5	16.1	13.9
BN34	621713	311699	Kerbside	83.4	82.7		25.4	30.0	29.0	24.5
BN35	620205	311723	Suburban	100	99.7		14.3	19.0	15.9	15.7
BN36	629892	317484	Kerbside	100	99.7		17.8	21.5	20.6	18.2
BN37	627597	309179	Kerbside	100	99.7		10.0	11.0	11.4	10.1
BN38	619440	315702	Suburban	100	99.7		13.0	14.7	14.5	13.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
BN39	609932	322874	Kerbside	100	99.7			14.6	12.7	11.4
BN41	626804	319855	Kerbside	100	99.7					15.2

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3) – South Norfolk

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
DT1	619245	305653	Suburban	100	100.0	19.9	14.0	14.4	14.4	13.4
DT2	616934	310462	Suburban	100	100.0	19.1	13.9	14.7	15.1	13.9
DT3	626790	302088	Suburban	100	100.0	18.2	12.6	13.4	13.3	12.1
DT4	611943	279567	Suburban	100	100.0	21.5	18.7	22.1	22.4	21.3
DT5	611943	279567	Suburban	100	100.0	26.9	19.5	21.9	21.5	19.0
DT6	636210	298771	Suburban	100	100.0	19.8	13.2	13.0	16.1	12.2
DT7	619725	292748	Roadside	100	100.0	35.3	24.6	27.3	25.8	24.4
DT8	611100	301436	Kerbside	91.7	92.6	22.9	15.3	15.7	15.5	15.3
DT9	625438	306163	Kerbside	100	100.0	23.9	17.1	17.9	18.4	16.6
DT10	612514	302653	Suburban	100	100.0	15.7	10.3	10.5	11.6	9.9
DT11	618138	305619	Rural	100	100.0	15.0	10.3	10.8	11.4	9.9
DT12	611529	300995	Suburban	100	100.0	22.7	17.2	18.8	18.7	17.1
DT13	612704	302788	Suburban	100	100.0	14.2	10.2	10.6	11.4	10.2

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
DT14	611367	301622	Suburban	100	100.0	15.9	11.9	12.0	12.8	11.8
DT15	624476	283267	Roadside	100	100.0	29.8	19.8	21.4	19.9	19.0
DT16	614902	278861	Roadside	100	100.0	20.5	14.0	14.5	14.6	13.6
DT17	616984	311560	Roadside	100	100.0		21.7	22.4	24.6	22.3
DT18	619714	292717	Roadside	100	100.0	25.3	18.0	20.4	20.0	18.9
DT19	619731	292745	Roadside	100	100.0	38.4	23.3	24.4	24.3	22.8
DT20	619643	292348	Suburban	100	100.0	26.7	19.6	21.0	21.8	21.1
DT21	619685	292629	Suburban	100	100.0	27.9	21.1	23.4	21.6	20.2
DT22	619711	292720	Roadside	100	90.7	20.8	15.0	15.5	16.1	15.1
DT23	618991	309891	Suburban	100	100.0	15.2	10.8	10.8	11.1	10.2
DT24	611325	301191	Suburban	100	100.0	16.8	11.1	12.9	13.7	13.2
DT25	619821	293028	Roadside	100	100.0	28.1	19.8	21.2	21.1	19.8
DT26	619772	305851	Roadside	100	100.0	20.7	14.0	14.0	14.4	12.8
DT27	616852	310342	Roadside	100	100.0	16.2	10.5	12.9	12.4	10.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
DT28	617170	311659	Suburban	100	100.0		10.1	11.2	12.1	10.4
DT29	624633	283505	Suburban	100	82.0	35.1	21.8	27.6	23.6	22.3
DT30	611785	279593	Roadside	100	100.0		15.8	19.4	17.6	15.8

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

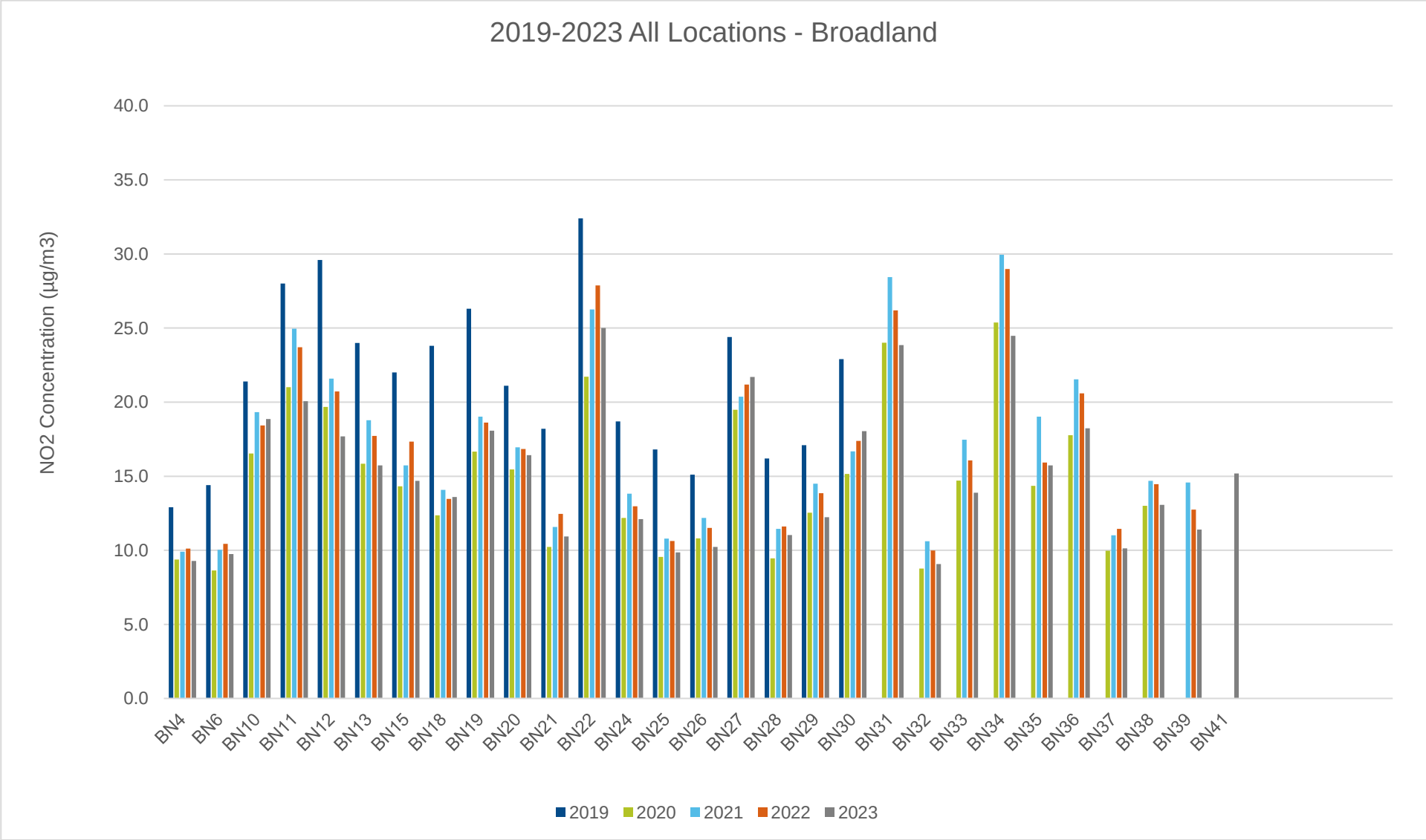
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

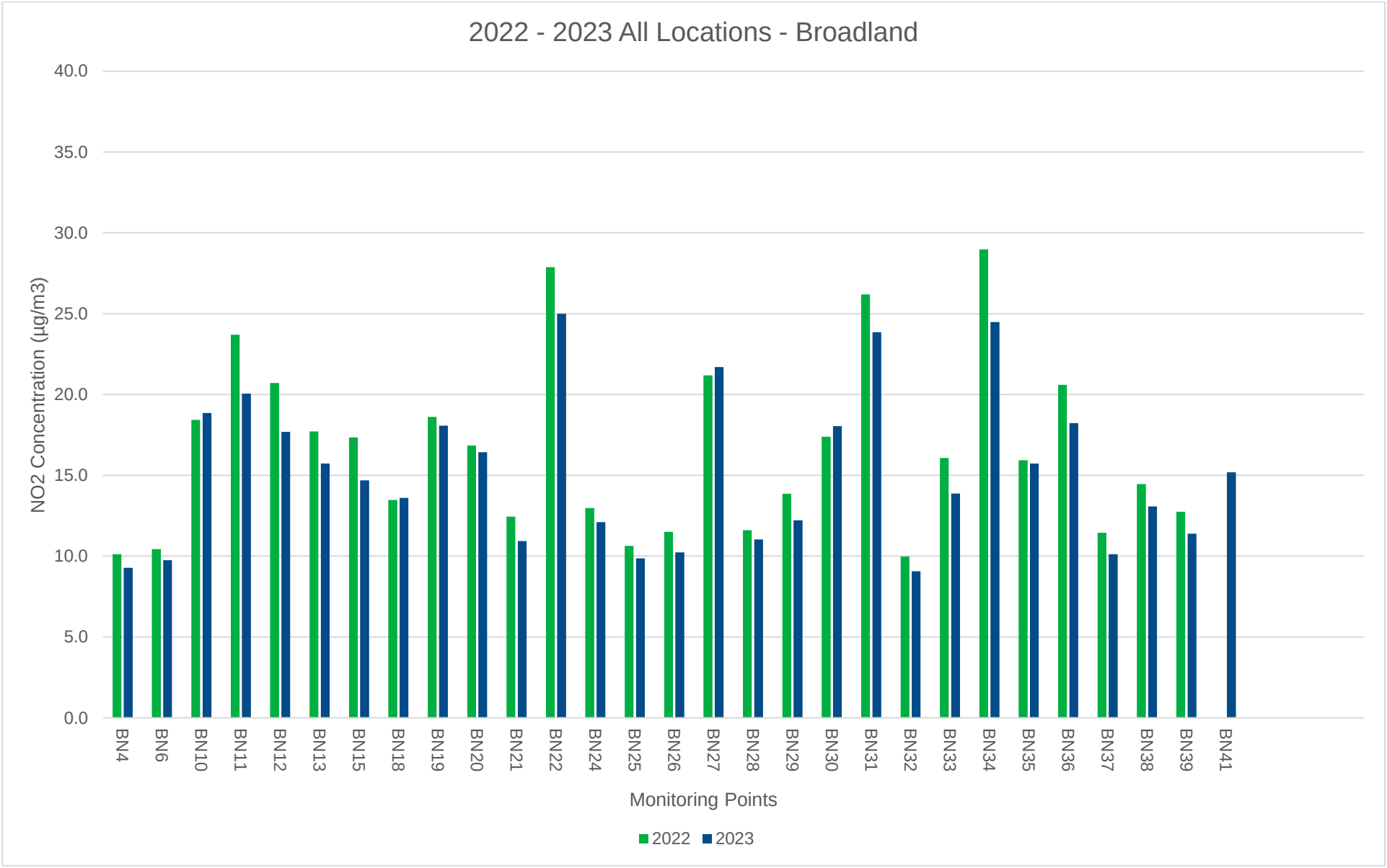
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

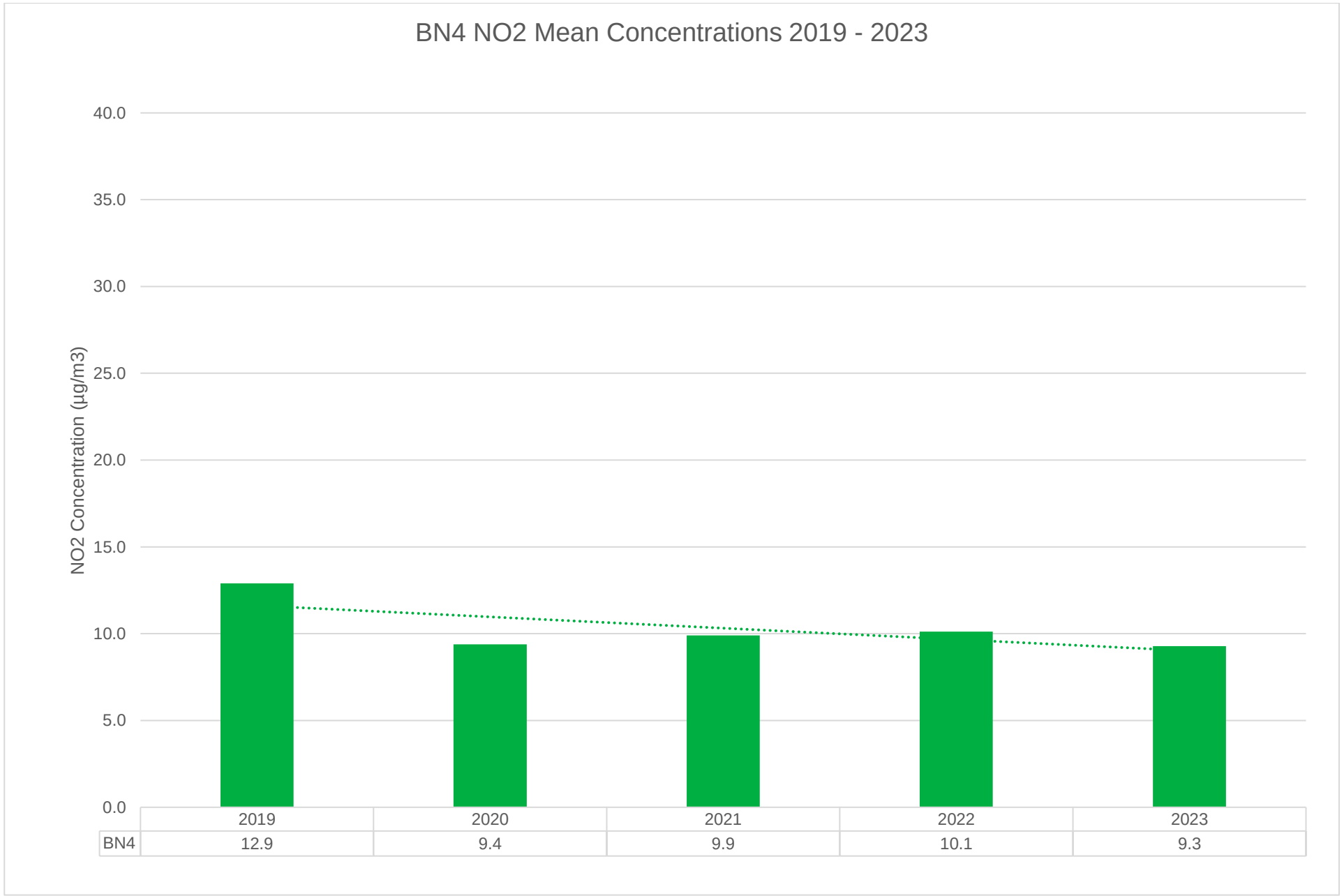
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

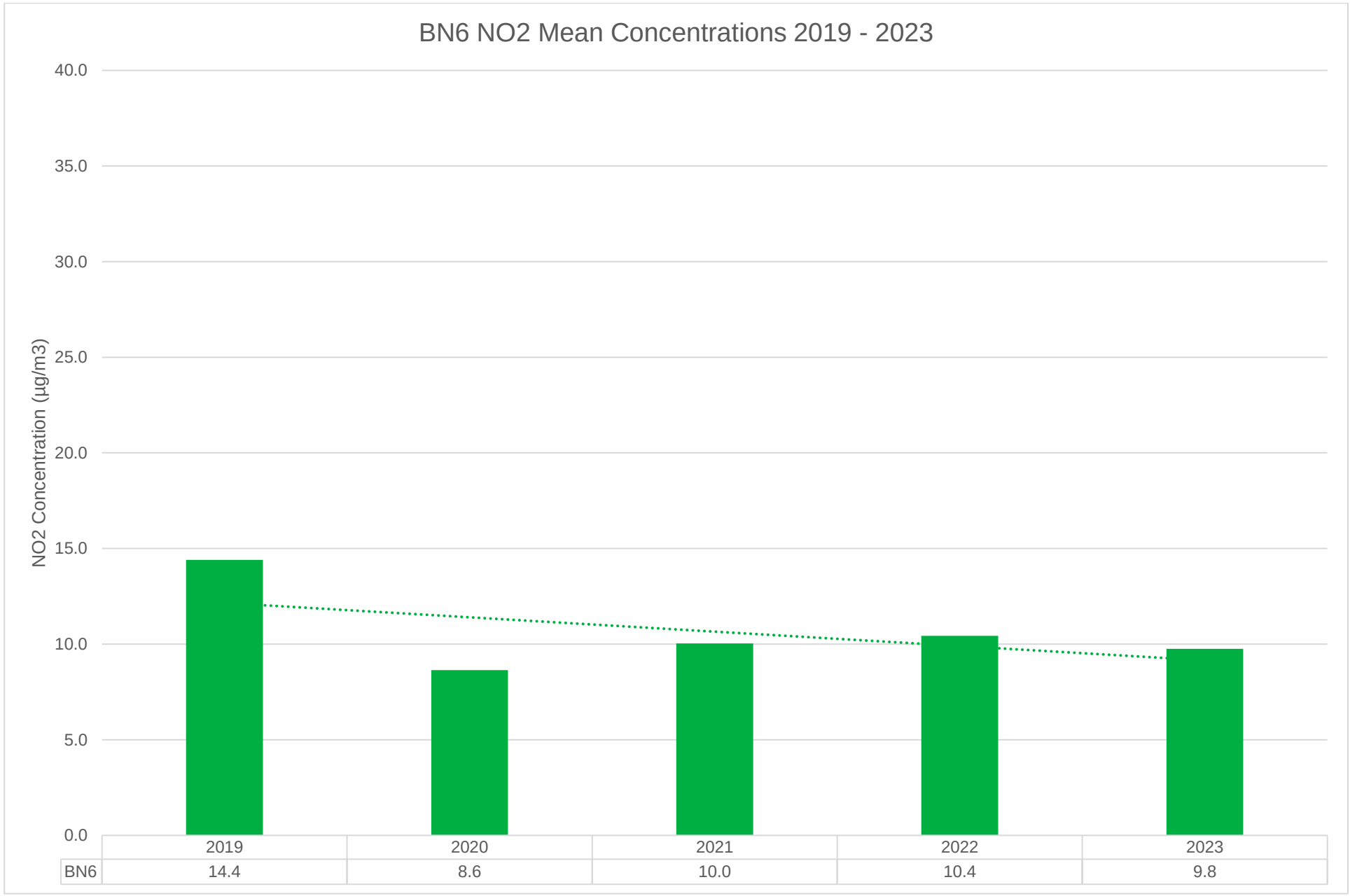
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations – Broadland




2022 - 2023 All Locations - Broadland
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
NO2 Concentration (µg/m3)
BN4
BN6
BN10
BN11
BN12
BN13
BN15
BN18
BN19
BN20
BN21
BN22
BN24
BN25
BN26
BN27
BN28
BN29
BN30
BN31
BN32
BN33
BN34
BN35
BN36
BN37
BN38
BN39
BN41
Monitoring Points
2022
2023


BN4 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN4
12.9
9.4
9.9
10.1
9.3


BN6 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
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5.0
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2019
2020
2021
2022
2023
BN6
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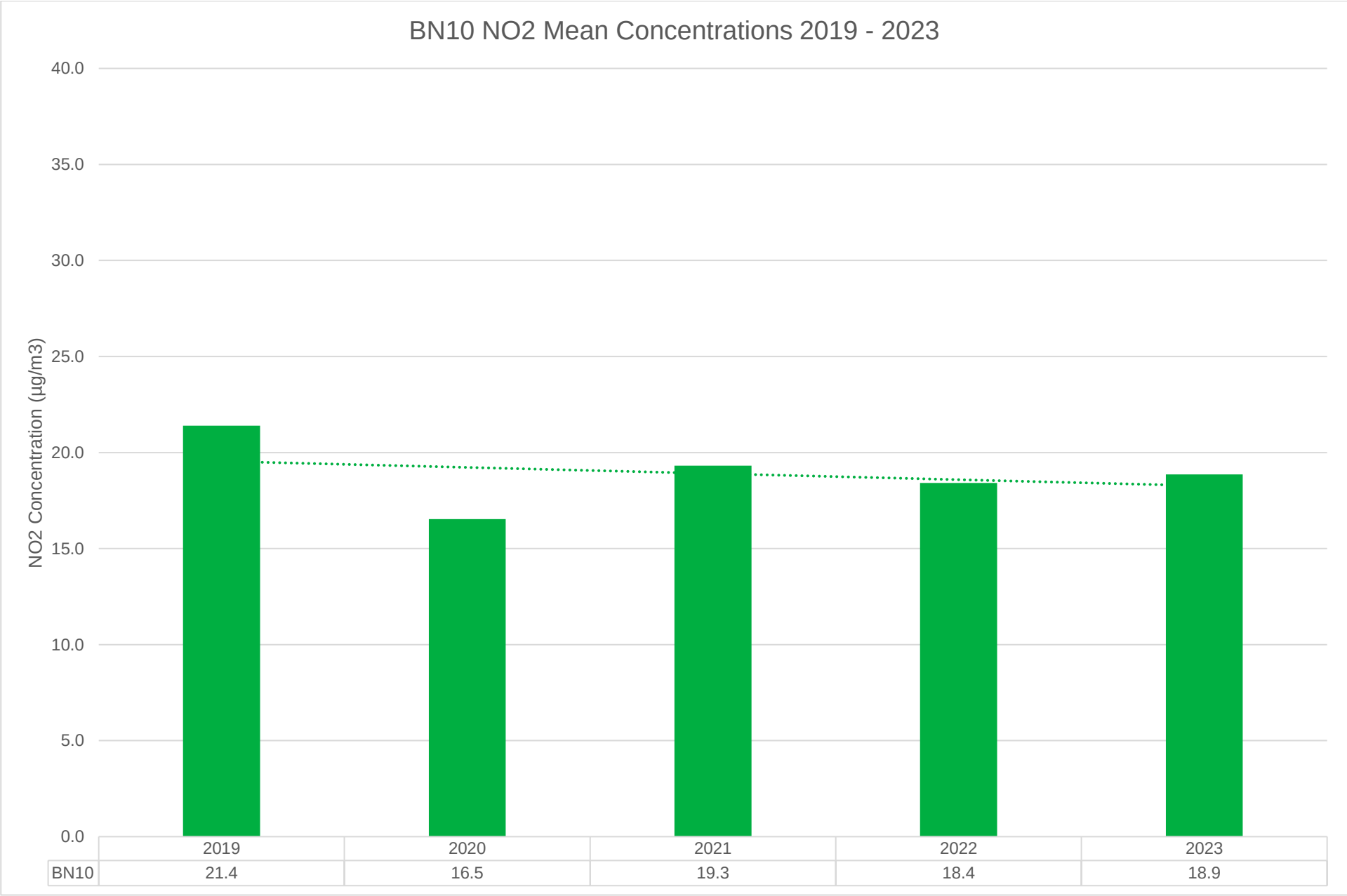
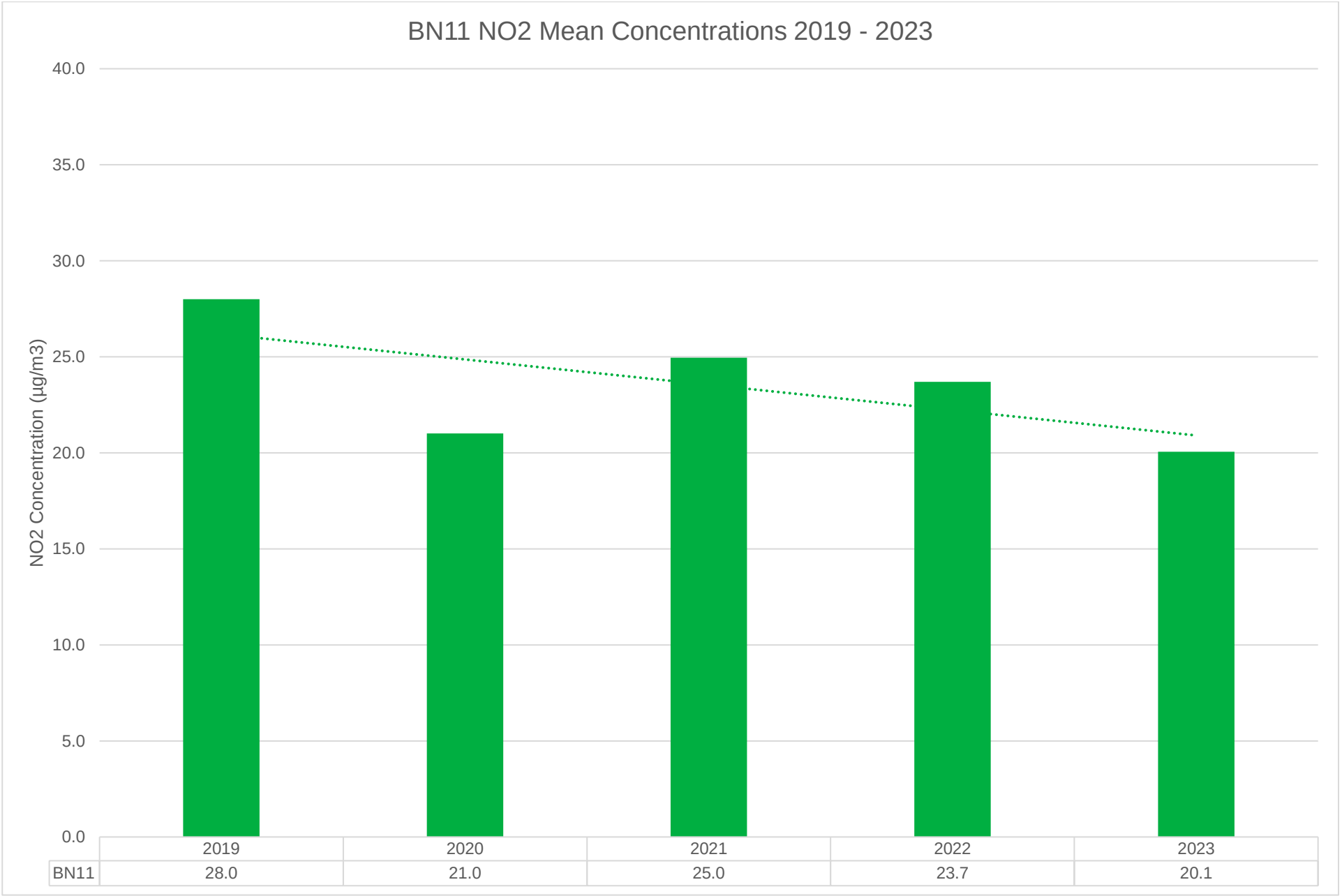
8.6
10.0
10.4
9.8


BN10 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN10
21.4
16.5
19.3
18.4
18.9


BN11 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
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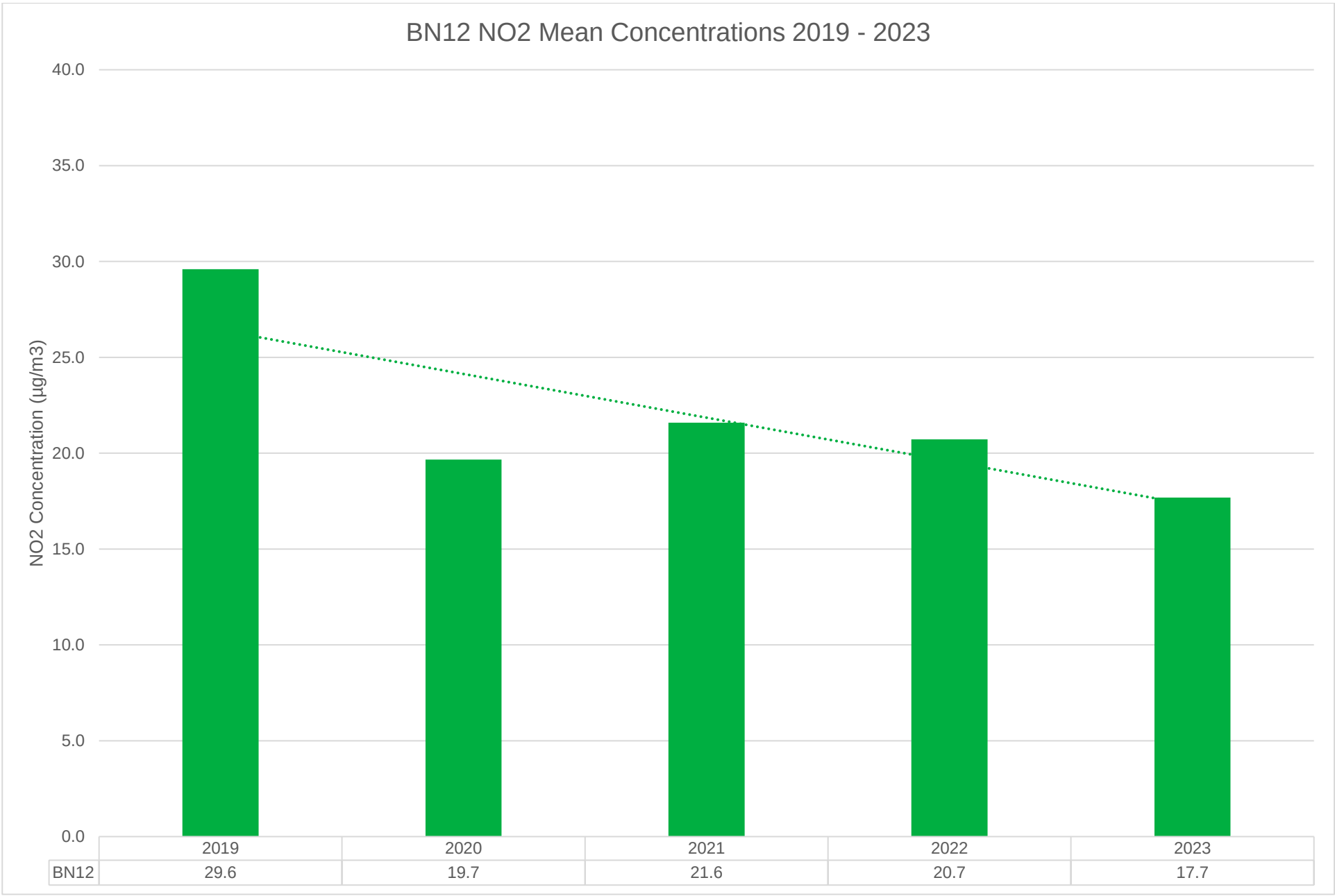
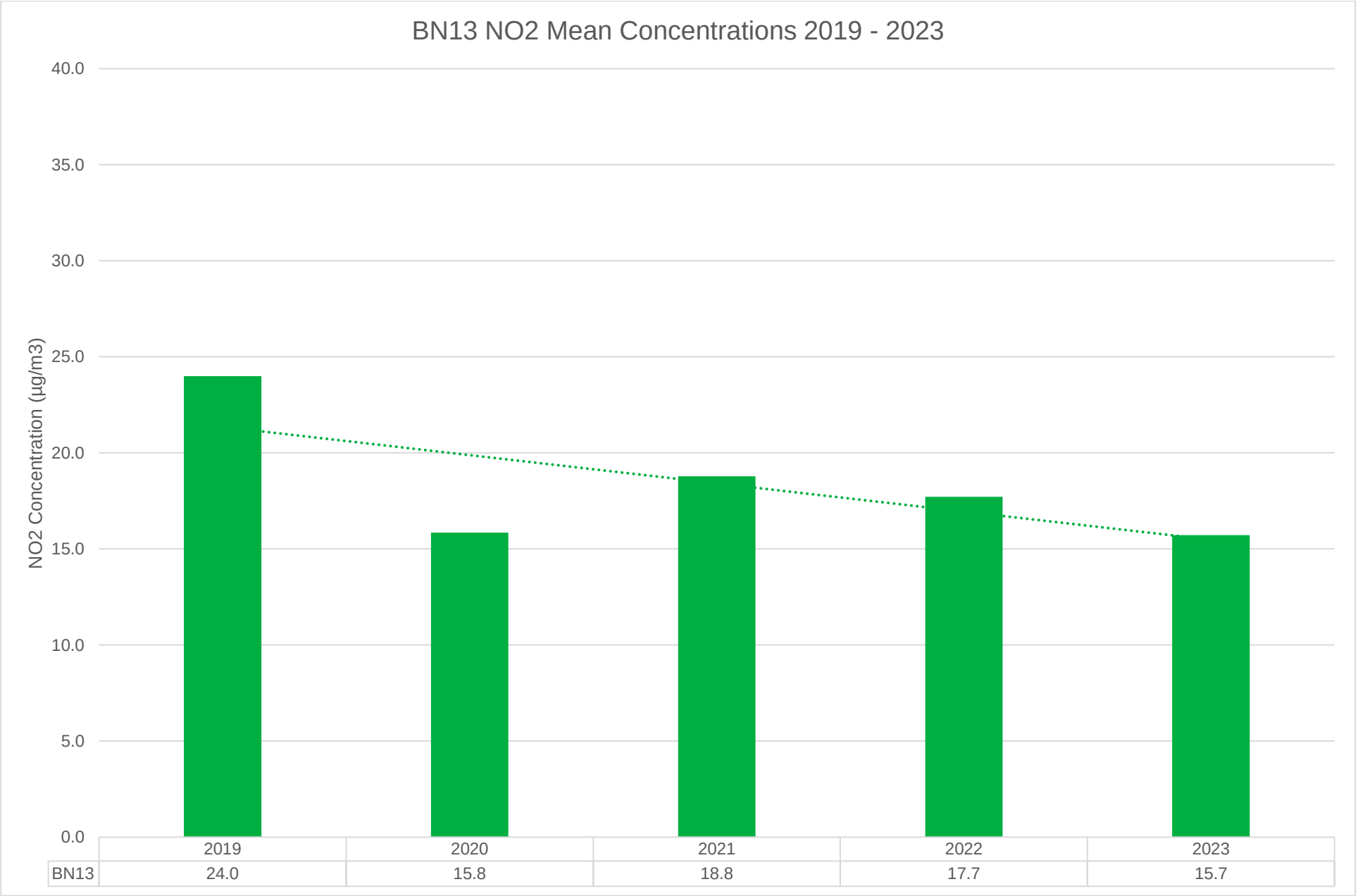
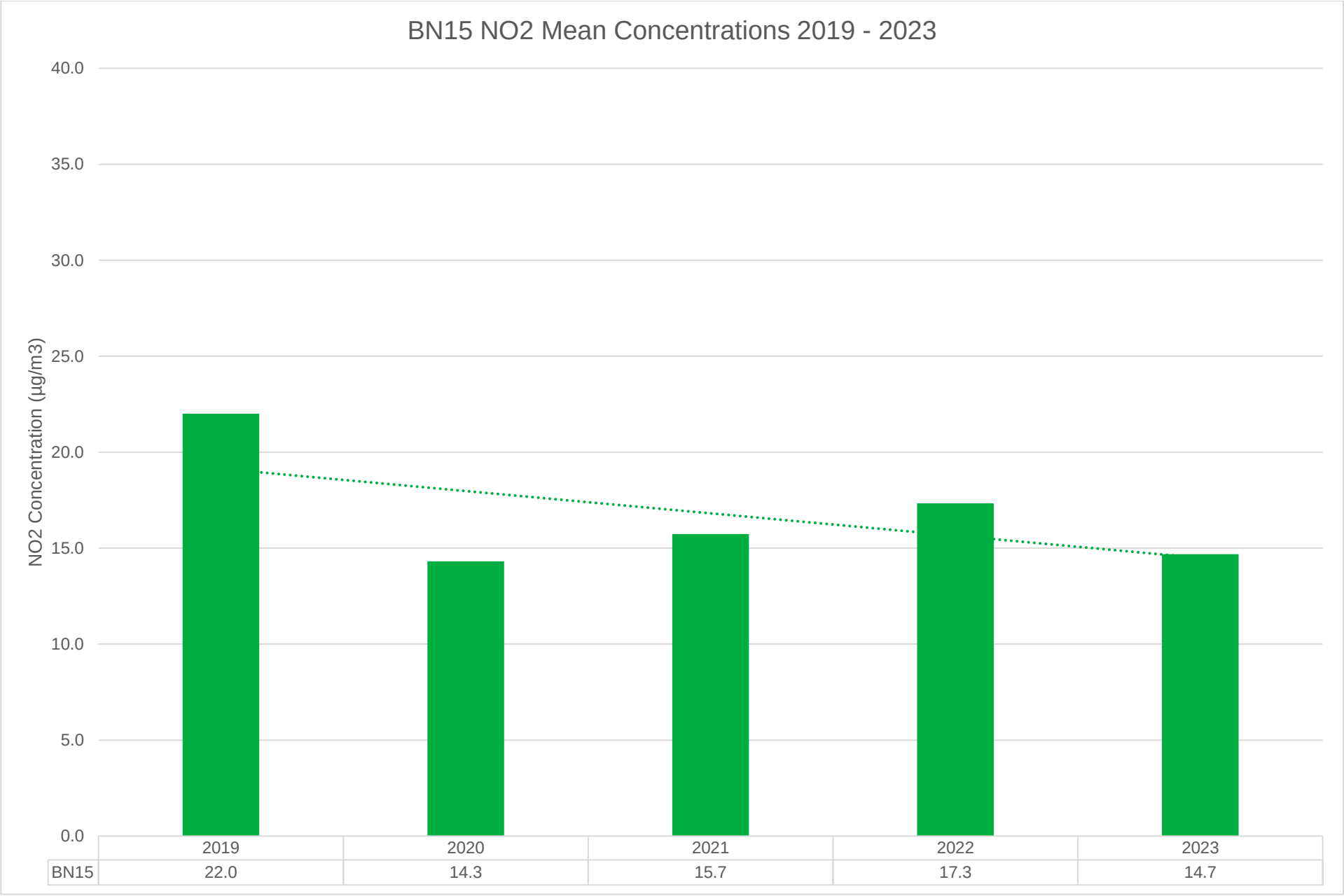
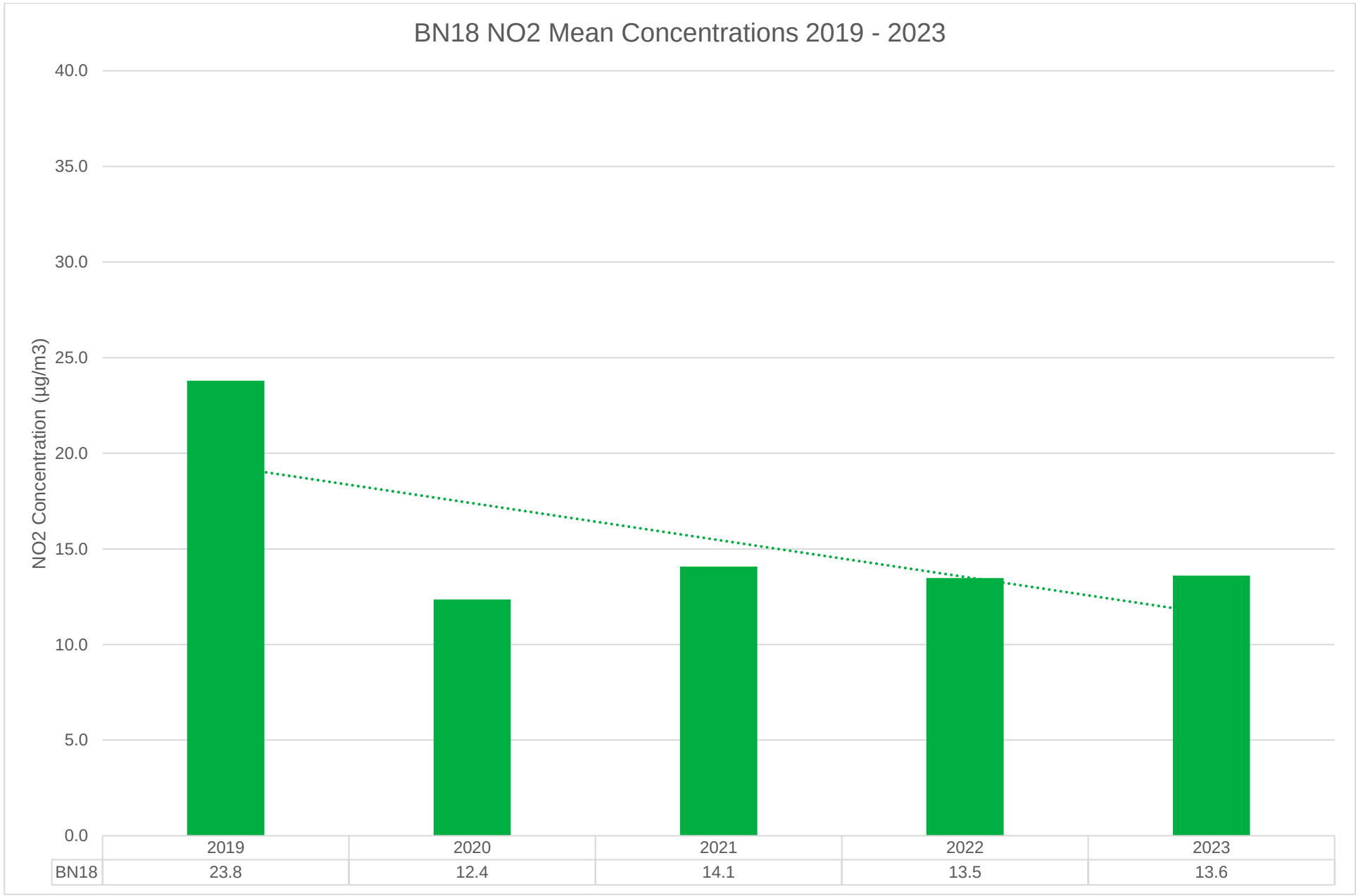
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN11
28.0
21.0
25.0
23.7
20.1

