TEMPLATE

DEVIATION REQUEST FORM

PUBLICATION DATE **14.1.2021**

Version **4.0**

A. To be completed by Gold Standard

1| Decision

1.1 | Date – 03/02/2022

1.2 | Decision

The applied deviation request is **not approved**.

The Secretariat has reviewed the changes proposed to the registered CDM methodology AMS.III.C – Emission Reductions by electric and hybrid vehicles v 15.0 and is of an opinion that principally, the proposed concept is ineligible under GS4GG. Should the PD have any further changes to be made to the methodology, the PD must submit a methodology approval request to Gold Standard in line with the Impact Quantification Methodology Approval Procedure.

1.3 | Is this decision applicable to other project activities under similar circumstances?

No

B. To be completed by the Project Developer/Coordinating and Managing Entity and/or VVB requesting deviation (Submit deviation request form in Microsoft Word format)

2| Background information

Deviation Reference Number	DEV_223	
Date of decision	03/02/2022	
Precedent (YES/NO)	No	
Precedent details	N/A	
Date of submission	24/12/2022	
Project/PoA/VPA	Project	ID – GSXXXX
	☒ PoA	ID – GS11329
	☐ VPA	ID – GSXXXX
Project/PoA/VPA title	Beam Mobility - Micromobility	
Location of project/PoA/VPA	New Zealand	
Scale of the project/PoA/VPA	☐ Microscale ☒ Small scale ☐ Large scale	
Gold Standard Impact Registry link of the project/PoA/VPA	https://impact.sustain-cert.com/public_projects/2976	
Status of the project/PoA/VPA	☒ New ☐ Listed ☐ Certified design ☐ Certified project	
Title/subject of deviation	Claiming retroactive crediting	
Specify applicable rule/requirements/methodology and version number	AMS III C – Emission Reductions by electric and hybrid vehicles v 15.0, 2015	
Specify the monitoring period for which the request is valid (if applicable)	Start date End date	
Submitted by	Contact person name: Ferdinand C Balfoort Email ID: ferdinand@balfourlondon.com	
	Organisation: Beam Mobility Holdings Pte Ltd	
	Project participant: Yes ☒ NO☐	
Validation and Verification body (VVB opinion shall be included, where required by the applicable rules/requirements	Yes ☐ NO☒	

or request is submitted by the VVB).	If yes; VVB name: Bureau Veritas, our appointed VVB, has reviewed but is not required to provide opinion Auditor name: Ram Desai

3| Deviation detail

3.1 | Description of the deviation:

**Guidance* Use the space below to describe the deviation and substantiate the reason for requesting deviation from applicable rules/requirements. Please include all relevant information in support of the request. You are requested to follow the principles for requesting deviations, given in the Deviation Approval Procedure/ Design Change Requirements.*

3.1.1 | Deviation detail (to be completed by Project developer):

Micromobility Introduction and Overview

Beam Mobility Holdings Pte Ltd (Beam) aims to certify its Programme of Activities containing initially four VPA, in New Zealand, and to thereafter expand its PoA to include other countries in the operational geographies where Beam has deployed e Scooters in a range of national cities, which will be defined as additional VPA in future.

Beam is a micromobility operator which operates a class of shared micro e vehicles including e Scooters and e Bikes. E Bikes are not currently included in the scope of the PoA that is proposed to be registered. As Tuli *et al* (2021) have noted, echoing numerous other academic researchers and industry research, "Many cities in the USA and Europe are experiencing a rapid change in the mode of micromobility with the introduction of the shared e-scooters. In 2017, the shared e-scooter was first introduced as a new mode of micromobility in the United States. By the end of 2018, shared e-scooters overtook the place of station-based pedal bikes as the preferred vehicle by making two million more trips".

Lee *et al* (2021) noted, "Micro-mobility modes are mainly powered by electricity, smaller than traditional transportation modes, and suitable for personal use at relatively short distances."

Micromobility is defined as "an emerging field of transportation that encapsulates travel undertaken using a range of light vehicles, collectively referred to as microvehicles" (Santacreu *et al*, 2020). Equally, the same authors defined micro vehicles as both "traditional and emerging vehicle types, from conventional bicycles and powered-two wheelers, through to power-assisted e-bikes, e-scooters and new vehicles such as electric skateboards and "hoverboards". (Ibid, O'Hern, 2020).

