Bridging the Gap: Pathways for Transport in the Post Kyoto Process

Strategies to bring land transport into the climate change negotiations

Draft Discussion Paper prepared for distribution at the UNFCCC SB meeting

June 2009

About this paper

This Draft Discussion Paper is intended to provide the climate negotiators with key recommendations on how to include land transport in the climate change negotiations of the Bali Action Plan. Most of the ideas are also relevant to freight transport as well as other modes such as air and maritime.

These suggestions are based on the outcomes from the "Bridging the Gap"" expert workshop in Paris in March 2009, submissions by Parties to the UNFCCC, and negotiation texts prepared by the chairs of the AWG-KP and AWG-LCA.

The paper has been developed by TRL on behalf of GTZ, Veolia Transport and UITP as part of the 'Bridging the Gap' initiative (see below). The partnership is also grateful for the support and contributions of UNEP to this paper. The paper does not reflect the official positions of any of these organisations.

This document reflects the current state of the negotiations. It also summarises key elements related to the integration of transport into the negotiation process. By their nature the recommendations contained within this paper will continue to evolve, both to keep in line with UNFCCC negotiations and to reflect the outputs of future research activities. The recommendations contained herein will, for example, be further developed and refined during the second and third Bridging the Gap workshops in Bonn (June 6th) and Brussels (September 17th) . This paper should therefore be recognised as an interim milestone, and not the final output of the process.

This paper is also considered to be a contribution towards the activities convened by the Asian Development Bank (ADB) under the "Joint Action Plan to Make Transport in Developing Countries More Climate- Friendly":

http://www.sutp.org/bridgingthegap/?page_id=141

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Disclaimer

The "Bridging the Gap" Initiative

The transport sector is the fastest growing sector in terms of CO_2 emissions in developing countries. To encourage international action to make transport more climate friendly, GTZ, UITP, Veolia Transport and TRL have decided to join forces to encourage the recognition that transport can and should play under the Post-2012 framework.

Our work is supported by many other institutions, including UNEP, who has supported the production of this Discussion Paper.

As our name suggests, we aim to "Bridge the Gap" between transport and climate policy, through expert workshops to formulate key strategies, side events at UNFCCC meetings, supporting submission papers to the UNFCCC, and dissemination of key information on transport and climate change, for example through our website:

www.sutp.org/bridging_the _gap

The "Bridging the Gap" contributes to, and is intended to mutually enforce, activities convened by the Asian Development Bank (ADB) under a "Joint Action Plan to Make Transport in Developing Countries More Climate- Friendly".

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Contents

Key messages and recommendations

The transport sector accounts for around one quarter of global carbon dioxide (CO_2) emissions (IEA, 2005) and global transport energy-related CO_2 emissions are predicted to increase by 1.7% a year from 2004 to 2030 (IEA, 2006b). The predicted road transport growth to 2030 is driven largely by increased demand for mobility in developing countries, where growth rates are predicted to average 2.8% a year. Coupled with rapid urbanisation, transport related emissions from urban areas are set to rise significantly.

The suggestions presented here are based on the outcomes from the 'Bridging the Gap' expert workshop held in Paris in March 2009, submissions by Parties to the UNFCCC, and negotiation texts prepared by the chairs of the AWG-KP and AWG-LCA.

Efforts to better integrate land transport into the negotiation process could fit under the following three key themes. In addition, several other recommendations are also important at the UNFCCC AWG and SB meetings in Bonn in June, 2009.

Incorporate transport into Nationally Appropriate Mitigation Actions

- Consider model transport elements for inclusion in NAMAs, such as strategies to promote low-carbon transport such as fuel/vehicle efficiency standards, public transport improvements and congestion charging.
- Develop transport specific data sources and measurement methodologies to support the MRV requirements for NAMAs.

Transfer technology and knowledge to support low carbon transport

- Support the transfer of ***technologies*** such as Bus Rapid Transit (BRT) other mass rapid transit (MRT) systems and non motorised transport, ***policy measures*** such as fuel (efficiency) standards and parking policy and regulations, as well as ***skills/techniques*** such as sustainable transport management, eco-driving and maintenance of vehicles.

Build capacity for mitigation and adaptation actions for transport

- Support institutional strengthening and capacity development for developing countries to plan, build and operate sustainable transport systems, both at national and local level.
- Support adaptation actions by strengthening the capacity of developing countries to assess risk and vulnerability of transport infrastructure, and to action the planning of adaptation.

Ensure a financing arrangement that works for the transport sector

- Consider the various options for financing mitigation actions in transport, including;
    - A Mitigation Fund, which could support transport NAMA elements.
    - The crediting of transport NAMAs (i.e. a Policy CDM).
    - A programmatic CDM with Programmes of Activities developed for transport such as Bus Rapid Transport (BRT) and other mass transit systems in cities.
    - A transport specific instrument, e.g. a 'Clean Transport Mechanism,' or 'Low Carbon Transport Facility,' incorporating both crediting and funding elements
    - Other potential funds such as a 'capacity-building fund,' and a 'multilateral climate technology fund' to support capacity building and technology transfer respectively.

1 Introduction

The transport sector potentially plays a significant role for any substantial success in reversing the present pathway towards permanent changes in the climate due to human activity and an increase in Greenhouse gases in the atmosphere. To realize these benefits the transport sector needs to be better integrated within the climate negotiation process, most notably with the Bali Action Plan.

Transport as a whole sector consumes approximately 20% of global energy demand, 80% of which derives from fossil fuels (IEA, 2008). In 2006 it was also responsible for approximately 13% of global greenhouse gas (GHG) emissions and 23% of global CO_2 emissions from fuel consumption (IEA, 2008).

Transport related CO_2 emissions are expected to increase 57% worldwide in the period 2005 to 2030. The largest share of GHG emissions from the transport sector are still emitted from developed countries, but it is expected that transport in developing countries will be responsible for approximately 80% of the predicted increase (IEA 2008, in Bongardt et al 2009).

Despite the above, transport has not benefitted from the existing Kyoto Protocol instruments that are currently in place; for example only 10 of the 4733 projects within the CDM pipeline are transport projects (as of 1st May, 2009). This calls for a much larger role of the transport sector in the Post-2012 framework.

To address this challenge, various actors including a range of international transport related organisations are stepping up efforts to support a variety of options to better link passenger land transport with the climate change debate.

The COP 13 in Bali in 2007 marked the beginning of a two-year negotiating process, the 'Bali Action Plan,' (BAP) which will culminate at the COP 15 in Copenhagen during December 2009. As COP 15 will mark the end of a crucial year for climate negotiations, it is now vital that the transport sector takes a targeted and proactive approach to ensure that sustainable transport is recognised in the climate change negotiations and that the post 2012 agreement works for transport.

1.1 Background and objectives

This Discussion Paper has been produced primarily for climate change negotiators (in both developed and developing countries), and key transport actors working to enhance the inclusion of transport on local, regional, national or global scales. This includes: government officials, transport professionals, academics, NGOs, IGOs, multilateral institutions and other private sector actors.

This paper provides recommendations and specific suggestions to the Parties[1] for the integration of transport in the negotiation process in particular the UNFCCC Ad hoc Working Group on Long-term Co-operative Action (AWG-LCA) and the Ad hoc Working Group on further commitments for Annex I Parties under the Kyoto Protocol (AWG-KP).

The complexity of transport warrants the attention of the target audience to ensure that transport plays a role in reducing GHG emissions, and to help ensure that the openings set out in the BAP are fully applicable to the transport sector.

The recommendations that are contained within this report will be presented at an official side event on co-operative sectoral approaches and sector-specific actions[2] during sessions of the AWG-KP and AWG-LCA, and SB in Bonn (June 10th).

[1] This refers to all countries that are Parties to the UNFCCC: http://unfccc.int/parties_and_observers/items/2704.php

[2] See http://www.sutp.org/bridging_the_gap/bonn1.html for details of the side event.

The recommendations are also in line with the UNEP submission paper on land transport to the AWG-LCA[3]. The paper was endorsed by a wide range of organisations, including GTZ and UITP to support a strong and coherent framework in which the role of transport is fully realised.

1.2 Content and structure

The Discussion Paper contains recommendations for further actions within different areas of the climate negotiations, either directly or indirectly.

The report is structured as follows:

- Methodology;
- Analysis of the negotiation texts;
- Recommendations, and;
- Conclusions.

[3] See Annex C.

2 Methodology

The recommendations here are based on the outcomes from a series of workshops and stakeholder dialogues on land transport and climate change since 2007 (COP 13 in Bali with the inception of the Bali Action Plan).

The most recent efforts in 2009 that have directly contributed to this paper are;

- The Paris 'Bridging the Gap' workshop
- An analysis of relevant documents including the advance negotiation texts of the AWG-KP and AWG-LCA.

These are detailed below.

2.1 Paris 'Bridging the Gap' workshop

The workshop held in Paris on 27th March 2009 within the "Bridging the gap" initiative (hosted by Veolia Transport) was the first of three workshops[4]. The workshop was therefore scheduled prior to the UNFCCC AWG-KP7 and AWG-LCA5 Sessions in Bonn to enable the results to be disseminated at this important event.

The workshop brought 38 transport and climate change policy experts together to;

- support the development of a clear target oriented strategy;
- develop clear recommendations for future transport funding mechanisms (which are outlined within this paper), and;
- discuss the options with participants and to link with other initiatives and activities.

Parallel discussion groups focused on key elements of the climate negotiations, namely adaptation, mitigation, financing and the BAP (NAMAs), were also held to draw upon collective knowledge to develop ideas that could be used to inform the future contribution of transport to climate change targets. This provided a unique opportunity to;

- debate opposing viewpoints;
- build a common understanding, and;
- generate new concepts, recommendations and next steps.

Further details can be accessed from http://www.sutp.org/bridging_the_gap/ws-paris.html.

2.2 Document analysis

The project consortium closely followed the official UNFCCC climate change negotiations as it is imperative that research activities occur within the context of the official process. Party submissions and the negotiation texts were therefore reviewed and analysed to help inform and contextualise the findings from the Paris workshop. The analysis of these submissions was used to inform two UNEP submissions; one for the AWG-LCA and the other for the AWG-KP. These two submissions elaborated upon both the findings from the Paris workshop and submissions from IGOs and NGOs, and so the content of the UNEP submissions has also been of direct relevance to this paper and drawn from accordingly.