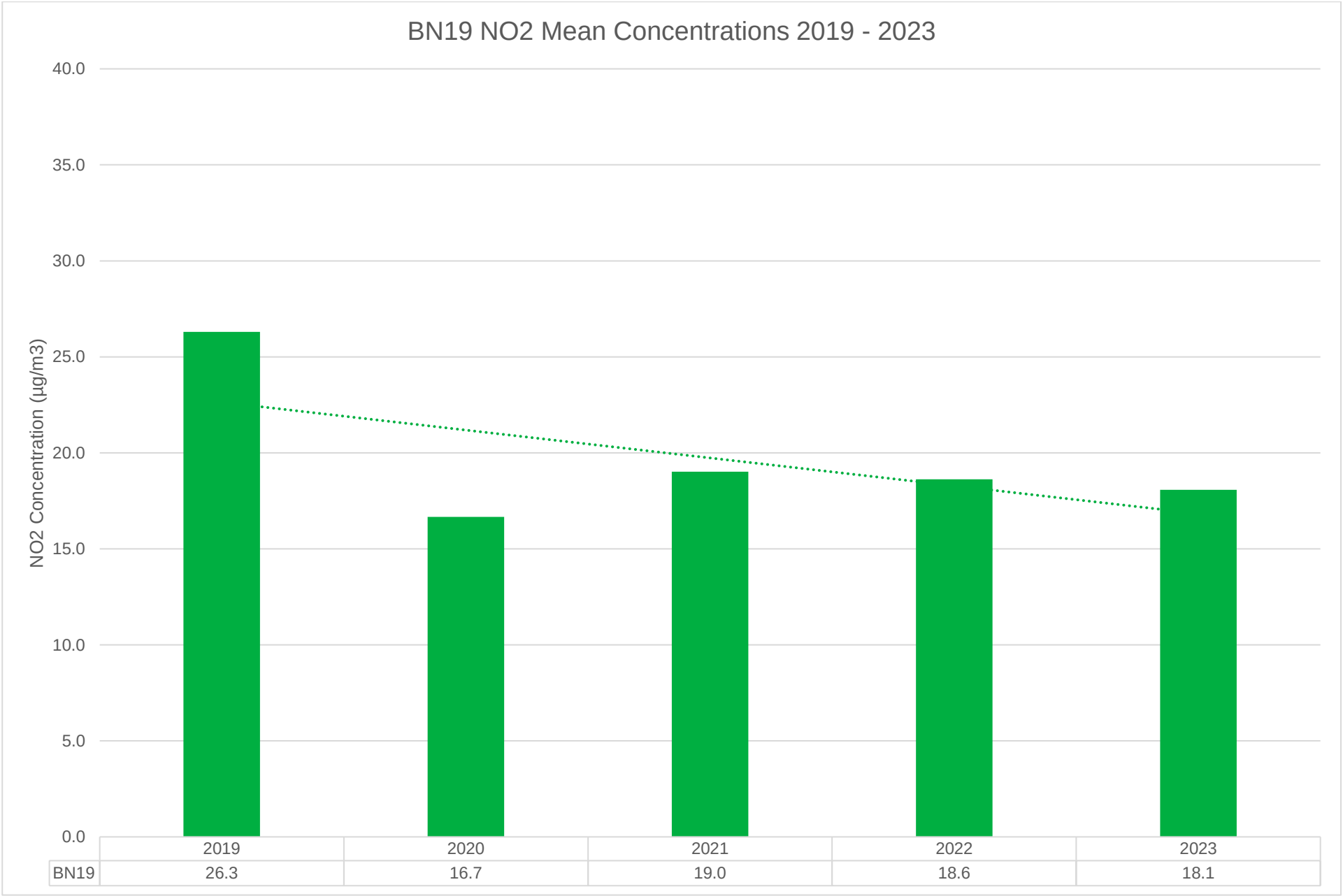

BN12 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN12
29.6
19.7
21.6
20.7
17.7

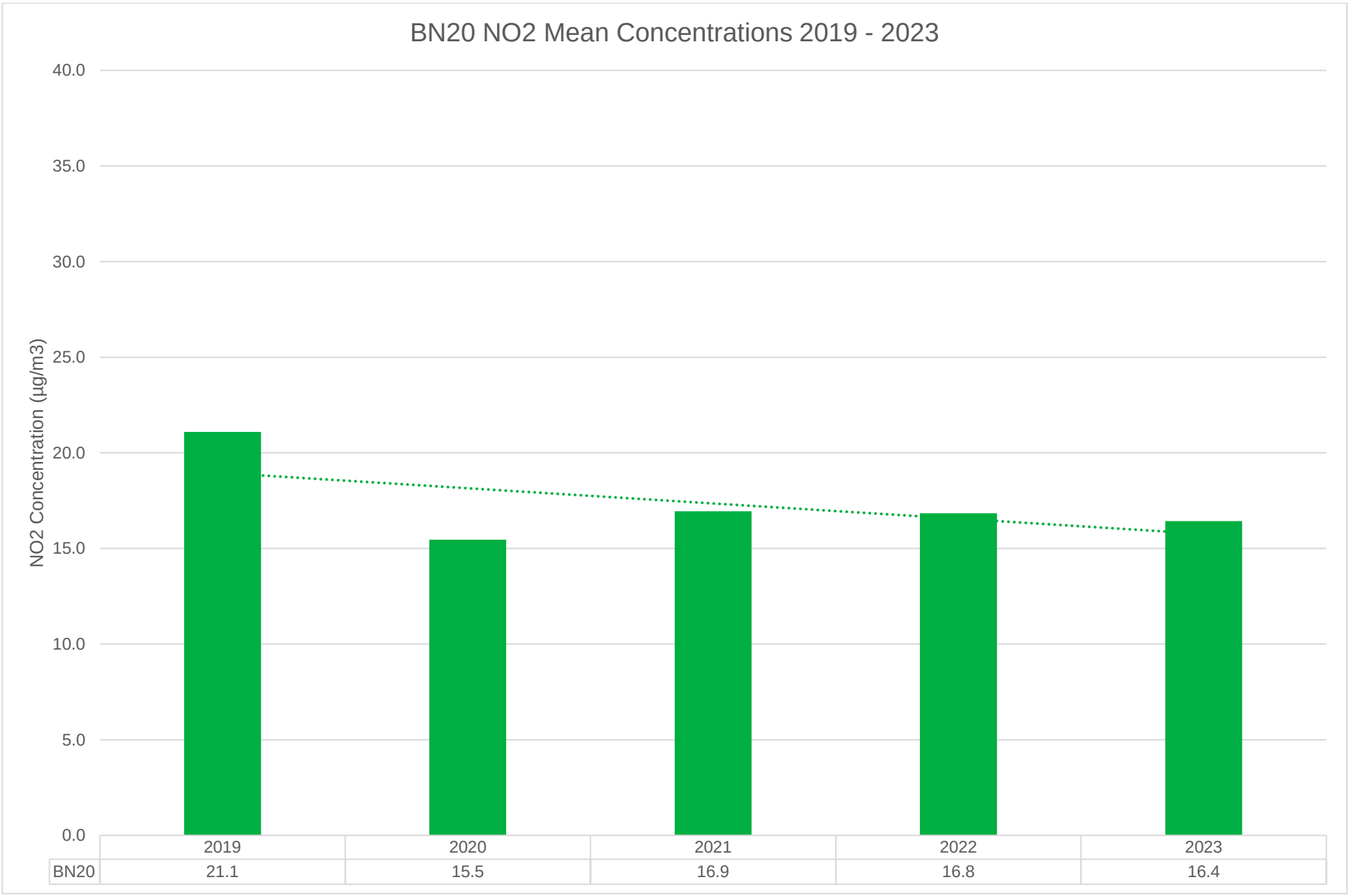

BN13 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN13
24.0
15.8
18.8
17.7
15.7

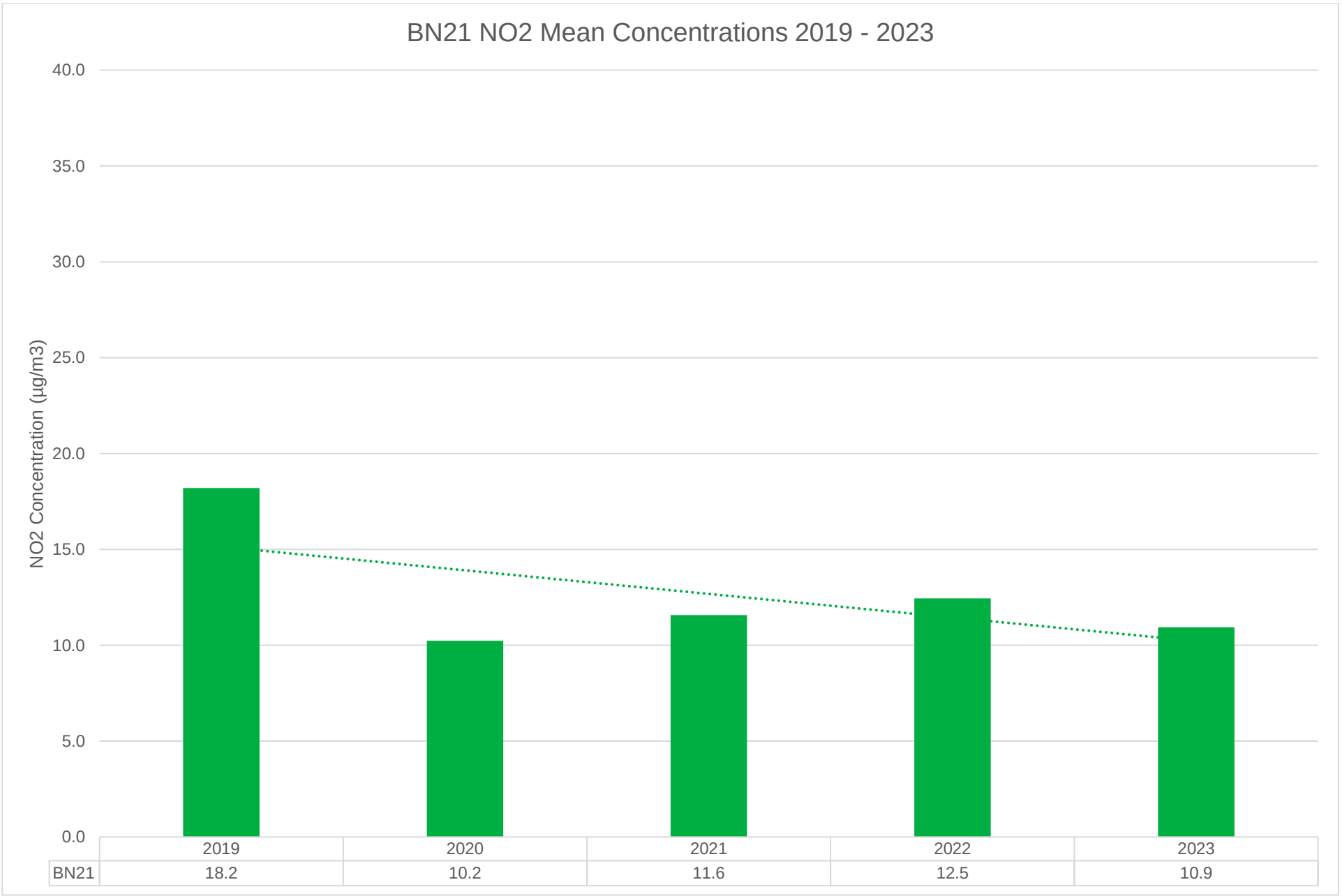


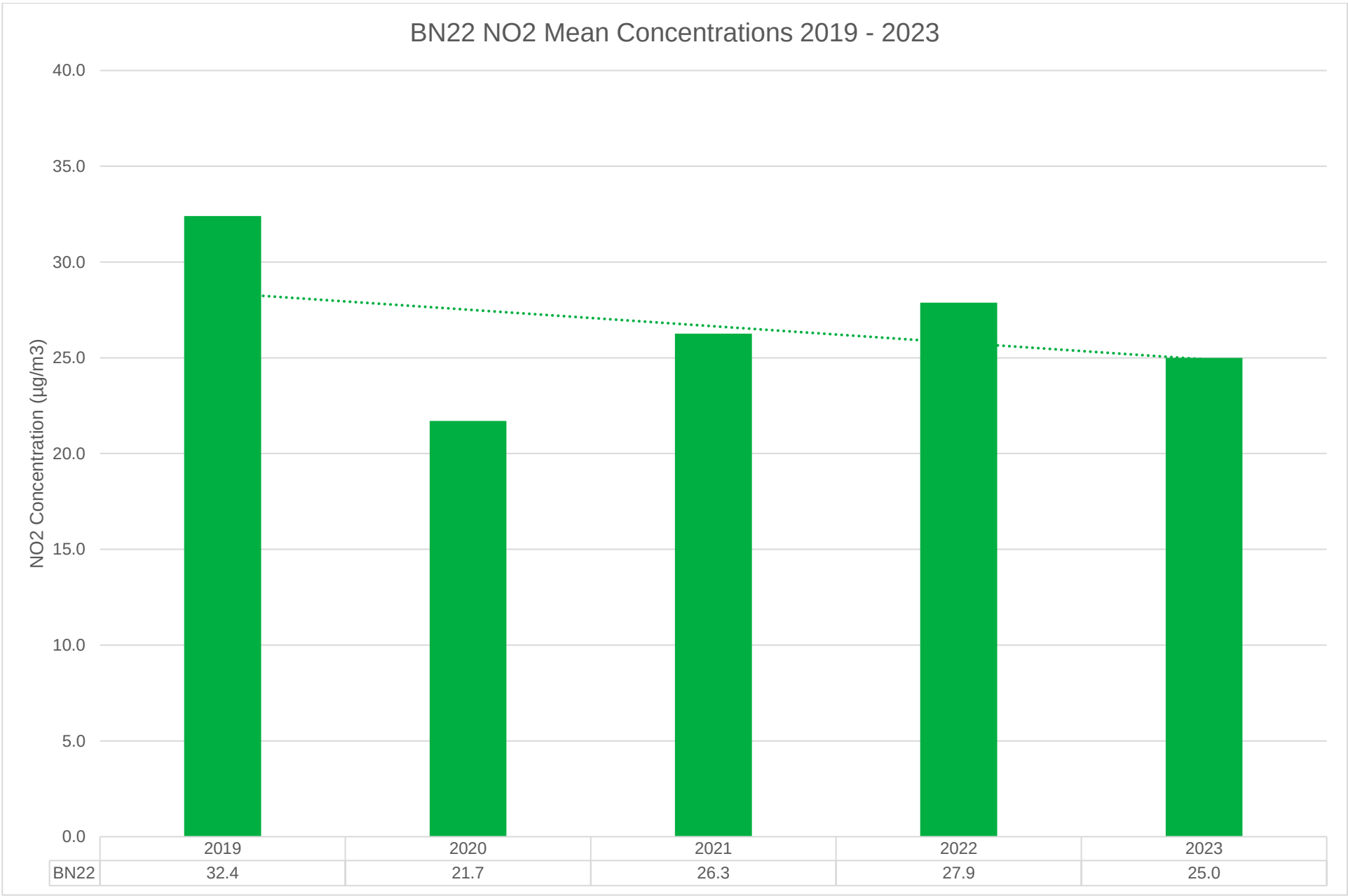
	2019	2020	2021	2022	2023
BN15	22.0	14.3	15.7	17.3	14.7

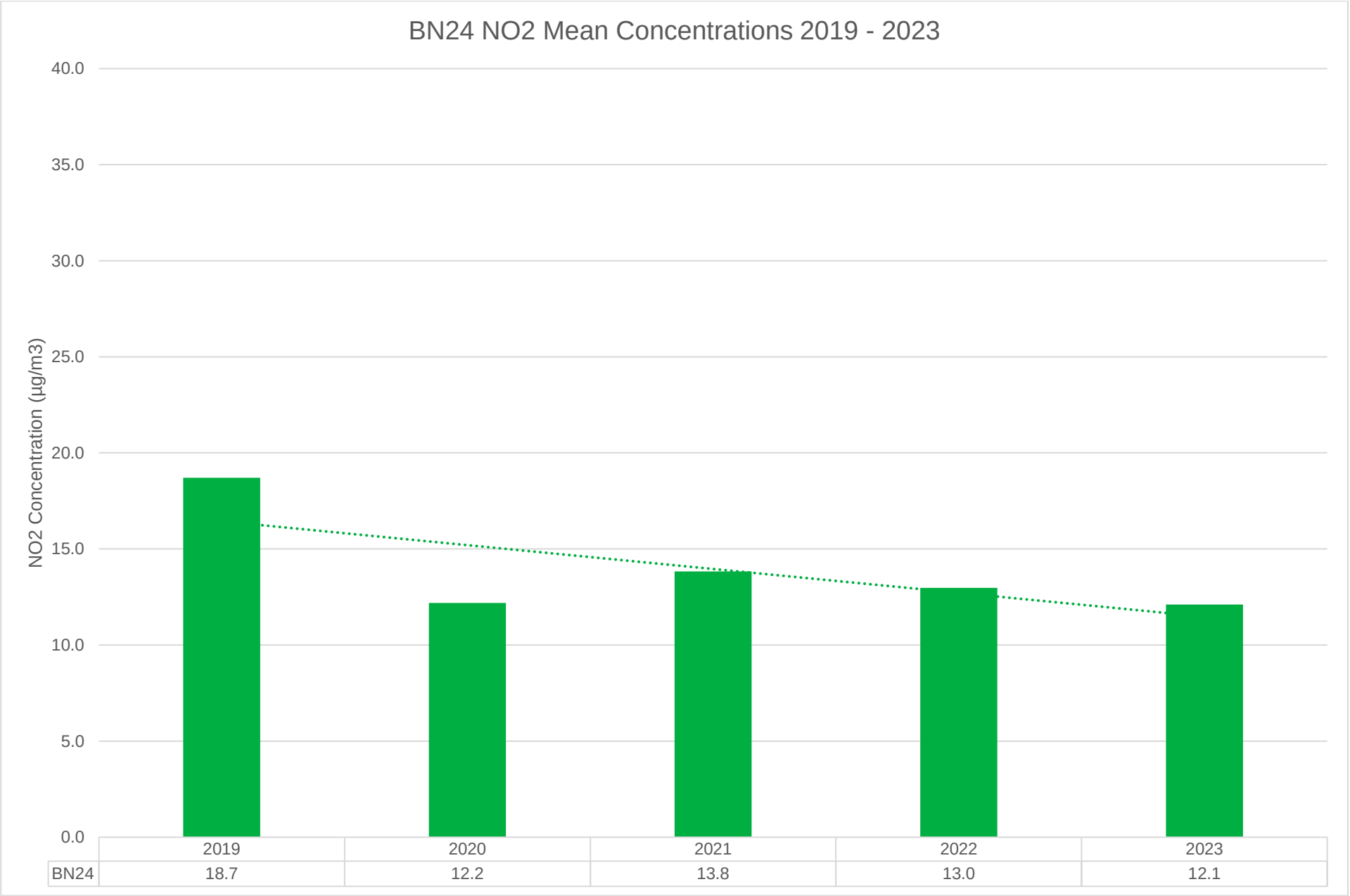

BN18 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN18
23.8
12.4
14.1
13.5
13.6

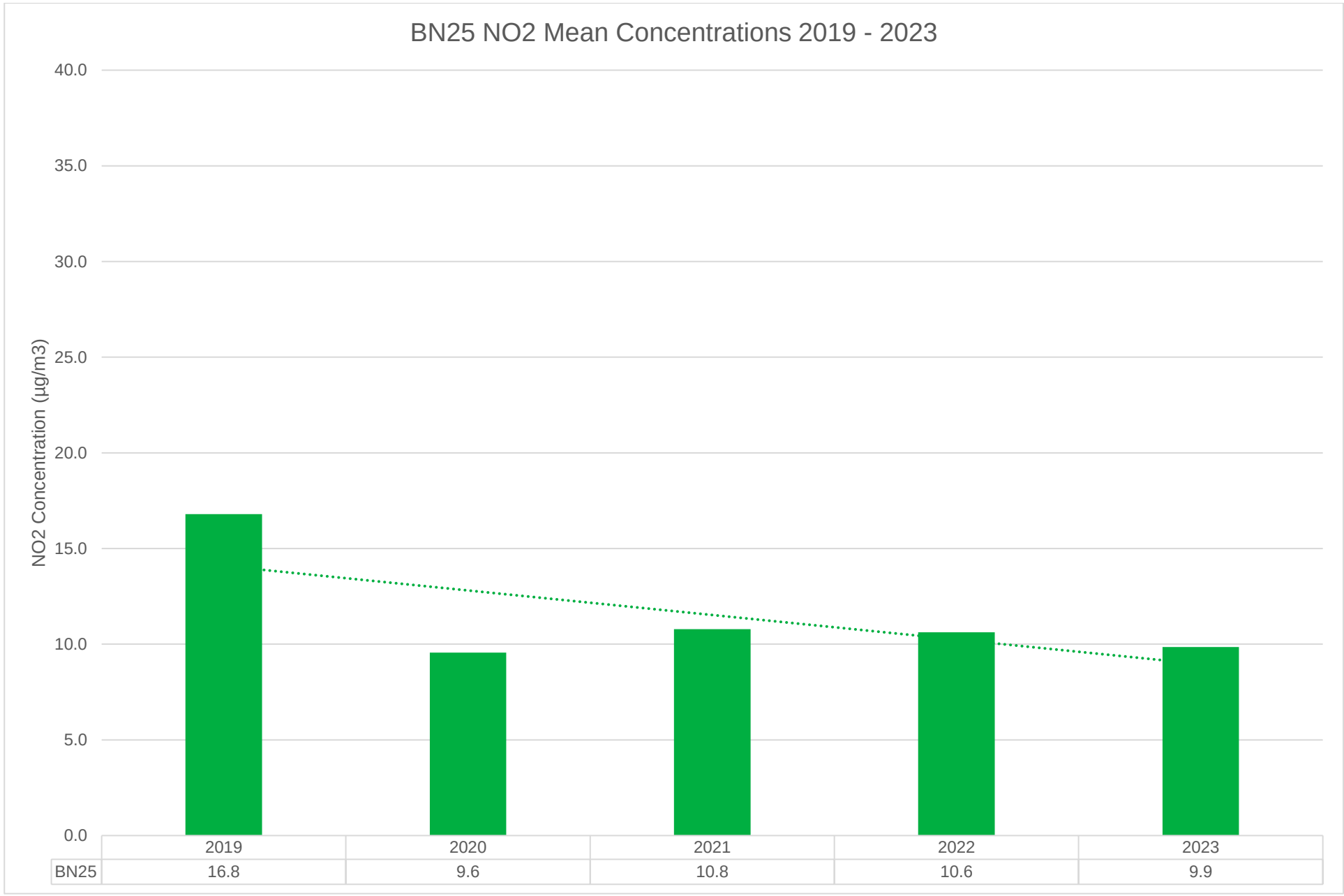

BN19 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN19
26.3
16.7
19.0
18.6
18.1

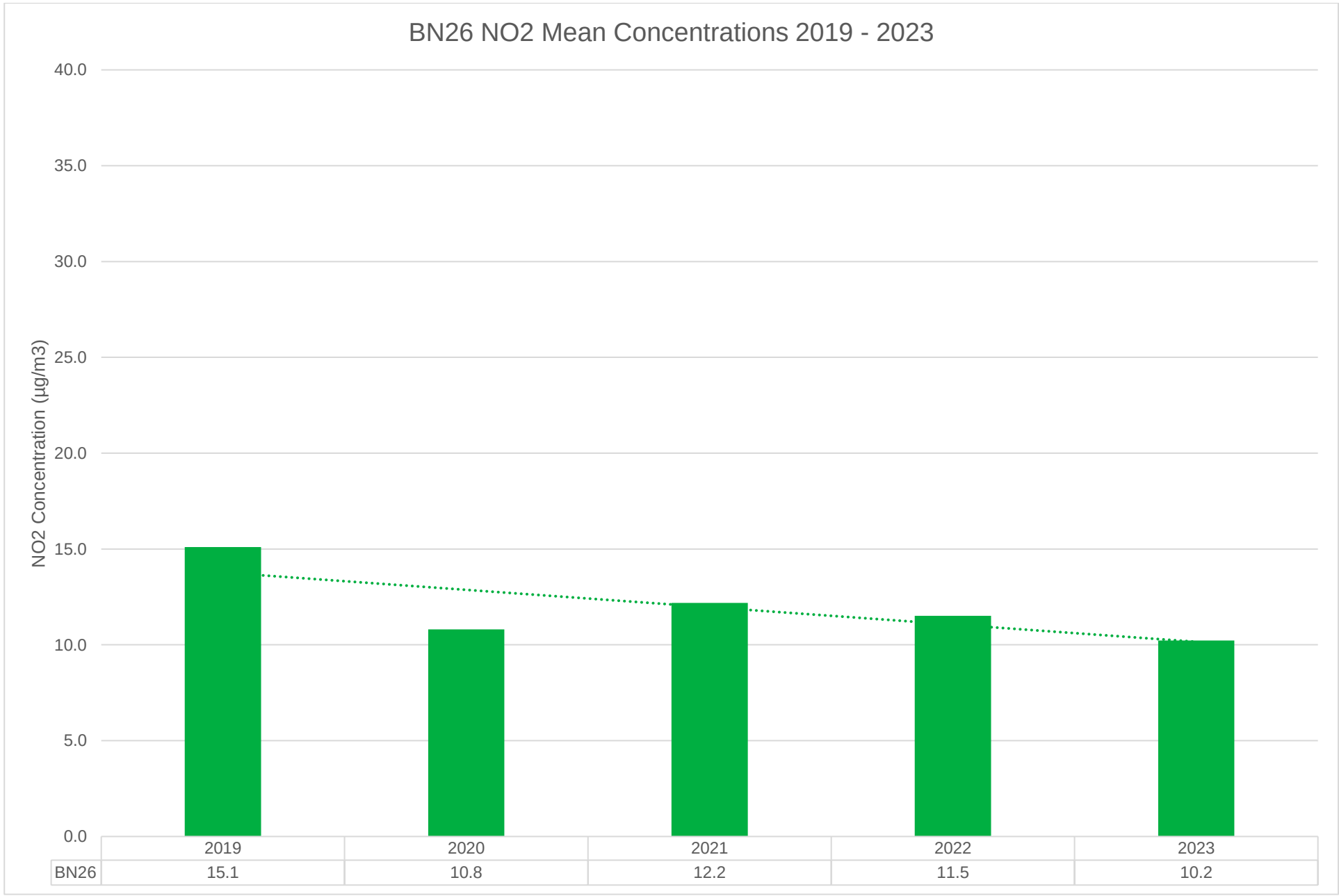

BN20 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN20
21.1
15.5
16.9
16.8
16.4

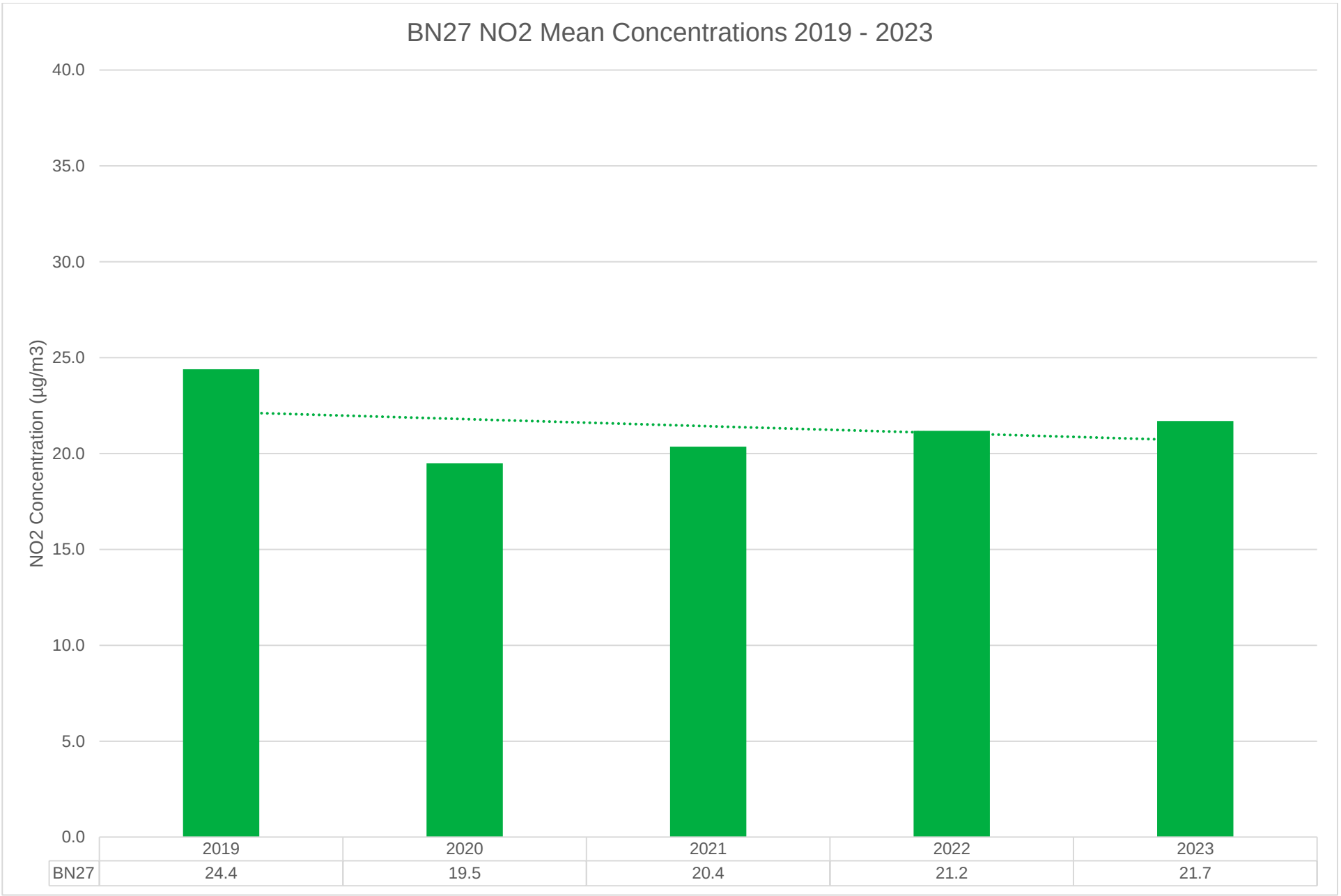

BN21 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN21
18.2
10.2
11.6
12.5
10.9