ITF (2020) defines micromobility as "Personal transportation using devices and vehicles weighing up to 350 kg and whose power supply, if any, is gradually reduced and cut off at a given speed limit which is no higher than 45 km/h. Micromobility includes the use of exclusively human-powered vehicles, such as bicycles, skates, skateboards and kick-scooters."

In fact, e Scooters, which are the e Vehicle in scope for the Beam PoA and VPA that we aim to be certified under Gold Standard requirements, are generally held to have a mass of between 20 kg – 31 kg in total materials compared to the average personal vehicle mass of around 1,885 kg (EPA USA 2020). This is around 60 times greater than an e Scooter. The significant difference in vehicular mass has equally significant carbon emission efficiency implications. These principally arise from fuel usage per kilometer in moving one person (Passenger Kilometer Travelled or PKT) with a vehicle of 1,885 kg, compared to one person riding an 31 kg e Scooter with a small electro motor that is fueled by renewable energy. At the same time, while e Scooters carry on average one passenger (PAX) during a trip, personal vehicles powered by fossil fuels (ICE) carry on average 1.5 PAX and a significantly high proportion of ICE trips are with a single passenger.

As ITF (2020) notes "This definition (of micromobility *sic*) limits the kinetic energy of such micro-vehicles to 27 kJ, one hundred times less than the kinetic energy reached by a compact car at top speed. The report classifies micro-vehicles into four types based on their speed and mass: Type A micro-vehicles have a mass of up to 35 kg and their power supply (if any) is electronically limited so the vehicle speed does not exceed 25 km/h (15.5 mph). Many bicycles, e-bikes, e-scooters and self-balancing vehicles fall into this category. Other types of micro-vehicles have a higher mass (Type B) or speed (Type C) or both higher mass and higher speed (Type D)."

Beam Mobility operates Type A microvehicles under the ITF definition.

Furthermore, as the ITF (2021) noted in its report titled "Micromobility, Equity and Sustainability", "Available data suggests that shared e-scooters and bikes are particularly suitable for short trips in urban areas. The typical scooter user or bikeshare pass-holder rides for 11-12 minutes and 1-3 kilometres on an average trip in major cities across the United States (NACTO, 2019a). The same trend is observed in European cities." In context, more than 50% of trips globally by ICE are with a single passenger and for a distance of less than 5 km (INRIX 2019). Beam has found direct confirmation for the ITF assessment through its own trip data and user behaviours in the New Zealand VPA in scope.

The same ITF report (2021), echoing similar studies internationally over the past three years since academic research accelerated, also notes that "The carbon footprint of e-scooters has reduced since their initial implementation, as documented by reports from Voi Technology, showing a 70% reduction in CO_2 per km, down to 35g CO_2 per km since January 2019 (Voi, 2020)." Note that this is based on full Life Cycle Assessment emissions calculations, comparing different transport modes, including ICE, bus, taxi, EV etc. In fact, on a fuel usage comparison basis, which is confirmed may be used for baseline comparisons in the CDM manual titled AMS III C – Emission Reductions by Electric and Hybrid Vehicles v 15, dated 2015, Section 5.4.26, e Scooters show a 0 gramme rated $CO_{2\text{-eq}}$ per km. This is due to the usage of renewable energy to charge the swappable batteries used in Beam e Scooters.

Further, e Scooters are found to be effective in replacing a range of transport modal trips of less than 5 km length, including ICE, Public Transport, Uber/ Taxi/ Ridehail, EV/BEV/ PHEV, biking and walking. This is confirmed in a range of other international studies to date including de Bortoli (2021), Moreau (2020). The ITF also notes the positive impact of e Scooters in creating better accessibility to Public Transport, in solving first and last mile challenges. ITF 2021 notes "Some micromobility trips may replace public transport trips. For instance, in Brussels, around 30% of users stated that the e-scooter replaced a public transport trip (Moreau *et al.*, 2020). However, a large proportion of both bike-sharing and e-scooter trips are part of longer intermodal trips, therefore increasing the catchment area of public transport (Shaheen and Cohen, 2016; ITDP, 2018)."

Finally, academic research by Shaheen (2016) and supported by other research and surveys (PBOT 2018), there is a significant potential for e Scooters to reduce reliance on owned ICE, with respondents to research surveys noting their willingness to reduce car ownership or defer acquisition of ICE.

