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TYPE III - OTHER PROJECT ACTIVITIES

Project participants shall apply the general guidelines to SSC CDM methodologies, information on additionality (attachment A to Appendix B) and general guidance on leakage in biomass project activities (attachment C to Appendix B) provided at <http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html> *mutatis mutandis*.

III.AT. Transportation energy efficiency activities installing digital tachograph systems to commercial freight transport fleets

Technology/measure

1. This methodology is for project activities that install digital tachograph systems in freight vehicles operating on a number of identified traceable routes.[1] A digital tachograph system reduces GHG emissions associated with fossil fuel combustion in freight transport by providing to the driver feedback[2] against inefficient driving,[3] and thus encouraging efficient driver behaviour which results in improved vehicle fuel efficiency.

2. The functions of the digital tachograph system to be installed include, but are not limited to:

(a) Provide instant feedback during instances of inefficient driving, following which the driver must adjust to a more efficient driving pattern in order to deactivate the instant feedback;

(b) Continuously record the freight truck's operation (e.g. position, speed, acceleration, RPM, etc.) over a period of time;

(c) Provide a graphical representation of a driver's performance based on recorded data in order to further improve driving efficiency.

3. This methodology applies to freight truck fleets that are centrally controlled and managed by a single entity and are driven by contractors or employees of the central entity, and where this central entity (and not the drivers) is responsible for the cost of fuel.

4. Project participants must demonstrate that:

[1] A traceable route is the most logical and appropriate route between pick-up and delivery points with similar traffic conditions and terrain in the same city or region (e.g. traffic density of the route and average speed of vehicles) as identified by the central controlling entity and recorded by the digital tachograph system.

[2] Instant feedback (e.g. by voice reminders, lighting, beeping sound, etc.) and periodic feedback (e.g. summary of driving operation records).

[3] That is revving the engine, long idling, abrupt acceleration/braking

(a) The project activity is unlikely to change the level of service provided before the project activity;[4]

(b) The project activity does not include measures to bring about a modal shift (e.g. a shift from truck to rail) in transport;

(c) The project activity does not involve a fuel switch in existing vehicles, except for an optional switch to biofuel blends where the blending ratio is not greater than 20% by volume, in which case emission reductions shall be discounted by the percentage of biofuel in the blend (e.g. 20% in the case of B20).

5. This methodology is not applicable to project activities in locations where the installation of digital tachograph systems is mandatory by law and the existing mandatory policy/regulation has a high level of enforcement.

6. Project participants shall identify the following parameters:

(a) The traceable routes along which the vehicles operate;

(b) The characteristics of those routes;[5]

(c) The level of service on each route;

(d) The vehicles that are in use on each traceable route before and after project implementation. These vehicles should not be part of another CDM project activity.

7. Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually.

8. The project design document shall include documentation of procedures to eliminate any potential double counting of emission reductions from, for example, the same vehicles participating in other CDM projects or Programmes of Activities.

Boundary

9. The project boundary includes the following:

(a) The fleet to which the digital tachograph systems are introduced;

(b) The geographical area covering the traceable physical routes along which these vehicles operate (start to end point);

[4] That is, showing the frequency of operations is not decreased because of the CDM project activity, the characteristics of the travel route and/or that the freight capacity during the project activity crediting period is sufficient to service the level of freight transport previously provided.

[5] That is, the following route characteristics may be identified: distance, type of road, average speed, traffic density, traffic patterns, and whether these are urban or inter-city routes.

(c) Auxiliary facilities such as fuelling stations and workshops and service stations that are visited by the vehicles in the fleet.

In the case that the project boundary crosses national borders, all relevant government regulations in the territories crossed by the project boundary should be assessed.