The significance of the negotiation texts upon the efforts of transport actors to construct recommendations is reflected by the insertion of key sections that could be used to

[4] The second will be held in Bonn on 6th June, and the third has been tentatively scheduled for 17th September in Brussels.

guide thinking and support direct input to this process. The negotiation text has been directly referenced throughout this paper to contextualise and focus the recommendations.

Other Initiatives that Bridging the Gap consortium members are, and have been, involved in were also used to inform this paper. This includes the output from a meeting in Bellagio, which comprised of a number of transport and climate change professionals, and an Asian Development Bank (ADB) report that explored approaches to mitigate CO_2 emissions from land transport in developing Asia.

3 Analysis of the negotiation texts

3.1 Background

The primary aim of the AWG-KP and AWG-LCA negotiation texts is to facilitate discussions in Bonn, and inform the COP15 in December in Copenhagen. Key sections of the text that could have relevance to the transport sector and recommendations formulated within this paper are provided below. The numbers and letters attributed to each section contained in the below text correspond to paragraphs of the negotiating text. The negotiation texts have also been referred to extensively throughout the next section of this paper, putting the recommendations developed into the official UNFCCC context.

3.1.1 AWG-KP 8th Session

The AWG-KP negotiating texts are divided into two:

Text 1 For the proposals for amendments to the Protocol. This text contains targets that will be set for the Parties under the next agreement.

Text 2 This text focuses on mechanisms. There are areas, specific parts of the negotiation text that provide opportunities to accommodate provision for transport specific mechanisms (see UNFCCC, 2009b).

The second text is of primary relevance for considerations of how transport could be better integrated. There could be particular scope within Annex 1 'Emissions trading and the project-based mechanisms.' Negotiation points under this Annex that could provide opportunities for the integration of transport are as follows:

- *'In relation to crediting on the basis of nationally appropriate mitigation actions'*
- *'In relation to encouraging the development of standardized, multi-project baselines under the clean development mechanism'*
- *'In relation to improving access to project activities under the clean development mechanism by specified host Parties'*
- *'In relation to promoting co-benefits for clean development mechanism project activities by facilitative means' and*
- *'In relation to multiplication and discount factors under the clean development mechanism.'*

3.1.2 AWG-LCA 6th Session

Key sections of the AWG-LCA negotiating text (UNFCCC, 2009c) are provided here to indicate the direction that recommendations for integrating transport within these negotiations could take. They are structured under the four annexes of the negotiation text.

I. A shared vision for long-term cooperative action

'Developed country Parties must show leadership in mitigation commitments or actions, in supporting developing country Parties in undertaking adaptation measures and nationally appropriate mitigation actions (NAMAs), and in assisting them through the transfer of technology and financial resources to move towards a low-emission development path.'

II. Enhanced action on adaptation

'Financial support {shall} {should} generally be provided to adaptation through a programmatic approach {and to project-based adaptation action}.'

III. Enhanced action on mitigation

A. Mitigation by developing countries

'NAMAs may include:

(a) Sustainable development policies and measures;

(b) Low-emission development strategies and plans;

(c) Programmatic CDM, technology deployment programmes or standards, energy efficiency programmes and energy pricing measures;

(d) Cap-and-trade schemes and carbon taxes;

(e) Sectoral targets, national sector-based mitigation actions and standards, and no-lose sectoral crediting baselines;

(f) REDD-plus19 activities and other mitigation actions implemented in different areas and sectors, including agriculture.'

'An international institutional framework {shall} {should} be established for measurement, reporting and verification of GHG emission reductions and to provide systematic support for Parties.'

D. Cooperative sectoral approaches and sector-specific actions

'Priority areas shall be identified sector by sector and technology by technology. The most climate-sensitive sectors, including GHG-intensive and climate-vulnerable sectors, shall be fully considered for the development, transfer and deployment of environmentally sound technologies.'

E. Various approaches to enhance the cost-effectiveness of, and to promote, mitigation actions

'Co-benefits should be included as eligibility criteria for project activities; these may include technology transfer, capacity-building, employment creation and positive environmental impacts. {These criteria shall be defined by a new body to be created under the Convention.}'

'A NAMA crediting mechanism {shall}{should} be established, under which credits may be generated for the verifiable emission reductions achieved by the NAMAs by developing country Parties in order to assist them in achieving sustainable development and contributing to the global efforts to combat climate change.'

IV. Enhanced action on financing, technology and capacity-building

3. Institutional arrangements, including funds

'Institutional arrangements on funds {shall} include {the relevant existing funds}40 {as well as the following new funds}:

Option 1 An adaptation fund under the guidance and authority of the COP, to complement the Adaptation Fund established under the Kyoto Protocol, including a window to address loss and damage from climate change impacts, including insurance, rehabilitation and compensatory components, and a window for risk reduction and management related to climate change.

Option 2 Multilateral adaptation fund for low and medium income countries, with revenues partly channelled into national climate change funds for financing national climate change policies according to the country's specific needs and legal frame. The

multilateral adaptation fund will provide funding for a prevention pillar and an insurance pillar.

Option 3 Solidarity funds and insurance mechanisms, including micro-insurance.

Option 4 Mitigation fund.

Option 5 Multilateral climate technology fund {to support the implementation of the technology mechanism} for the provision of technology-related financial resources on a grant or concessional basis. The fund shall be used as a catalyst to provide stakeholders with incentives to implement the development, deployment, diffusion and transfer of technologies by meeting the full incremental costs for, inter alia, the deployment and diffusion of technologies in developing countries and full costs of activities such as technology R&D and demonstration of technologies, capacity-building, technology needs assessments, information sharing and construction of policy instruments.

Option 6 Capacity-building fund.

Options for funds for multiple uses: Option 7 A world climate change fund or green fund, to {establish linkages between} scale-up funds for mitigation actions, support efforts on adaptation and provide technical assistance and promote the transfer and diffusion of clean technologies. All Parties could benefit according to specified criteria. Once its operations stabilize, the fund could establish functional connections with existing or potential carbon units, such as those from mechanisms established under the Kyoto Protocol.'

Further details of the negotiating text are contained within Annex B of this report.

The negotiating texts consider the different elements of the negotiations in turn, although the cross-cutting nature of many of the key themes is evident. This emphasises the need, and opportunities for actions taken to be co-ordinated and mutually enforcing.

Recommendations that have arisen from our research activities are detailed in the next section of this paper. Where appropriate the negotiation text has been directly referenced in the section to highlight opportunities for directly linking with the negotiation text and the official UNFCCC process.

4 Recommendations

The findings from the analysis of the Paris workshop and the relevant documents are presented in this section in the form of recommendations. These have been structured as follows:

- Nationally Appropriate Mitigation Actions in non-annex 1 countries
- Adaptation;
- Project based mechanisms;
    - Clean Development Mechanism (CDM); and
    - Joint Implementation (JI).

This format has been adopted to reflect the discussions held during the workshop, and also to accommodate the format of the submissions and negotiating text. It is acknowledged that there are overlaps between these issues, reflecting on their wide-ranging and cross-cutting nature.

4.1 Post 2012 with focus on MRV NAMAs

4.1.1 Overview

The Bali Action Plan adopted at COP13 in Bali in 2007 set out a process to enable the full, effective and sustained implementation of the Convention now, up to and beyond 2012. It focused on general instruments and targets rather than tailoring approaches to, or giving explicit consideration to, specific sectors, and as a result applicability to transport was severely limited.

4.1.2 Recommendations

There is not one single route or instrument that can work for all types of transport; even monitoring/measuring fuel/energy use poses problems as it does not show the flow of people and goods and does not necessarily deliver the environmental benefits or reductions required.

Much of the discussion is currently focused on, or related to the concept of Nationally Appropriate Mitigation Actions (NAMAs) which must be Measurable, Reportable and Verifiable (MRV) and supported by financing, capacity building and technology transfer.

The main recommendations on the Post-2012 framework, with a focus on NAMAs, are as follows:

1. Nationally Appropriate Mitigation Actions (NAMAs)

From the Bali Action Plan, developing country NAMAs (that support sustainable development and the effective implementation of the Convention) should be supported and enabled by technology, financing and capacity-building in a Measurable, Reportable and Verifiable (MRVable) manner.

The AWG-LCA negotiation text (paragraph 70) discusses NAMAs in relation to mitigation, which"should be country-driven, undertaken on a voluntary basis in the context of sustainable development, in conformity with prior needs of sustainable development and eradication of poverty, and determined and formulated at the national level in accordance with the principle of common but differentiated responsibilities and respective capabilities."

The potential application to the transport sector is summarised in the table below.

Table 1: NAMA elements and potential transport applications

NAMA elements	Potential transport applications
(a) Sustainable development policies and measures;	• Local, regional and national sustainable development strategies incorporating transport elements
(b) Low-emission development strategies and plans;	• These are likely to be economy wide strategies, although they also have the potential to include transport sector policies. These could include regional and national transport plans/strategies with low-carbon objectives (see example from India and China in box below) or; • Guidelines/assessment on consequences of infrastructure development
(c) Programmatic CDM, technology deployment programmes or standards, energy efficiency programmes and energy pricing measures;	• CDM based on transport PoAs (see section 4.3.1) • Fuel economy/vehicle standards (s) • Taxation and fiscal policy on fuels and vehicles
(d) Cap-and-trade schemes and carbon taxes;	• Cap-and-trade of transport fuels (upstream trading), although such measures should be designed to take high capacity transport modes, such as public transport, into special account on a national level[5] • Fuel taxes
(e) Sectoral targets, national sector-based mitigation actions and standards, and no-lose sectoral crediting baselines;	• Sectoral targets, either absolute or intensity based. These should again take high intensity transport modes, such as public transport, into account. • Sub-sectoral targets might be modal (e.g. car, rail, urban bus and coach maritime and aviation transport) or programmatic (regional, urban or metropolitan based). Targets would need to be based on an urban context, although this could be one of the most difficult to effectively manage and could cause particular problems in relation to setting baselines.
(f) REDD-plus19 activities and other mitigation actions implemented in different areas and sectors, including agriculture.'	• Land use regulation and policy to manage long-term transport demand.