Beam has registered its PoA accordingly under the CDM AMS III C Methodology, due to the confirmed reductions in $CO_{2\text{-eq}}$ emissions. ITF (2021) reports a range of baselines against which micromobility vehicles are compared, in line with academic research to date. For example, ITF notes an average fuel emissions footprint of around 160 g CO_2 emissions/ kilometer for ICE, and 90 g/km for bus. These figures are global blended averages and vary from VPA to VPA as Beam has determined on research and national as well as city by city statistics. In New Zealand these so-called Tailpipe emissions are substantially higher, due to the age and engine sizes of the New Zealand private vehicle ICE fleet. Regardless of VPA and PoA specificities, on the basis of the ITF (2021), a Beam e Scooter ride carrying one person one kilometer would reduce emissions by 160 g/km. This is significant considering the level of car/ICE rides taken daily in today's autocentric world.

1. **AMS III C Deviation is proposed to be adjusted to allow for a wider range of baseline comparatives under GS4G certification.**

The CDM AMS III C manual further notes that "Project participants shall demonstrate that the project and baseline vehicles are comparable, using the following means:

a. Project and baseline vehicles belong to the same vehicle category, e.g. motorcycle, bus, taxi, truck, tricycle;
b. Project and baseline vehicle categories have comparable passenger/load capacity and power rating with a variation of no more than 20 per cent (comparing the baseline vehicle with the respective project vehicle of same category).

Since Beam e Scooters are classified as Type A Microvehicles (ITF (2021) they clearly do not meet the comparability principle required by the AMS III methodology, since they do not belong to bus or private vehicle classifications. Further, microvehicles do not have load capacities and power ratings that are comparable to any other class of larger vehicles.

Beam believes this Deviation Request is therefore appropriate, to allow its micro vehicles Type A and other microvehicles to be comparable to other classes of transport modes like bus, ICE, taxi, which equally carry a passenger from Point A to B and generate PKT as a result. This is because the $CO_{2\text{-eq}}$ emissions differential achieved is based on one passenger travelling for one kilometer via any transport mode of choice, as firmly established in academic research and by agencies such as the ITF.

Beam believes this proposed update in baseline comparatives is appropriate due to the date of the version 15 of the CDM AMS III C methodology (16 April 2015), which was well before the first launch of micromobility in 2018 and its significant global expansion since, which could not have been envisaged by the original authors of the AMS III C methodology therefore.

Beam therefore proposes that the relevant section 11 in the AMS III C methodology be amended for GS4G certification purposes as follows:

"For Micromobility projects to be registered and certified under GS4G requirements, project participants shall demonstrate that the project and baseline transport modes are comparable, using the following means:

a. Project and baseline vehicles must belong to a comparable transport mode category that can carry one passenger for a comparable distance, e.g. micromobility, private vehicle, motorcycle, bus, taxi, truck, tricycle, biking and walking;
b. Project and baseline vehicle categories have a minimum comparable passenger capacity of one passenger to be carried over a defined comparable distance (PKT), without requiring any power rating comparison, thereby comparing the baseline vehicle with the respective micromobility project vehicle of a comparative transport mode category on the basis of Passenger Kilometer Travelled (PKT).

2. Upper Limit for emissions resulting from projects registered is proposed to be removed for GS4G registration purposes

Further, in Section 12 of AMS III C CDM notes:

"Measures are limited to those that result in emission reductions of less than or equal to 60 ktCO2 equivalent annually."

Beam proposes instead a Deviation from this requirement, based on its calculations, and notes that this requirement is redundant. The reason for proposing that Section 12 should not be applicable and removed under GS4G requirements is that e Scooters and Micromobility have a significant potential to replace a substantial portion of other transport modes for trips under 5 kilometres in duration carrying one passenger, and would thereby easily exceed 60,000 T $CO_{2\text{-eq}}$ emissions. For example, INRIX (2019), based on transport data analysis, noted it "analyzed trillions of data points from hundreds of millions of connected devices to rank the Top 25 American, Top 5 British and Top 5 German cities where micromobility services could have the most significant impact on replacing vehicle trips." Based on this research, INRIX found up to 55% of trips under 5 km in duration could be replaced by micromobility vehicles. Beam research and data for New Zealand finds the switchable percentage is much higher due to a much higher reliance on private vehicles in New Zealand cities. For example, the number of vehicle trips reported by NZ Statistics (2018), on the basis of its three year rolling Household Travel surveys, was 3,687,000,000 trip legs. If we assumed a 60% switchable potential, e Scooters could target an addressable PKT switch of 2,212,200,000 trips. Taking an average of 2.5 km, the targetable emission reductions for the whole of New Zealand would be 884,880 T $CO_{2\text{-eq}}$ emissions, based on ITF (2021) tailpipe emissions comparables of 160 g/km (ICE) versus 0 g/km (e Scooters recharged with renewable energy). This potential, subject to VPA specific variables and statistics, is almost 15 x higher than the upper limit proposed by CDM, and this is only for a New Zealand PoA boundary.