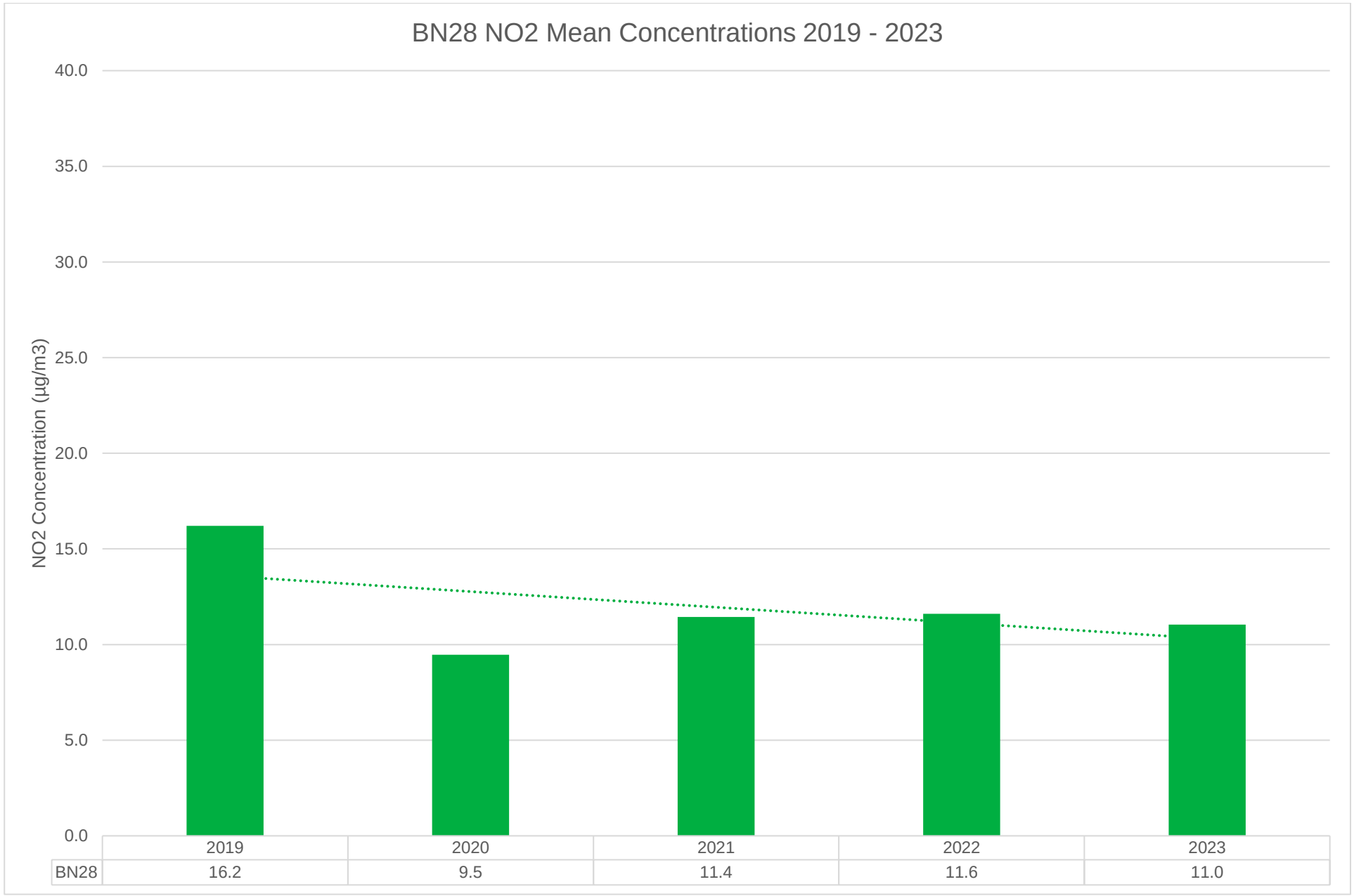

BN22 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN22
32.4
21.7
26.3
27.9
25.0

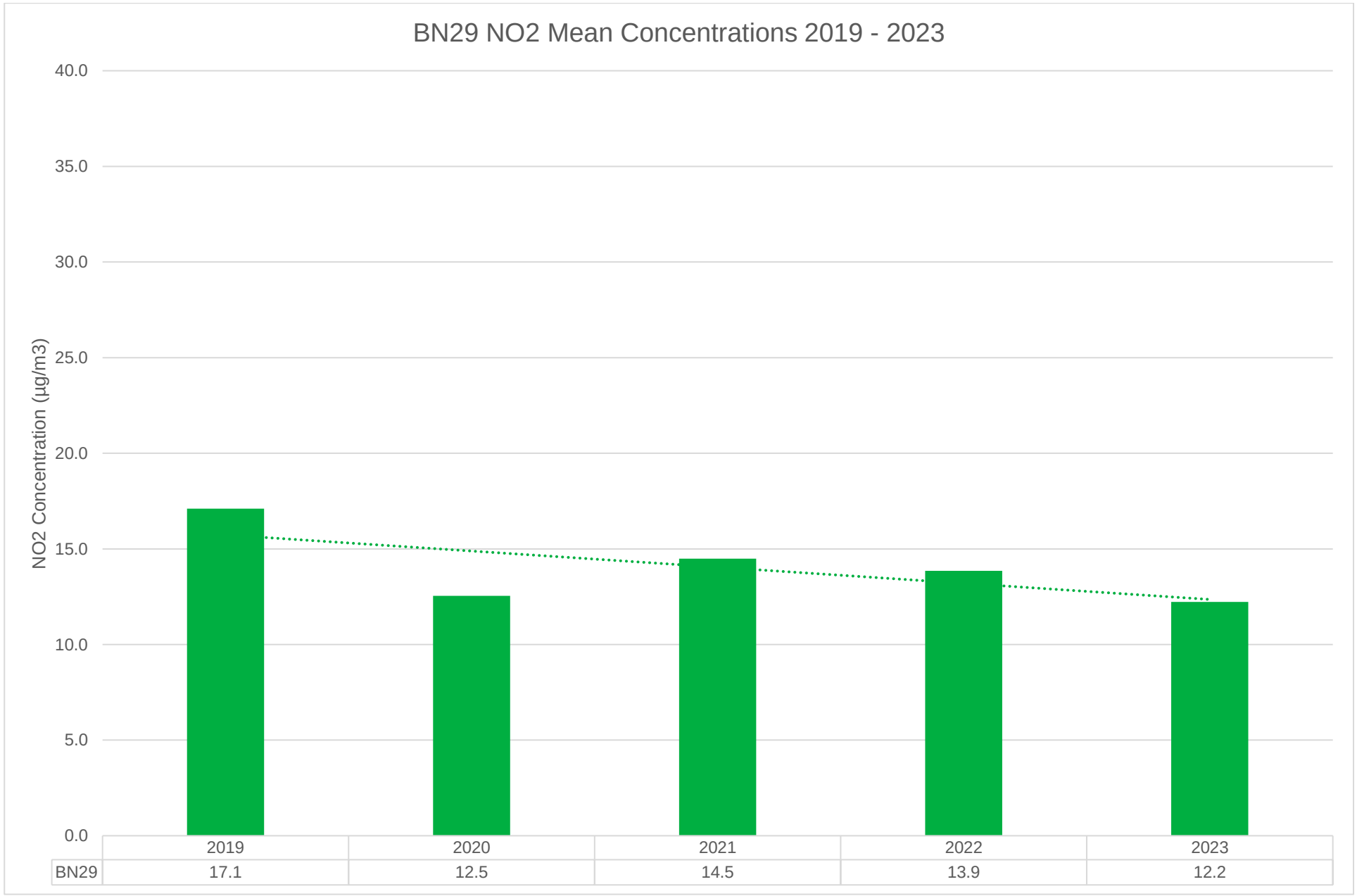

BN24 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN24
18.7
12.2
13.8
13.0
12.1

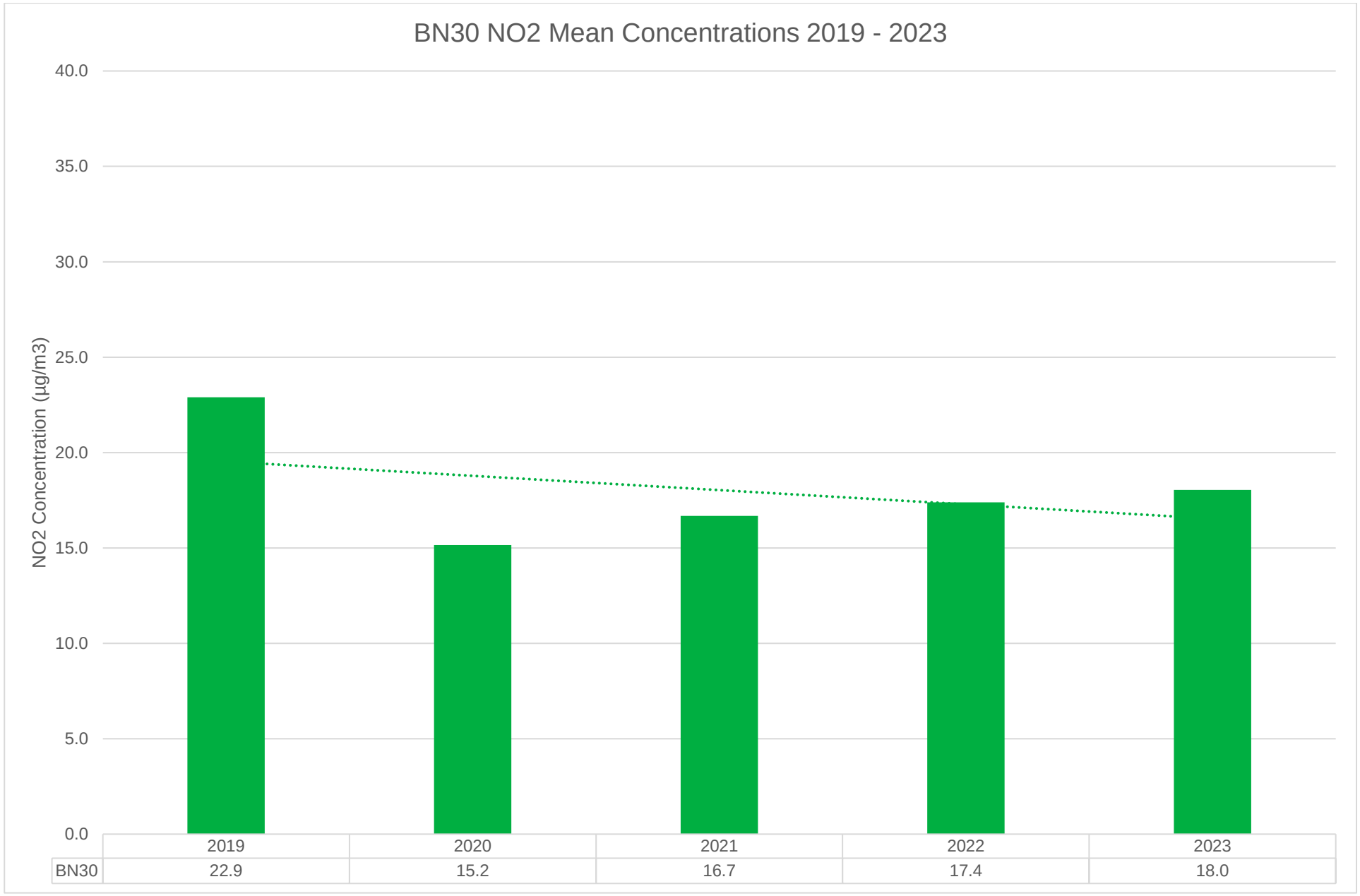

BN25 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN25
16.8
9.6
10.8
10.6
9.9

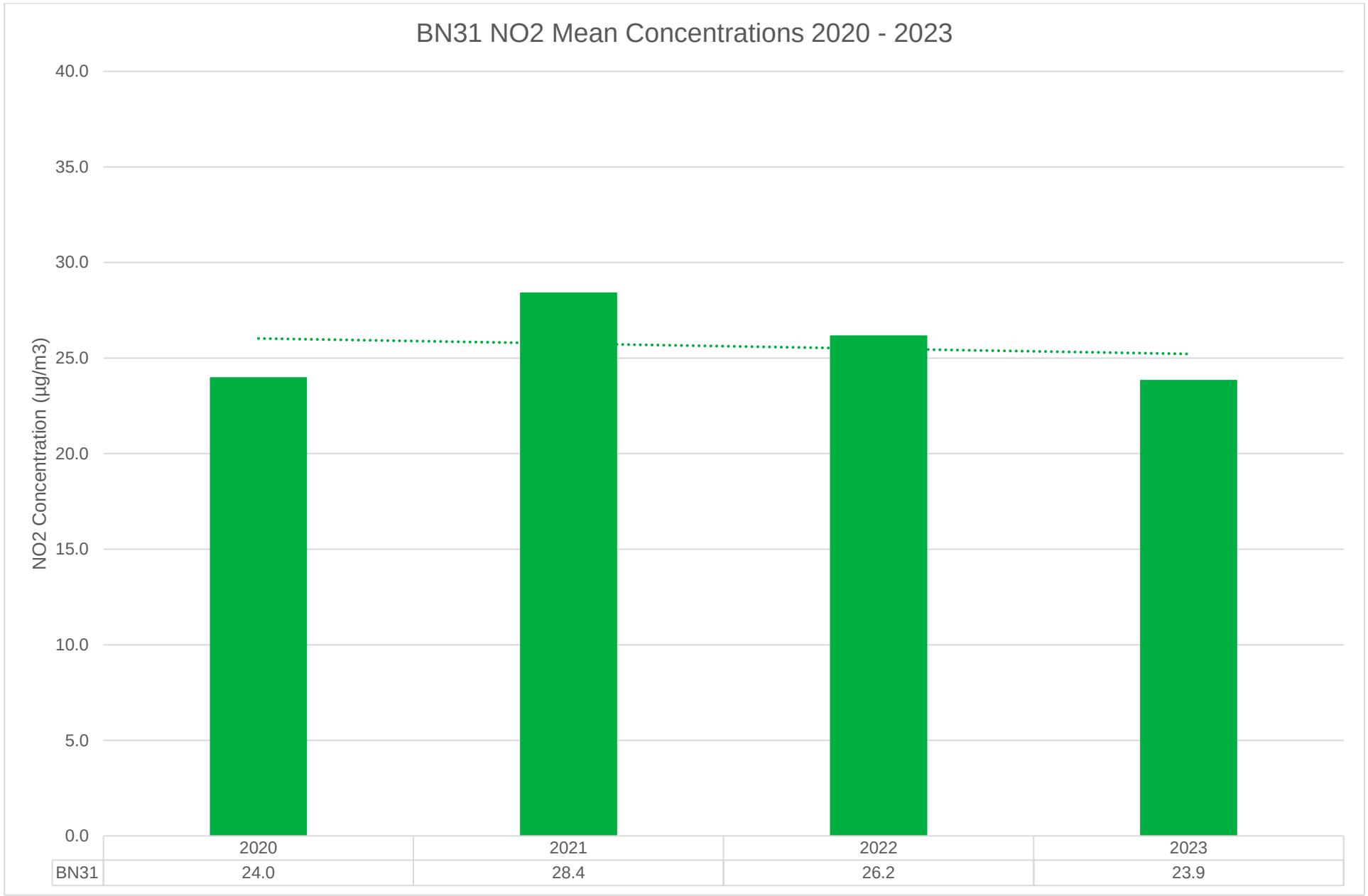

BN26 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN26
15.1
10.8
12.2
11.5
10.2

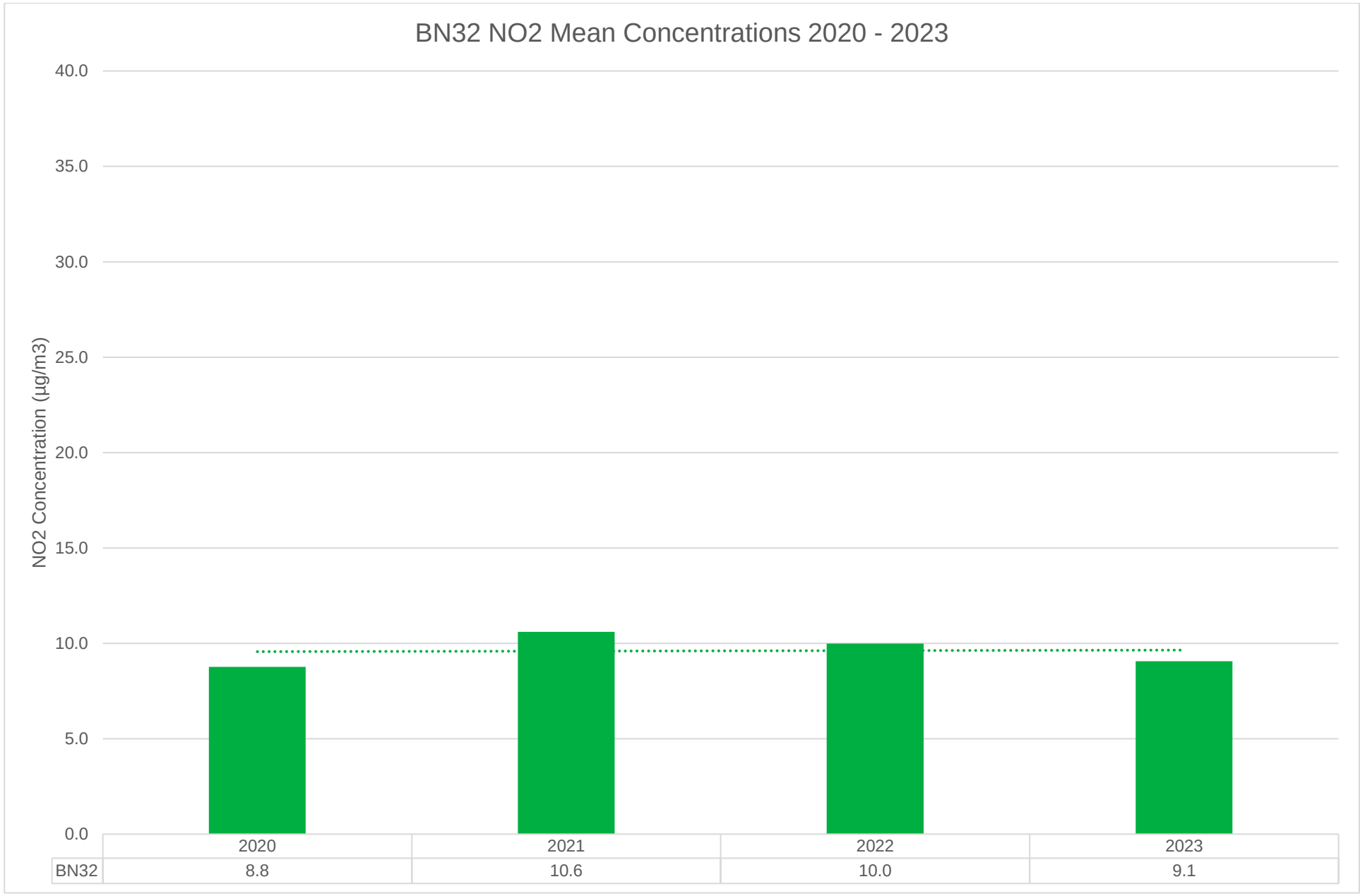

BN27 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN27
24.4
19.5
20.4
21.2
21.7

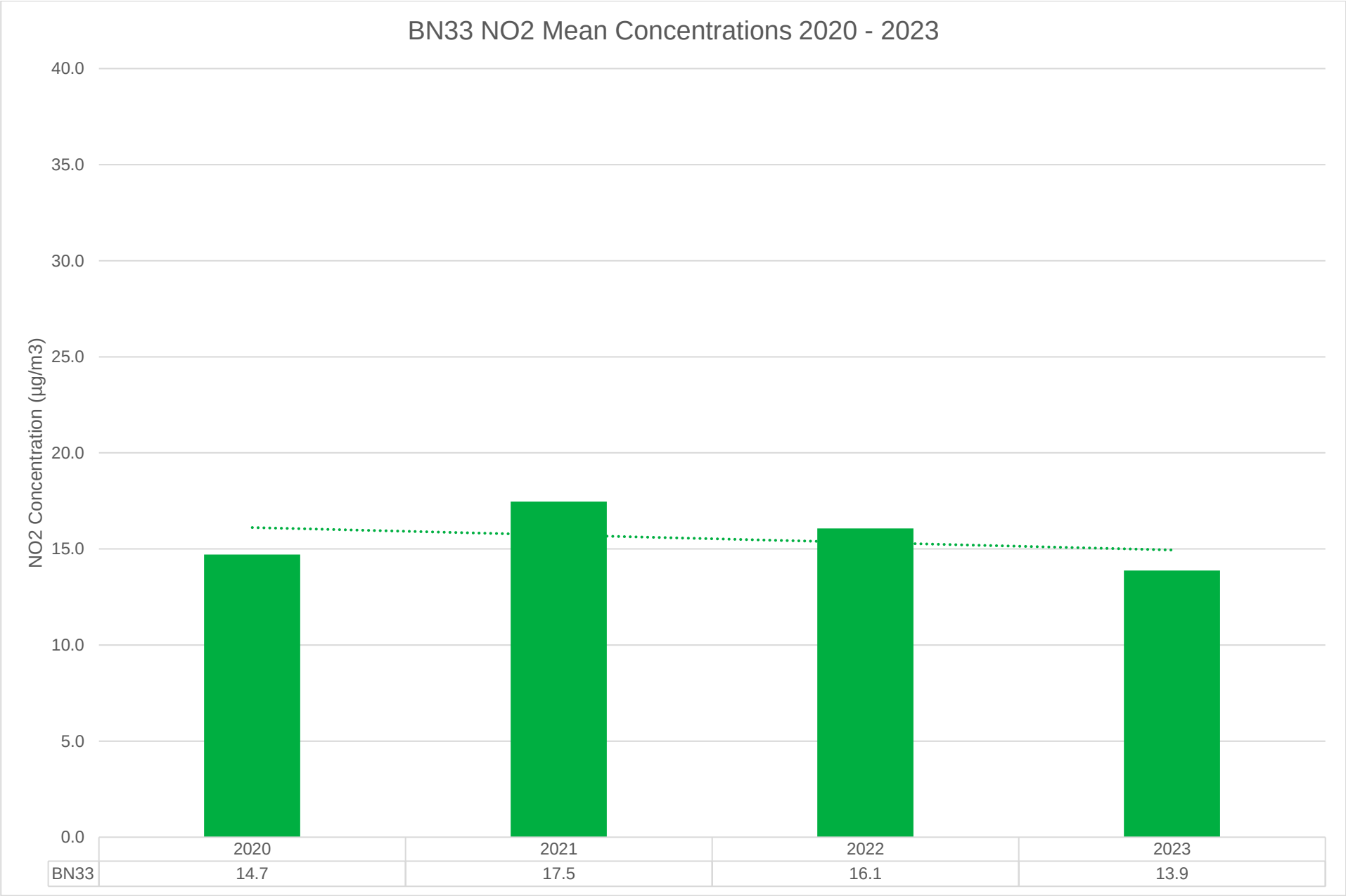

BN28 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN28
16.2
9.5
11.4
11.6
11.0

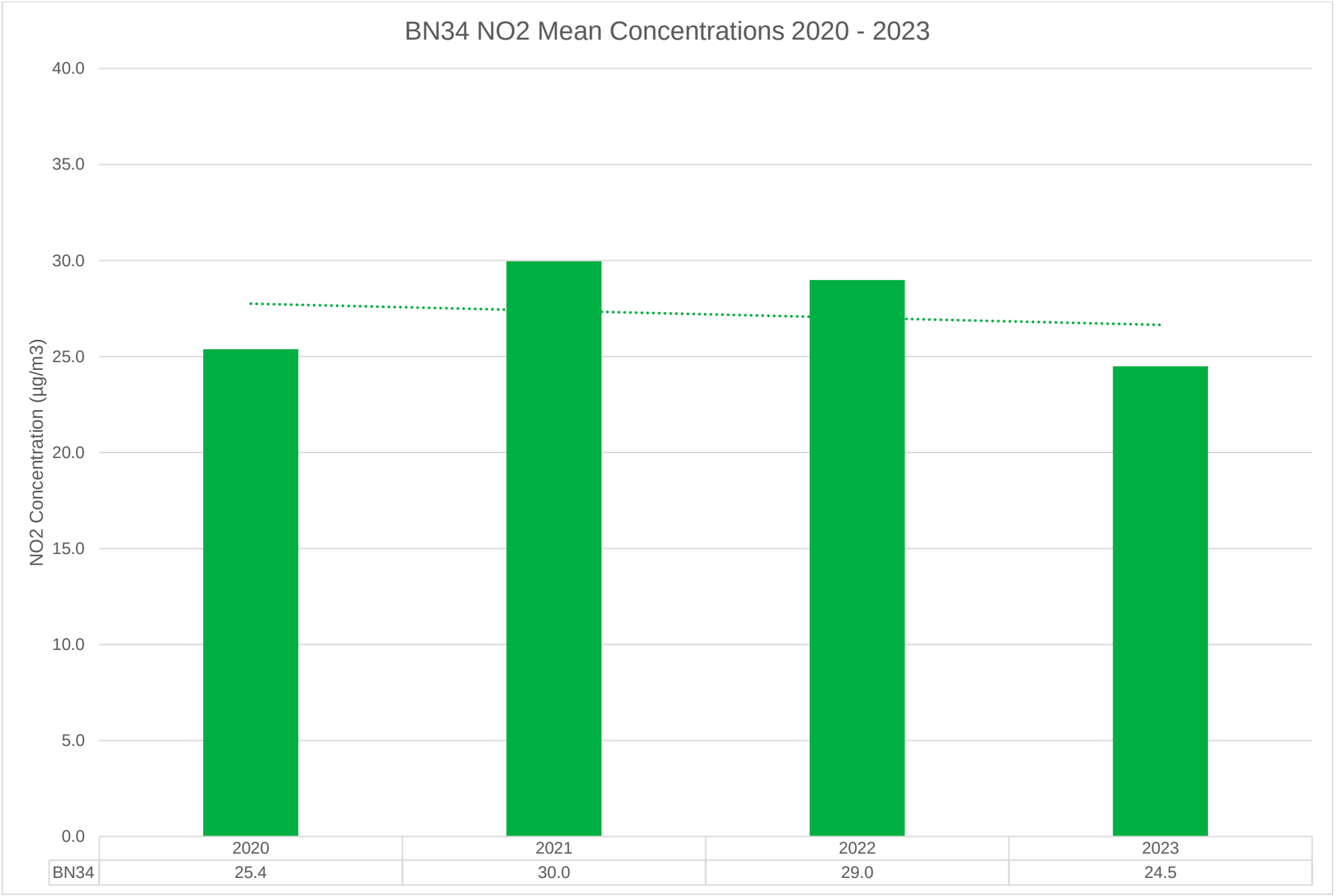

BN29 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN29
17.1
12.5
14.5
13.9
12.2

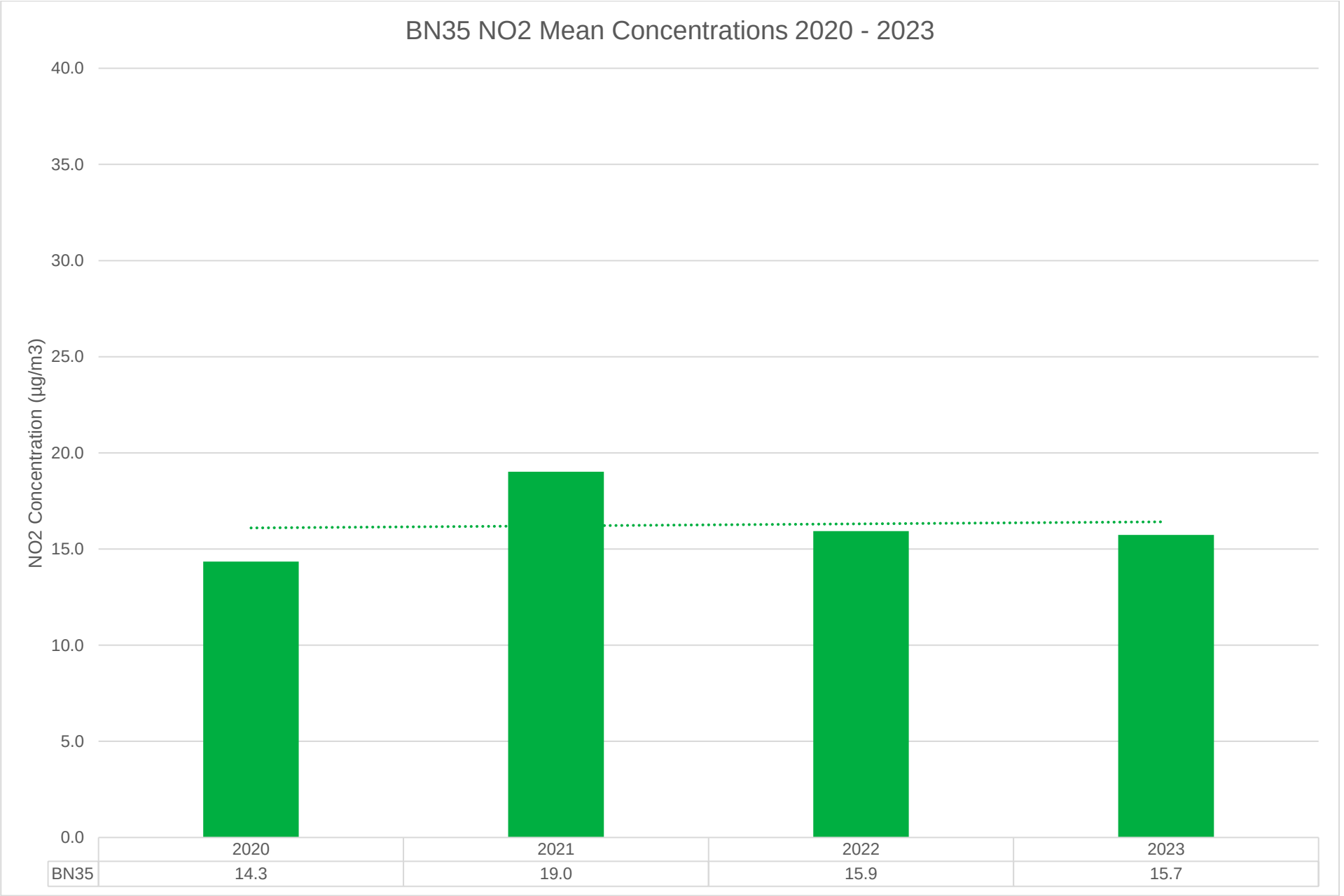

BN30 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
BN30
22.9
15.2
16.7
17.4
18.0

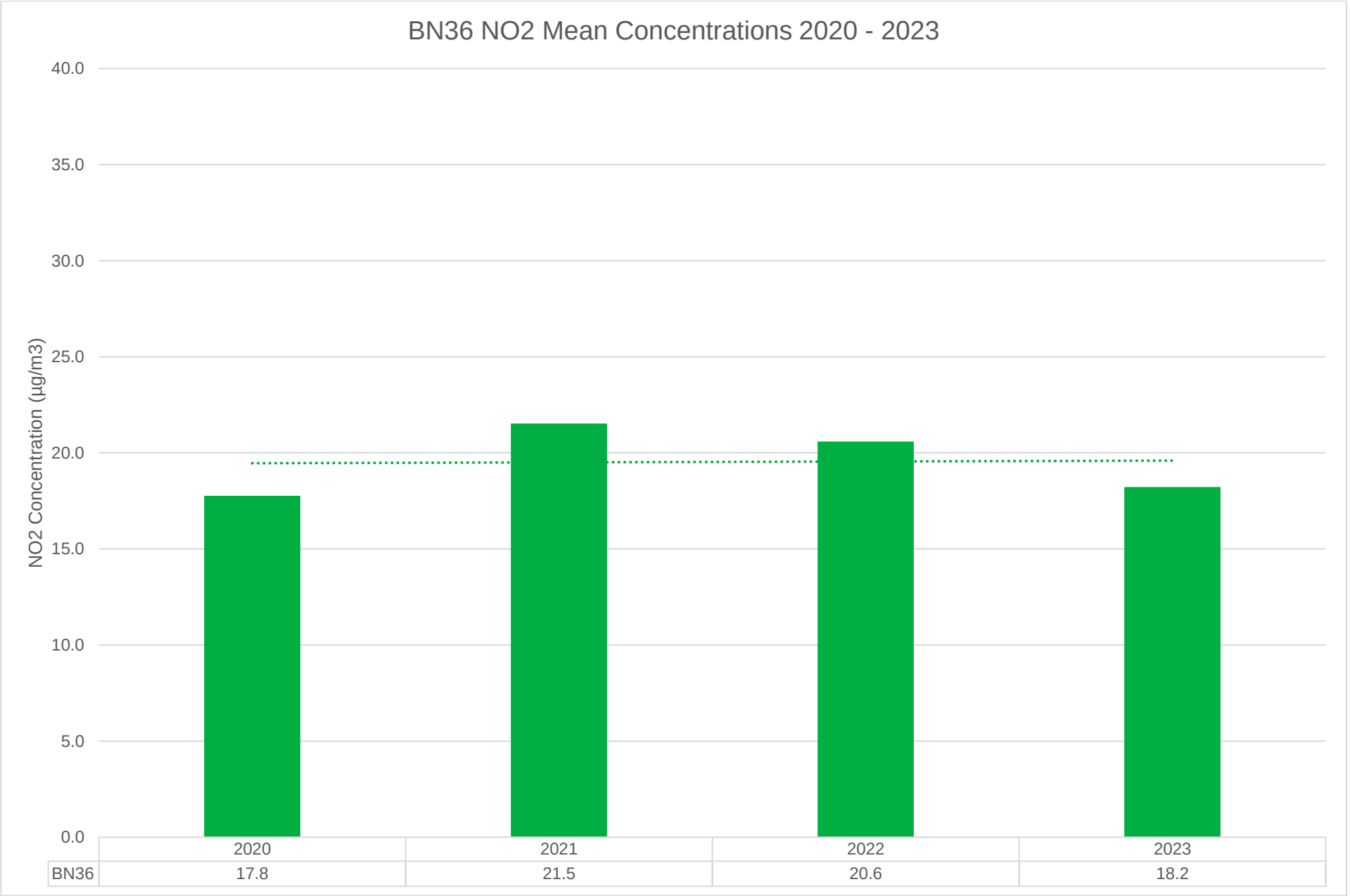

BN31 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
BN31
24.0
28.4
26.2
23.9

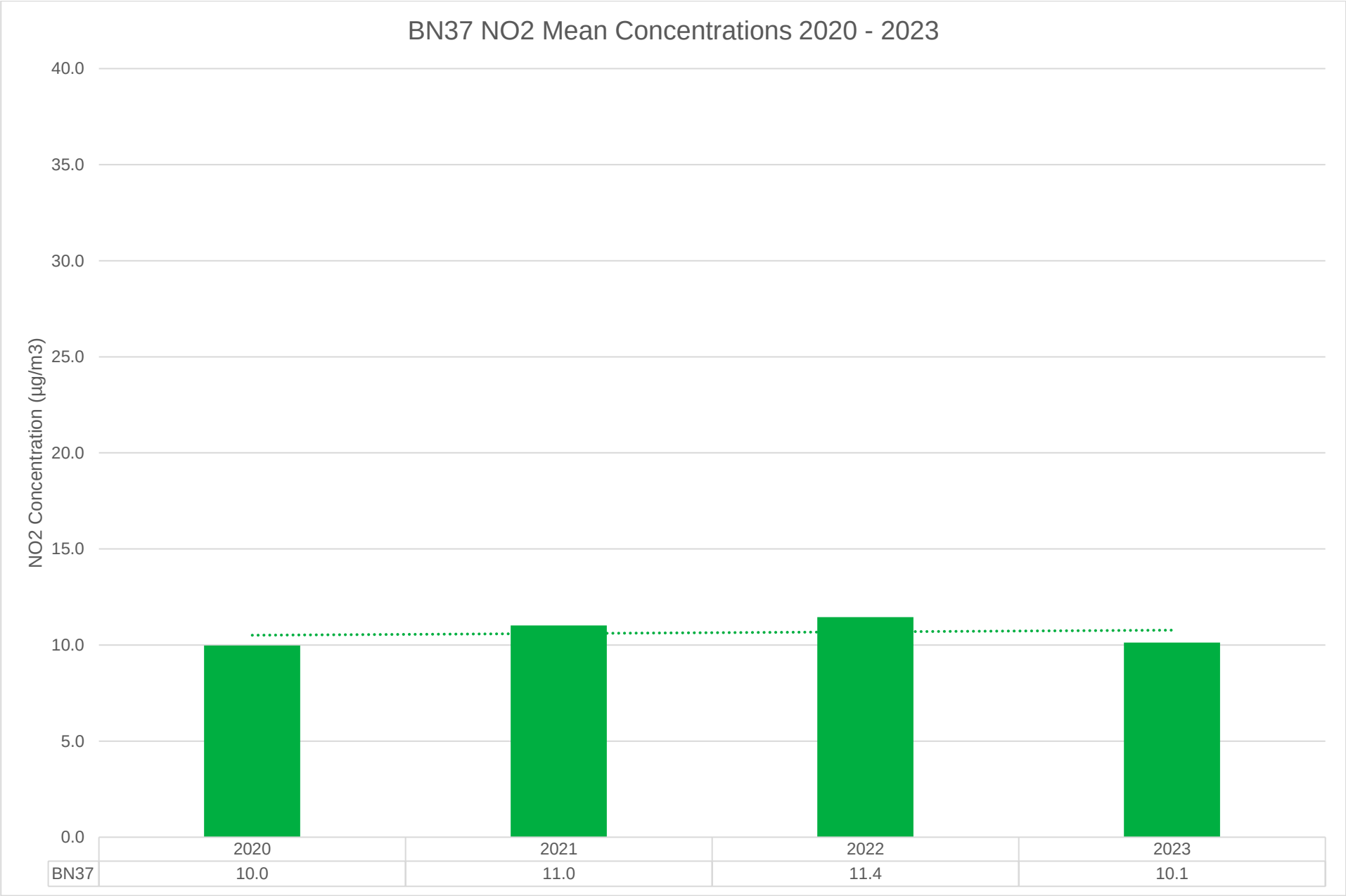

BN32 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
BN32
8.8
10.6
10.0
9.1