The above could comprise model transport NAMA elements, which when carried out could form part of NAMA registries (paragraph 78 of negotiating text). Box 2 below contains further real-life examples of initiatives that could constitute NAMAs, with the

[5] If stringent levels of capping energy are applied across the whole transport sector services it can lead to perverse actions where it becomes more attractive to cut rail and public transport services rather than increase them (as a new or increased service over the base line would increase rather than decrease energy and therefore emissions). There is a need to avoid actions that contradict the development of sustainable transport, particularly in developing countries owing to the need for them to establish a low-carbon development trajectory.

examples suggested to demonstrate how broad those relating to the transport sector could be. As per the Convention, NAMAs can be any actions defined by developing country Parties.

Box 1: Examples of how NAMAs might include land passenger transport

Local level

In 2006 Japan introduced an 'Energy Conservation Frontrunner Plan' in their National Energy Strategy. A key component of the plan was to reduce the energy intensity of the transport sector. To help achieve the required reduction in oil dependence the government pledged to establish a state-of-the-art energy supply-demand structure with strategic plans for both the medium and long-term. Their approach includes developing energy conservation technology and the development and dissemination of a benchmarking approach, so that the energy conservation effect can be quantitatively verified (IEA, 2006a).

Municipal level

The Mumbai Urban Transport Project (MUTP) was established to improve the sustainability and efficiency of Mumbai's transport network. With financial support from the World Bank investment has been earmarked for a wide range of enhancements to the transport network across all modes, including suburban railway projects, local bus network initiatives, new roads, bridges, pedestrian subways, and traffic management programmes. The project has the key objective to reduce air pollution and GHGs. Beginning in 2002, work is still ongoing and will deliver system-wide efficiencies and improvements (MMRDA, 2008).

National level

China established a national urban transport strategy in response to high levels of traffic congestion, poor road safety and high levels of GHG emissions. It has been estimated that in 2005 emissions from vehicles accounted for 79% of the total emissions from urban areas. The rapid speed of development has meant that local governments have found it difficult to respond strategically, although under the national urban transport development strategy a framework has been created under which national strategy and policy can be formulated to support sustainable development. To enable national government to further guide this process central/local partnerships have been created through a '**Partnership and Demonstration Program**,' to support implementation of national strategy. These partnerships are to be formed in between five to eight cities to demonstrate how land use plans and transport strategies can be implemented to support sustainable development (World Bank, 2006).

NAMAs could comprise actions of the following types (paragraph 76 of the AWG-LCA negotiation text);

1 Actions that are undertaken by developing country Parties and are not enabled or supported by other Parties (unilateral NAMAs);
2 Actions that are supported by developed country Parties[6]; and
3 Actions that are undertaken to acquire carbon credits.

The above three may differ in their requirement for support in terms of finance, capacity building, and technology transfer. 2 is likely to be supported by fund-type instruments,

[6] Support could include not only financing, but also capacity building and knowledge/technology transfer

whereas 3 would be enacted through a crediting scheme such as an upscaled CDM (see Point 4 below on financing for more details). This is represented in the diagram below:

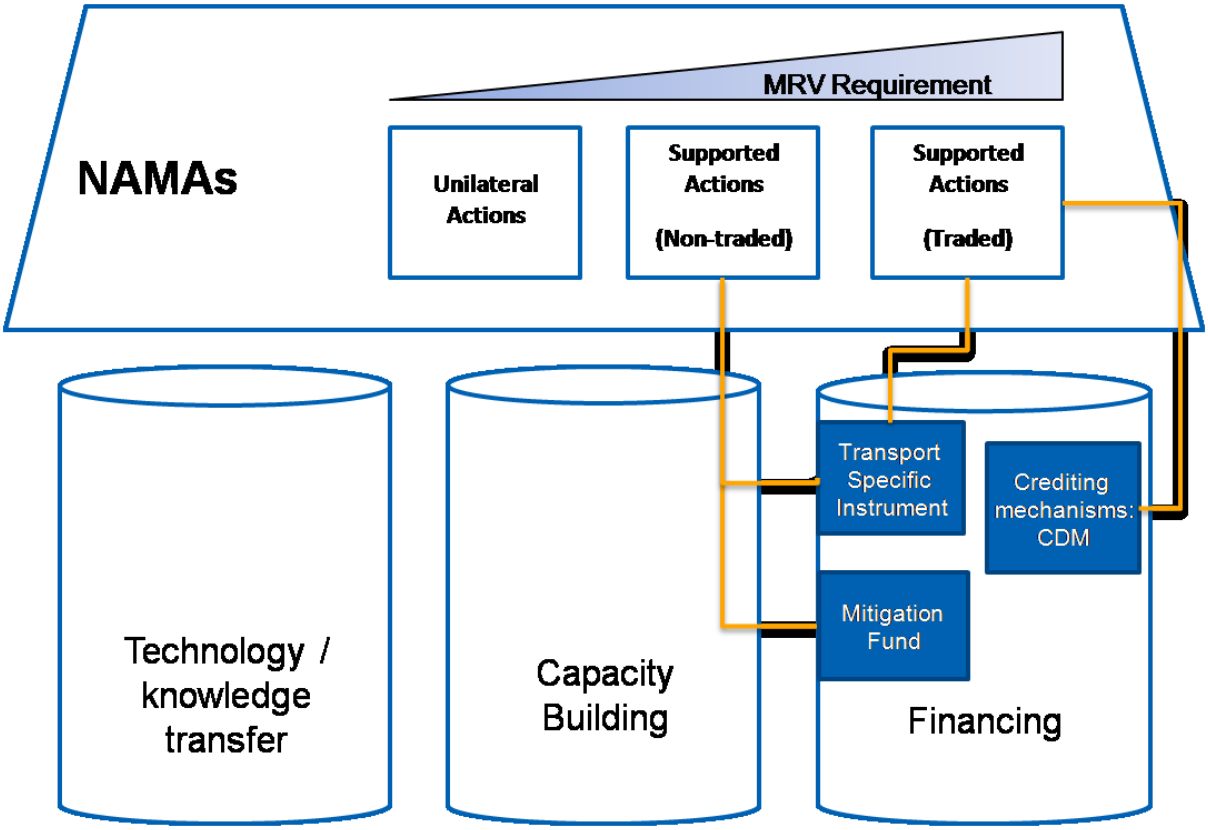

Figure 1: NAMAs and their supporting pillars

In consideration of the above, the potential of NAMAs to support the integration of transport into the climate change negotiations makes it necessary to closely monitor the development of the NAMA process and take the suggestions in table 1 into account. There is particular need to:

- Discuss different types of NAMAs, sectoral approaches, and similar;
- Relation between tradeable and non-tradeable parts;
- Introduce incentives for applying transport NAMAs, and;
- Develop a "tool box" of policies that could fit under NAMAs.

2. Measurement

The Bali Action Plan states that actions should be MRVable, and emphasised the need for related measures to be put into place, including quantified emission limitation and reduction objectives (by all developed country Parties), whilst also ensuring that they are comparable.

In the context of NAMAs, MRV is a central notion in both the actions by developing countries, as well as the support given by developed country parties (paragraph 88-101 of the AWG-LCA negotiation text).

The largest challenge for the transport sector is the definition of the baseline, and the gathering of reliable data on GHG emissions.

Key indicators could be developed to monitor progress. There are already a number of high profile global indicator initiatives that could be built upon or lessons learnt from.

Examples include the Global City Indicators Program, which has established a set of city level indicators using a globally standardised methodology (Global Cities Indicators Facility, 2007). Other high profile initiatives include the Commission on Sustainable Development (CSD) national indicators for sustainable development , which again use a standardised methodology for comparability (UN ESD, 2009), and the ICLEI process (ICLEI, 2008). The ICLEI methodology is a fairly straightforward standardised means of monitoring, measuring and reporting performance. It has been developed as part of its Cities for Climate Protection campaign.

There are a wide range of benefits to the development of reliable statistics, notably to support the MRVability of NAMAs and to contribute to better understanding of the relative impacts of policies and changes to policies.

3. Target setting

Sectoral or sub-sectoral targets could be useful for setting strong incentives for reducing transport emissions. Such targets could also form part of NAMAs (Paragraph 73-74 og the AWG-LCA negotiation text). In particular, discussions around the use of emission intensity targets (either sectoral or economy wide) for developing countries is worth noting.

4. Financing

Financing, together with technology and capacity building, is listed as a supporter and enabler of enhanced actions on mitigation (paragraph 9 and 15 of the AWG-LCA negotiation text).

There are continued discussions on how the required levels of finance are to be raised. Paragraph 167-168 of the AWG-LCA negotiation text provides two main options:

- Public finance as the major source of funds
- Private funding, including carbon markets[7], as the major source of funding, with public resources used to leverage private investments and provide incentives for additional efforts by the private sector..

In any case, it is likely that both public and private investment streams would be needed. A Post 2012 agreement could support;

- The crediting of transport NAMAs (Policy CDM).
- An upscaled, programmatic CDM
- A 'Clean Transport Mechanism,' or 'Low Carbon Transport Facility,' which is discussed in Box 3 below. It is one recommendation made regarding a funding arrangement under the Post-2012 framework that would work specifically for the transport sector by addressing the key barriers that are currently experienced in relation to other more generic funding mechanisms, such as the CDM.
- A mitigation fund presented in paragraph 175 of the AWG-LCA negotiation text
- Other potential funds such as a 'capacity-building fund,' and a 'multilateral climate technology fund.' (see paragraph 175 of the AWG-LCA negotiation text). The latter is the only one that has been described in the text, which is detailed as having been proposed to support the implementation of the technology mechanism.

Any of the above would need to be developed with close consideration of developments in NAMAs and their crediting, as well as other climate related funds made available from the UNFCCC (e.g. the GEF) and multilateral agencies (e.g. the CIF), and bilateral arrangements (e.g. the Japan Cool Earth Partnership).

[7] Crediting mechanisms will only be effective at reducing overall emissions when ambitious targets for industrialised countries are set. These targets must be in line with requirements defined by the IPCC.

Box 2: Recommendations for a Low Carbon Transport Facility (LCTF)

The failure of the existing Kyoto Mechanisms to effectively support mitigation in the transport sector should not be repeated in the Post-2012 framework, as it will seriously undermine international efforts to reduce GHGs to the required levels.

One of the ways in which transport emissions can be properly addressed is to establish a financial facility unique to the transport sector. A workshop of transport and climate experts held in Bellagio resulted in a suggestion to create a Low Carbon Transport Facility (LCTF) which could be established and replenished through a number of revenue streams, including:

- A levy on the carbon allowance trading by Annex 1 countries;
- Revenue from the selling of (international) aviation and maritime credits (see paragraph 173 of the AWG-LCA negotiation text);
- Contributions from industrialized countries, potentially via the suggested Mitigation Fund (see paragraph 175 of negotiation text), and;
- Resources from other multi-lateral and bi-lateral development assistance programs.