3. **Small Scale Limitations are proposed to be removed under GS4G certification, in order to allow for Large Scale certification of Micromobility under AMS III C.**

As a result of the aforementioned Deviations requested, and the potential targeted transport emission reductions as noted for the New Zealand PoA, Beam proposes a further deviation to allow for AMSIII C to be applicable to Large Scale projects. Whereas CDM sets the Small Scale upper limit at 60,000 T $CO_{2\text{-eq}}$ emissions, GS4G uses an upper boundary of 50,000 T. Neither are sufficiently high to allow for micromobility potential to be unlocked in terms of emission reductions through transport mode switches and other factors noted earlier, and would thereby limit the number of VER that could be certified. Considering additionality requirements, this would thereby reduce the speed of deployment and operation of microvehicles (e Scooters) and sub optimize the ability by Beam to contribute even higher levels of emission reductions to address the major and growing transport emissions footprint globally and in New Zealand specifically. Under financial additionality prescriptions, which Beam will describe in relevant PDD (PoA and VPA), additional VER will strategically be deployed to incentivize greater deployment, usage and trip lengths for e Scooters, to accelerate uptake and increased emission reductions.

4. **AMS III C Methodology is proposed to be applicable to both PoA and VPA for GS4G certification purposes.**

AMS III C notes that the methodology is applicable to Programmes of Activities under Section 7.46. Due to the structure of the Beam project as a high level PoA with subsidiary city based VPA, Beam proposes a deviation to this requirement to read:

"The methodology is applicable for a programme of activities and voluntary project activities."

Beam notes no other Deviation Requests will be required once these four Deviations are approved by Gold Standard.

3.1.2 | VVB opinion (to be completed by VVB, if applicable):

Bureau Veritas has confirmed the need to submit this current Deviation Request in a timely manner before Beam can complete PoA and VPA PD.

3.2 | Assessment of the deviation:

**Guidance* Use the space below to describe how the deviation complies with the requirements, and, where applicable, the accuracy, completeness and conservativeness is ensured. Please include all relevant information in support of the request.*

3.2.1 | Deviation assessment (to be completed by Project developer):

In preparing this application, Beam has interpreted The Gold Standard rules in accordance with the Standard's core principles of fairness, reliability, conservativeness and pragmatism. (**Principles, Clause 1.2.6**)

This Methodology Deviation Request from Beam addresses the core Gold Standard principles as follows:

Fairness: Beam bases its assertions and Deviation Requests contained here on a broad range of peer reviewed academic, institutional and industry research. Current Subject Matter Expert peer review, as part of the GS4G certification process, notes no departure or material errors in any of the logic, assumptions, models, calculators, baseline comparatives or any assertions resulting from academic research presented in support of Beam calculations, subject to the completion of the final SME Peer review report that will be submitted by Beam as part of its submissions for certification.

Reliability: There is unlikely to be an impact on the reliability of emission and other UN SDG models Beam has developed for certification and on going measurement, monitoring and reporting of its net impact under selected UN SDG goals. Beam is in addition engaged with a Subject Matter Expert from a reputable micromobility and transport faculty at Swinburne University of Technology in Melbourne, Australia, to ensure any negatives are identified during a comprehensive Peer Review, and to ensure that emission reductions are reliable and prudent.

Conservativessness and Pragmatism: This Deviation request evidences Beam's pragmatic and conservative approach by virtue of the number of references to peer reviewed and reputable academic, institutional and industry research. As proposed to

SME and VVB, source variables will be utilized only from reputable sources and if in any doubt due to the age of such data, will be adjusted conservatively to avoid over claiming.