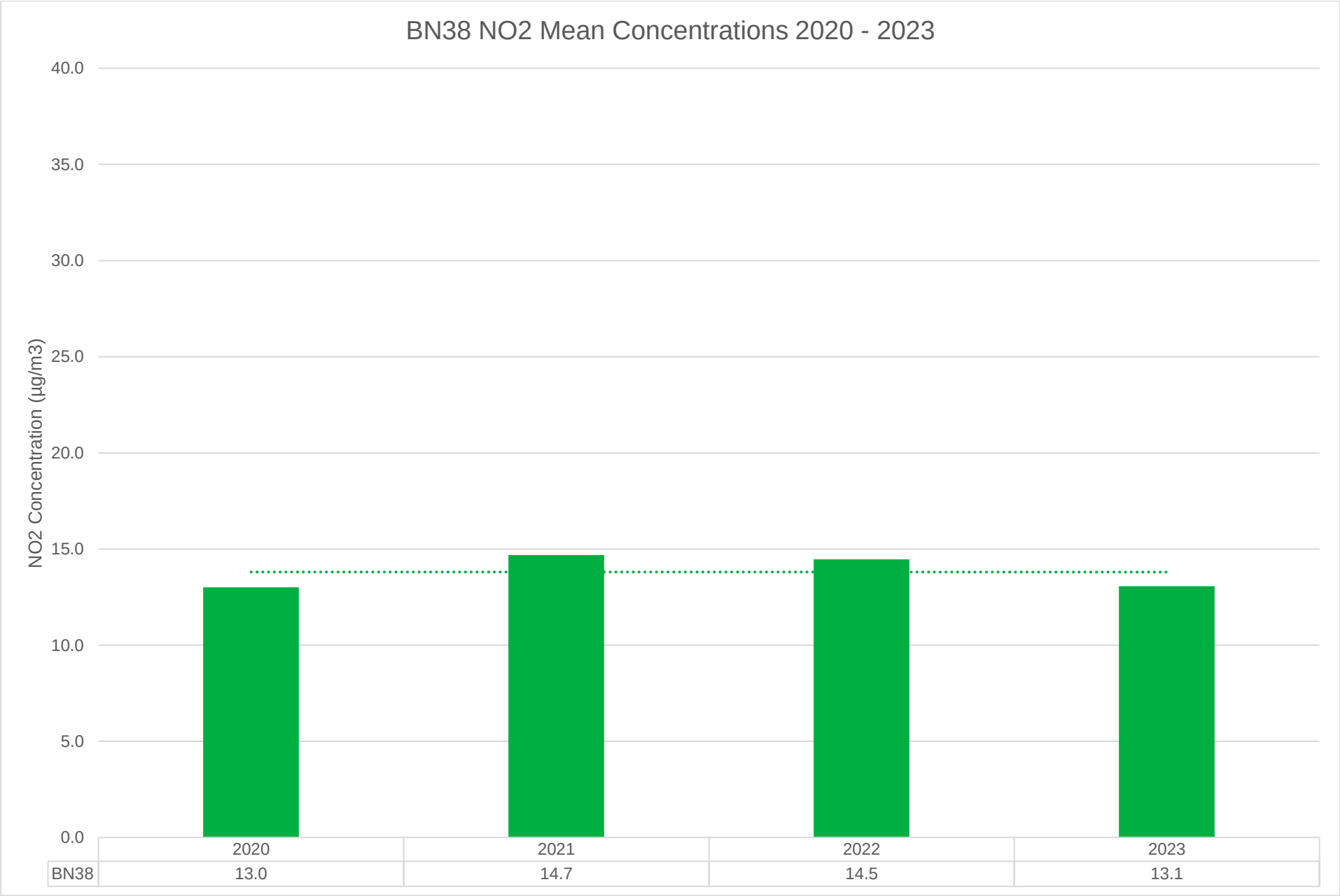

BN33 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
BN33
14.7
17.5
16.1
13.9


BN34 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
BN34
25.4
30.0
29.0
24.5


BN35 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
BN35
14.3
19.0
15.9
15.7


BN36 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
BN36
17.8
21.5
20.6
18.2


BN37 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
BN37
10.0
11.0
11.4
10.1


BN38 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
BN38
13.0
14.7
14.5
13.1

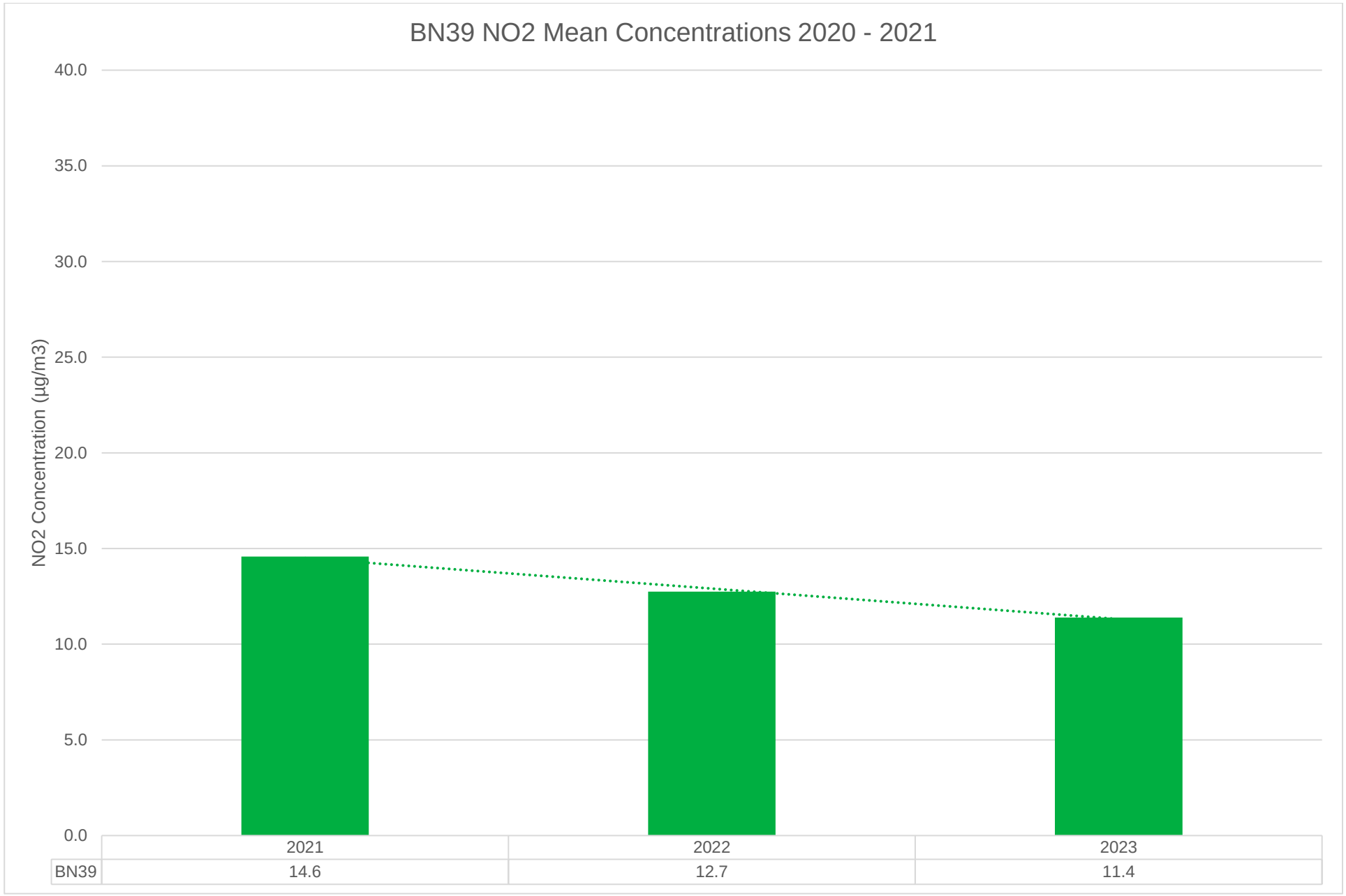
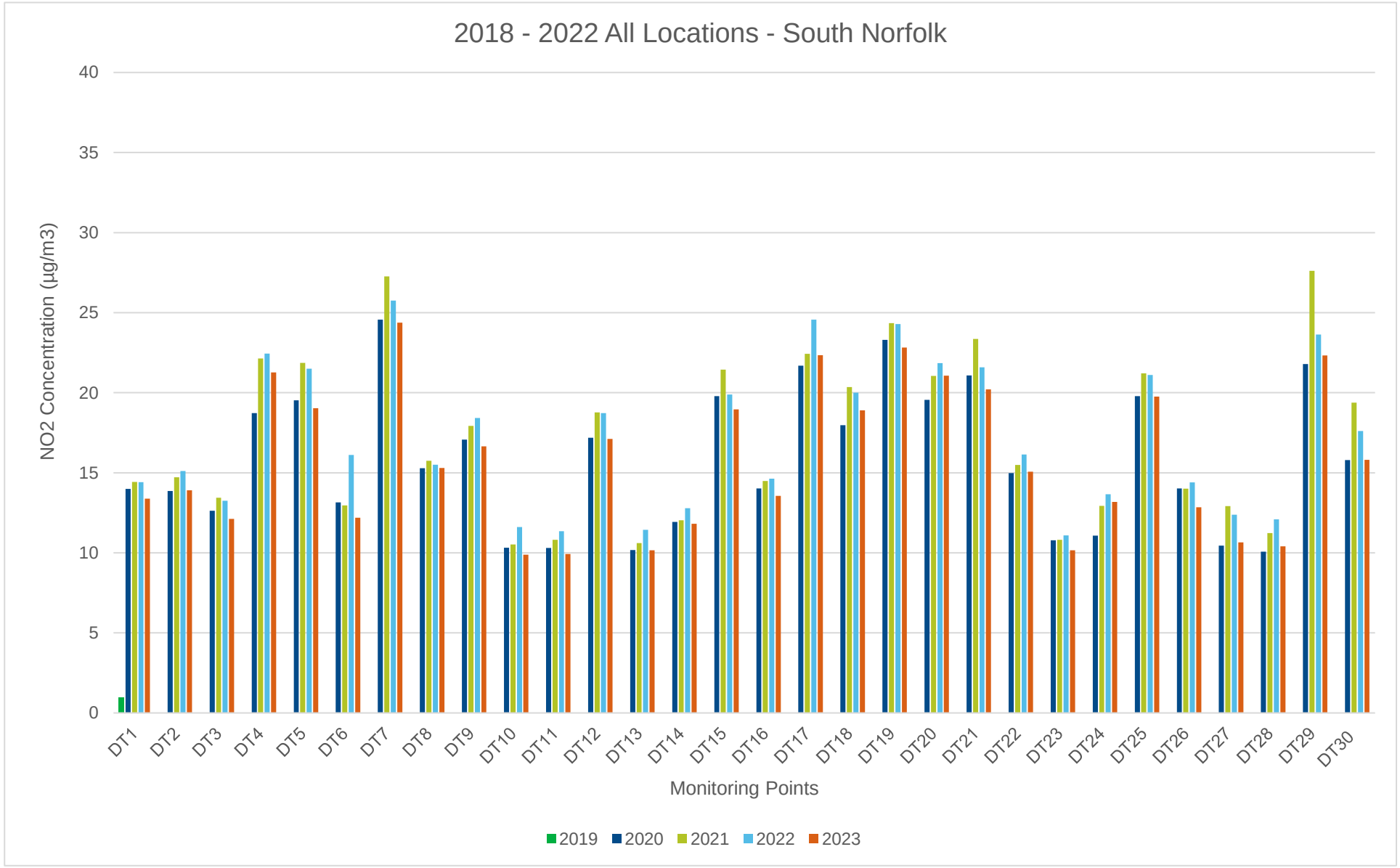
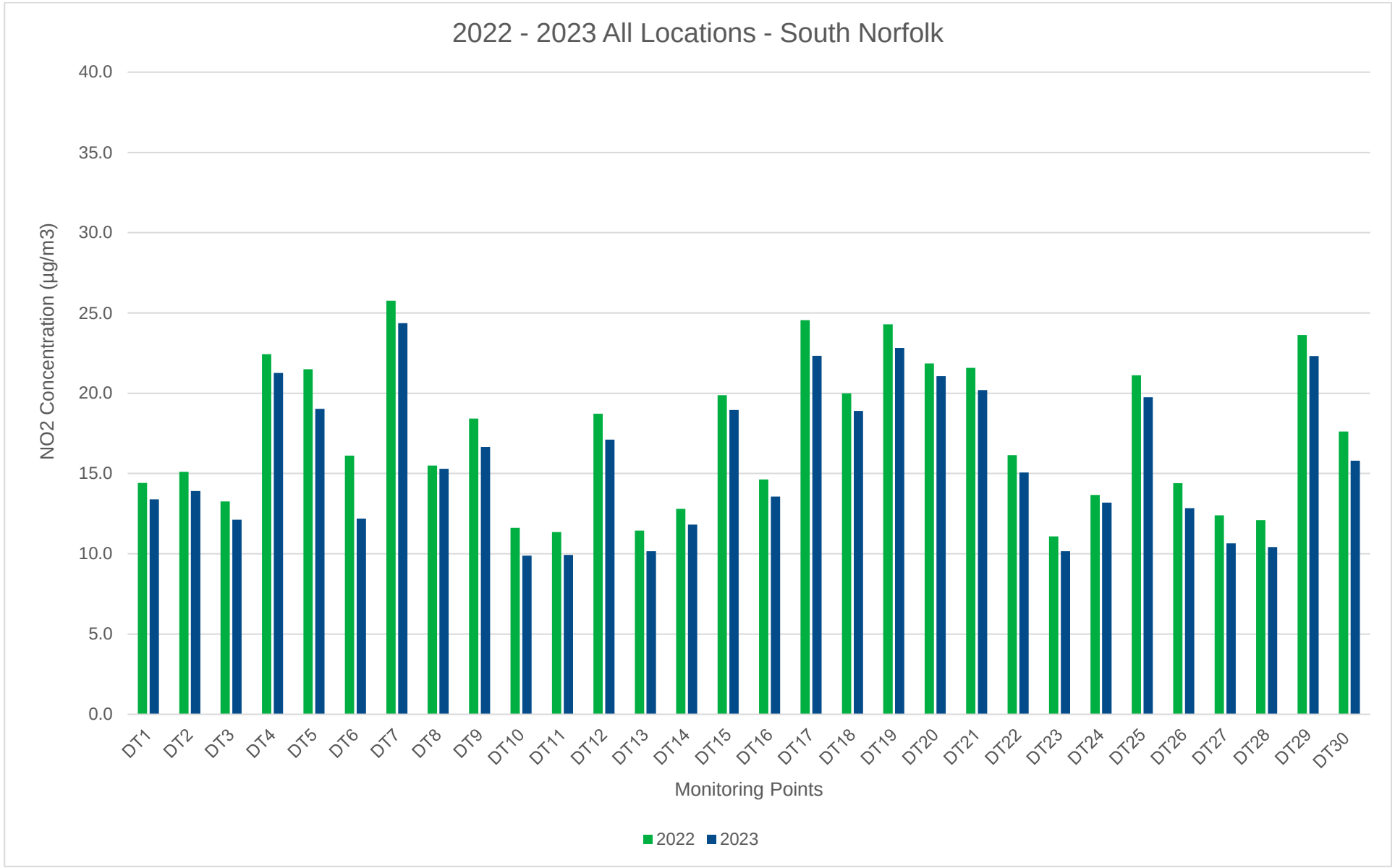
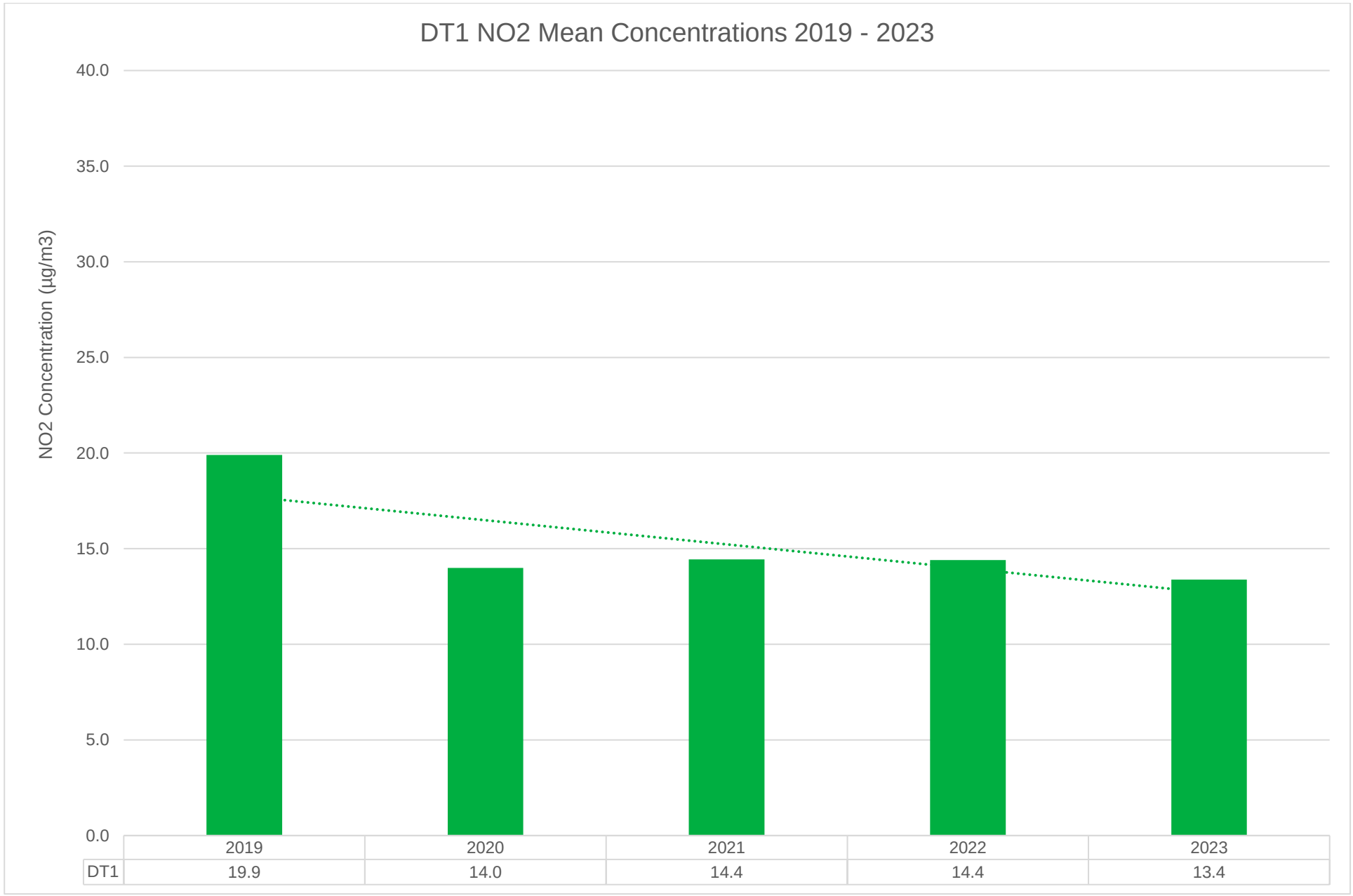
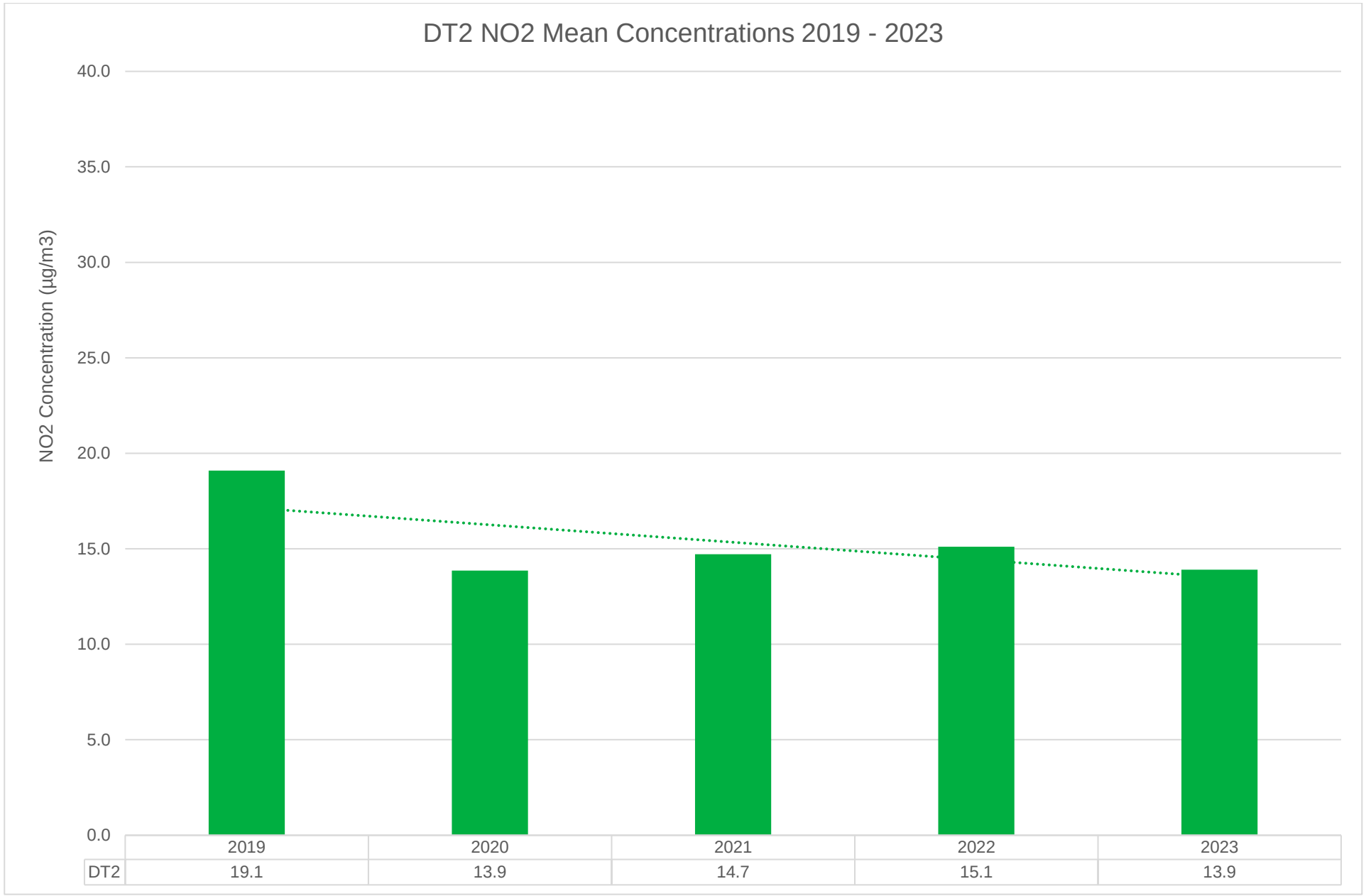

BN39 NO2 Mean Concentrations 2020 - 2021
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2021
2022
2023
BN39
14.6
12.7
11.4

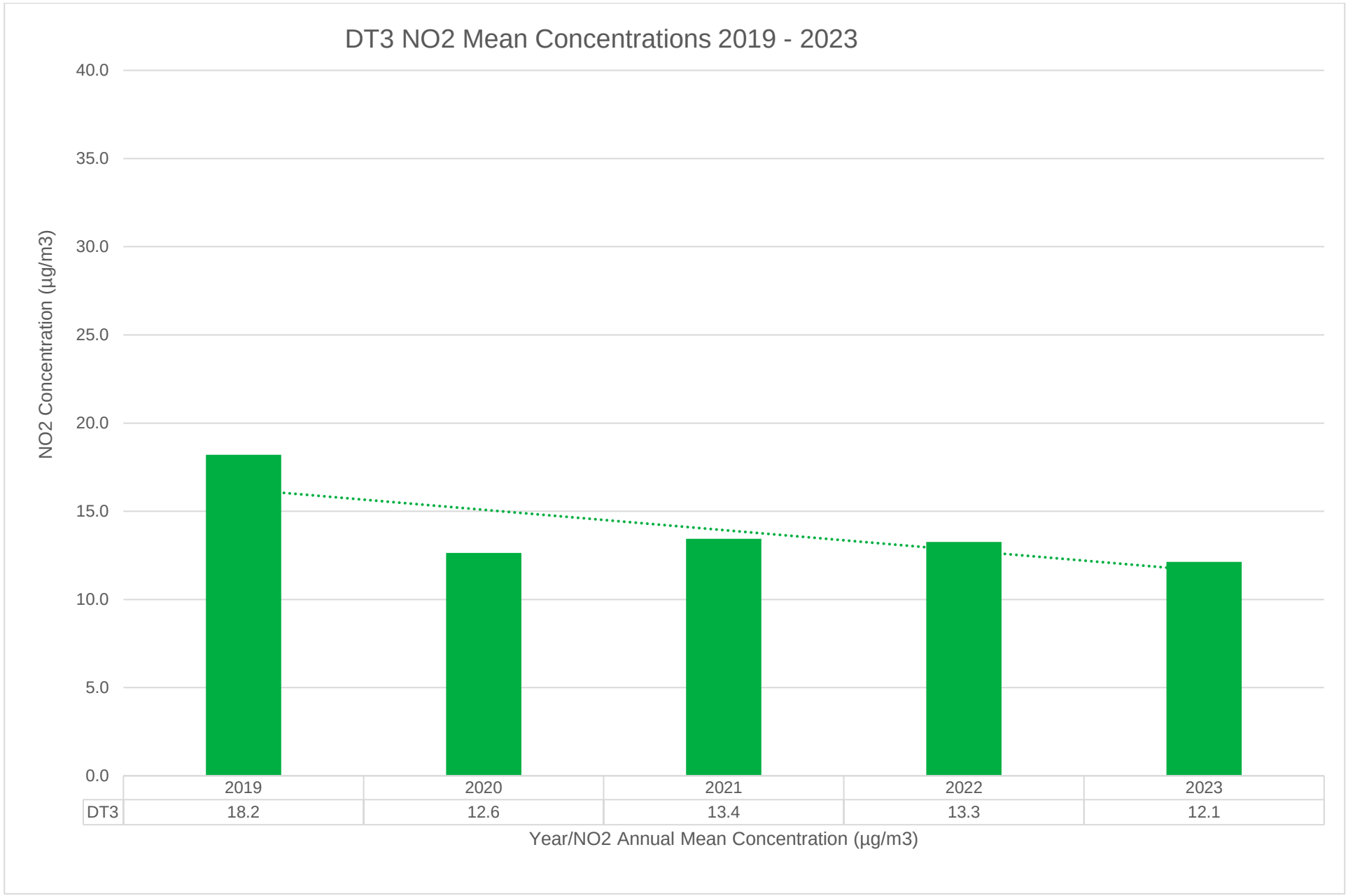
Figure A.2 – Trends in Annual Mean NO_2 Concentrations – South Norfolk

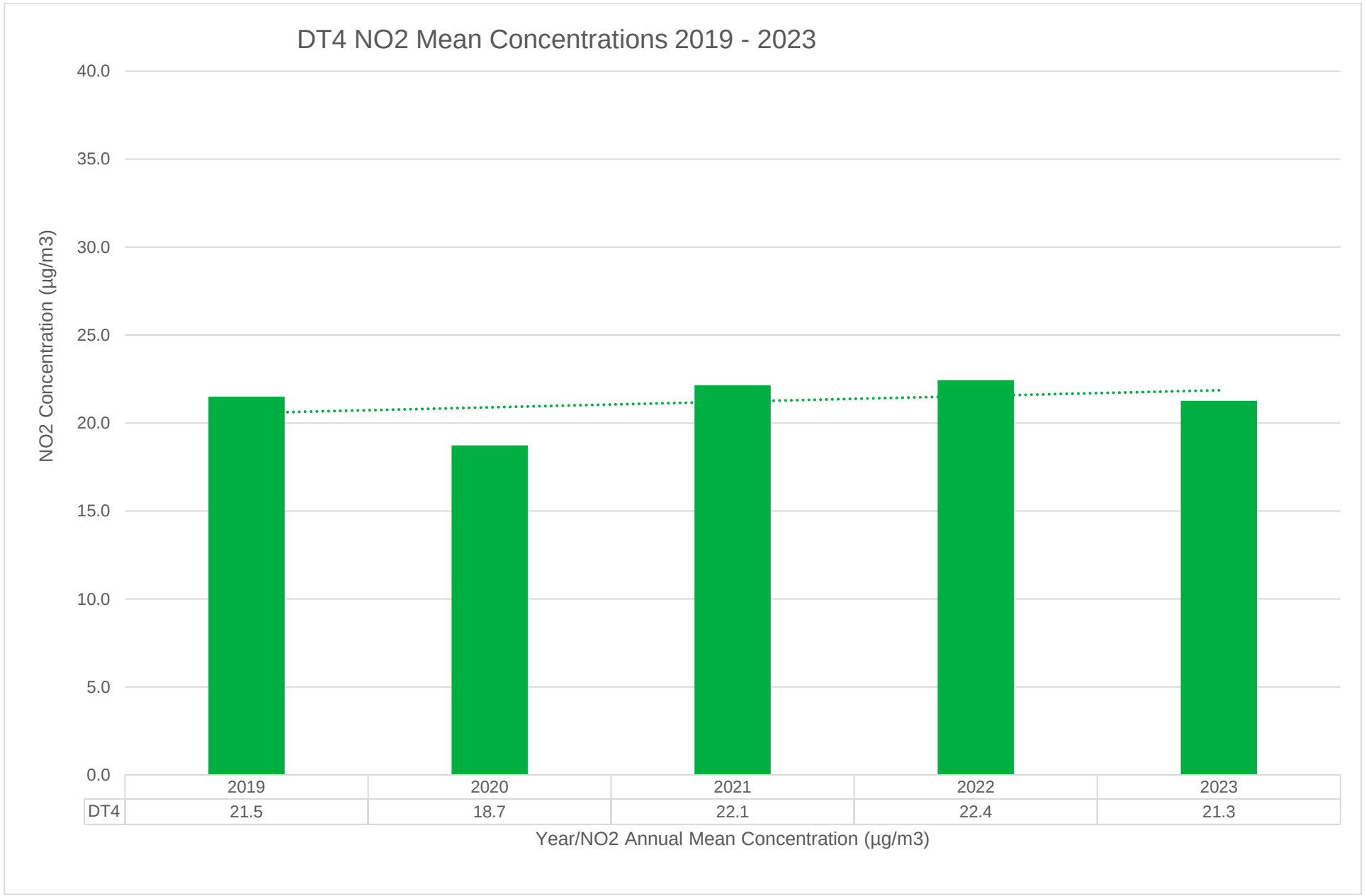


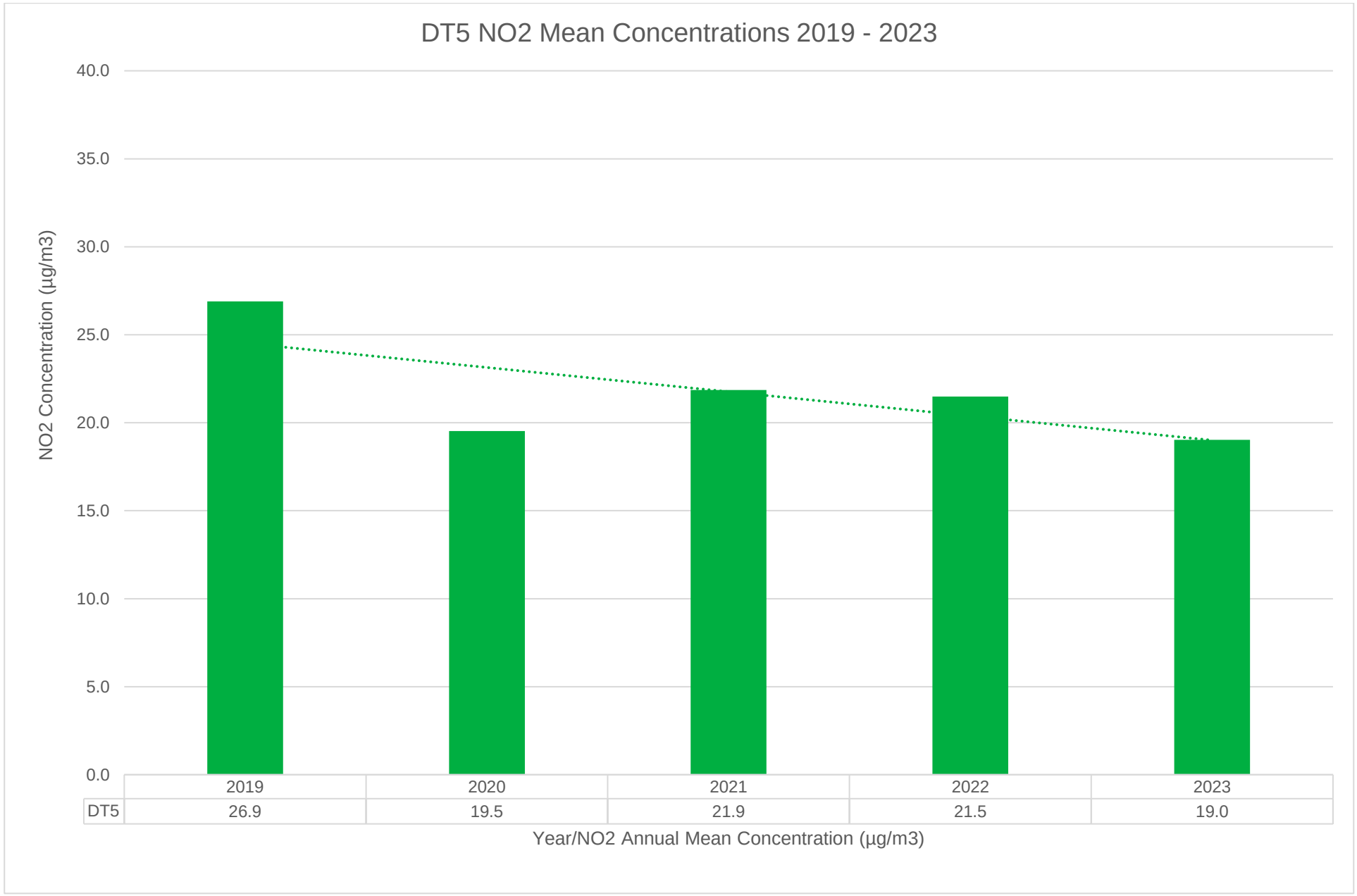

2022 - 2023 All Locations - South Norfolk
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
NO2 Concentration (µg/m3)
DT1
DT2
DT3
DT4
DT5
DT6
DT7
DT8
DT9
DT10
DT11
DT12
DT13
DT14
DT15
DT16
DT17
DT18
DT19
DT20
DT21
DT22
DT23
DT24
DT25
DT26
DT27
DT28
DT29
DT30
Monitoring Points
2022
2023