The LCTF would therefore incorporate both crediting and fund-based elements in its revenue generation.

The purpose of the LCTF would be to act as catalyst towards sustainable low carbon transport by providing;

1. *Funding for national governments, as well as provincial and local authorities to incentivize (a) policy/program development on sustainable transport, (b) institutional strengthening and capacity building, and (c) MRV activities specific to the transport sector.*
   This funding stream would enable the development of investment programs and projects, possibly in the form of NAMA's; evaluation of baseline and projected mobility, accessibility, emissions, and other impacts and benefits; comparing business-as-usual long-term transportation plans and short-term investment and system management programs vs. alternative scenarios that are designed to support mobility and economic development while minimizing GHG emissions; and capacity building activities.
2. *Direct (co) financing of investments in sustainable transport projects, including those conducted by private or non-governmental entities*.
   This may include a broad set of actions and activities that to incentivize policy changes and innovative best practices to reduce travel demand, increase vehicle fleet fuel efficiency, reduce the carbon-intensity of transport fuels, and increase the GHG efficiency of transportation networks. Such actions, which could be NAMAs would be evaluated for their effectiveness in reducing GHGs within the context of overall transportation investment programs and policies, while acknowledging and quantifying co-benefits. Funding would be made available to support public transportation service infrastructure development; pedestrian and bicycle facilities, improvements and services; transit oriented development; brownfield remediation; parking management and pricing; carsharing and bikesharing initiatives; and road pricing and congestion charging. It would supplement financing for transit investments, supporting integrated transportation and land development initiatives. These funds might be available only to authorities that have adopted satisfactory policies that demonstrate reasonable timely progress in slowing and eventually capping and reducing transportation GHG growth. Funding can be in the form of support for specific projects or to support governments to include sector wide policy changes.

For further information, refer to:
http://www.sutp.org/bridgingthegap/downloads/cornie/Common_Policy_Framework_on_Transport_and_Climate_Change-27May2008.pdf

5. Technology transfer and capacity building

The BAP emphasised the importance of technology transfer and capacity-building for realising effective implementation of the Convention. This has been reflected in the AWG- LCA negotiation text (UNFCCC, 2009c).

One of the four annexes of the text is based upon financing, technology and capacity-building. The need for developing country Parties (supported by developed country Parties) to benefit from technology transfer to move to a low-emission development path is repeatedly referred to as a key element of long-term co-operative action.

Technology transfer is a broad concept which can be used to refer to a wide range of technologies but also embraces knowledge transfer in relation to the transport sector in its widest sense. Transfer can therefore take many forms, including policy measures, techniques, research, and skills. Table 2 below describes some key examples of technology and knowledge transfer in the transport sector.

Table 2: Types of transfer and transport applications

Type of transfer	Example
Technologies	• Non motorised transport technologies • Energy economy technologies in the drive train and performance optimisation such as stop/start systems • Simple radio based technologies for priority and traffic management • Use of new technologies such as GSM phone technology • New and improved fuels, including transfer of knowledge on use additives to traditional energy sources (e.g. fossil fuel) to reduce emissions and improve engine efficiency
Policy	• Fuel (efficiency) standards • Vehicle inspection and maintenance standards (and their enforcement) • Parking charges and regulation • Driving license requirements that includes knowledge of cyclists and pedestrian road rights
Skills / techniques	• Planning and guidance on the development of Bus Rapid Transit (BRT) and other mass transit systems • Cyclist training • Eco-driving • Maintenance of vehicles (importance of correct tyre pressure for optimising efficiencies) • Public and media awareness campaigns on the advantages of sustainable transport and the disadvantages of most present transport systems.

The emphasis must remain on setting targets for emission reductions rather than setting targets for the diffusion of a particular technology. In this context affordable and appropriate technology for the developed world can not just be 'transferred' to the

developing world as their needs and the transport context is quite different. Capacity also needs to be built in the developing world to help ensure that the technologies introduced are applicable and that the framework is in place for their adoption to be effective. As technology transfer capacity building can take a range of forms, but there is a particular need for enhanced institutional capacity in the developing world. A prerequisite will also be relevant expertise. There is therefore the need for knowledge to be shared with actors in these countries so that it is available where required.

Much can be done with low cost simple technologies that will allow the developing world to 'leapfrog' as was done successfully with mobile phones, now in widespread use without the need for expensive land lines to be put in place first.

Support should be provided to develop market demand for clean technologies, particularly in developing countries. This could lead to economies of scale within these countries.

It is important to recognise that the transfer of knowledge in a wide range of forms, but in relation to the Kyoto mechanisms, should be recognised. Transfer of successful CDM methodologies from one area to another would reduce transaction costs and bring valuable exchanges of experience and capacity building.

Furthermore, technology and knowledge transfer in transport can and should take place between developing countries, i.e. a south-south transfer. At present there is little or no incentive so to do.

Technology transfer also needs to be effectively financed. An interesting development to follow is the proposed Multilateral Climate Technology Fund (see paragraph 175 of AWG-LCA negotiation text).

4.2 Adaptation

4.2.1 Overview

The UNFCCC recognises that adaptation is vital to reduce the impacts of climate change and to increase resilience to future impacts. This is reflected in Articles 2 and 4 of the Convention, and the Bali Action Plan's call for long-term co-operative action. It is also evident from the fact that adaptation is one of the four key building blocks of the Bali Action Plan, and therefore one of the four areas of work that the AWG-LCA Parties are focusing upon.

The Subsidiary Body for Implementation (SBI) and the Subsidiary Body for Scientific and Technological Advice (SBSTA) are both seeking to identify new and develop existing ways of implementing adaptation (see Decisions 5/CP.7, 2001 and 2004, Decision 1/CP.10, Article 4.8 and 4.9 of the Convention, and the Buenos Aires programme of work). See also FCCC/AWG-LCA/2008/16/Rev.1 for ideas and proposals on adaptation that have been submitted by the parties.

The transport sector is, however, conspicuous by its absence in these key UNFCCC texts. The negotiation text does include mention of sector-based activities as part of national adaptation plans (25-(a) of the AWG-LCA negotiation text).

The Paris meeting identified that whilst people are aware of the potential of mitigation, they are less aware of the requirements of adaptation, and that it is sometimes considered to be an 'either or' decision in respect to limited financial resources and capacity at the local and national level.

Today there is little assessment of the full vulnerability of transport infrastructure.

As noted in the negotiation text, there is a need for adaptation actions to be supported by capacity building, including financial and technical support for the operational

planning of adaptation, as well as undertaking sound vulnerability and adaptation assessments. (paragraph 24-(c) and (d) of the AWG-LCA negotiation text).

This gap needs to be fulfilled, as even with ambitious mitigation efforts future climate risk is unlikely to be avoided and impacts of climate change are already being experienced, particularly in the developing world.

4.2.2 Recommendations

1. Inclusion of transport in Adaptation Strategies

- Adaptation discussions need to recognise, and provide for, the importance of transport.
- National assessments of vulnerability to climate change need to include the transport sector.
- National Adaptation Strategies and Plans should be consistently produced, and transport should be a key element of these.

The content and quality of adaptation strategies is currently variable, and therefore guidance regarding their preparation would be welcomed. As a minimum it is recommended that adaptation strategies contain the following aspects:

- A long term perspective (how to build climate resilient infrastructure from new).
- Requirements for fixing and adapting what already exists (maintenance).
- Recognition of the need to respond to climate emergencies (a "preparedness" approach).

2. Measuring risks and vulnerability

The Paris Workshop identified that risks of climate change appear to be widely underestimated, in both the developed and developing world. There is therefore the need for real data to be provided based on the measurement of actual risks and vulnerability. A number of steps can be taken to support this:

- Data needs to be collected to better understand risks;
- Data should be used to develop adaptation criteria;
- Detailed impact assessments should be formulated based on knowledge;
- An international toolkit could be developed to support the assessment of climate change risks; and
- Infrastructure investments should be screened on adaptation criteria.

3. Awareness raising

In response to the lack of recognition of the risks that climate change poses in general, but in particular to transport infrastructure, there is a need to raise awareness of this risk. Steps should therefore be taken to engage with those responsible for related areas, such as economic risk management and safety, to foster enhanced recognition of the nature of the issue, how it is likely to affect them, and how they need to respond.

4. Co-operation

To support raised awareness there is the need for actors to share information relating to transport infrastructure. This must include key details about their value and vulnerability. On a wider level there is the need for co-operation between all levels from the local to the global, and among the relevant ministries (such as financial, transport, environment and meteorological), as well as with the private sector. This is required to both identify needs and to provide solutions to overcome challenges.

5. Technology transfer and capacity building

There is the need for increased knowledge sharing. There is a concern that there is currently a problem of knowledge 'access' rather than 'transfer.' The pooling of knowledge and production of guidelines based upon collective knowledge and data would therefore benefit adaptation measures in both the developed and developing world. A number of other actions will need to be taken if this is to be effective, however. Technologies will, for example, need to be practically available, and the necessary funding must also be accessible for their adoption to be viable.

There is also a clear need for enhanced institutional capacity. Adaptation measures are often managed by one person in developing countries, and this capacity needs to be increased. The creation of regional or national 'Centres of excellence' could address this in an effective manner. Expertise within the subsections of transport could be shared making the knowledge available to those that most need it (Bongardt et al, 2009).

6. Financing

There is widespread consensus that the Adaptation Fund needs to be upscaled to meet demand (see paragraph 175 of the AWG-LCA negotiation text). Other approaches will, however, also be required to bridge the shortfall. There appears to be no clear solutions for the funding of necessary adaptation measures, particularly in the developing world. One recommendation could, however, be the potential for developing climate trust funds, which could provide pragmatic support.

Financing adaptation measures need to be equitable and funding for countries that can least afford adaptation measures should be prioritised. This is of particular importance in the current economic situation, where overall resources are limited.

7. Process reform

Adaptation and mitigation are currently treated separately, with efforts occurring within different streams.

A key recommendation and output from the workshop was to combine adaptation and mitigation efforts intelligently, to create synergies and increase the cost effectiveness of action.