VVB opinion (to be completed by VVB, if applicable):

Beam's VVB has confirmed the need for this Deviation Request.

3.3 | Impact of the deviation:

**Guidance* Use the space below to describe the impact of the deviation on project design, safeguarding principles assessment, SDG assessment, emissions reductions, monitoring frequency, data quality, potential risk or any other relevant aspect of the project. Please substantiate the impact assessment with relevant and verifiable data/information.*

3.3.1 | Impact assessment (to be completed by Project developer)

In terms of the Principles noted in the manual **Deviation Approval Requirements and Procedures, V. 1.1, Section 2.1**, Beam notes as follows:

Environmental Integrity – Beam asserts that the Environmental Integrity of its GS VERs will not be overestimated as a result of this Deviation Request, since baseline comparatives are so well detailed and disseminated globally, including standard academic and institutional baseline comparatives used in assessing the benefits and impact of micromobility since it inception in 2018.

Contribution to the SDGs – Beam asserts that it will be able to address more than three UN SDG as prescribed by GS4G Principles and Requirements, due to the broad positive impact of micromobility established by research globally. Once Deviation are approved, Beam will in fact be able to contribute more greatly through accelerated deployment of its e Scooters, amplifying the PKT emissions reductions via greater deployment, uptake and usage of microvehicles.

Safeguarding Principles and Requirements – Beam asserts that there will be no negative implications from the Deviation Request in regard to any of the nine Safeguarding Principles noted in **Manual 103, Version 1.2, Section 3**.

Compliance with Host Country Regulations – This Deviation Request has been prepared on the basis of Beam's continued compliance with New Zealand city (VPA) and national Regulations and will in effect improve its ability to enter discussions for greater vehicle deployments once greater numbers of VER can be confirmed.

3.3.2 | VVB opinion (to be completed by VVB, if applicable):

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3.4 | Documents:

**Guidance* List of documents provided (note that once a decision has been made by Gold Standard, this deviation form along with supporting documents will be made public on the Gold Standard website. If any of the supporting documents are confidential, please indicate here to ensure they are omitted.)*

All documents enclosed with this Deviation Request are **commercially sensitive and confidential**. Any supporting documents should therefore be omitted from being made public on the Gold Standard website.

References

De Bortoli, A. "Environmental performance of shared micromobility and personal alternatives using integrated modal LCA." Transportation Research Part D 93, 2021. Available on line at 10.1016/j.trd.2021.102743

ITF (2020), "Safe Micromobility", OECD/ITF, available on line at https://www.itf-oecd.org/safe-micromobility

ITF (2021), "Micromobility, Equity and Sustainability: Summary and Conclusions", ITF Roundtable Reports, No. 185, OECD Publishing, Paris. Available at https://www.itf-oecd.org/sites/default/files/docs/micromobility-equity-sustainability.pdf

Lee, H., *et al* (2021). Factors affecting heterogeneity in willingness to use e-scooter sharing services. Transportation Research Part D: Transport and Environment, 92, 102751. Available at 10.1016/j.trd.2021.102751

Moeller, T.H. and Simlett, J. (2020). Micromobility: moving cities into a sustainable future. Ernst and Young. Available from https://www.ey.com/en_nz/automotive-transportation/how-micromobility-is-moving-cities-into-a-sustainable-future

Moreau *et al*. (2020), "Dockless E-Scooter: A Green Solution for Mobility? Comparative Case Study between Dockless E-Scooters, Displaced Transport, and Personal E-Scooters", Sustainability, 12 (1803), https://www.mdpi.com/2071-1050/12/5/1803

NACTO (2019a), Shared Micromobility in the U.S.: 2019, https://nacto.org/shared-micromobility-2019/

O'Hern, S. & J. Oxley (2019), "Pedestrian injuries due to collisions with cyclists Melbourne, Australia", Accident Analysis and Prevention, Vol. 122, pp. 295-300, https://doi.org/10.1016/j.aap.2018.10.018.

PBOT (2018), "2018 E-Scooter Pilot User Survey Results", Portland Bureau of Transportation, www.portlandoregon.gov/transportation/article/700916.

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Tuli, F.M.; *et al* (2021). Factors influencing the usage of shared E-scooters in Chicago. Transportation Research Part A 154, 2021. Available at https://trid.trb.org/view/1884687