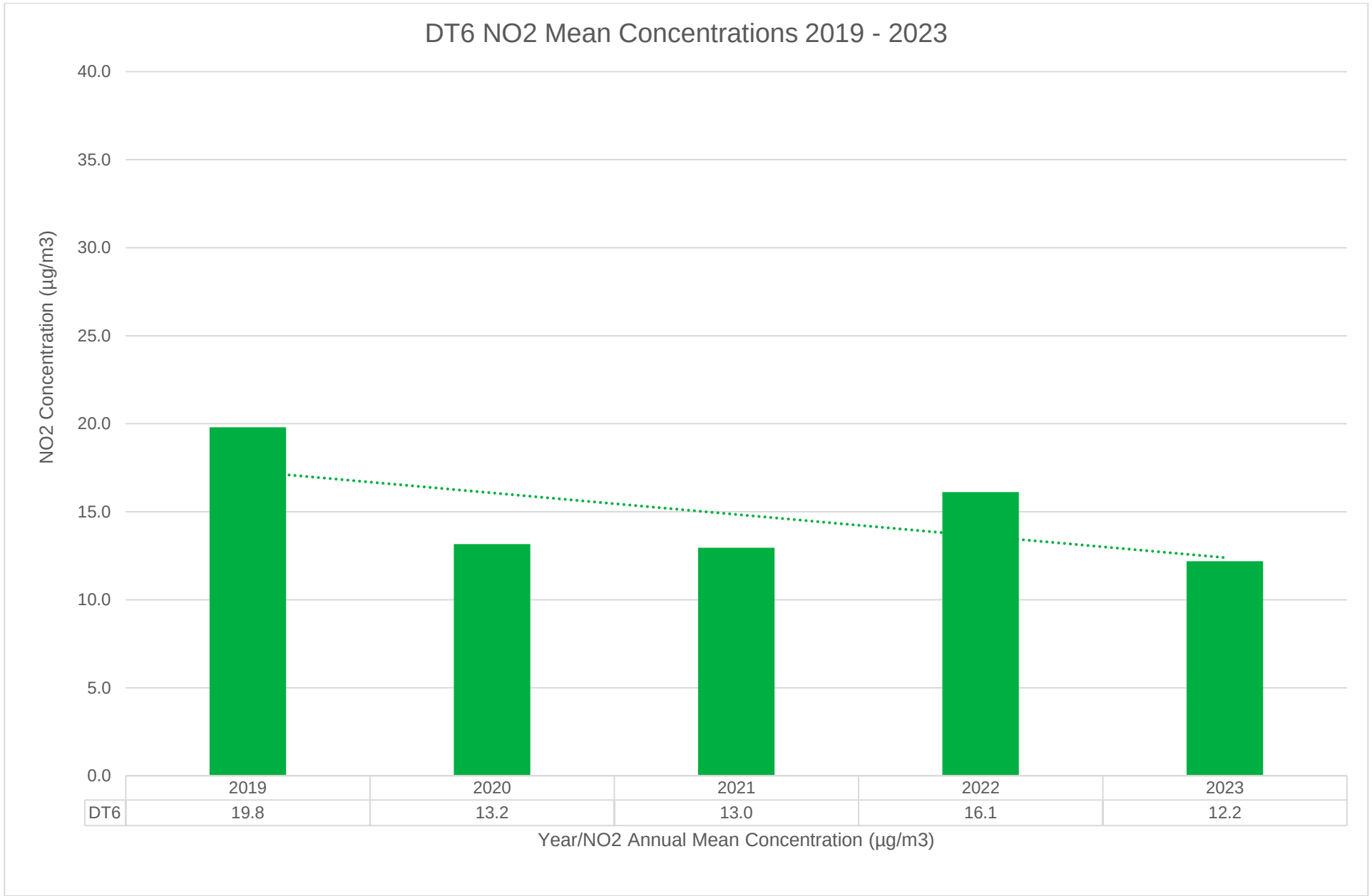

DT1 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT1
19.9
14.0
14.4
14.4
13.4

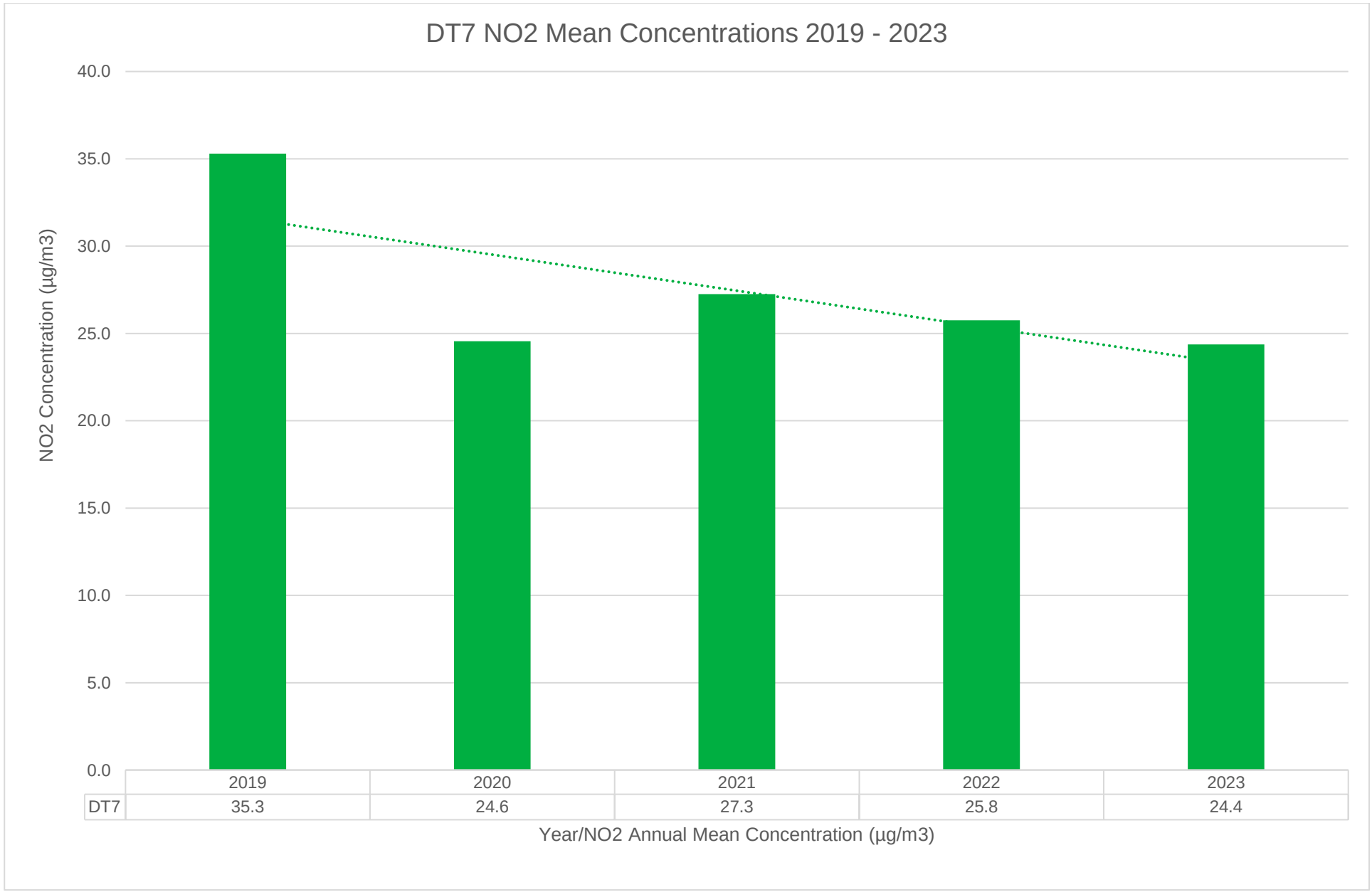

DT2 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT2
19.1
13.9
14.7
15.1
13.9

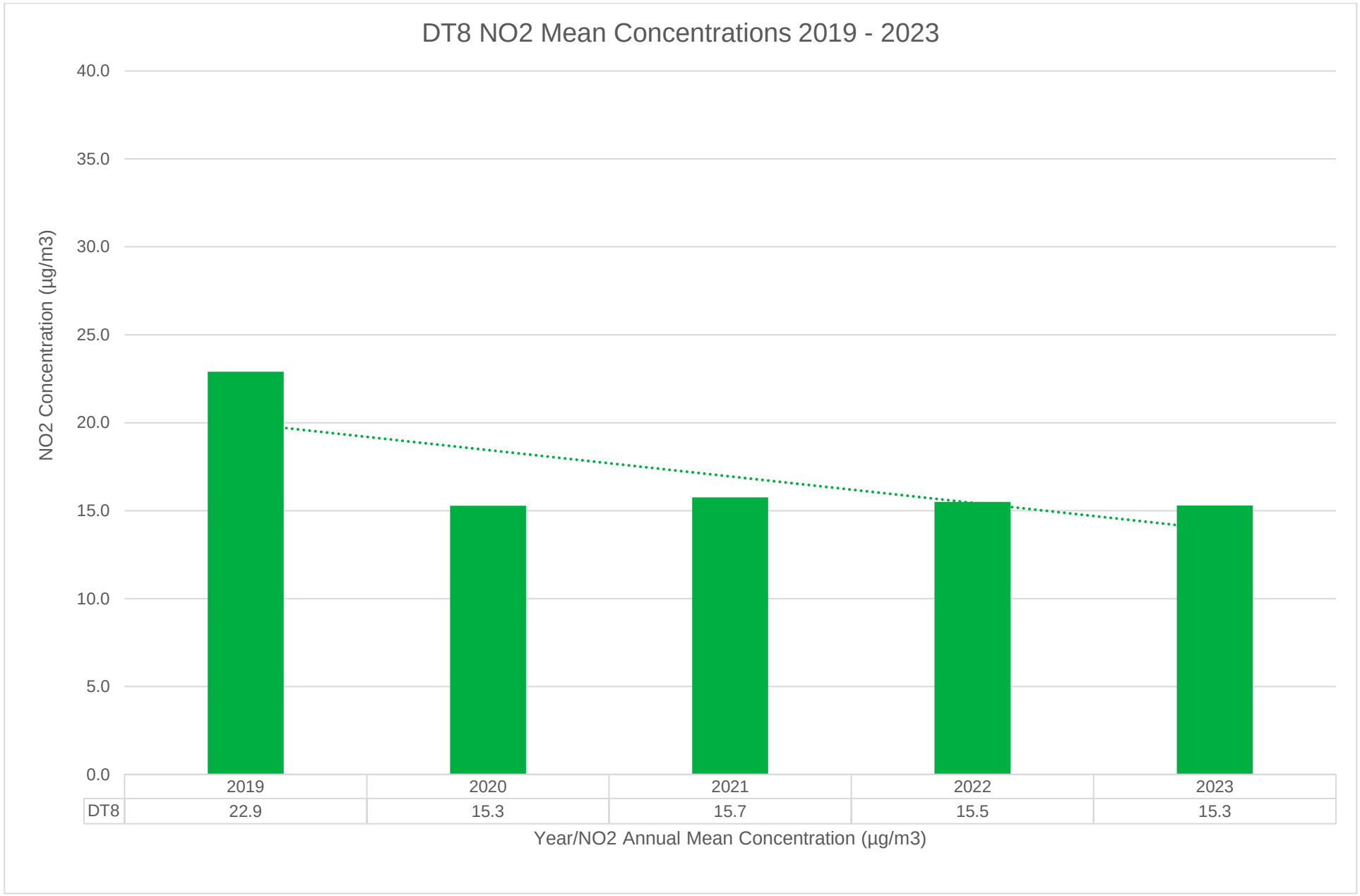

DT3 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT3
18.2
12.6
13.4
13.3
12.1
Year/NO2 Annual Mean Concentration (µg/m3)

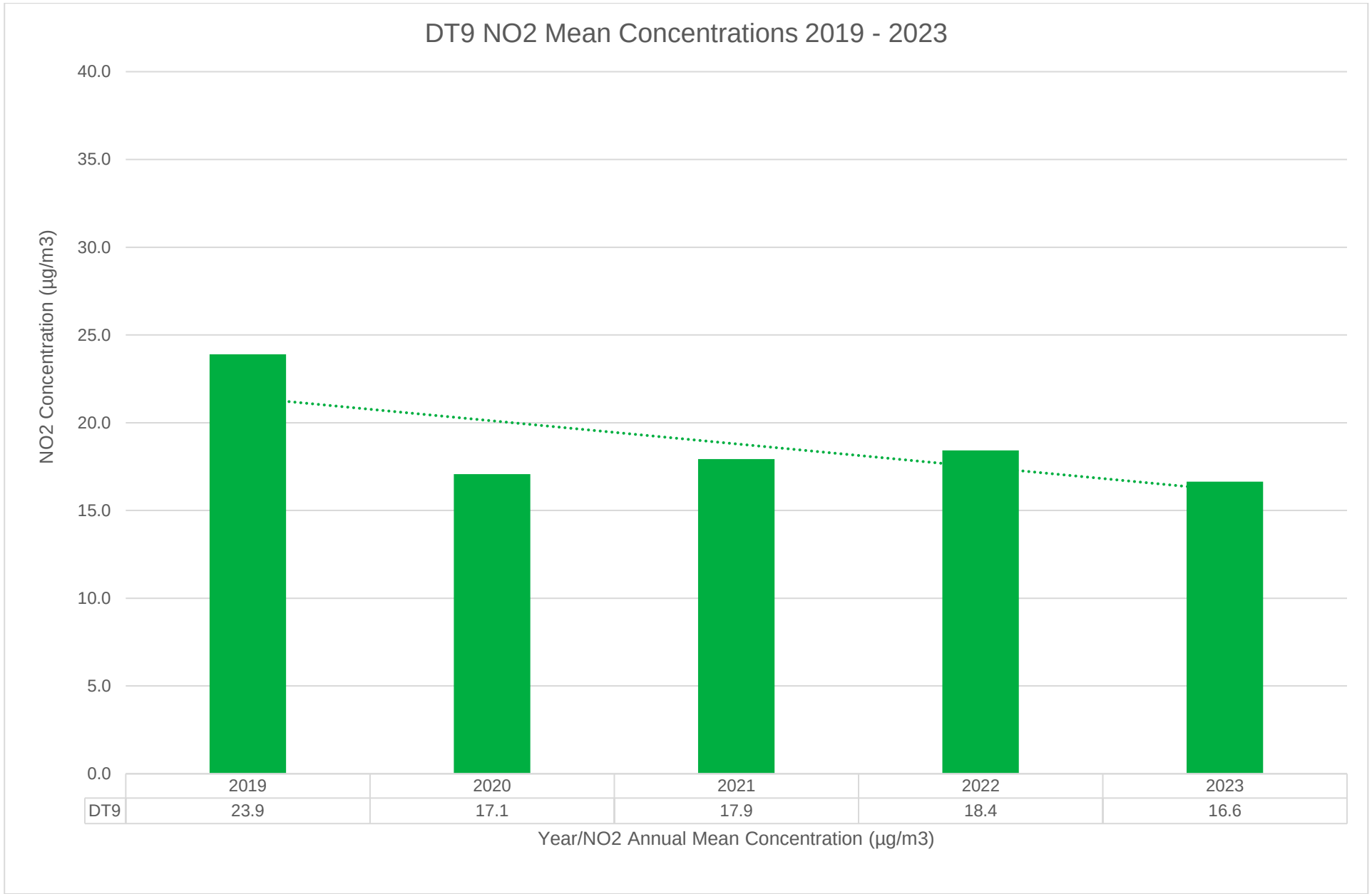

DT4 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT4
21.5
18.7
22.1
22.4
21.3
Year/NO2 Annual Mean Concentration (µg/m3)

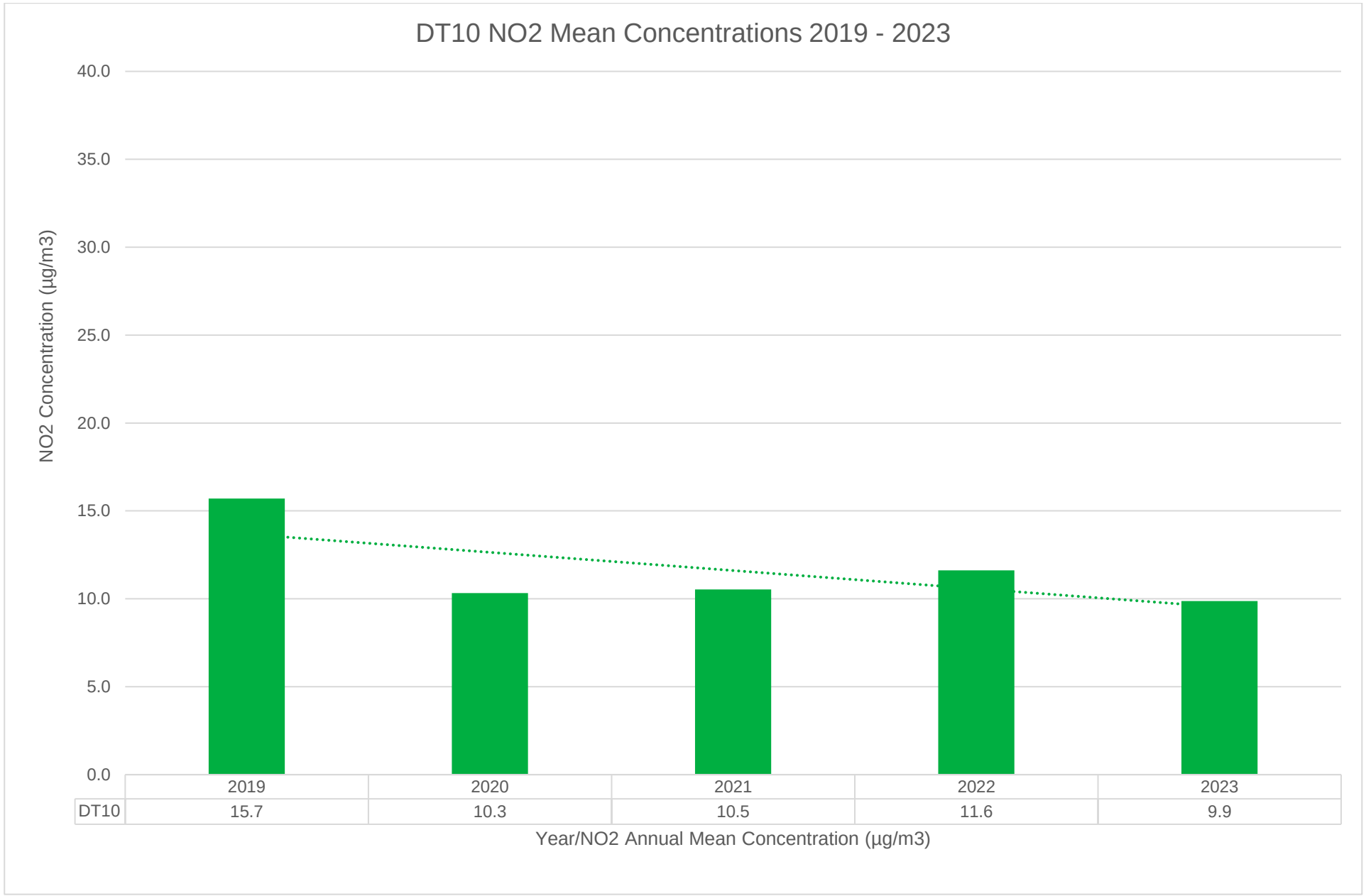

DT5 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT5
26.9
19.5
21.9
21.5
19.0
Year/NO2 Annual Mean Concentration (µg/m3)

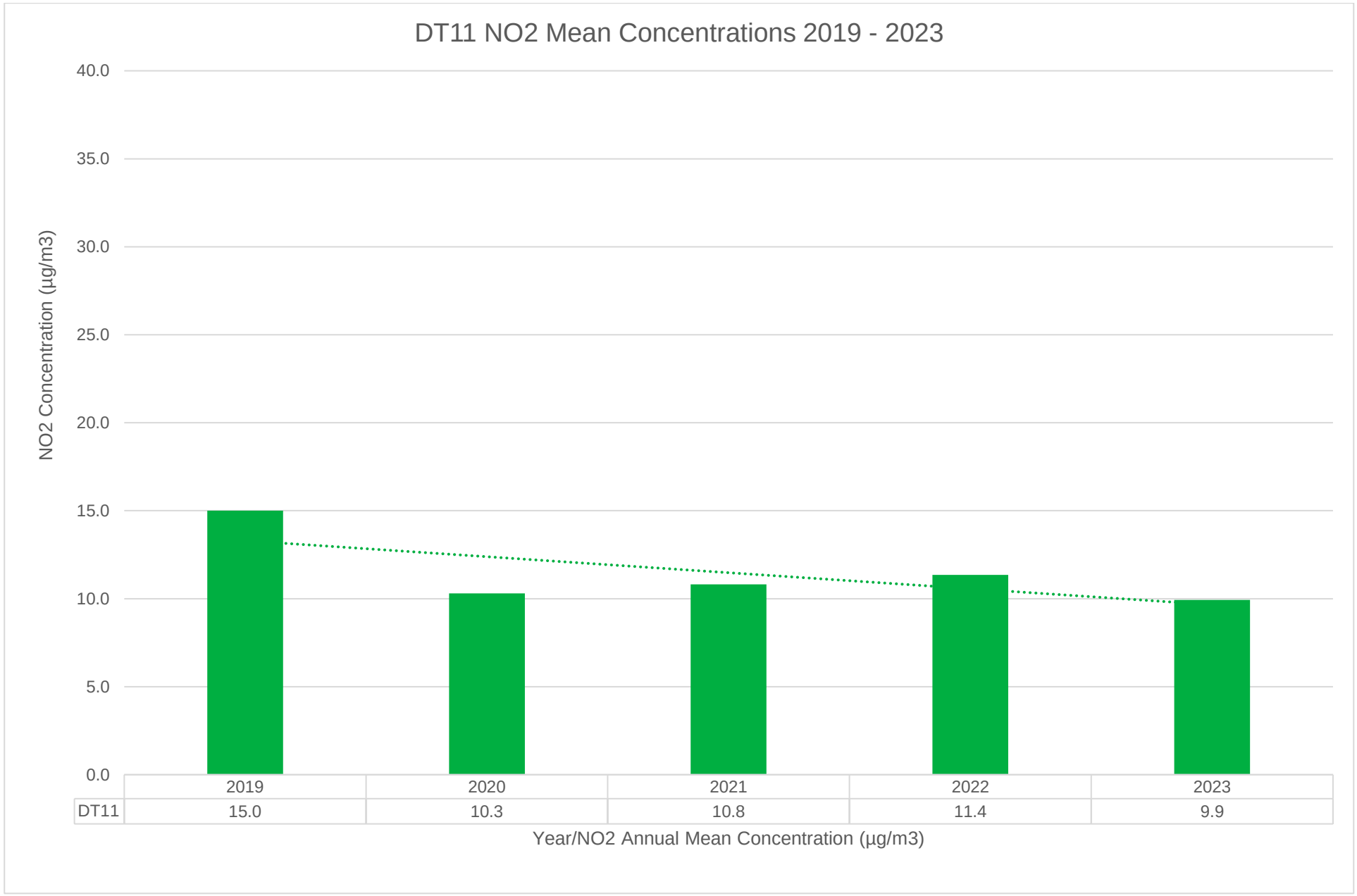

DT6 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT6
19.8
13.2
13.0
16.1
12.2
Year/NO2 Annual Mean Concentration (µg/m3)

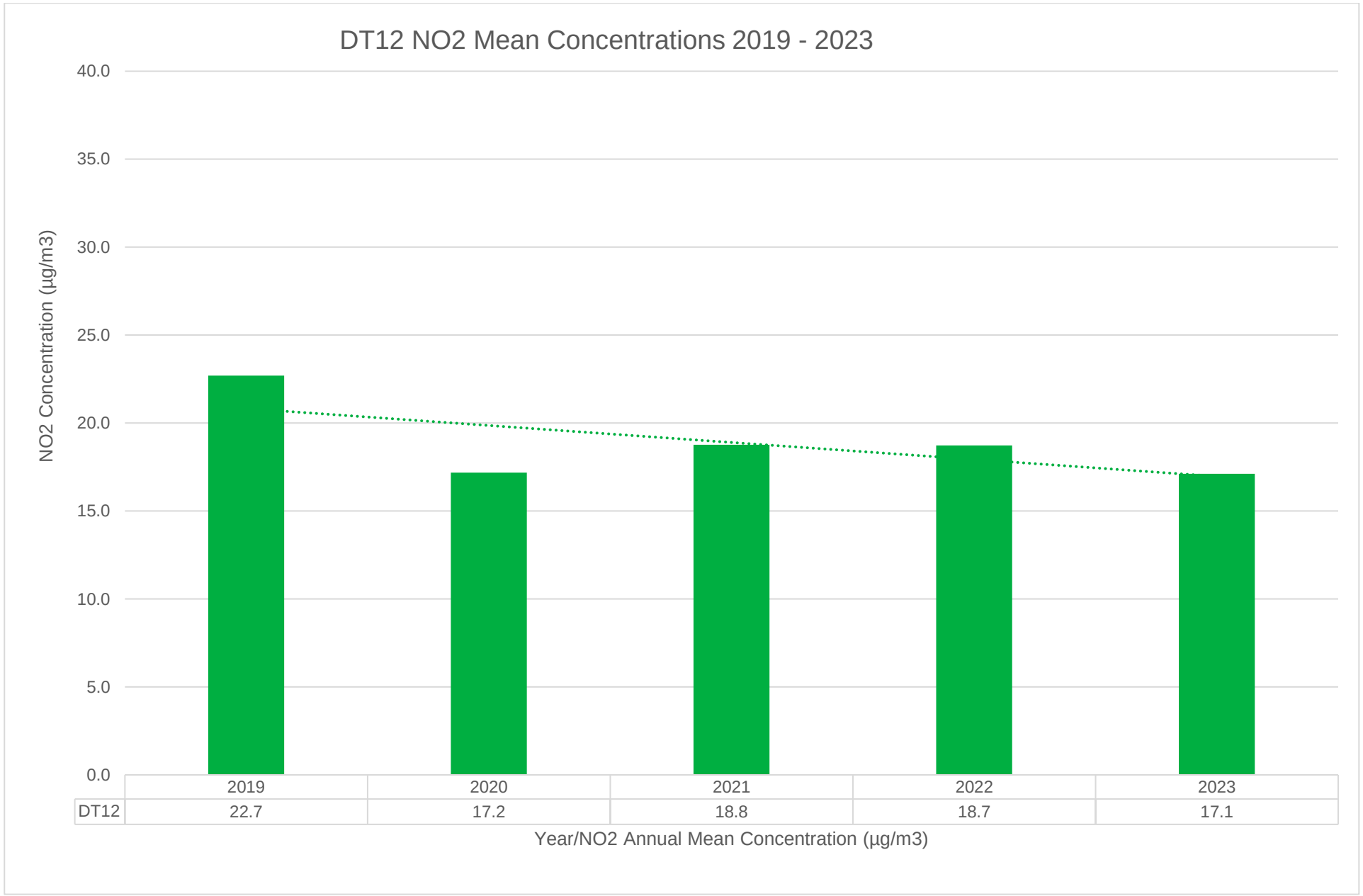

DT7 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT7
35.3
24.6
27.3
25.8
24.4
Year/NO2 Annual Mean Concentration (µg/m3)

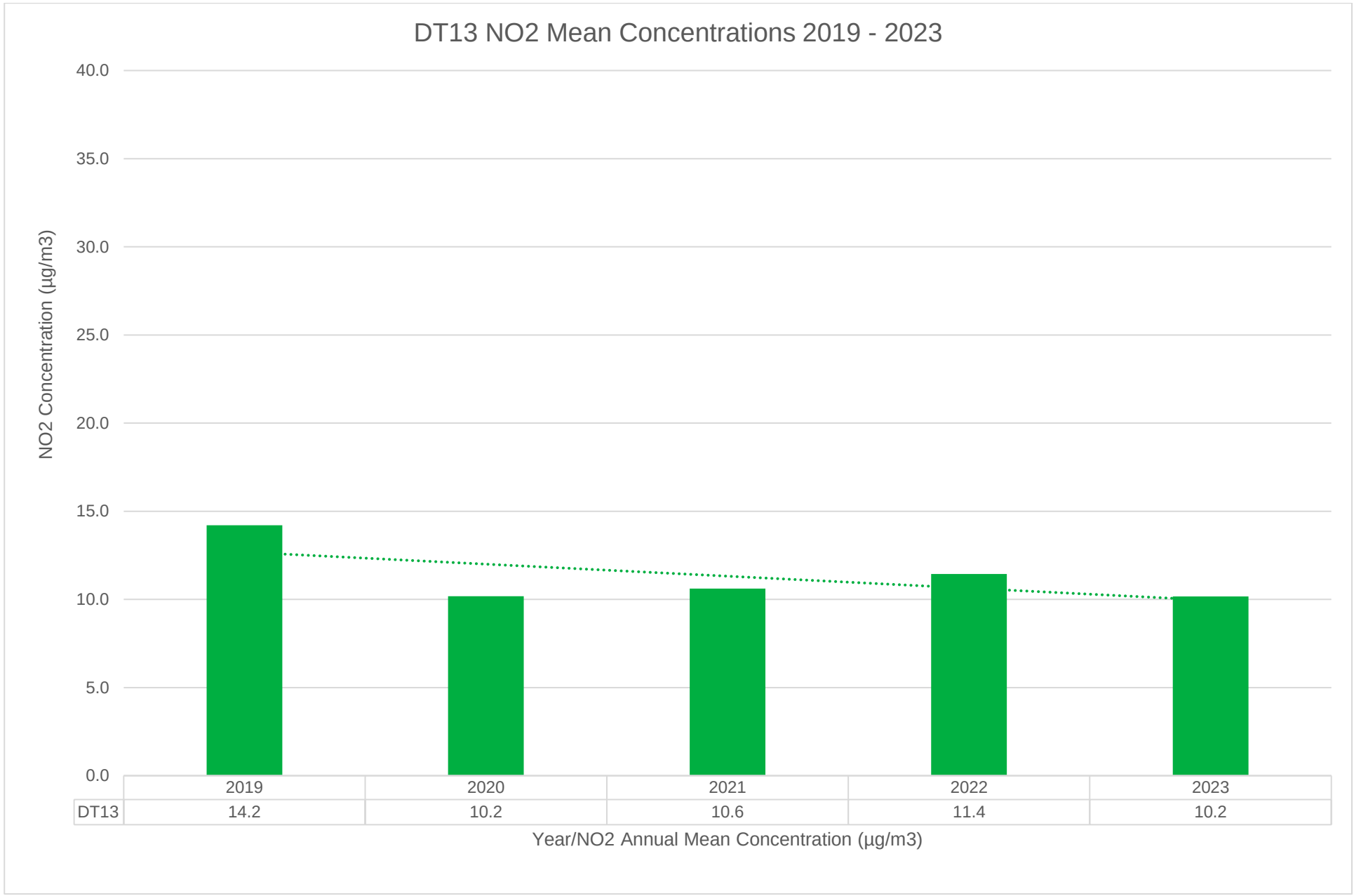

DT8 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT8
22.9
15.3
15.7
15.5
15.3
Year/NO2 Annual Mean Concentration (µg/m3)

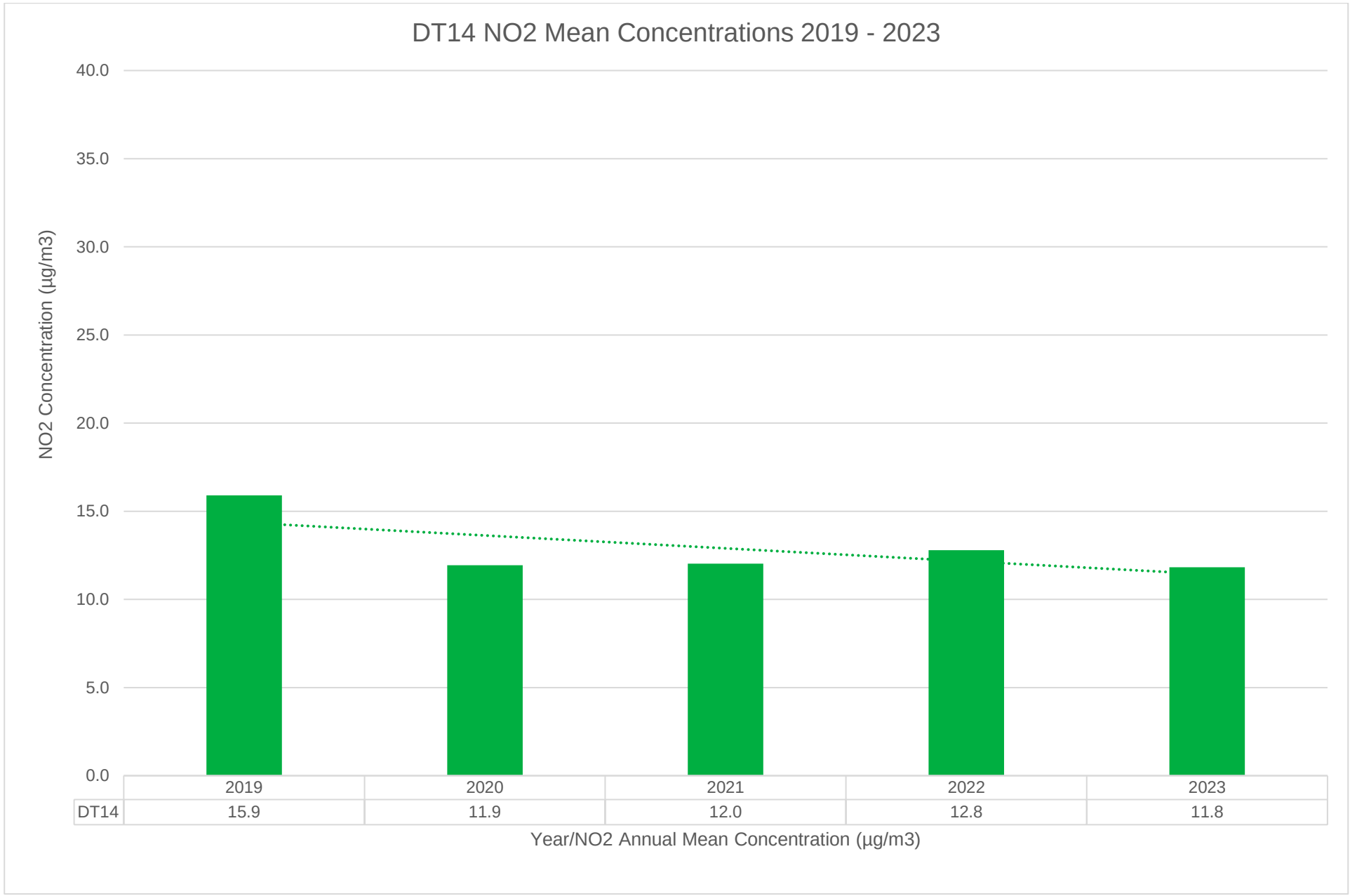

DT9 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT9
23.9
17.1
17.9
18.4
16.6
Year/NO2 Annual Mean Concentration (µg/m3)