Baseline

10. The first step to determine the baseline emissions is to calculate a baseline emission factor per tonne of goods per kilometre for the baseline vehicle (BEF_i). For existing vehicles, the baseline emission factor is determined by dividing the emissions from the total annual distance travelled by each baseline vehicle before the project begins (D_i), by the total weight of goods transported by each baseline vehicle (P_i), times the annual average distance of transportation per tonne (dp_i), before the project begins, based on at least one year of historical data, but preferably three years. Vehicle fuel efficiency for existing vehicles is determined as the average annual fuel consumption (*FC*) divided by the average distance travelled (*D*) by each vehicle based on at least one year of historical data and preferably three years.

$$BEF_i = \frac{\sum_j D_i * \eta_{BLVi} * NCV_j * EF_{CO2,j}}{P_i * dp_i} \quad \textbf{(1)}$$

Where:

BEF_i	Baseline emission factor per tonne of goods per kilometre for vehicle *i* under baseline conditions (tCO_2/ton km)
P_i	Total annual weight of goods transported by each vehicle *i* under baseline conditions (tonnes)
dp_i	The annual average distance of transportation per tonne of freight by each vehicle *i* under baseline conditions (km)
D_i	Total annual distance travelled by each vehicle *i* under baseline conditions (km)
η_{BLVi}	Fuel efficiency of vehicle *i* under baseline conditions (qty of fuel/km, see paragraph 13 for fuel efficiency of new vehicles)
NCV_j	Net calorific value of fuel *j* (MJ/Unit qty of fuel)
$EF_{CO2,j}$	CO_2 emission factor of fuel *j* used by vehicle (tCO_2/energy content of fuel, country specific data or IPCC default value)

11. In the baseline calculations the remaining lifetime of the vehicles replaced shall be taken into account in accordance with the guidance provided by the Board (EB 22, annex 2).

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12. The total baseline emissions are calculated on an annual basis using the monitored data as described below.

$$BE_y = \sum P_{i,y} \times BEF_i \times dp_{i,y} \quad \textbf{(2)}$$

Where:

BE_y	Total baseline emissions in year y (tCO_2/yr)
$P_{i,y}$	Total annual weight of goods transported by each project vehicle i in year y on each traceable route (tonnes)
BEF_i	Baseline emission factor per tonne of goods per kilometre for vehicle i (tCO_2/tonne km) under baseline conditions
$dp_{i,y}$	Annual average distance of transportation per tonne of goods by project vehicle i in year y (km)

13. The baseline fuel efficiency (η_{BLVi}) for vehicles added to the fleet after the start of the project activity and already installed with the project digital tachograph system is determined using one of the following options:

(a) When a specific baseline vehicle can be identified from existing vehicles, i.e. a vehicle used along the same route and with similar operating conditions, the following applies: the baseline fuel efficiency (η_{BLVi}) is determined using baseline operational data from that existing vehicle as described in paragraph 10;

(b) The baseline fuel efficiency (η_{BLVi}) for added vehicles is estimated by using the fuel efficiency of top 20% of similar type vehicles in the fleet before the project activity, as determined according to travel distance of each vehicle for the previous three years. If no data exists for the time period, a shorter period can be chosen, with a minimum of one year. Otherwise, data on fuel efficiency can be obtained from manufacturer's specification, if it can be demonstrated that the value is conservative given the operating conditions of the vehicles in the baseline;

(c) Taking one year of real data before implementing the feedback mechanisms, as is described in paragraph 10.

14. Once measured, the baseline vehicle fuel efficiency will be fixed throughout the crediting period.

15. Note that if the baseline vehicle does not have air conditioning then the data used should also be from vehicles without air conditioning.