4.3 Project based mechanisms

The three Kyoto flexible mechanisms (CDM, JI and ETS) have not succeeded in promoting sustainable transport. If developing countries are to adopt low carbon mobility there is therefore the need for the existing mechanisms to be significantly modified, or for new mechanisms to be introduced. The recommendations detailed above for the Post 2012 agreement contain suggestions for new instruments that are capable of acting as sustainable transport enablers.

A key issue under the present framework is how to demonstrate that measures and projects would not have taken place under a 'Business as Usual' scenario. The complexity and interdependence on policies and measures outside the direct sphere of transport (such as land use, planning and fiscal policies) of transport hampers its fit with the present framework and flexible mechanism. System wide improvements rather than project based approaches will deliver in the post 2012 period.

In this context the following are recommendations suggested for modifying CDM and JI to enable them to work for the transport sector.

4.3.1 Clean Development Mechanism (CDM)

4.3.1.1 Overview

Transport is currently poorly represented in CDM projects. Of the 1,515 registered CDM projects (as of late March 2009) only two were transport projects, and only 9 out of the

4,541 CDM projects in the pipeline relate to the transport sector. Transport therefore only constitutes 0.1 to 0.2% of all CERs.

The lack of CDM transport projects has been attributed to a number of barriers. These are:

- Methodological (notably the difficulty in proving additionality, baselines and boundaries and the lack of recognition of co-benefits);
- Financial (including high transaction costs, monitoring costs, and abatement costs (both real and perceived), as well as the volatile (and low) carbon price for transport for investors); and
- Institutional (transport experts are not adequately represented on the CDM methodology panel).

Despite these barriers it is felt that the CDM could potentially be revised to work for the transport sector in the following manner;

- It may work for certain aspects of the transport emission reduction strategy (such as by inducing technological changes), or
- They could be used to 'tip the scale' for some transport projects that are intended to deliver other co-benefits
- Flexing the additionality aspect of CDM without compromising its integrity could also increase the speed and size of transport projects and give clear incentives and signals to the developing world to create sustainable transport systems rather than individual limited boundary projects.

4.3.1.2 Recommendations

The relative incompatibility of transport projects to the CDM methodology has been the subject of considerable research. One of the most prominent responses has been the 'Berlin Strategy,' which was outlined at COP14 (see Box below).

Box 3: The Berlin Strategy

An international multi-stakeholder effort, led by the Clean Air Institute (CAI) and involving an expert workshop in Berlin in June 2008, has resulted in a strategy for:

a) Reforming the existing CDM to make it a more viable tool to finance transport interventions, via;
   - Broadening its scope,
   - Simplifying and improving data collection.
   - Simplifying the additionality requirement by using the existing "first of its kind" approach.
   - Facilitating development of methodologies for Program of Activities.
   - Strengthening expertise to facilitate the methodologies and programs/project approval process.

b) To ensure the development of improved clean transport funding mechanisms under the forthcoming climate change negotiations, by;
   - Being specific to the transport sector rather than of broad applicability.
   - Better accounting for national and local benefits.
   - Integrating into a comprehensive approach of planning transport sector investments (instead of project specific)

Adopted from Sanchez (2009)
http://www.cleanairnet.org/caiasia/1412/articles-73312_sanchez.pdf

See UNEP (2008) for more details:
http://www.cd4cdm.org/Publications/Perspectives/ReformedCDM.pdf

These requirements were reflected in discussions at the workshop. Additional recommendations that resulted regarding the future of the flexible mechanism are as follows.

1. Development of programmatic approaches

It was suggested that Programme of Activities (PoA) could be developed for transport, and could be workable under the CDM approach. This could perhaps be extended to combine with non-transport activities. Furthermore, they could also work as a part of a tradeable NAMA.

PoAs originate from a decision of the 2005 Conference of the Parties serving as the Meeting of the Parties of the UNFCCC. The term is used to refer to measures that are co-ordinated and implemented voluntarily by private or public entities that implement policies or measures leading to real GHG emission reductions. The approach enables programmes incentivising a large number of different entities to undertake a certain type of activity. The German Federal Environment Agency (2009) has recently produced guidance on PoA for a range of sectors. Using this guidance, an example of what could constitute transport PoAs are detailed in Box 4 below.

Box 4: Example of a potential PoA

Indian National Urban Transport Policy

The Indian Government produced a National Urban Transport Policy in 2005. A key objective of the strategy was the improvement of public transport, a target of which was for all Indian cities with a population of over 4 million to start to plan for mass transit. The aim was for each city to adopt a technology within the next 30 years that would best suit the requirements of the individual city, with development and implementation supported by a national mass transit fund. The program of activities would include a an integrated approach to urban transport, with some new metros and comprehensive BRT networks with complementary land use and non-motorised transport policies (Center for Clean Air Policy, UITP 2006).

2. Developing Policy Based CDM (Crediting NAMAs)

A methodology could be developed to make policy based CDM effective for the transport sector. Such an approach could have boundaries or a baseline at the city level, allowing trading either between or within cities. A geographical grid matrix accounting and monitoring approach could also be applied, and links made with NAMAs.

3. Rewarding co-benefits

A CDM approach could be developed whereby co-benefits are rewarded whilst also mitigating against double-counting and allowing comparability with other sectors using a robust accounting mechanism. This could be done, for example, by:

- Linking co-benefits with the CDM gold standard and developing verification methodologies that would be appropriate in both the regulated and the voluntary sector (Bongardt et al, 2009);
- Only approving projects that realise co-benefits; or
- Discounting CERS based on co-benefits.

4. Institutional reform

Institutional reform could support the changes in approach as detailed above. Specific recommendations for doing so include:

- Reform of the CDM Executive Board;
- Making the Executive Board a permanent board to allow decentralisation and a clearing of backlog;
- Including more transport specialists on the Methodology Panel; and
- Creating a two-way feedback mechanism, for example by having ombudsmen for the EB.

4.3.2 Joint Implementation (JI)

4.3.2.1 Overview

There have not been any transport projects registered under the JI mechanisms, and so the application of JI to transport in either Track 1 and Track 2 could be considered to have failed. Projects from transport include a JI methodology for the use of biogas in bus fleets that was approved for use in France. A German proposal from Deutsche Bahn, which promoted a modal shift from road to rail, was submitted but rejected due to difficulties with demonstrating additionality.

There is widespread scepticism over the likely applicability of the JI methodology to transport. This is largely owing to the following barriers:

- There is generally a lack of demand for JI projects;
- Proving additionality and monitoring is difficult;
- There is some competition with CDM, and CDM is often considered to be the preferred option. In theory the JI mechanism (especially track 1) is more flexible than the CDM. However, parties following the track 1 (such as France) adopt the CDM procedures for the additionality demonstration and certification process;
- Short crediting periods. There are long term reductions and short term CO_2 assessment periods (2008 – 2012);
- Some sectors are more interested in asking for subsidies than in participating in market mechanisms;
- Awareness of host countries is very low – many don't know that they can implement JI projects in their own countries. Nor do they know that that sectoral JI has existed under track 2 since 2008; and
- The vision of countries is often very short term, which can make many governments cautious of relinquishing Kyoto assets.

4.3.3 Recommendations

There is a considerable amount of overlap in the recommendations that were devised for CDM and JI. This is reflected in the fact that submissions have chosen to refer instead to 'project based mechanisms.' Key recommendations that have been raised specifically in relation to JI are as follows:

- Raise awareness of the potential and scope of JI in host countries. Emphasis should be placed on the feasibility of the methodology;
- Establish lists that can be used to prove additionality;
- Extend crediting periods to make them compatible with the timeframes and lead times of transport projects;
- Enable the crediting of co-benefits. The monetisation of co-benefits could, however, be challenging;
- Establish a 'first-of-kind' approach;
- Develop new project approaches. These could be based on the urban level, for example by enabling the trading of credits between Annex I cities and Non Annex I cities; and
- Simplify the verification process. An approach that mirrors that of the verification required for REDD could be adopted, although this will have to attract credibility.

A number of additional recommendations have also been made that relate specifically to the EU and EU member states. These include:

- Analyse the French and German JI experiences to enable a better understanding of the barriers to the implementation of transport related JI projects;
- Explore the feasibility of a large pan European project, such as a rail transport initiative;
- Consider a harmonised JI approach. There is currently a legislative resolution in the European Parliament (of 17 December 2008) for a directive amending Directive 2003/87/EC. The new directive is to improve and extend the EU ETS, which raises the possibility of implementing harmonised rules for projects that reduce emissions outside the EU ETS (see Article 24 a).

5 Conclusion

This Discussion Paper examined the most up-to-date sources of information on transport in relation to the climate change negotiations, including the outputs from the "Bridging the Gap" expert workshop in Paris, Party submissions to the UNFCCC, and negotiation texts prepared by the chairs of the AWG-KP and AWG-LCA for use in their June meetings in Bonn. Also reflected were the activities conducted by a wide range of international organisations that are working to develop a variety of options to better link transport to the climate negotiations.

The results indicate that there are two prerequisites for better integrating transport and climate change; political will and finance. Next steps should therefore be to increase awareness of the significance of the transport sector in terms of GHG emissions and to identify ways in which to mobilise the required finance to support action to this effect. Funds, crediting mechanisms or a hybrid of the two should be considered, whilst of equal importance is the need to identify whether there is the need for a specific transport fund or if it can be incorporated in funds with a broader scope, such as part of a mitigation, adaptation or clean technology fund.

Next steps should also seek to develop steps around NAMA. There is, for example, the need to begin developing specific guidance for different NAMA categories and ideas for pilots. Data and methodology requirements for different levels of NAMAs should also be considered, along with the potential to link to other indicator sets or ghg emission inventories. Emphasis is also needed on developing ideas for piloting technology transfer.

The recommendations contained within this report are summarised below under three key themes;

- Post 2012 framework with a focus on MRV NAMAs
- Adaptation
- Project based mechanisms (i.e. CDM, JI)

The advance versions of the negotiating texts reinforce the validity of focusing efforts on these three areas of the negotiations. Below is a brief summary of the main recommendations for the above three points;

Post 2012 framework with a focus on MRV NAMAs

- NAMAs could include model transport elements, such as sustainable development strategies incorporating transport, transport plans/strategies with low-carbon objectives, fuel/vehicle taxes and standards, Cap-and-trade of transport emissions (upstream trading of fuels), sectoral or sub-sectoral targets, upscaled CDM based on transport PoAs etc.
- NAMAs could be unilateral (voluntary), supported by developed countries, or subject to crediting. The first and second may take the form of Low Carbon Development Strategies (LCDS), which are not subject to approval via the UNFCCC. The second may be supported via a Mitigation Fund, whereas the last option could work under an (upscaled) CDM. A transport specific funding instrument that incorporates both crediting and funding elements (e.g. a Clean Transport Mechanism, or a Low Carbon Transport Facility) could support the latter two.