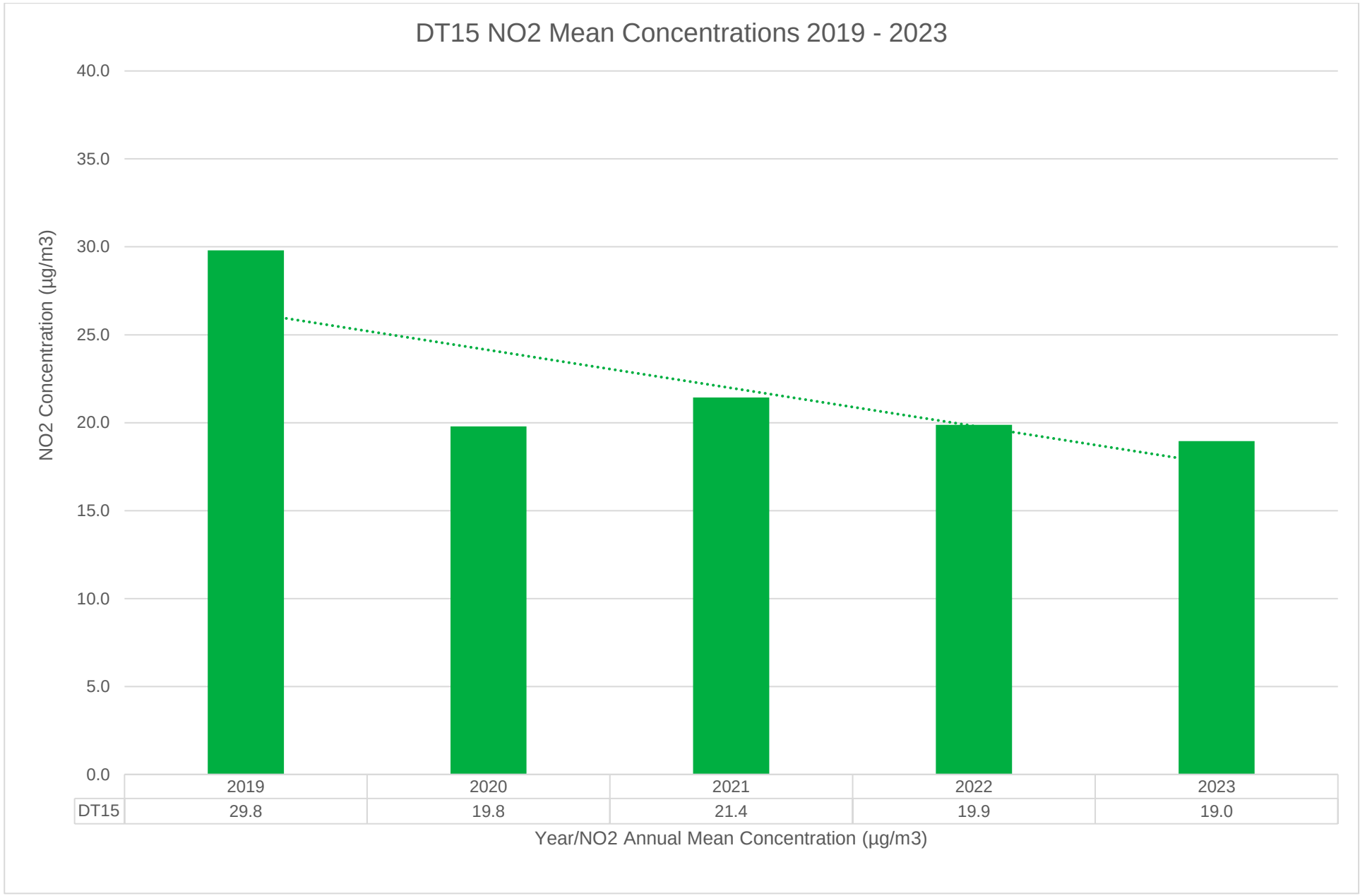

DT10 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT10
15.7
10.3
10.5
11.6
9.9
Year/NO2 Annual Mean Concentration (µg/m3)

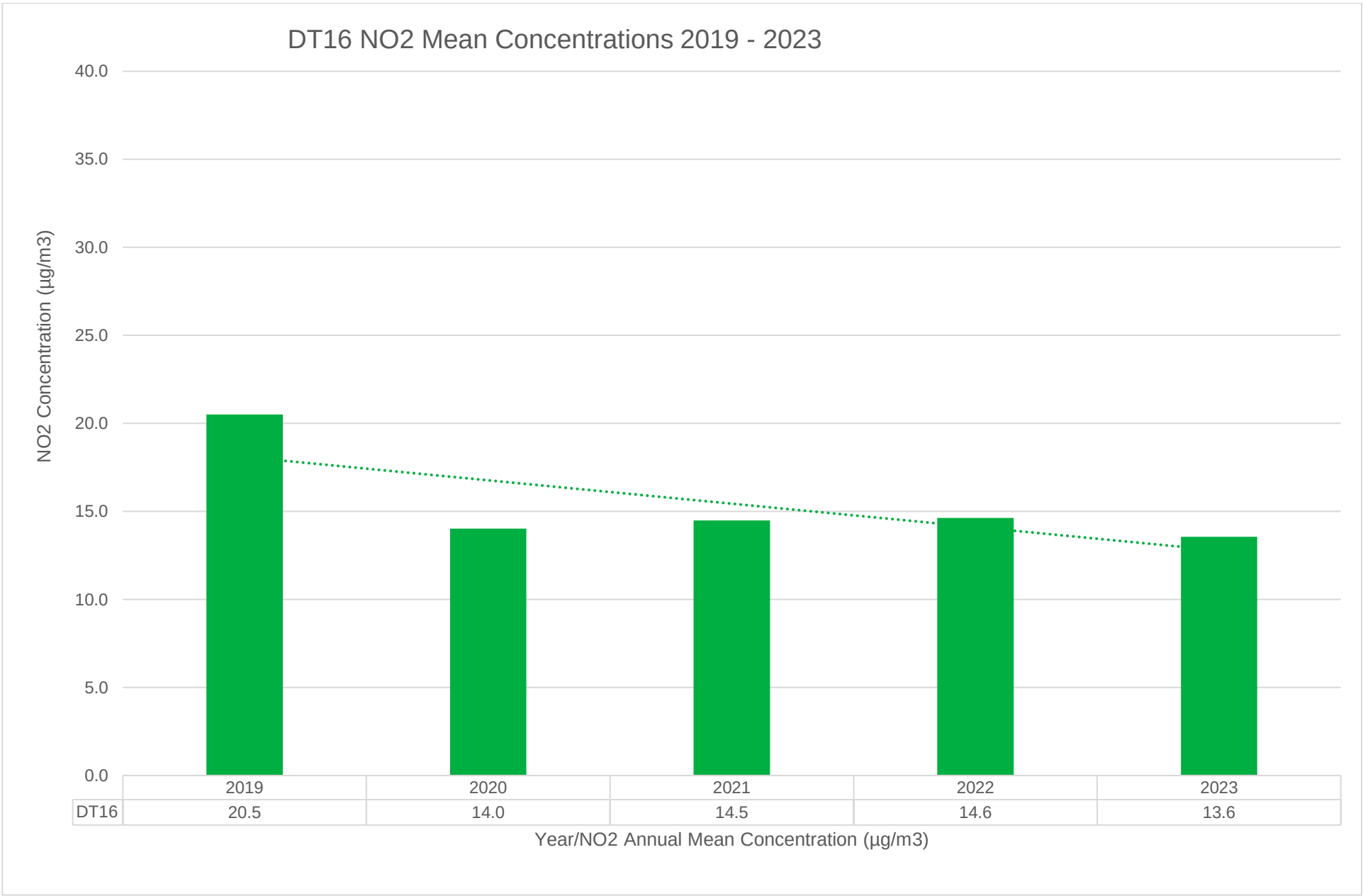

DT11 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT11
15.0
10.3
10.8
11.4
9.9
Year/NO2 Annual Mean Concentration (µg/m3)

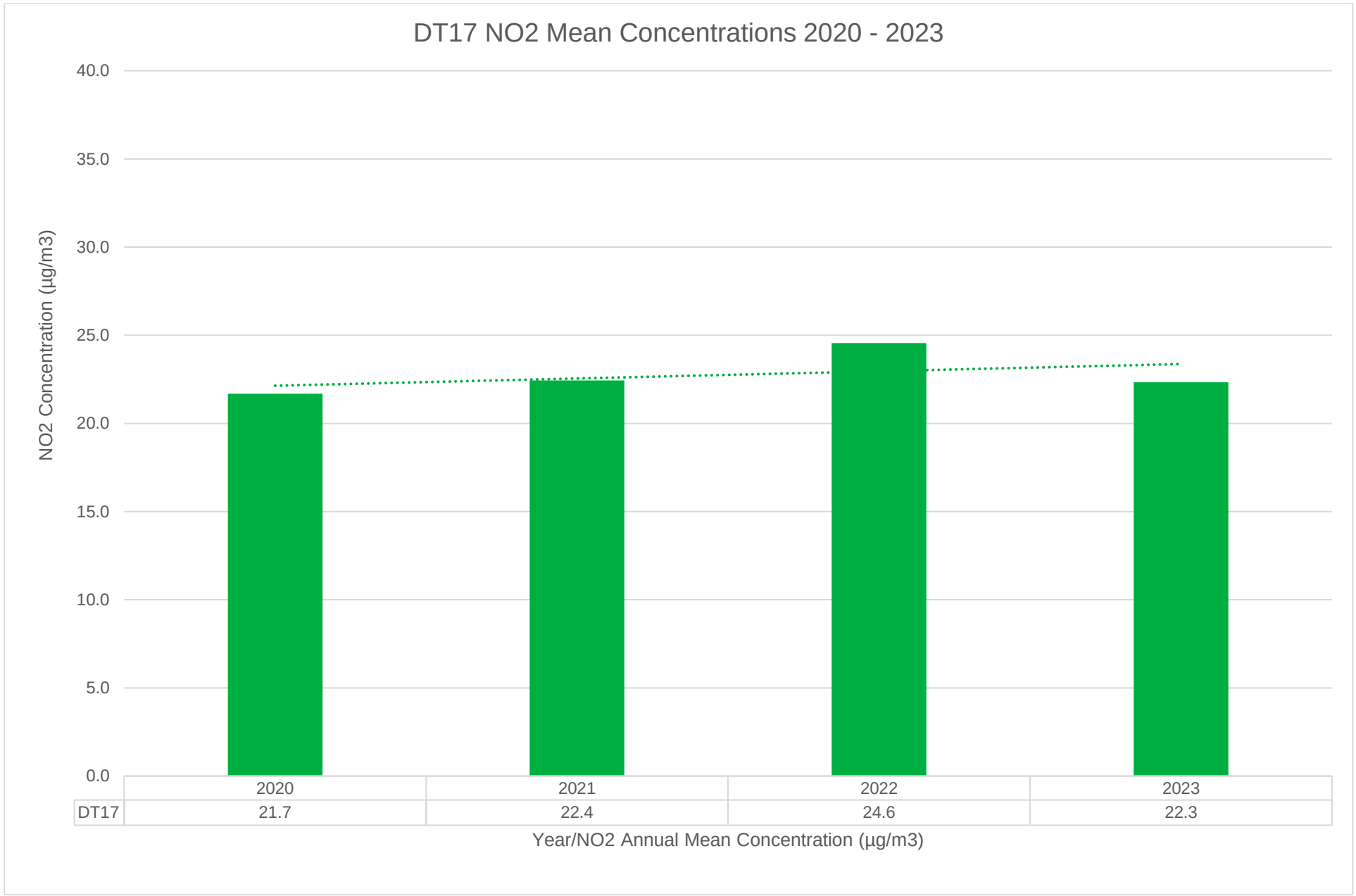

DT12 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT12
22.7
17.2
18.8
18.7
17.1
Year/NO2 Annual Mean Concentration (µg/m3)

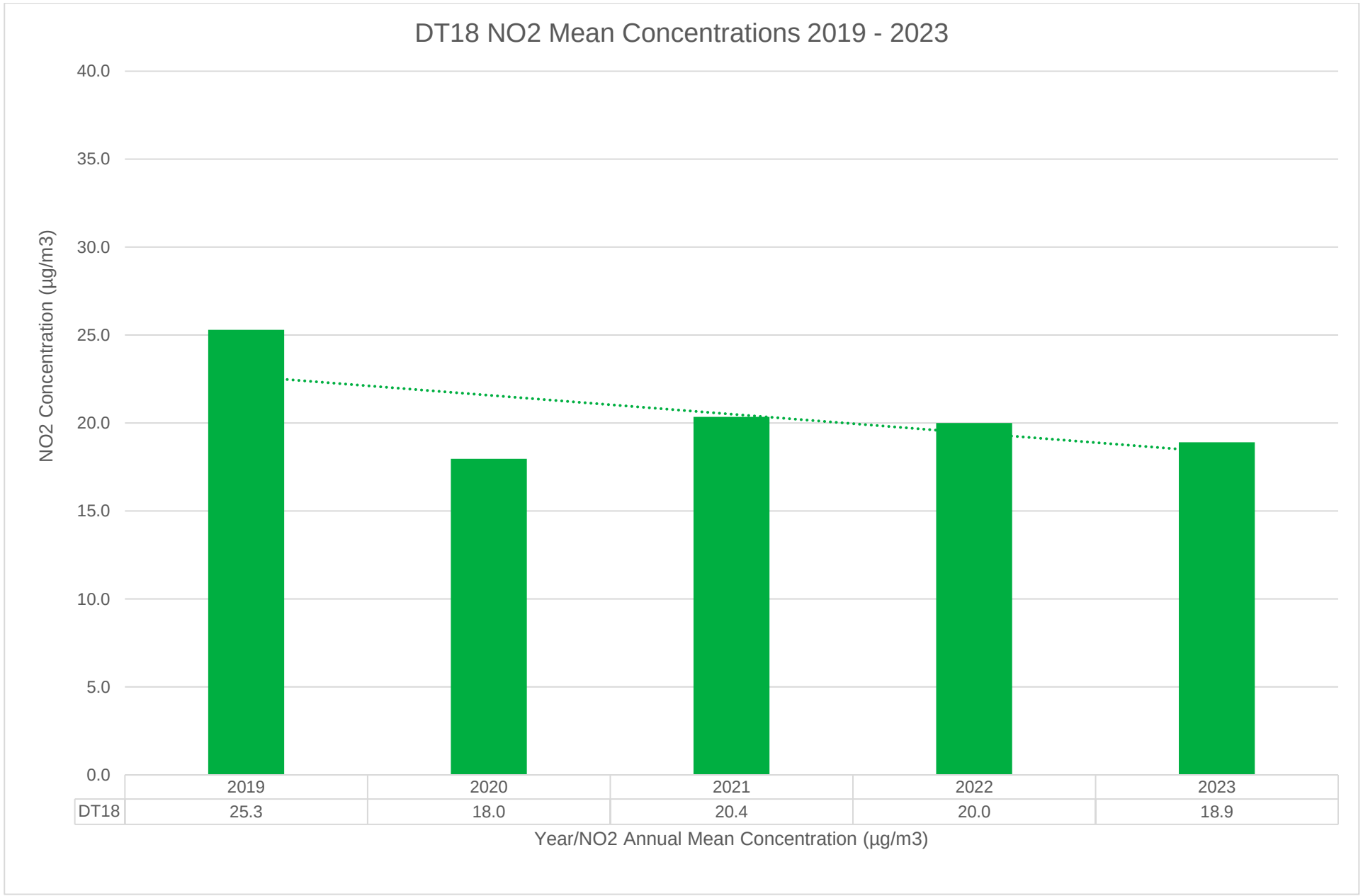

DT13 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT13
14.2
10.2
10.6
11.4
10.2
Year/NO2 Annual Mean Concentration (µg/m3)

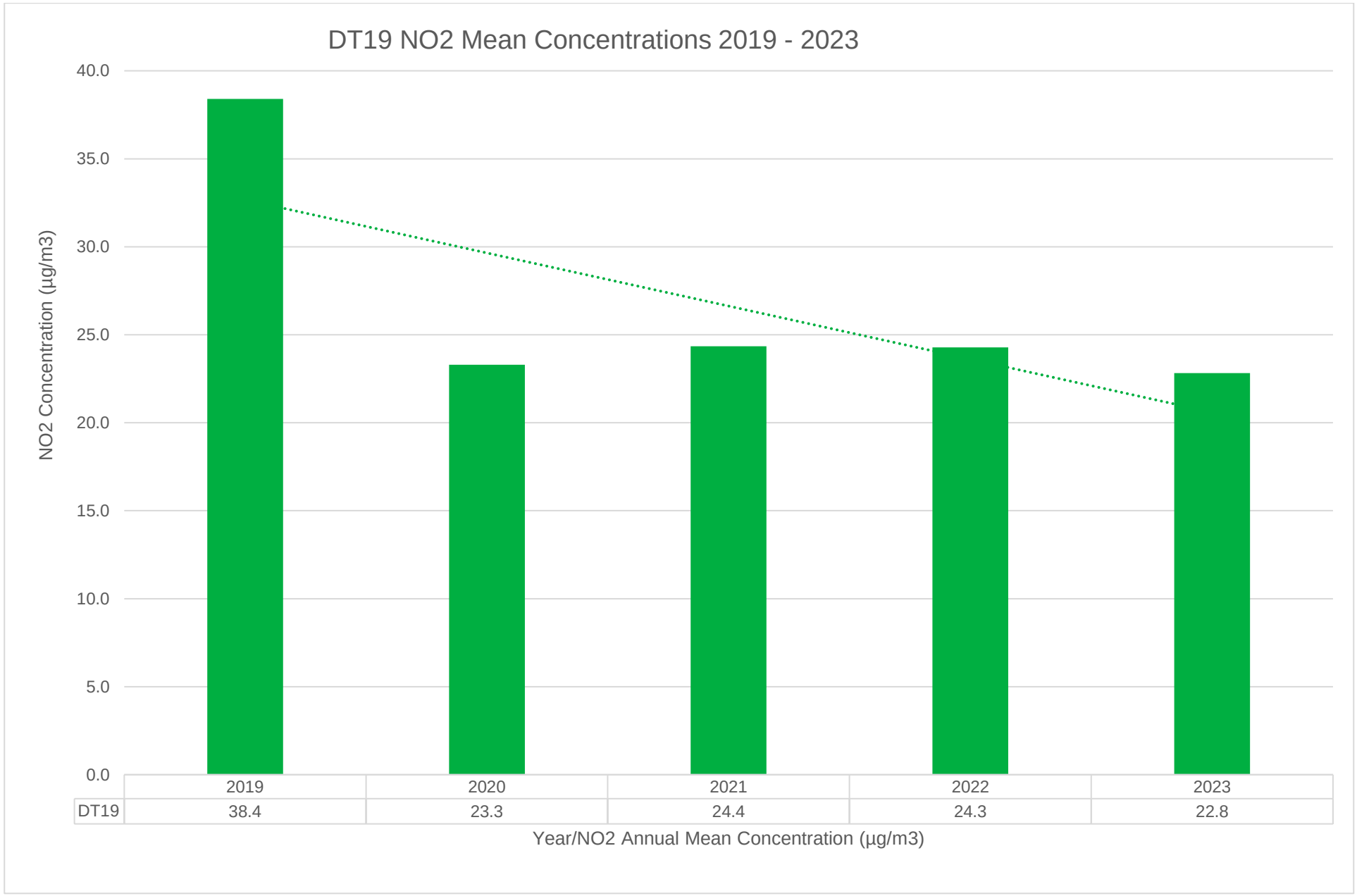

DT14 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT14
15.9
11.9
12.0
12.8
11.8
Year/NO2 Annual Mean Concentration (µg/m3)

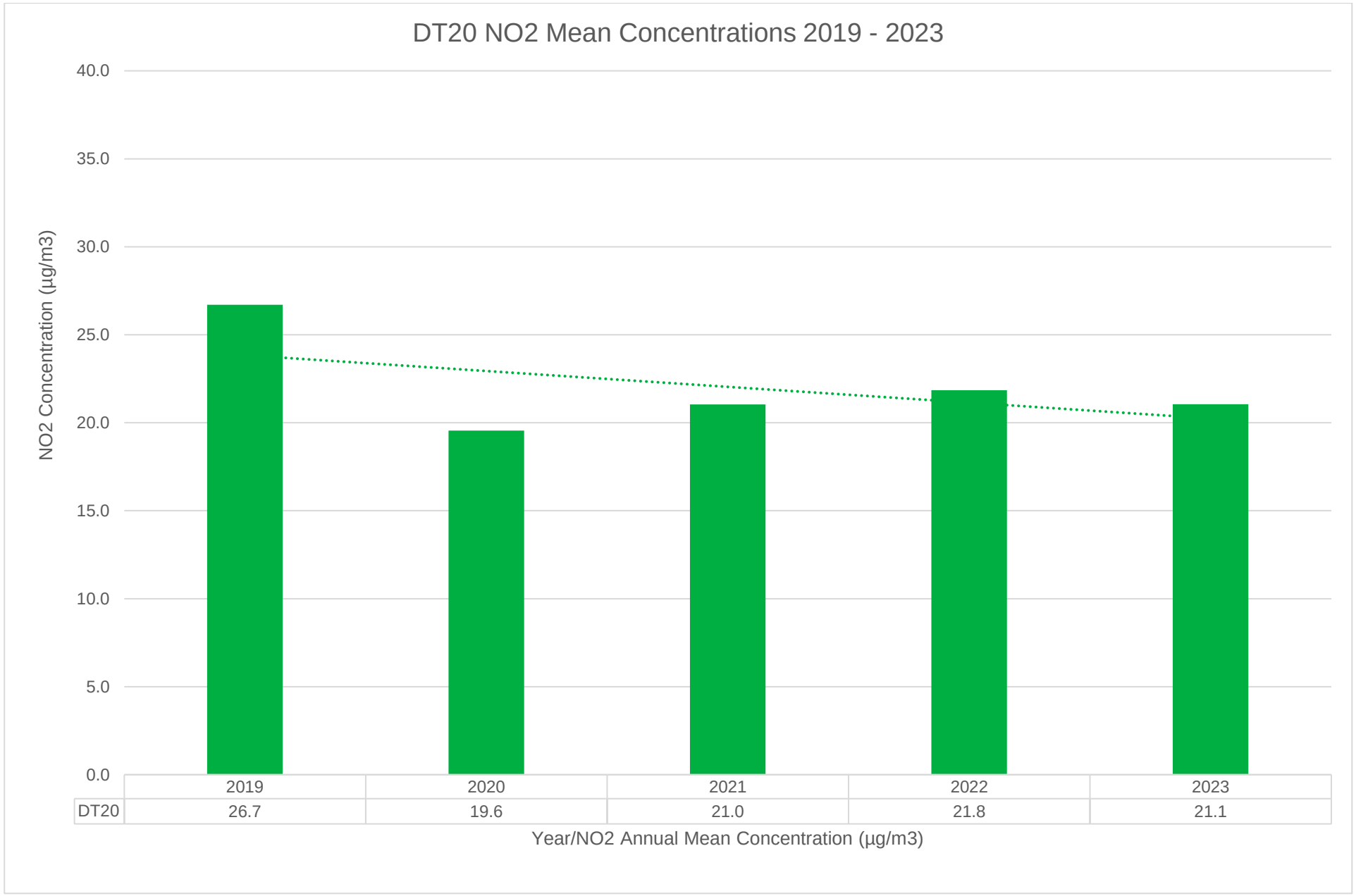

DT15 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT15
29.8
19.8
21.4
19.9
19.0
Year/NO2 Annual Mean Concentration (µg/m3)

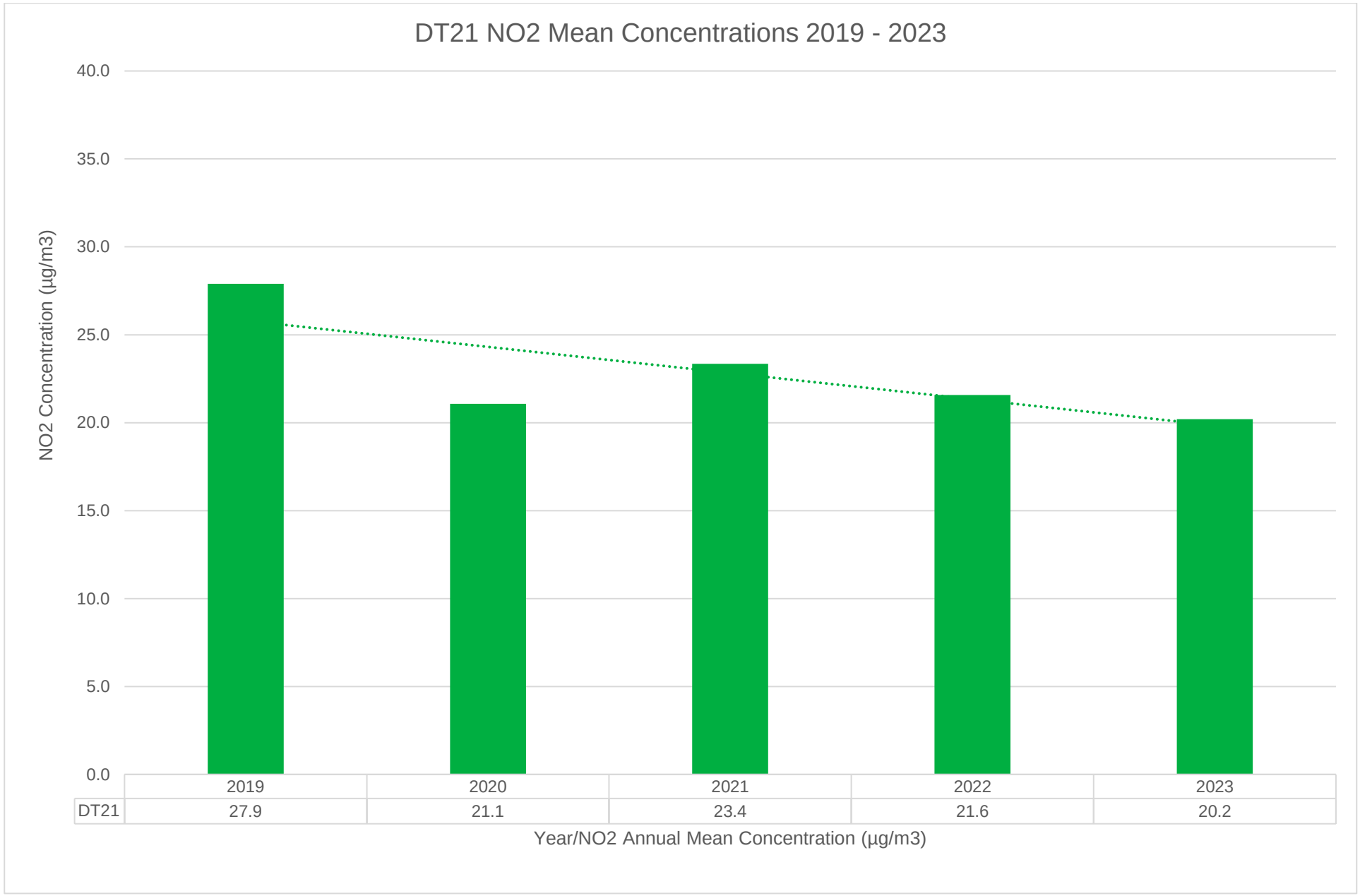

DT16 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT16
20.5
14.0
14.5
14.6
13.6
Year/NO2 Annual Mean Concentration (µg/m3)

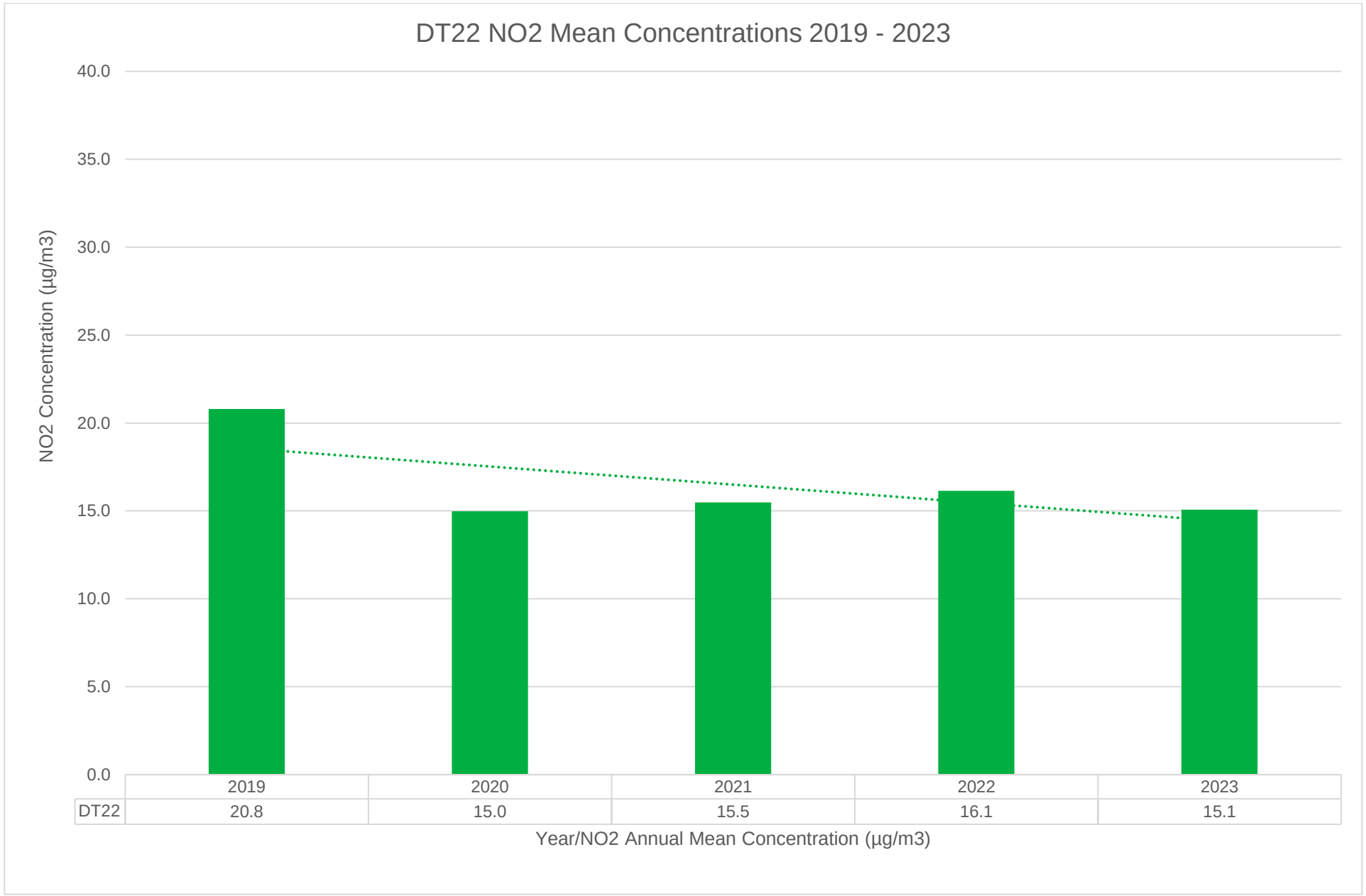

DT17 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
DT17
21.7
22.4
24.6
22.3
Year/NO2 Annual Mean Concentration (µg/m3)

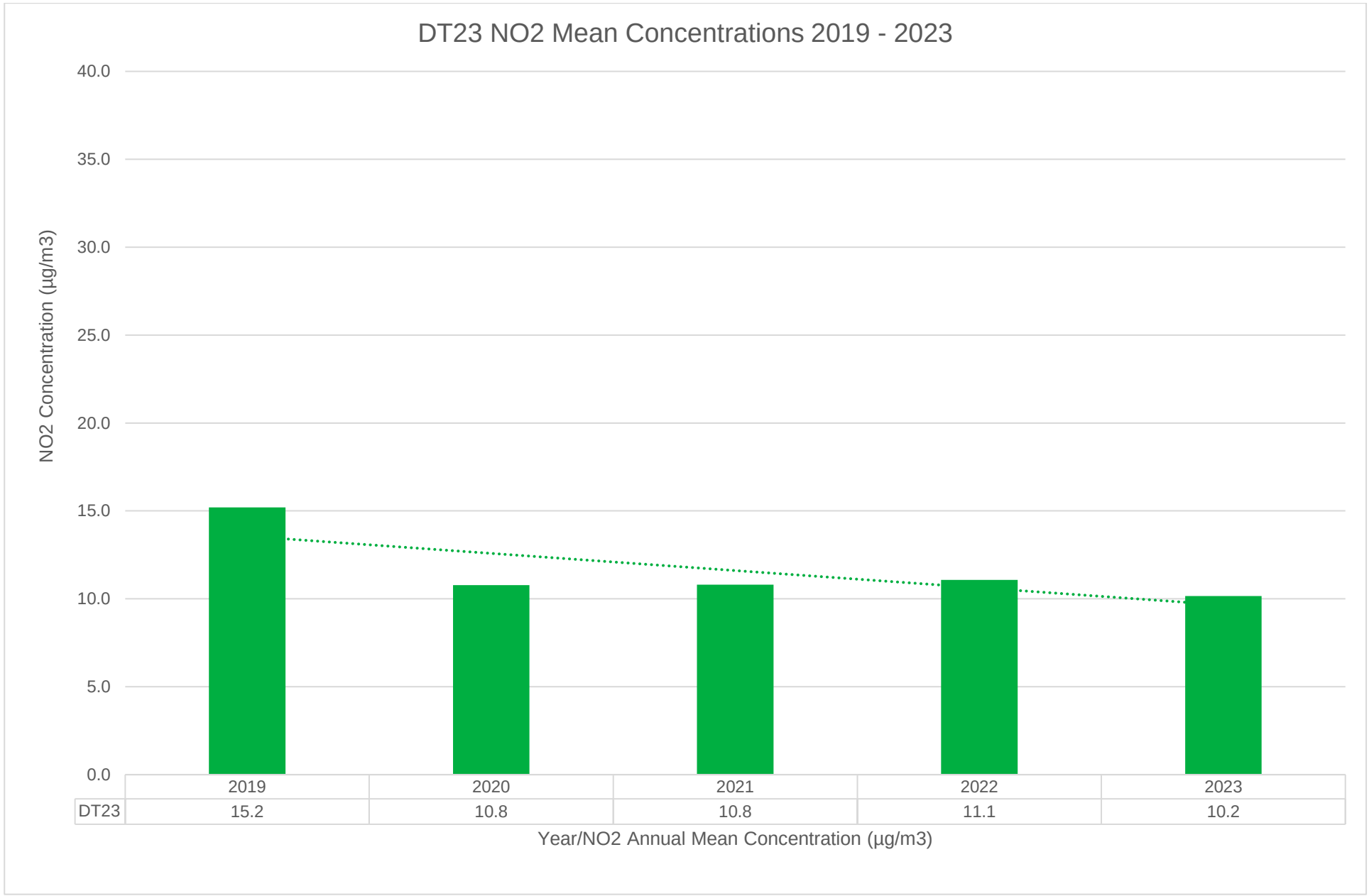

DT18 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT18
25.3
18.0
20.4
20.0
18.9
Year/NO2 Annual Mean Concentration (µg/m3)

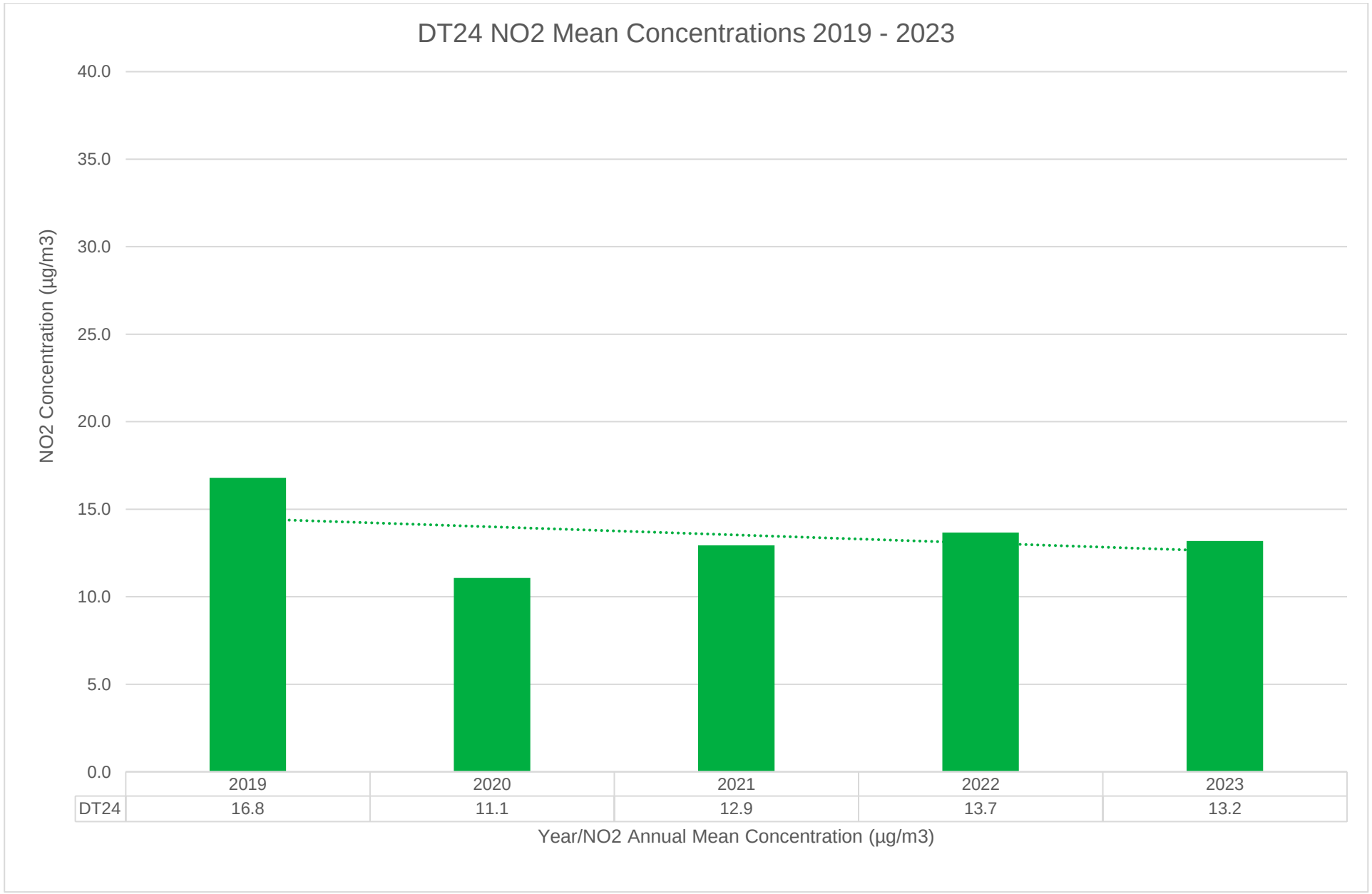

DT19 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT19
38.4
23.3
24.4
24.3
22.8
Year/NO2 Annual Mean Concentration (µg/m3)