Leakage

16. No leakage calculation is required.

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Project activity emissions

17. Project emissions are determined by monitoring the consumption of fuel or energy consumed by the vehicles introduced, according to the following formula:

$$PE_y = \sum_j \sum_i FC_{i,j,y} * NCV_j * EF_{CO2,j} \quad \textbf{(2)}$$

Where:

PE_y	Total project emissions in year *y* (tCO_2/yr)
$FC_{i,j,y}$	Consumption of fuel *j* by vehicle *i* in year *y* (quantity of fuel)
NCV_j	Net calorific value of fuel *j* (as obtained by country specific data or IPCC default value)
$EF_{CO2,j}$	CO_2 emission factor of fuel *j* used by vehicle *i* under baseline conditions (tCO_2/energy content of fuel, country specific data or IPCC default value)

18. In project activities where the vehicles in the project activity have air conditioning whereas in the baseline scenario they did not, then seepage of HFC shall be taken into account. If data is available this should be calculated for the specific AC units and operating conditions of the vehicles in question. Otherwise a default value of 400 $kgCO_2e$/year should be used for each vehicle.

Monitoring

19. The following shall be monitored:

Abbr.	Item, unit	Monitoring method / item
$DT_{,i,y}$	Total distance travelled by each vehicle *i* in year *y* (km/yr)	Driver logs and route maps, recorded by GPS tracking system
i	The trucks are identified based on the age, characteristics and load capacity and availability of historical data	The data are periodically checked on annual basis and recorded electronically
$dp_{i,y}$	Annual average distance of transportation per tonne of freight by each project vehicle *i*	Monitored through company records
$FC_{i,j,y}$	Consumption of fuel *j* by vehicle *i* in year *y* (quantity of fuel consumed)	Purchase or consumption records, whose higher value is taken to ensure conservativeness
NCV_j	Net calorific value of fuel *j* (energy content of fuel/quantity of fuel)	Country specific data or IPCC default value

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Abbr.	Item, unit	Monitoring method / item
$EF_{CO2,j}$	CO_2 emission factor of fuel used by baseline vehicle (tCO_2/energy content of fuel)	Country specific data or IPCC default value
$P_{i,y}$	Total annual goods transported by each project vehicle in year *y*	Monitored data during the project e.g. driver logs and route maps, plus sales receipts
$SL_{,k}$	Service level in terms of volume of goods times the average distance of transportation per tonne of freight by truck class *k* in year *y*	Monitored for each truck class, from company/operators records, e.g. driver logs and route maps, plus sales receipts
	Annual monitoring to check if tachograph systems have become a mandatory practice, or that highly-enforced anti-idling policies or legislation have been put into place	
	Monitoring to ensure that all tachograph and feedback systems are operating correctly and have not been disabled	If any tachograph system installed in a project vehicle is not operating correctly, no emissions reductions can be attributed to that vehicle for the period that the system has not been operating correctly

20. The following shall be determined once and remains fixed throughout the crediting period:

Abbr.	Item, unit	Measurement method / item
$\eta_{BLV,i}$	Efficiency of vehicle *i* under baseline conditions (km/quantity of fuel)	As detailed in paragraph 10 and 13
P_i	Total annual goods transported by each vehicle under baseline conditions	Measured data before feedback mechanisms are activated
D_i	Total distance travelled by each vehicle under baseline conditions	Measured data before feedback mechanisms are activated

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Abbr.	Item, unit	Measurement method / item
dp_i	Average distance of transportation per tonne of freight by each vehicle *i* under baseline conditions	Calculated through company records
$SL_{BL,k}$	Service level in terms of volume of goods times the average distance of transportation per tonne of freight by truck class *k* before the beginning of the project	Determined from company/operators records, e.g. driver logs and route maps, plus sales receipts

21. Service level determined by weight of goods times the average distance of transportation tonne of freight ($SL_{k,y}$) shall be capped at baseline level ($SL_{BL,k}$). Emission reductions beyond this level will not be counted.

22. Considering that many other factors may impact fuel saving (e.g. expansion of road lanes, use of other fuel saving devices, more efficient tyres, etc), if annual emissions reductions are greater than 10% of baseline emissions in year *y,* then this must be appropriately justified as feasible based on relevant studies (i.e. studies of the potential emissions reductions from tachograph systems).

Project activity under a Programme of Activities

23. No leakage calculation is required, even when applying to a project activity under a programme of activities.

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History of the document

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01	EB 60, Annex 15 15 April 2011	Initial adoption.
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