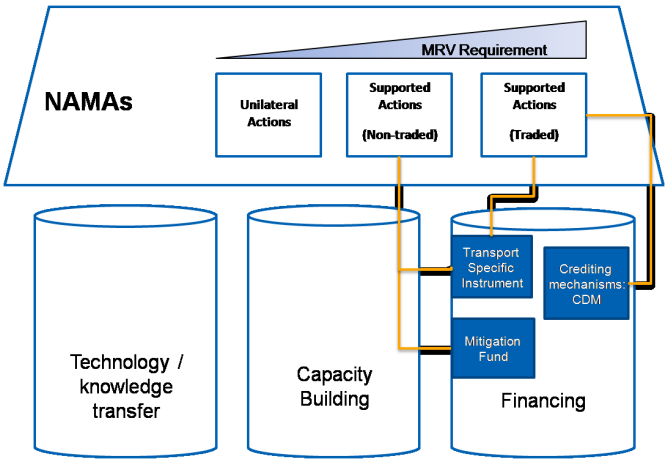

Figure: NAMAs and their supporting pillars

- Transport specific data sources and measurement methodologies need to be developed that acknowledge the full range of transport emission sources, and which support the MRV requirements for NAMAs.

Adaptation

- There is the need for adaptation actions to be supported by capacity building, including financial and technical support for the operational planning of adaptation.
- The scale and scope of current adaptive measures fall far short of meeting the level of vulnerability and risk posed by climate change.
- Transport (infrastructure) and its vulnerability to climate change has so far not been adequately recognised in the UNFCCC negotiations. As the negotiation text highlights, sector-based activities could become more pronounced in national adaptation plans (25-(a) of the AWG-LCA negotiation text).
- Sound vulnerability and adaptation assessments (see paragraph 24-(c) and (d) of the AWG-LCA negotiation text) are a prerequisite to properly addressing adaptive actions in transport.

Upscaling project based mechanisms

- The three Kyoto flexible mechanisms (CDM, JI and ETS) have not succeeded in promoting sustainable transport. If developing countries are to adopt low carbon mobility there is therefore the need for the existing mechanisms to be significantly modified, or for new mechanisms to be introduced.
- Reform of the CDM and JI could take the form of;
    - Policy approaches guided by sectoral targets (potentially in the form of no-lose targets) for the transport sector,, which could be linked to NAMAs subject to crediting, or take place at local/city level.
    - Further development of programmatic approaches, supported by standardised methodologies for Programmes of Activities (PoAs) for transport, such as vehicle efficiency standards, sustainable travel towns and regional BRT networks.
- Recommendations for the reform of the current institutional arrangements include the inclusion of more transport specialists in the Methodology Panel, as well as increasing the responsiveness, transparency and permanency of the CDM Executive board.

On top of the above, financing, technology/knowledge transfer and capacity building are identified as supportive of both mitigation and adaptation actions. Measurement, reporting and verification (MRV) were highlighted as key requirements under the Post-2012 framework. Key issues identified are as follows:

Financing

- Financial instruments need to take into account the failure of existing Kyoto instruments to be fully applied to the transport sector. Future mechanisms must be assured their applicability for the transport sector.
- Under a Post-2012 framework, mitigation actions in transport could be financed through;
    - The crediting of transport NAMAs (Policy CDM).
    - An upscaled, programmatic CDM
    - A transport specific instrument, e.g. a 'Clean Transport Mechanism,' or 'Low Carbon Transport Facility,'
    - A Mitigation Fund
    - Other potential funds such as a 'capacity-building fund,' and a 'multilateral climate technology fund.'

Technology/knowledge transfer and cooperation

- There should be a leapfrogging approach to transport technology, policy approaches and broader knowledge (including dissemination of good practices, standards and scientific evidence) linked to the transport sector.
- Subjects of transfer in the transport sector could include ***technologies*** such as BRT, ***policy measures*** such as fuel (efficiency) standards and parking regulations, as well as ***skills/techniques*** such as cyclist training, eco-driving and maintenance of vehicles.
- The access and diffusion of technology/knowledge is equally important to transfer. Technologies will, for example, need to be practically available, and the necessary funding must also be accessible for their adoption to be viable.
- Transfer of technologies and knowledge between developing countries (South-South transfers) should be encouraged and supported. A narrow prescription of technological solutions from industrialised countries should be mitigated.

Capacity building

- Support institutional strengthening and capacity development for developing countries to plan, build and operate sustainable transport systems, both at national and local level.
- Increase capacity for indigenous technological development, including R&D capability.
- Capacity should be built on both national and local levels, and should encompass the (integrated) institutional requirements for both mitigation and adaptation.
- There is a clear need for enhanced institutional capacity for adaptation, which is often managed by one person in developing countries.

It remains important not to consider these issues in isolation, but for recommendations and next steps to reflect the fact that all actions taken must be co-ordinated and mutually reinforcing. Opportunities for synergies should therefore be identified, for example from an understanding of the importance of capacity building and measurable criteria within mitigation, adaptation, technology and finance.

Glossary

AWG-KP	Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol
AWG-LCA	Ad Hoc Working Group on Long-term Cooperative Action under the Convention
BAP	Bali Action Plan
BRT	Bus Rapid Transit
CERs	Certified Emissions Reductions
CDM	Clean Development Mechanism
CIF	Climate Investment Funds
CO_2	Carbon Dioxide
COP	Conference of Parties
CTF	Clean Technology Fund
ETS	Emissions Trading Scheme
EUETS	European Union Emissions Trading Scheme
GEF	Global Environment Facility
GHG	Greenhouse Gas
GTZ	German Technical Cooperation
IEA	International Energy Agency
IGO	Inter-Government Organisation
JI	Joint Implementation
LCDS	Low Carbon Development Strategies
LDC	Least Developed Countries
MRV	Measurable, Reportable, Verifiable
NAMA	Nationally Appropriate Mitigation Actions
NGO	Non-Government Organisation
PoA	Programme of Activities
REDD	Reducing Emissions from Deforestation and Degradation
SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technological Advice
TRL	Transport Research Laboratory (UK)
UNEP	United Nations Environment Programme
UNFCCC	United Nations Convention on Climate Change

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Annex A: The "Bridging the Gap" Initiative

In the run up to COP15 there is the need for a multi-faceted approach to improving the link between the transport sector and the climate change negotiations. The Bridging the Gap initiative was established by GTZ, Veolia Transport, TRL and UITP to facilitate:

- strong interactions with key stakeholders in the negotiation process (including the UNFCCC, governmental representatives, transport and climate experts and donors);
- strong links to other initiatives (such as ADB activities, Climateworks and the Clean Air Institute) to ensure a most efficient outcome and to integrate best available knowledge into the concept;
- a series of workshops to link the debate in the transport community to achieve a low carbon sustainable transport system;
- developing further input for the workshops and the UNFCCC process;
- hosting side events at the key UNFCCC events during 2009, and;
- producing a series of related outputs.

The Initiative has been structured to capitalise upon the opportunities presented by the UNFCCC sessions leading to COP15. A programme of workshops and side events have been organised by the consortium around the UNFCCC official events to engage key stakeholders along with transport and policy experts and climate change negotiators in discussions.

Table 3: Bridging the Gap Activities

Location	UNFCCC meeting	'Bridging the gap' work
Bonn **29th March – 8th April 2009**	AWG-KP 7 and AWG-LCA 5	Expert workshop 1 (Paris, Veolia), 27.03.09 Side event (Bonn), 01.04.09
Bonn **1st – 12th June 2009**	AWG-KP 8 and AWG-LCA 6 SBSTA 30 and SBI 30	Expert workshop 2 (Bonn, GTZ), 06.06.09 Side event (Bonn) , 10.06.09
Bonn **10th – 14th August 2009**	Inter-sessional informal consultations AWG-KP and AWG-LCA	
Bangkok **28th September – 9th October 2009**	AWG-KP 9 and AWG-LCA 7	Expert workshop 3 (Brussels, UITP) 17.09.09 (to be confirmed) Side event (Bangkok), 25.09.09 (to be confirmed)
Venue TBC **2nd – 6th November 2009**	Resumed sessions AWG-KP 9 and AWG-LCA 7	
Copenhagen **7th – 18th December 2009**	COP 15 and CMP5	Final Report and dissemination - participation at various side events and any further activities to be confirmed

These activities follow on from events that were previously organised with an extended alliance of transport and environmental professionals and organisations. Concerted actions already taken include a side event in Bali, workshops in Washington and Berlin,

and joint side events at the COP14 in Poznan. These additional activities are continuing outside the 'Bridging the Gap' initiative, and will be linked with to increase the synergy benefits.

The extended co-operation of the consortium with other external organisations that resulted from Poznan has resulted in the establishment of a common Action Plan on transport and climate change. The aim of this Action Plan is to co-ordinate broad actions across a multitude of themes, together with short term actions to influence negotiations, policies and investments in climate-friendly transport provision. Contributors to the action plan include bilateral and multilateral development/environmental organisations, transport institutions, NGOs, various partnerships, foundations and transport operators. See http://www.sutp.org/bridging_the_gap/ for further details.