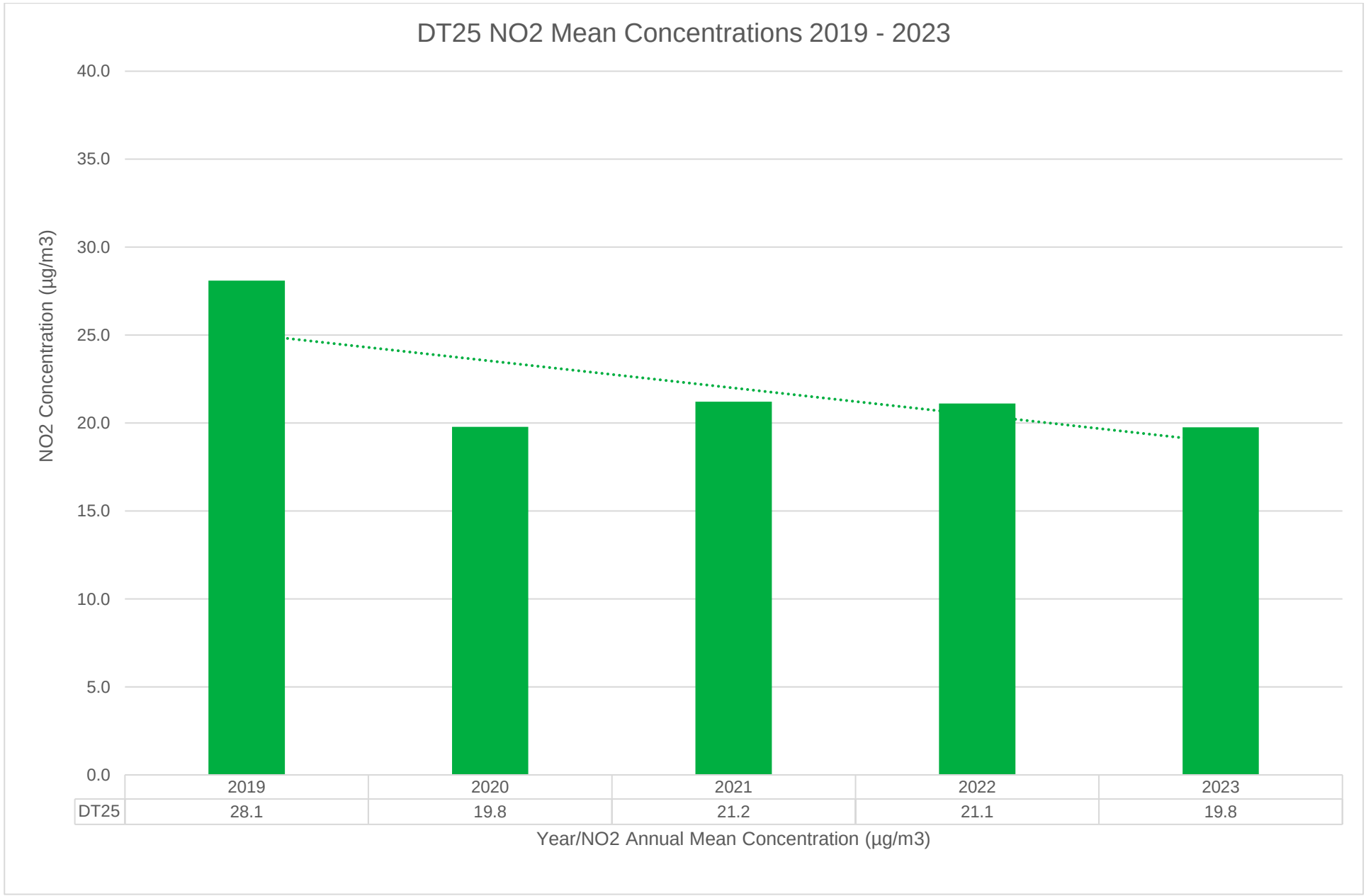

DT20 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT20
26.7
19.6
21.0
21.8
21.1
Year/NO2 Annual Mean Concentration (µg/m3)

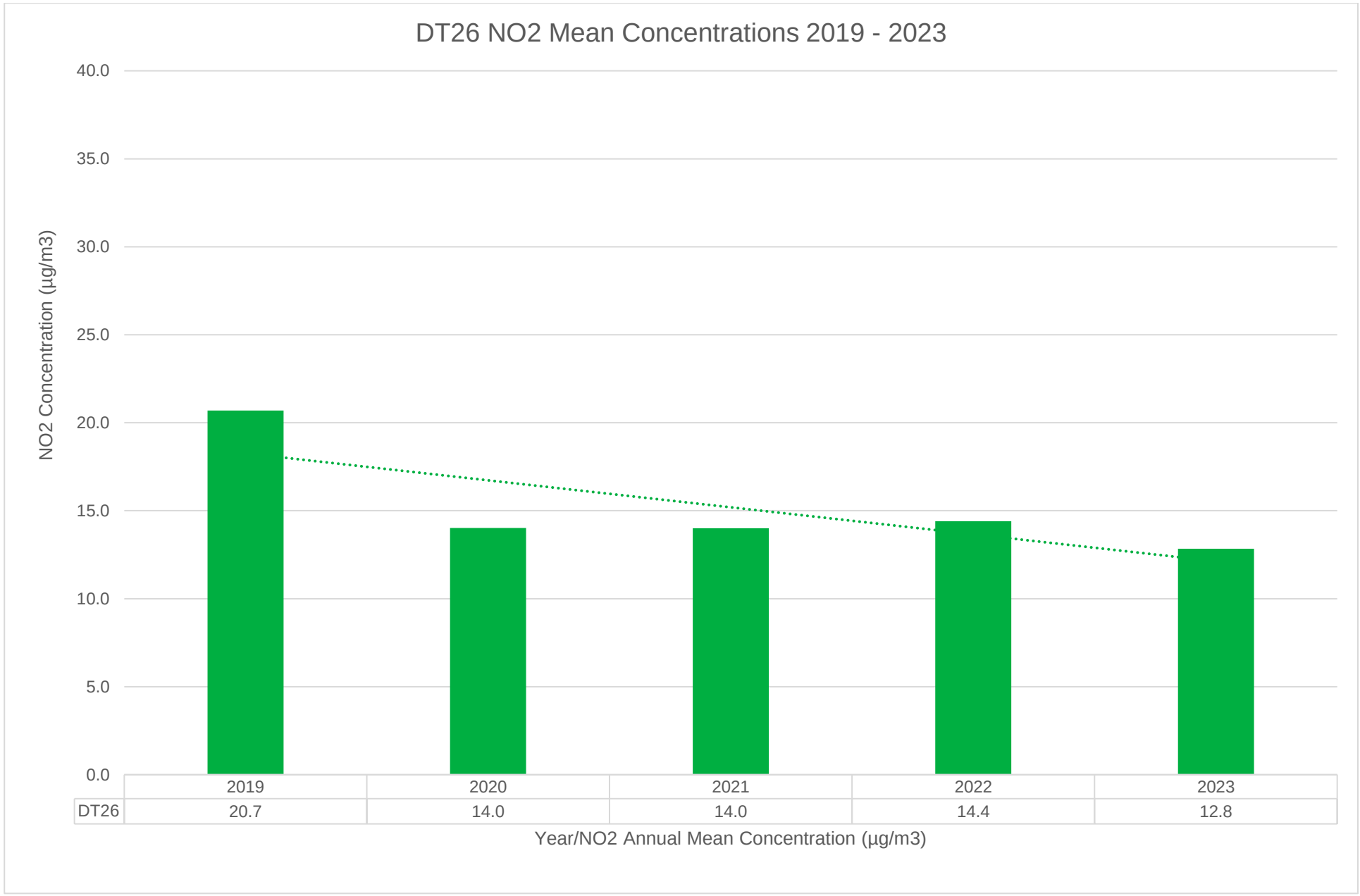

DT21 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT21
27.9
21.1
23.4
21.6
20.2
Year/NO2 Annual Mean Concentration (µg/m3)

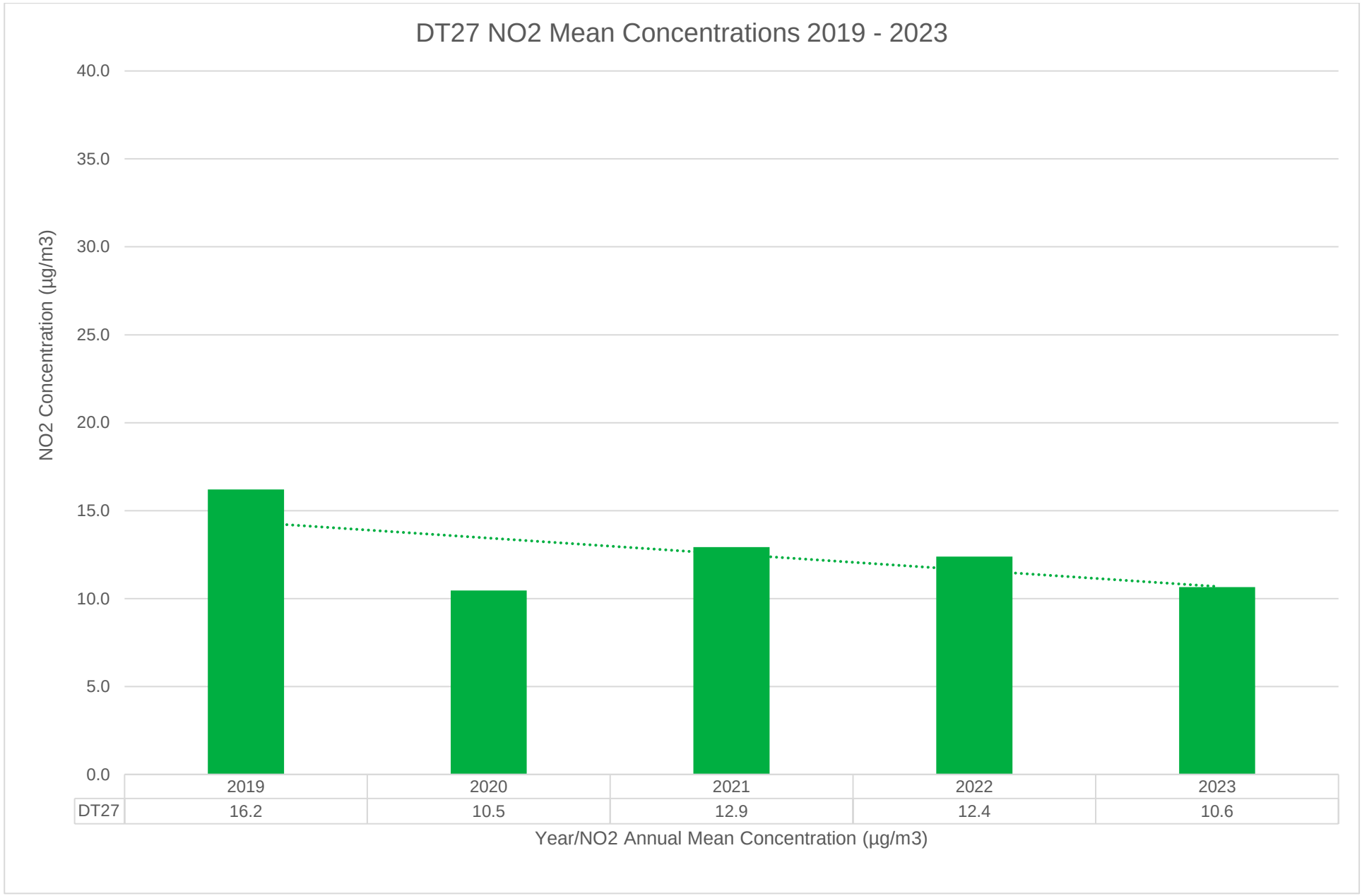

DT22 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT22
20.8
15.0
15.5
16.1
15.1
Year/NO2 Annual Mean Concentration (µg/m3)

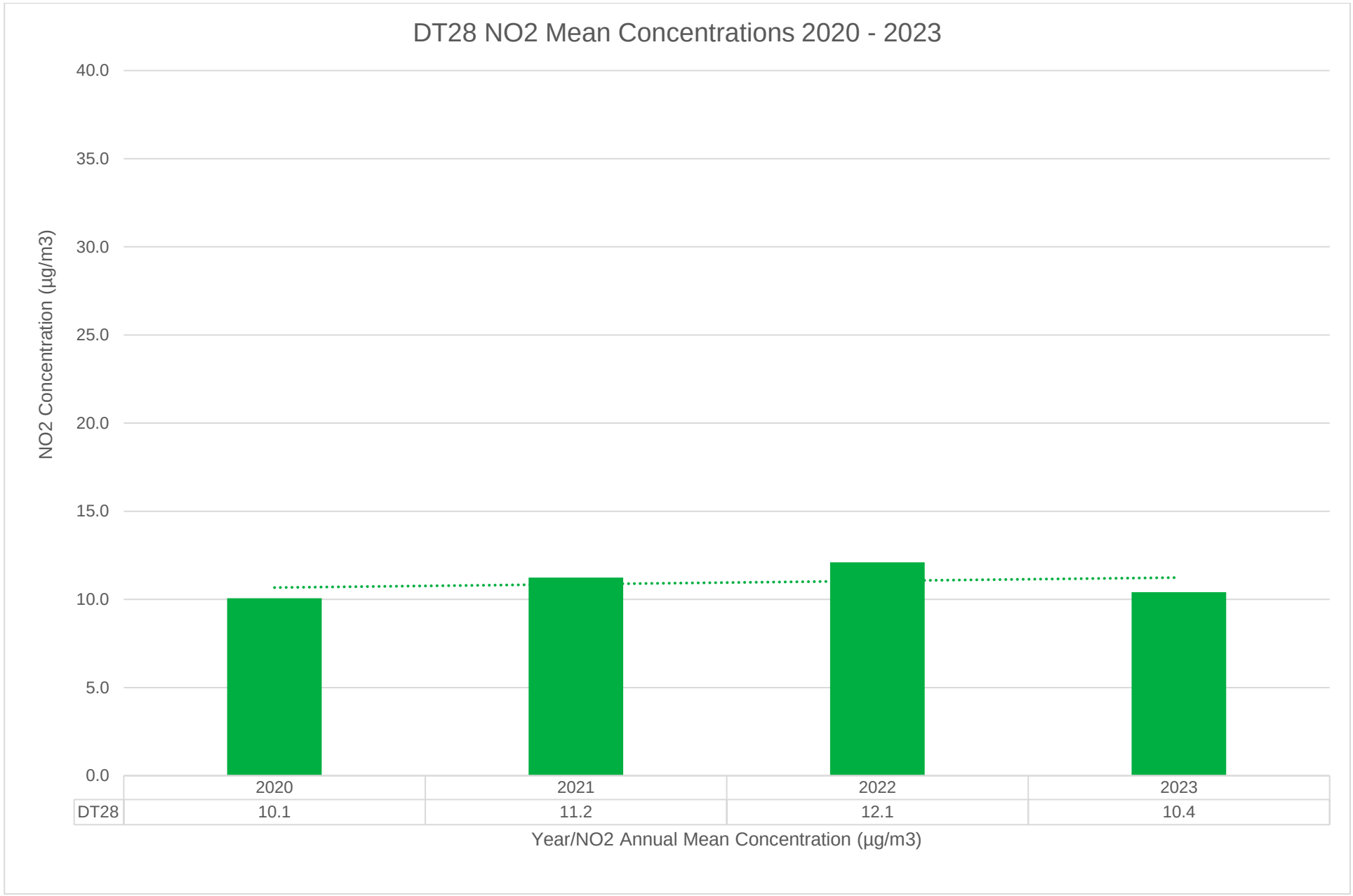

DT23 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT23
15.2
10.8
10.8
11.1
10.2
Year/NO2 Annual Mean Concentration (µg/m3)

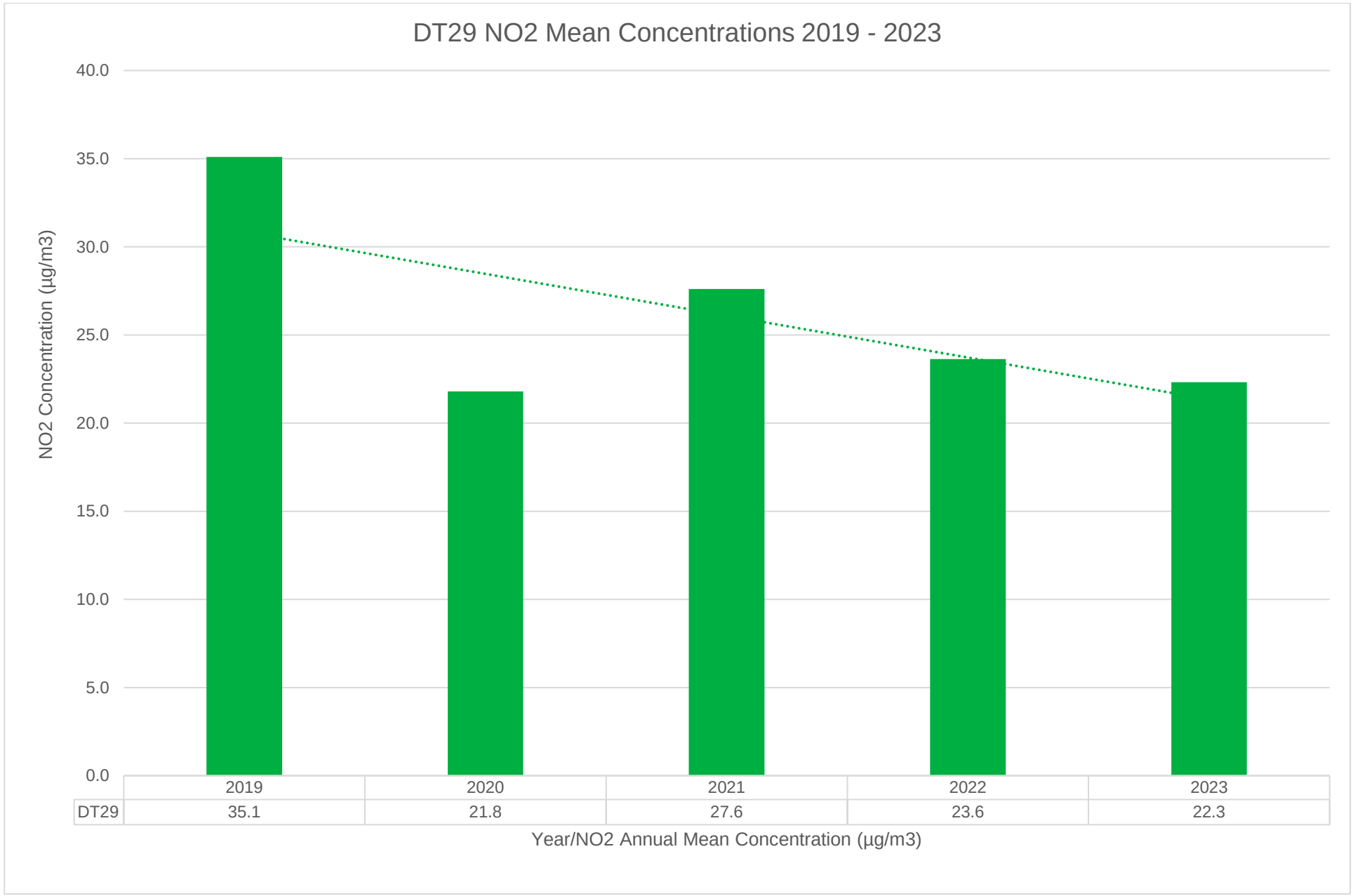

DT24 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT24
16.8
11.1
12.9
13.7
13.2
Year/NO2 Annual Mean Concentration (µg/m3)

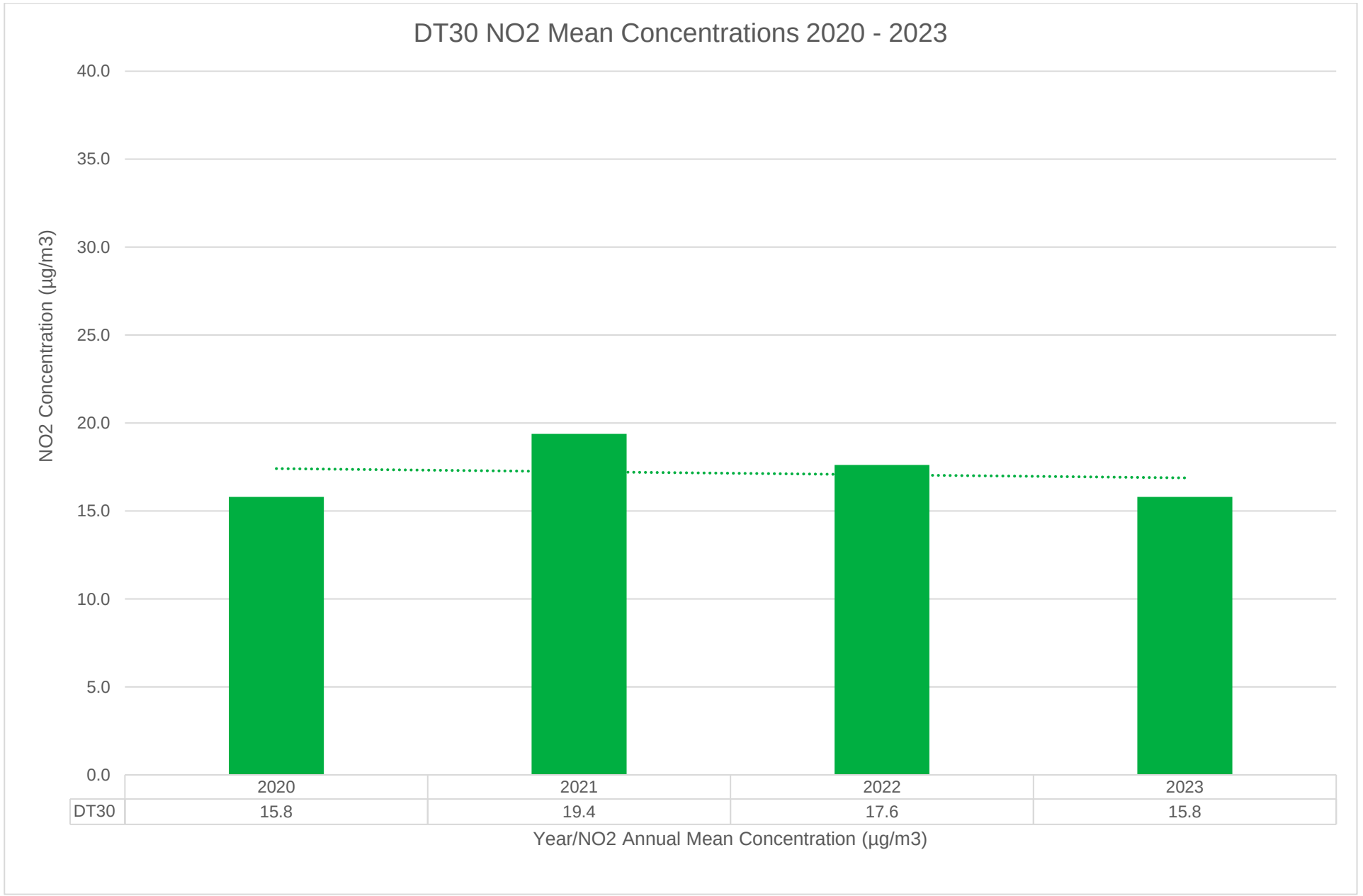

DT25 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT25
28.1
19.8
21.2
21.1
19.8
Year/NO2 Annual Mean Concentration (µg/m3)


DT26 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT26
20.7
14.0
14.0
14.4
12.8
Year/NO2 Annual Mean Concentration (µg/m3)


DT27 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT27
16.2
10.5
12.9
12.4
10.6
Year/NO2 Annual Mean Concentration (µg/m3)


DT28 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
DT28
10.1
11.2
12.1
10.4
Year/NO2 Annual Mean Concentration (µg/m3)


DT29 NO2 Mean Concentrations 2019 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2019
2020
2021
2022
2023
DT29
35.1
21.8
27.6
23.6
22.3
Year/NO2 Annual Mean Concentration (µg/m3)


DT30 NO2 Mean Concentrations 2020 - 2023
NO2 Concentration (µg/m3)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2020
2021
2022
2023
DT30
15.8
19.4
17.6
15.8
Year/NO2 Annual Mean Concentration (µg/m3)

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results (µg/m^3) - Broadland

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BN4	626918	308740	18.7	17.5	10.0	8.6	6.2	6.9	7.3	9.0	10.7	13.5	16.4	12.7	11.5	9.3	-	
BN6	626317	311012	19.8	19.3	10.7	8.1	6.1	7.1	7.7	8.7	9.8	14.5	17.8	15.1	12.0	9.8	-	
BN10	625369	308438	30.9	30.9	21.5	20.0	18.2	20.0	19.3	18.9	24.2	24.5	27.5	23.4	23.3	18.9	-	
BN11	621651	311632	31.4	33.0	26.8	25.1	20.5	20.6	14.3	14.5	30.6	28.4	27.7	24.3	24.8	20.1	-	
BN12	621698	311569	25.6	28.4	22.5	23.2	20.6	19.6	13.1	16.8	23.9	24.5	24.5	19.4	21.8	17.7	-	
BN13	621814	311648	22.8	28.2	19.4	17.0	12.9	14.4	11.7	14.3	24.1	24.0	23.7	20.4	19.4	15.7	-	
BN15	630114	318015	16.9	21.5	17.1	17.4	17.5	19.9	14.7	18.4	20.9	19.9	19.7	13.6	18.1	14.7	-	
BN18	620186	311834	23.5	23.3	17.1	12.2	10.6	12.6	14.5	16.3	16.1	18.3	21.1	16.0	16.8	13.6	-	
BN19	627490	308775	28.0	29.7	21.8	22.0	22.2	23.0	16.5	19.4	23.0	22.8	20.6	18.7	22.3	18.1	-	
BN20	640166	310354	23.1	25.7	18.3	18.1	14.8	17.0	18.3	18.2	23.2	23.0	23.5	20.2	20.3	16.4	-	
BN21	627743	310905	15.7	15.4	11.9	12.8	9.6	11.2	11.5	12.0	16.1	16.3	16.9	12.6	13.5	10.9	-	
BN22	624065	311161	39.8	40.6	31.3	28.2	27.2		25.7	25.5	31.1	28.4			30.9	25.0	-	
BN24	621465	312666	20.0	21.0	16.9	13.3	11.8	11.2	10.3	12.8	14.2	15.6	18.6	13.8	14.9	12.1	-	
BN25	619321	326913	14.6	16.0	11.5	11.3	9.0	9.8		10.9	12.6	13.0	14.1	11.0	12.2	9.9	-	
BN26	626308	310096	17.7	18.0	10.5	10.5	8.6	9.8	9.2	11.4	11.1	14.0	17.8	12.9	12.6	10.2	-	
BN27	625504	312473	35.5	35.3	25.7	23.0	23.2	23.9	22.3	21.7	28.1	26.8	30.3	25.6	26.8	21.7	-	
BN28	621212	312970	16.7	18.4	13.3	13.6	12.2	11.9	8.6	12.8	14.0	15.3	16.2	10.5	13.6	11.0	-	
BN29	613459	323916	16.8	20.7	14.9	15.0	13.4	14.3	11.7	13.9	16.1	16.3	18.0	9.9	15.1	12.2	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BN30	626171	311059	34.3	30.3	20.0	16.6	16.2	17.9	15.5	19.7	21.3	23.8	26.1	25.6	22.3	18.0	-	
BN31	623069	311327	35.4	38.3	26.0	28.9	27.5	25.4	24.5	24.8	31.8	30.9	32.9	27.2	29.5	23.9	-	
BN32	627038	309912	16.6	18.0	10.2	8.4	6.3	7.2	7.4	8.3	10.4	13.3	16.3	12.0	11.2	9.1	-	
BN33	637749	309865	20.8	21.4	15.7	15.8	15.4	15.6	11.1	17.3	13.1	20.2	22.3	16.9	17.1	13.9	-	
BN34	621713	311699	34.6	36.9	29.5	30.8	26.6	25.2	12.1		36.4	35.8	34.4		30.2	24.5	-	
BN35	620205	311723	23.0	26.6	20.0	17.8	17.2	17.0	16.3	20.0	19.1	19.2	21.7	15.3	19.4	15.7	-	
BN36	629892	317484	20.0	32.2	23.3	23.3	17.7	21.1	20.0	20.9	22.9	22.1	27.5	19.2	22.5	18.2	-	
BN37	627597	309179	18.9	19.6	11.4	9.8	6.8	7.8	8.6	9.7	12.4	14.7	16.9	13.5	12.5	10.1	-	
BN38	619440	315702	20.1	22.8	16.8	15.3	12.5	12.3	12.5	13.6	16.6	17.0	19.4	14.8	16.1	13.1	-	
BN39	609932	322874	18.0	19.0	15.0	13.2	12.4	12.0	9.6	12.1	13.1	14.4	18.3	11.8	14.1	11.4	-	
BN41	626804	319855	21.7	24.2	17.5	17.6	14.9	16.3	16.6	18.4	20.5	19.4	21.7	16.3	18.8	15.2	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **Broadland Council confirms that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Table B.2 – NO_2 2023 Diffusion Tube Results (µg/m^3) – South Norfolk

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	619245	305653	21.8	23.4	15.6	14.7	9.4	11.3	12.7	14.3	18.4	19.0	20.0	17.8	16.5	13.4	-	
DT2	616934	310462	22.1	21.9	14.9	12.3	9.6	12.5	16.2	16.3	19.2	19.6	22.5	19.1	17.2	13.9	-	
DT3	626790	302088	19.7	18.9	13.7	11.6	10.0	11.7	12.6	13.2	15.9	17.3	19.3	15.7	15.0	12.1	-	
DT4	611943	279567	27.3	31.2	27.1	24.7	24.1	28.9	20.1	25.5	28.2	28.2	26.2	23.5	26.3	21.3	-	
DT5	611943	279567	24.9	25.8	24.1	21.5	19.1	21.6	19.6	23.5	27.1	26.4	25.0	23.2	23.5	19.0	-	
DT6	636210	298771	21.1	20.4	16.9	15.3	14.4	12.9	7.1	8.6	11.1	14.7	20.7	17.4	15.1	12.2	-	
DT7	619725	292748	35.3	35.4	30.1	27.1	25.8	26.5	26.1	29.1	30.6	32.0	35.3	27.7	30.1	24.4	-	
DT8	611100	301436	23.7	24.9	17.4	17.6		18.2	12.7	15.8	17.8	19.9	22.8	16.9	18.9	15.3	-	
DT9	625438	306163	26.7	27.5	22.6	20.2	14.2	16.7	15.8	17.8	18.1	20.7	23.8	22.5	20.5	16.6	-	
DT10	612514	302653	15.3	14.9	11.6	13.1	9.6	11.8	7.2	10.2	12.9	15.6	13.5	10.7	12.2	9.9	-	
DT11	618138	305619	14.7	16.6	11.1	12.5	8.8	9.8	8.0	10.3	14.0	16.1	14.0	11.3	12.3	9.9	-	
DT12	611529	300995	27.0	25.1	22.2	20.2	15.9	16.3	18.4	19.1	23.4	23.1	23.6	19.3	21.1	17.1	-	
DT13	612704	302788	16.9	17.2	12.6	11.7	7.3	9.9	9.0	10.5	13.3	15.4	14.7	12.0	12.5	10.2	-	
DT14	611367	301622	21.2	20.6	14.7	13.6	8.5	13.0	10.4	11.8	14.8	16.0	17.1	13.3	14.6	11.8	-	
DT15	624476	283267	23.1	26.8	23.5	26.7	22.2	24.3	18.8	23.1	27.1	24.9	22.7	17.8	23.4	19.0	-	
DT16	614902	278861	20.1	22.3	16.0	14.7	11.9	14.0	13.7	15.6	17.8	17.7	20.8	16.4	16.7	13.6	-	
DT17	616984	311560	31.3	32.4	31.6	31.1	20.4	22.7	23.0	24.7	29.8	28.6	29.3	26.0	27.6	22.3	-	
DT18	619714	292717	27.4	25.8	23.4	25.2	23.2	24.5	15.7	19.6	24.1	24.5	27.7	18.9	23.3	18.9	-	
DT19	619731	292745	33.8	33.1	27.0	27.5	24.4	27.5	22.6	27.6	29.5	30.0	30.9	24.1	28.2	22.8	-	
DT20	619643	292348	31.2	32.2	26.7	30.7	19.3	24.6	22.0	24.1	26.7	25.1	25.9	23.4	26.0	21.1	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT21	619685	292629	30.3	30.5	24.4	22.6	24.7	24.2	19.1	23.7	26.6	24.9	27.1	21.3	24.9	20.2	-	
DT22	619711	292720	21.5	21.0		18.5	16.7	18.7	12.4	16.6	21.2	21.2	20.6	16.3	18.6	15.1	-	
DT23	618991	309891	16.6	17.1	12.9	11.9	8.2	9.4	9.0	10.2	13.3	14.4	15.0	12.5	12.5	10.2	-	
DT24	611325	301191	21.0	21.2	18.9	18.9	15.8	16.2	10.9	11.3	14.1	16.1	17.6	13.4	16.3	13.2	-	
DT25	619821	293028	31.1	28.7	22.8	23.4	17.5	20.1	22.3	20.1	26.4	26.6	29.5	24.5	24.4	19.8	-	
DT26	619772	305851	22.4	23.2	15.1	8.0	10.5	12.7	11.8	13.6	16.4	18.8	21.5	16.3	15.9	12.8	-	
DT27	616852	310342	15.5	15.7	13.1	14.0	15.1	15.4	8.0	10.0	11.9	13.5	15.4	10.2	13.1	10.6	-	
DT28	617170	311659	18.3	18.5	11.5	10.2	7.3	9.1	9.5	11.0	13.4	15.5	16.8	13.3	12.9	10.4	-	
DT29	624633	283505	29.6	34.7		26.9	22.2	25.1	21.0	26.8	29.5	30.9	29.1		27.6	22.3	-	
DT30	611785	279593	23.0	23.7	19.9	19.8	13.3	16.7	15.5	18.3	21.5	21.5	22.2	18.8	19.5	15.8	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **Broadland Council confirms that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New or Changed Sources Identified Within South Norfolk and Broadland During 2023

South Norfolk and Broadland Councils have not identified any new sources relating to air quality within the reporting year of 2023

Additional Air Quality Works Undertaken by South Norfolk and Broadland Councils During 2023

South Norfolk and Broadland has not completed any additional works within the reporting year of 2023

QA/QC of Diffusion Tube Monitoring

The supplier used for diffusion tube preparation and analysis within 2023 was Gradko International Ltd and the method of preparation was 20% TEA in water.