Annex B: AWG-KP relevant sections of negotiating text

FCCC/KP/AWG/2009/8

A text on other issues outlined in document FCCC/KP/AWG/2008/8

Annex I

Emissions trading and the project-based mechanisms

In relation to crediting on the basis of nationally appropriate mitigation actions
Option 1:
No decision to be made with respect to this issue

Option 2:

Recalling the commitments of all Parties in Article 4, paragraph 1, of the Convention and the commitments in Article 4, paragraphs 3 and 5, of developed country Parties and other developed Parties included in Annex II of the Convention,

Recognizing the importance of incentivizing nationally appropriate mitigation actions of developing country Parties for the full and effective implementation of paragraph 1 (b) (ii) of the Bali Action Plan,

Taking into account paragraph 1 (b) (v) of the Bali Action Plan and noting the necessity of engaging the private sector and carbon markets to ensure sustainable sources of financial flows and technology transfers to enable and support the nationally appropriate mitigation actions of developing country
Parties in view of the limited capacity of public funds,

Acknowledging the need to build on experiences in the operation of Article 12 of the Protocol on the clean development mechanism and to further strengthen the mechanism,

10. *Decides* to set up a nationally appropriate mitigation action crediting mechanism under the Kyoto
Protocol, in which credits for the verifiable nationally appropriate mitigation actions of the developing country Parties not included in Annex I of the Convention can be issued in order to assist such Parties in achieving sustainable development and contributing to global efforts to combat climate change;

11. *Further decides* that this crediting mechanism shall be subject to the authority and guidance of the Conference of the Parties to the Convention and be supervised by [a dedicated body constituted by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol] [the executive board of the clean development mechanism]; and

12. *Agrees* that the criteria and standards by which credits issued for nationally appropriate mitigation actions need to be established, building on the current methodology for the clean development mechanism under the Kyoto Protocol, and that it shall adopt a decision at its sixth meeting on the operation of this crediting mechanism, including in relation to:
(a) The scope of the nationally appropriate mitigation actions that are eligible to generate

credits;

(b) Methodologies to measure and verify the generation of nationally appropriate mitigation

actions;

In relation to encouraging the development of standardized, multi-project baselines under the clean development mechanism

Option 1:
No decision to be made with respect to this issue

Option 2:

13. *Decides* that [the Executive Board of the clean development mechanism] [a dedicated body constituted by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol and operating under its authority] [one or more dedicated bodies established by the Executive Board of the clean development mechanism and operating under its authority] shall provide guidance on standardized baselines and, where appropriate, define standardized baselines for specific project activity types and specific sectors or subsectors under the clean development mechanism by establishing parameters, including benchmarks, and procedures and making them available for [mandatory] [optional] use by project participants and designated operational entities in the determination of additionality and the application or development of baseline methodologies;

14. *Decides* that standardized baselines [shall] [may] be established for types of project activities meeting the following criteria:

(a) [.];

15. *Decides* that the parameters and procedures used to facilitate standardized baselines shall:

(a) Be established on the basis of:

(i) Option 1: similar project activities undertaken in the previous five years, in similar social, economic, environmental and technological circumstances, whose performance is among the top [10] [20] per cent of their category;

(ii) Option 2: top-performing installations or processes in the relevant sector, based on, inter alia, the performance of key technologies that are beyond common practice and technology penetration rates;

(iii) Option 3: the top [x] per cent of the current distribution of carbon intensity for specific types of project activities or within specific sectors;

(iv) Option 4: the current distribution of carbon intensity for specific types of project activities or within specific sectors;

(b) [Reflect national circumstances] [Be regional, national or subnational in nature] and be

[periodically] [annually] adjusted;

16. *Further decides* that there shall be no double counting of emission reductions or removals on the basis of the use of standardized, multi-project baselines;

17. *Encourages* participants in clean development mechanism projects to apply the guidance of the
Executive Board of the clean development mechanism on standardized baselines, where appropriate, in developing new baseline methodologies, including the application of standardized baselines developed by the Executive Board;

18. *Requests* the Subsidiary Body for Scientific and Technological Advice to recommend modalities and procedures for the development of standardized, multi-project baselines under the clean development mechanism, with a view to forwarding a draft decision on this matter to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol for adoption at its [sixth] [seventh] session, including modalities and procedures in relation to:

(a) The determination of a standardized baseline, [including the definition of a sector boundary as applicable];

(b) The determination of the applicability of a standardized baseline;

In relation to positive or negative lists of project activity types under the clean development mechanism

Option 1:
No decision to be made with respect to this issue

Option 2:
19. *Decides* that reductions in anthropogenic emissions by sources or enhancements of anthropogenic removals by sinks achieved by the following categories of project activities are deemed [not] to be additional to any that would occur in the absence of the project activities:

(a) [Categories based on the primary technology employed in the project activity;]

(b) [Categories relating to the host Party of the project activity;]

(c) [Categories based on the scale of the project activity (small-scale or large-scale);]

20. *Requests* the Subsidiary Body for Scientific and Technological Advice to recommend modalities and procedures for periodically adjusting the categories of project activities referred to in paragraph 19 above, with a view to forwarding a draft decision on this matter to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol for adoption at its [sixth] [seventh] session;

In relation to improving access to project activities under the clean development mechanism by specified host Parties

Option 1:
No decision to be made with respect to this issue

Option 2:
21. *Decides* that the following conditions shall apply for [specified host Parties] [least developed countries and small island developing States] [other categories of countries]:

(a) A higher threshold for small-scale project activities;

(b) [Exemption from] [Further simplification of] requirements for the demonstration of additionality in relation to small-scale project activities;

(c) The financing of the validation, verification and certification of project activities through the [clean development mechanism management plan] [financial mechanism of the Convention];

(d) [.];

22. *Requests* the Subsidiary Body for Scientific and Technological Advice to recommend modalities and procedures for the conditions referred to in paragraph 21 above, with a view to forwarding a draft decision on this matter to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol for adoption at its [sixth] [seventh] session;

In relation to promoting co-benefits for clean development mechanism project activities by facilitative means

Option 1:
No decision to be made with respect to this issue

Option 2:
23. Option 2.1: *Decides* that each project activity under the clean development mechanism that demonstrates specified co-benefits shall be promoted through the following measures:

(a) Exemption from payment of registration fees;
(b) Exemption from the share of proceeds to cover the administrative expenses of the clean development mechanism and/or assist with the costs of adaptation;
(c) Expedited timelines for the registration of project activities;
(d) Exemption from additionality criteria;
(e) [.];

Option 2.2: *Decides* that each project activity under the clean development mechanism shall demonstrate specified co-benefits;

24. *Decides* that the co-benefits referred to in paragraph 23 above shall be:

(a) Energy efficiency;
(b) Technology transfer;
(c) Environmental services such as air pollution reduction, improvement of water quality, proper treatment and reduction of waste, conservation of biodiversity and management of hydrological resources;
(d) Poverty alleviation;
(e) Economic growth;
(f) Social benefits;
(g) Strengthening human and institutional capacity;

25. *Decides* that each designated operational entity shall, as part of its validation of a project activity, confirm [that the designated national authority of the host Party has confirmed] that one or more of the co-benefits referred to in paragraph 24 above are demonstrated by the project activity;

26. *Requests* the Subsidiary Body for Scientific and Technological Advice to recommend modalities and procedures for the measures referred to in paragraph 25 above, with a view to forwarding a draft decision on this matter to the Conference of the Parties serving as the meeting of the Parties to the Kyoto
Protocol for adoption at its [sixth] [seventh] session;

In relation to multiplication and discount factors under the clean development mechanism

Option 1:
No decision to be made with respect to this issue

Option 2:
27. *Decides* that each clean development mechanism project activity shall generate certified emission reductions equal to the emission reductions that are certified by the designated operational entities multiplied by a [multiplication] [discount] factor;

28. *Decides* that the total quantity of certified emission reductions issued for a commitment period shall not exceed the aggregate quantity of emission reductions or removals achieved by project activities under the clean development mechanism during the commitment period;

29. *Requests* the Subsidiary Body for Scientific and Technological Advice to recommend the [multiplication] [discount] factors referred to in paragraph 27 above, with a view to forwarding a draft decision on this matter to the Conference of the Parties serving as the meeting of the Parties to the Kyoto
Protocol for adoption at its [sixth] [seventh] session on the basis of the following:

(a) [Criteria based on environmental integrity;]

(b) [Criteria based on the primary sectoral scope of the project activity;]

(c) [Criteria based on the primary technology employed in the project activity;]

(d) [Criteria based on the global warming potential of the gases whose emissions are reduced through the project activity;]

(e) [Criteria relating to the host Party of the project activity;]

(f) [Criteria based on the scale of the project activity (small-scale or large-scale);]

Annex C: Submission on Transport by the United Nations Environment Programme (UNEP) to the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention (AWG-LCA)

United Nations Environment Programme

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PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT • PROGRAMA DE LAS NACIONES UNIDAS PARA EL MEDIO AMBIENTE

ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

Submission on Transport by the United Nations Environment Programme (UNEP) to the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention (AWG-LCA)

24 April 2009

Recommendations

- Give preferential support for transport projects and policies that reduce GHG emissions and have co-benefits or other sustainable development objectives, such as reductions in air pollution, noise, and congestion.
- Allow to be included in NAMA registries model transport elements, such as fuel efficiency standards, congestion charging and public transport improvements.
- Consider creating a new transport-specific mechanism, such as a Clean Transport Mechanism (CTM), through which countries are financially compensated (for example, through carbon credits) for transport emission reductions below a pre-defined baseline.
- Tailor CDM methodologies to the specific needs of the transport sector, for example through the approval of "first-of-its-kind" projects/programmes, whereby a new project or approach is considered additional if it is not commonly used.
- Move toward an upscale, wholesale approach, for example via a policy-oriented CDM for transport projects that is guided by sectoral targets at the national or even local level.
- Support capacity building efforts on both the national and local scales, including reform of institutional frameworks.
- Consider using the multiple sources of funding, including the Adaptation Fund, to provide adequate coverage of transport in both scale and scope.

***

This submission[8] provides suggestions on elements contained in paragraph 1 of decision 1/CP13, the Bali Action Plan, for promoting and implementing low carbon mobility in developing countries, and recommendations on how to integrate land transport, both passenger and freight, into the work of the AWG-LCA. It was jointly developed with

[8] The details of this submission will be developed into a strategy paper that will become available around June 2009 at www.sutp.org/bridging_the_gap. The initiative "Bridging the Gap" has been initiated based on joint efforts by a number of international organizations promoting sustainable transport since COP13 in Bali and, has provided substantial inputs to the debate on transport and climate change in particular to strengthen the importance and accountability of transport in the climate negotiation process. The "Bridging the Gap" process is ongoing and will provide support to the climate negotiation debate throughout the remaining year

support from a wide range of international organisations[9]. The aim is to contribute to an agreement at COP15 that fully recognises the role of transport and that promotes the development of workable policies and measures that reduce CO_2 emissions in this important and rapidly growing sector. Investments in low carbon mobility should focus on bringing about structural changes to transport approaches, with positive, long-term benefits.

Background

The transport sector accounts for around one quarter of global carbon dioxide (CO_2) emissions[10] and global transport energy-related CO_2 emissions are predicted to increase by 1.7% a year from 2004 to 2030[11]. The predicted road transport growth to 2030 is driven largely by increased demand for mobility in developing countries, where growth rates are predicted to average 2.8% a year[2]. Coupled with rapid urbanisation, transport related emissions from urban areas are set to rise significantly.

Under the present international climate change agreement, the incentives to create sustainable transport networks as a part of national commitments to climate change are weak. Sustainable transport is one of the most urgent challenges in tackling climate change, and yet transport currently only plays a minor role in the negotiations. There are signs that this is beginning to change with a sizeable group of transport related organisations supporting a set of recommendations to improve the position of land transport within the climate change discussions. The recommendations contained within this submission aim to support an agreement at COP15 that would better incorporate transport in agreed actions taken by governments.

The Road to COP15 Copenhagen

An effective response to the findings of the Intergovernmental Panel on Climate Change (IPCC) and the necessary reduction in global GHG emissions to avert severe climate change will need to include a focus on transport. The recommendations in this submission link actions needed in the transport sector with the four building blocks in paragraph 1 of decision 1/CP13, the Bali Action Plan:

- national/international action on mitigation of climate change, including Nationally Appropriate Mitigation Actions (NAMAs)
- action on the provision of financial resources and investment , including financing mechanisms beyond 2012
- action on technology development and transfer, including capacity building, and
- action on adaptation.

Actions taken on these four building blocks should be closely coordinated and mutually enforcing, with an understanding of the importance of capacity building and measurable criteria within mitigation, adaptation, technology and finance.

[9] This includes the Transport Research Foundation (TRF), the Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ), the International Association of Public Transport (UITP), ICLEI-Local Governments for Sustainability, Energy Research Centre of the Netherlands (ECN), and the ***Institute for Global Environmental Strategies (IGES)***.

[10] **IEA (2005)** CO_2 Emissions from Combustion 1971-2003. OECD/IEA

[11] **IEA (2006)** World Energy Outlook 2006, International Energy Agency. Accessed from http://www.worldenergyoutlook.org/2006.asp

Mitigation

Mitigation actions in the transport area generally follow one or more of three fundamental strategies: avoiding the need to travel, shifting travel to more sustainable modes, or improving the sustainability of modes. The IPCC[12] has suggested key mitigation options for the transport sector and explored both those that are commercially available and those that are yet to be commercialised (but that are expected to be before 2030). These include more fuel-efficient vehicles, modal shift, land-use and transport planning, and second generation biofuels and advanced hybrid vehicles.

Mechanisms could be devised to grant preferential support for transport projects and policies that realise co-benefits or other sustainable development objectives, such as reductions in air pollution, noise, and congestion. Such mechanisms should be accompanied by an institutional arrangement that allows for a simple and standardised measurement and rewarding/crediting process.

Mitigation efforts by developing countries that are supported by financing, technology transfer and capacity building could have significant potential to bring about sustainable transport. For example, NAMAs could provide a framework for (no-lose) sectoral targets, both in developed and developing countries, which given large uncertainties and market fluctuations would provide a better incentive for the transport sector to reduce emissions.

As suggested by a number of countries, NAMAs could comprise elements that were pledged voluntarily, including those for which some sort of international support was needed[13]. These could be measured, reported and verified under common rules set by the UNFCCC and rewarded through a crediting mechanism. NAMA registries could include model transport elements, such as fuel efficiency standards, congestion charging and public transport improvements.

These ideas should be piloted in targeted policy areas and countries, and developed further based on the results obtained. They should also be coupled with the development of transport specific data sources and measurement methodologies that fully acknowledge the wide range of transport emission sources. There is a need as well for research to be conducted to this end.

Financing Mechanisms

The currently available flexible mechanisms of CDM, JI and ETS provided within the Kyoto Protocol have not succeeded in promoting sustainable transport. Their application to transport has so far been extremely limited. As of 1st March 2009, out of 4,541 CDM projects sent for validation/determination, only 9 (0.2%) were in the transport sector,[14] and prior to this date only two had been approved.

Transport projects under the current CDM face particular difficulties *inter alia*:

(1) Methodologies (setting baselines and proving additionality)
(2) High transaction costs, and
(3) CERs are often (or usually) only a small part of sustainable transport benefits.

To overcome these difficulties under the existing arrangements, methodologies can be tailored to the specific needs of the transport sector, for example through the approval

[12] **IPCC (2007)** Climate Change 2007 Synthesis Report. Accessed from http://www.ipcc.ch/ipccreports/ar4-syr.htm
[13] Relevant country proposals include those provided by the Republic of Korea, India, and South Africa.
[14] **UNEP Risoe Centre (2009)** CDM pipeline overview. Accessed from http://www.cdmpipeline.org/cdm-projects-type.htm

of "first-of-its-kind" projects/programmes, whereby a new project or approach can be considered "additional" if it is not commonly used already. Standard methodologies that could be applied to Programmes of Activities (PoAs) could also be developed and shared amongst developing cities.

Under a post-2012 framework, financing should move towards an upscale, wholesale approach, for example via a policy-oriented CDM, guided by sectoral targets at national or even local level for the transport sector. Scaling up financing for sustainable transport must be complimented with sound pricing practices. Efforts must be taken to promote full cost pricing that reflects all environmental externalities including the cost of carbon. Efforts must be taken to remove subsidies on fossil fuels. This could be part of a crediting mechanism for Nationally Appropriate Mitigation Actions (NAMAs). A prerequisite to the upscaling of CDM is for industrialised countries to be committed to substantial greenhouse gas reduction targets. Discounting credits to incorporate the large uncertainties involved in quantifying NAMAs could also be discussed.

Furthermore, a new transport-specific mechanism could be devised, such as a Clean Transport Mechanism (CTM) in which countries can be financially compensated (e.g. through carbon credits) for transport emission reductions below a pre-defined baseline. Further assessment and piloting is needed to develop these ideas further.

In addition to crediting mechanisms, the role of climate funds such as the Global Environment Facility, the Climate Investment Fund, bilateral funds and any future mitigation-related funds under the UNFCCC in supporting sustainable transport can be acknowledged. Such funds can be instrumental in providing support for technology/knowledge transfer, capacity building and policy development to set transport on a sustainable path. They can also be used to leverage funding and investments by the private sector.

Technology Transfer

Significant increases in the reduction of emissions from transport in developing countries could be achieved from adopting a leapfrogging approach to the development of transport technology. Developing countries could embrace low carbon mobility with energy efficient transportation options, through accelerated deployment, diffusion and transfer of technologies, and learn from the technology progress within developed countries.

Technology transfer and development should include a range of support, including financial and capacity building. Technologies in this regard should range from existing affordable environmentally sound technologies such as non-motorised transport vehicles, to new and upcoming technologies in demand management such as Intelligent Transport Systems (ITS) and smart cards for use on public transport.

Transfer could also take place in the form of knowledge, for example through the dissemination of good practices, standards and scientific evidence. The development of soft measures, skills and behaviour are critical to the successful implementation of sustainable transport policies and projects, and need to be supported by knowledge transfer. The highest potential for addressing reductions at an affordable cost comes from a combination of land use policies and technology. International guidelines and examples of best practise with accompanying methodologies for managing emissions from transport over a significant time period could be part of this action. Efforts by the Expert Group on Technology Transfer (EGTT) should ensure holistic coverage of transport technologies, not only transport fuels and vehicle engines, but those for infrastructure, demand management and public transport systems.

The barriers to the effective transfer of technology and knowledge need to be addressed by capacity building in different transport sectors, particularly within developing countries. There is a need to build capacity on both the national and local scales, and the key component of any strategy to do so will require a reform of institutional frameworks. It will also be essential for adequate knowledge mechanisms to be put in place, and for all actors to be appropriately trained. In the short-term, capacity building to support the integration of land-use and transport planning, enhancement of public participation and the integration of environmental effects (for example using tools such as Strategic Environmental Assessment) should be focused upon in the transport sector.

Adaptation

With 45% of the world's population living on or near coastal regions and river beds, transport is particularly vulnerable to water related climate extremes. A fully integrated transport strategy is required that ensures support for both adaptation and mitigation actions, and which ensures climate resilient development in the most vulnerable areas. Transport infrastructure and services, both existing and planned, need to be evaluated against their vulnerability to climate change. These risks need to be incorporated into transport decision making processes as with any other risks that are reasonably foreseeable.

Assessment of climate risks need to include the impacting event (climate hazard), the likelihood of an impact occurring (its probability), the consequences of an impact if it does occur (the likely degree of impact), and the resilience of the planned or present infrastructure. The assessment can take place within existing needs assessments, for example National Adaptation Programmes of Action (NAPAs).

To facilitate this process, the overall framework should be set at the UNFCCC level, with levels of support suited to the respective adaptive capabilities of Parties provided through financial assistance, technology transfer and capacity building. Guidelines, assessment tools and studies on adapting transport infrastructure could be developed at the UNFCCC level. Consider using the multiple sources of funding, including the Adaptation Fund, to provide adequate coverage of transport in both scale and scope.

Conclusions

An upscale targeted strategy is needed in all building blocks of the Bali Action Plan to have an impact on future sustainable transport development in developing countries. This will need to be coupled with substantial emission reduction targets for Annex I countries alongside appropriate actions by developing countries.

The present flexible mechanisms are playing only a minor role in supporting low carbon mobility in developing countries. A post-2012 agreement must therefore include a combination of instruments that, together with local, regional and national applications of transport policies, work for all sectors including transport.

Mitigation efforts could be guided by NAMAs, part of which could be credited through an upscaled crediting scheme, e.g. a sectoral/policy CDM, and supported by technology/knowledge transfer, capacity building and robust measurement methodologies. Financing and capacity building for adaptation needs to increase in size and scope, to adequately address the vulnerability of existing and new transport infrastructure and services.

The transport sector does not operate in a vacuum and impacts on many other sectors and the efficient use of resources. Its role as an enabler of economic growth cannot be neglected in the developing world, and developing countries should pursue a 'leapfrogging' approach to low carbon mobility, learning from the experience of the

developed world. The transport sector therefore represents an opportunity to make significant reductions to global emissions, stabilise the impacts of climate change and introduce mechanisms that provide paths to social and economic development as well as to environmental protection.