Monitoring was undertaken in accordance with the 2023 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within South Norfolk and Broadland recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides

guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

South Norfolk and Broadland Councils have applied a national bias adjustment factor of 0.81 to the 2023 monitoring data. A summary of bias adjustment factors used by South Norfolk and Broadland over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

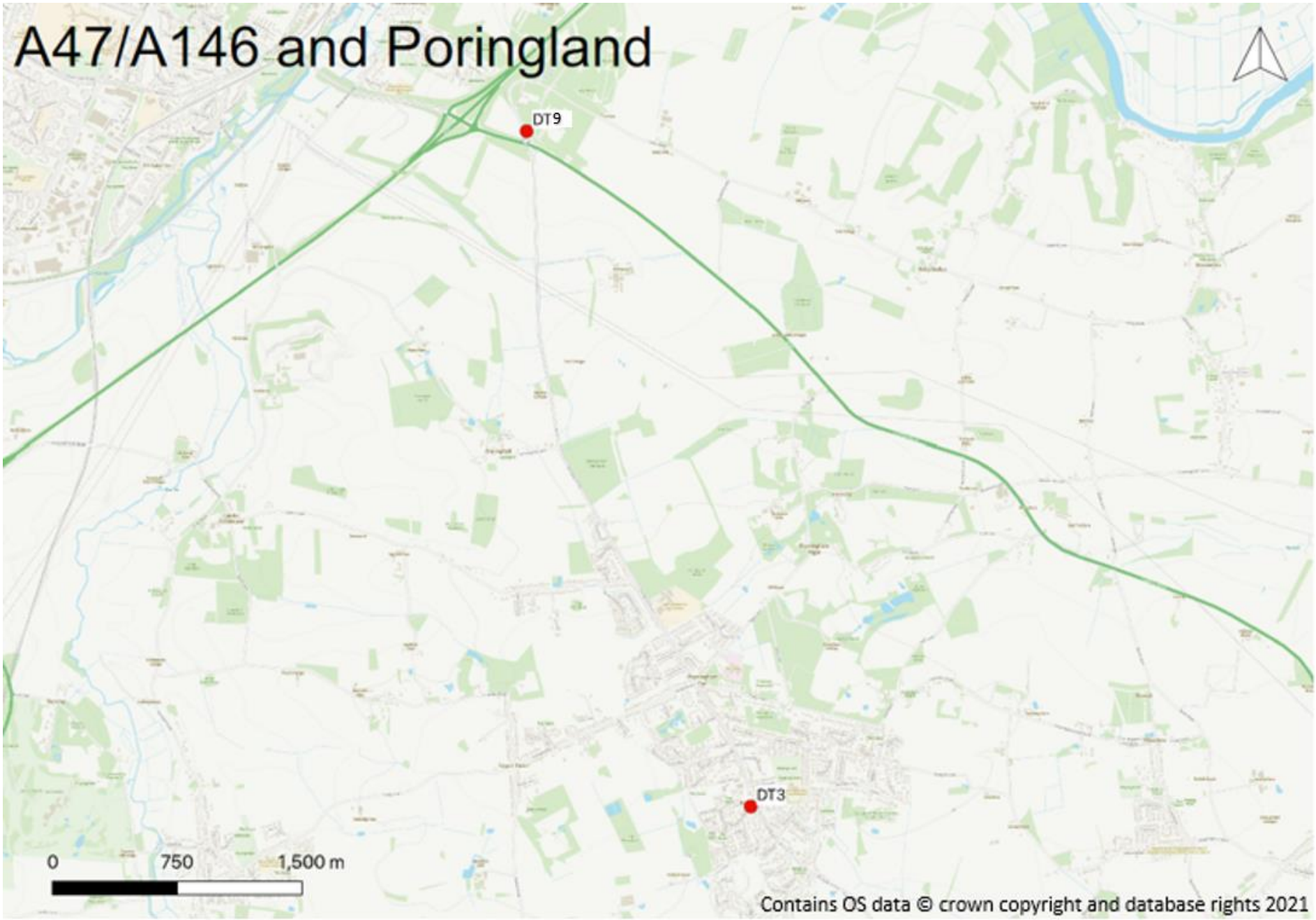
Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.93

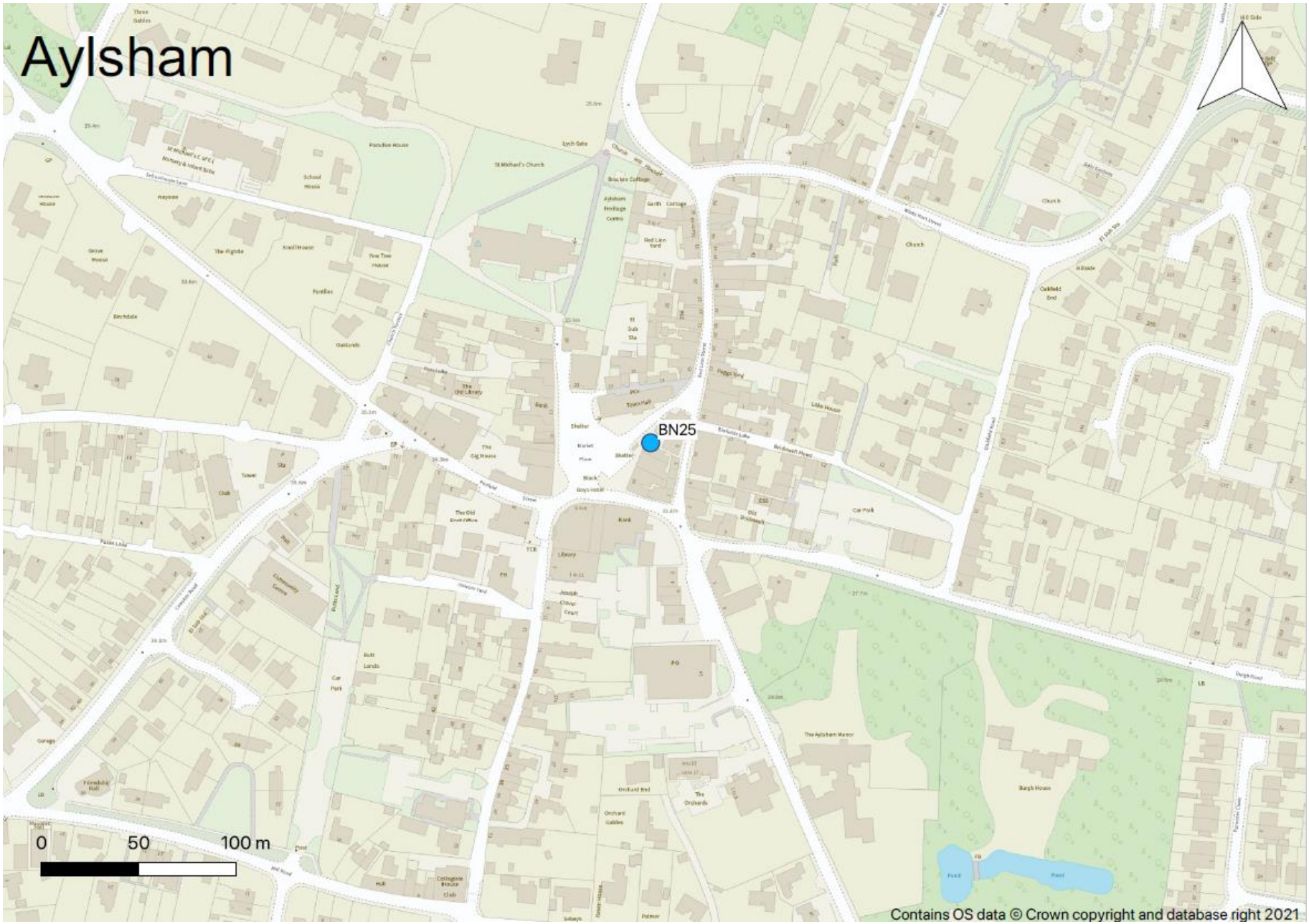
NO_2 Fall-off with Distance from the Road

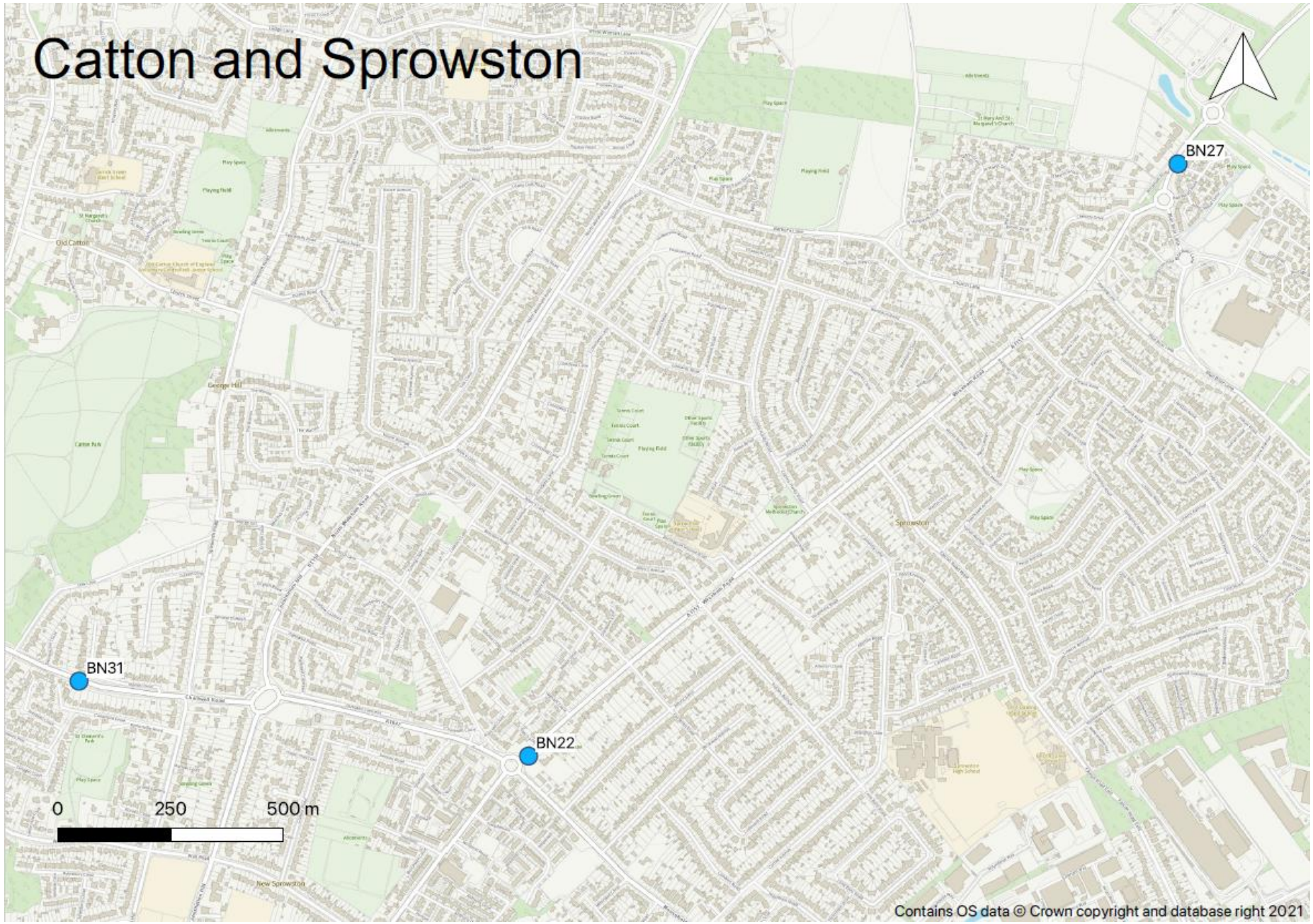
No diffusion tube NO_2 monitoring locations within South Norfolk and Broadland Council's required distance correction during 2022.

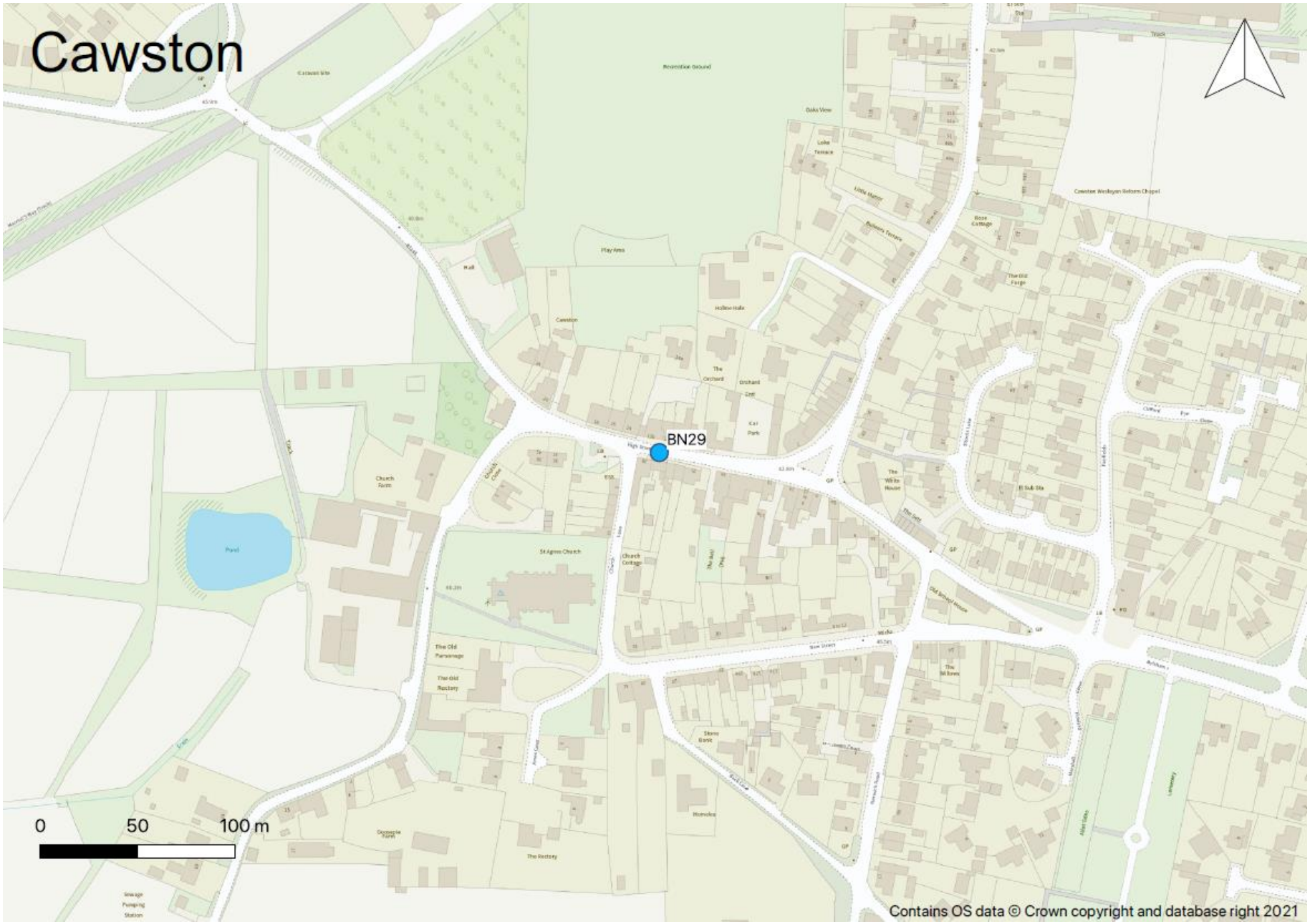
Appendix D: Map(s) of Monitoring Locations (NO_2 Diffusion Tubes)

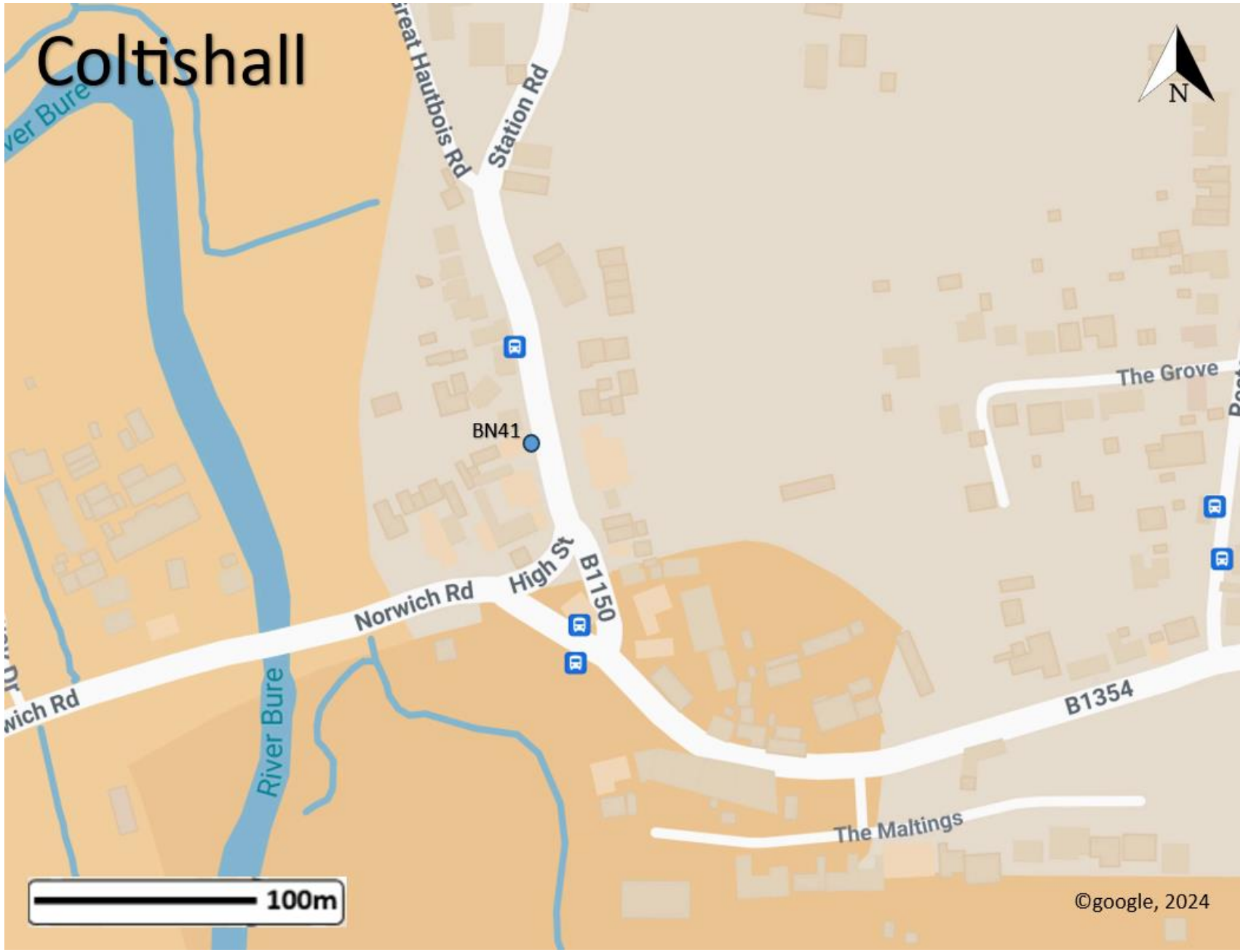

A47 Thickthorn and Cringleford
DT26
DT11
0
250
500 m
Contains OS data © crown copyright and database rights 2021


A47/A146 and Poringland
DT9
DT3
0
750
1,500 m
Contains OS data © crown copyright and database rights 2021


Aylsham
BN25
0
50
100 m
Contains OS data © Crown copyright and database right 2021

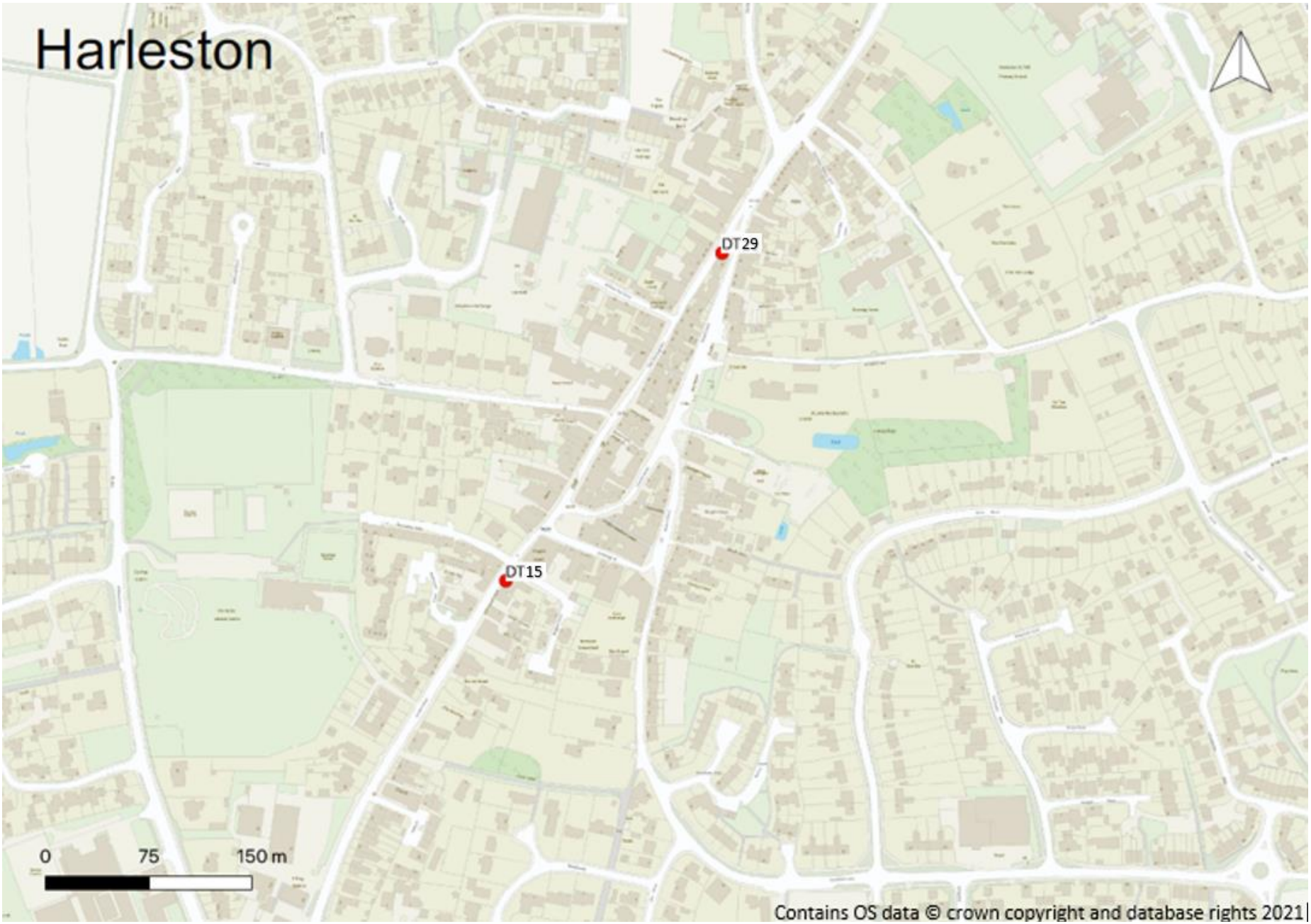

Catton and Sprowston
BN27
BN31
BN22
0
250
500 m
Contains OS data © Crown copyright and database right 2021


Cawston
BN29
0
50
100 m
Contains OS data © Crown copyright and database right 2021


Coltishall
Great Hautbois Rd
Station Rd
N
The Grove
BN41
High St
B1150
Norwich Rd
River Bure
B1354
The Maltings
100m
©google, 2024


Costessey
DT28
DT17
DT2
DT27
DT23
0
250
500 m
Contains OS data © crown copyright and database rights 2021


Diss and Scole
DT30
DT5
DT16
0
250
500 m
Contains OS data © crown copyright and database rights 2021


Harleston
DT29
DT15
0
75
150 m
Contains OS data © crown copyright and database rights 2021


Heartsease and Thorpe St Andrew
BN30
BN6
BN21
BN26
BN8*
BN32
BN37
BN19
BN10
0
250
500 m
*Decommissioned in 2021
Contains OS data © Crown copyright and database right 2021


Hellesdon and Mile Cross
BN24
* BN7
BN18
BN35
BN34
BN11
BN13
BN12
0 100 200 m
*Decommissioned in 2021
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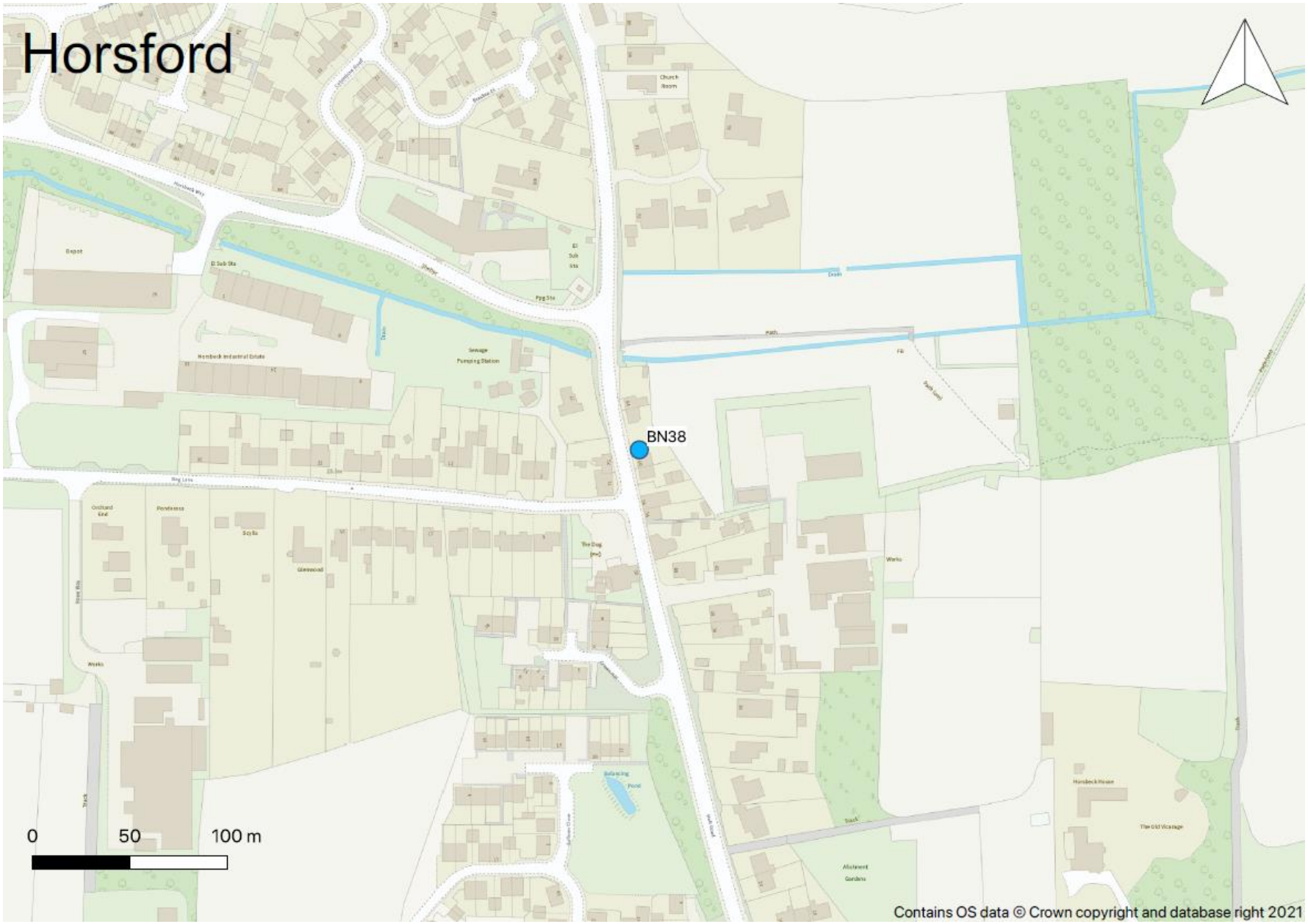
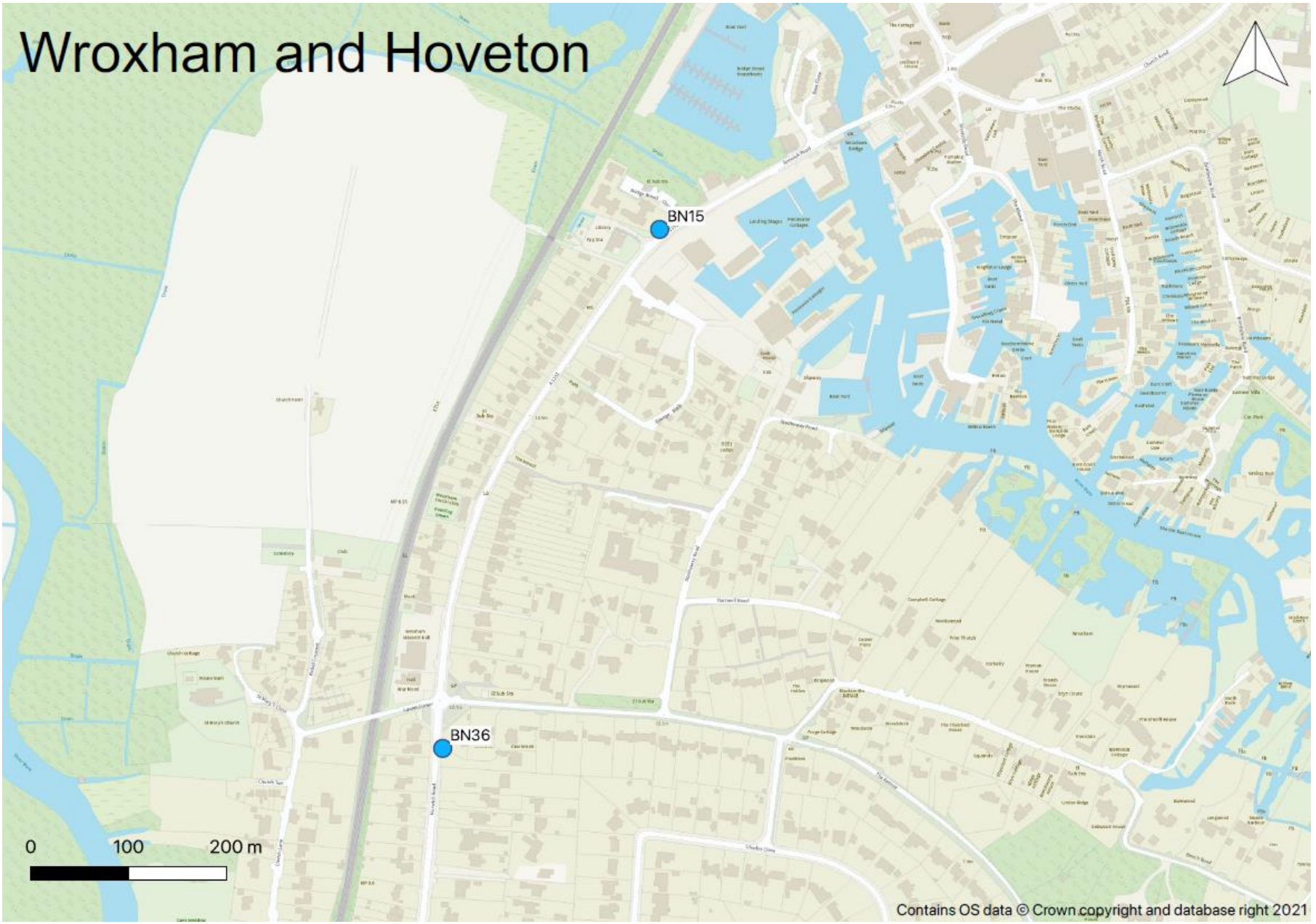
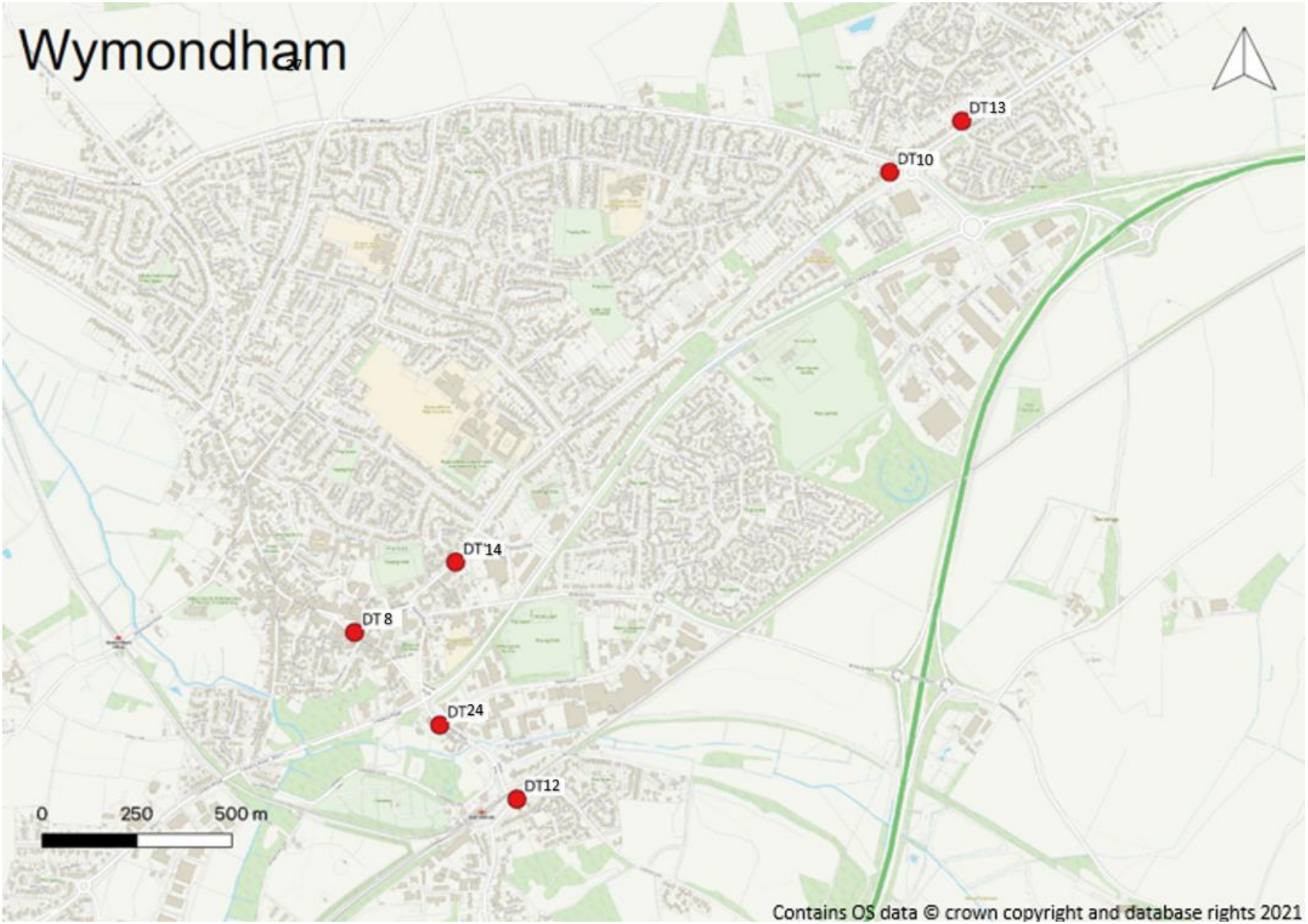

Horsford
BN38
0
50
100 m
Contains OS data © Crown copyright and database right 2021


Loddon
DT6
0
25
50 m
Contains OS data © crown copyright and database rights 2021


Long Stratton
DT25
DT7
DT19
DT22
DT18
DT20
0
75
150 m
Contains OS data © crown copyright and database rights 2021


Reepham
N
Chimes Way
Old Brewery Ln
Ollands Rd
Smuggler's Ln
B1145
B1145
B1145
BN39
Market Pl
Church Hill
Norwich
Park Ln
Back St
School Rd
Church St
Ewing Cl
Sun Barn Rd
Park Ln
School Rd
100m
©google 2022


Wroxham and Hoveton
BN15
BN36
0
100
200 m
Contains OS data © Crown copyright and database right 2021


Wymondham
DT13
DT10
DT14
DT 8
DT24
DT12
0
250
500 m
Contains OS data © crown copyright and database rights 2021

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[7] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.