



ITF CLIMATE CHANGE CONFERENCE **MEXICO CITY**
4 AUGUST 2010

DISCUSSION DOCUMENT

TRANSPORT WORKERS AND CLIMATE CHANGE: TOWARDS SUSTAINABLE, LOW-CARBON MOBILITY



ITF CLIMATE CHANGE WORKING GROUP IN COLLABORATION WITH

GLOBAL LABOR INSTITUTE (GLI), SCHOOL OF INDUSTRIAL
AND LABOR RELATIONS, CORNELL UNIVERSITY







ACKNOWLEDGEMENTS

This discussion document has been produced by the **ITF Climate Change Working Group** in collaboration with the **Global Labor Institute (GLI)**, School of Industrial and Labor Relations, Cornell University, New York.

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The ITF would like to extend a big thank you to Sean Sweeney and Lara Skinner from the Global Labor Institute at Cornell University who were commissioned to assist the ITF climate change working group with research and writing. Their ideas, knowledge, skills and commitment to climate and social justice resulted in a very stimulating and challenging process of which this discussion document is a proud result!

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INTRODUCTION

Climate change is the biggest single challenge ever faced by human civilization. Human economic activity has put so much carbon dioxide (CO₂) and other greenhouse gas emissions (GHGs) into the atmosphere that serious global warming is already happening. As a society, we have no choice but to reduce these emissions drastically in order to stand a good chance of avoiding potentially catastrophic changes in our climate. Moreover, emissions from transport are rising faster than emissions from any other sector and in some cases the increase in transport emissions is counteracting emissions reductions achieved in other sectors. Lowering transport emissions presents a series of unique and formidable challenges.

The good news for transport workers is that a serious approach to emissions reductions will create new opportunities for quality employment, particularly in public transport, railways (both passenger and freight), transport infrastructure, road repair, and in developing clean transport technologies.¹ But failure to act on climate change will have the opposite effect. A landmark 2007 study on the economics of climate change, known as the Stern Review, concluded that global warming, if left unchecked, would lead to a massive economic downturn comparable to the combined effects of the two world wars and the Great Depression of the last century.² The loss of jobs and the implications for workers and communities are likely to be very severe – infinitely more severe than the impacts brought about by measures needed to reduce emissions.

Meanwhile, climate change is not a problem for tomorrow; it is already having a huge impact on both the lives and livelihoods of many millions of people.

Already 150 million people can be described as “climate refugees” – forced to uproot as the result of failed crops, floods and droughts and other changes. The fact that an average 262 million people per year were affected by climate-related disasters during 2000 – 2004, underlines the scale of the threat.³

Unfortunately, the battle to reduce emissions has yet to really begin in earnest, and we are quickly running out of time. Emissions are rising globally and the pace of transport emissions’ growth is quickening. But according to the scientific consensus, the world has perhaps a decade to begin reducing emissions. And, especially for the global South, approaches must be developed that allow vulnerable regions and countries to adapt to the climate change that is already occurring. The finite nature of oil and natural gas, and the fact that coal is only available in certain parts of the world (principally China, the US, and a handful of other countries) means that a transition away from fossil fuels to a new energy economy will need to occur sooner if not later.⁴ Because of climate change, we cannot wait for fossil fuels to run out before we begin the transition. The transition must be fair to workers and communities, and planned and implemented over several decades.

ITF affiliates have become engaged in a range of initiatives aimed at both controlling and reducing transport-based emissions and will continue to do so. Efforts to directly and indirectly assist in reducing emissions are fully consistent with the ITF’s existing commitment to help bring about a truly sustainable transport system that provides good jobs for workers in all transport sectors, and promotes safe, affordable, responsible and sustainable mobility for all. However,

¹ See Part Two for citations of studies that consider the employment implications of low-carbon mobility

² Stern, N. (2006). “Stern Review on The Economics of Climate Change (pre-publication edition). Executive Summary”. HM Treasury, London. Archived from the original on 2010-01-31. <http://www.webcitation.org/5nCeyEYJr>. Retrieved 2010-01

³ ITUC (Guy Ryder), Global Unions statement on climate change. http://www.global-unions.org/IMG/pdf/GreenGrowth_Web.pdf

⁴ See: International Energy Agency. 2007. *Oil Supply Security 2007: Emergency Response of IEA Countries*. Organization for Economic Cooperation and Development and the International Energy Agency, Paris.

it is crucially important that these efforts are grounded in a clear and comprehensive assessment of the challenges posed by climate change; an awareness of both the real and potential climate solutions involving transport and other key economic sectors, and a sense of what strategies ITF affiliates can pursue in order to make a difference. The goal of this document is to present a discussion framework for the ITF's future climate work along these lines.

The ITF, along with its trade union and social movement allies, should not leave to governments and employers the task of proposing or developing solutions to the climate crisis. Just as the large corporations and political leaders have failed to protect the livelihoods of workers and communities, they have failed to even begin to seriously deal with rising emissions. And if or when they change course, they will need all the help they can get from unions to deal with this immense challenge. Currently, the market-based solutions they propose to reduce emissions have yet to produce real results, and there is strong evidence to suggest that emissions will only be brought under control when the profit and growth-driven dynamics of the global economy are intercepted and the dynamics of sustainability take their place. A deep restructuring of political and economic life is therefore necessary.

This document draws on the experience and thinking of ITF affiliates, and also rests on the solid body of work the ITF and European Transport Workers' Federation (ETF) have already done to promote and fight for truly sustainable mobility within a framework of social justice. For many trade union organisations, climate change is a relatively new area of work. What follows, therefore, is more a work in progress than a blueprint, but it aims to provide a framework for discussion that might serve as a guide to develop further thinking, concrete actions, and alliance-building on the part of transport unions internationally.

The ITF and trade unions everywhere should seek a genuinely sustainable economy that meets basic needs and desires in a way that does not compromise the ability of the planet to sustain life and for current and

future generations to enjoy a safe and healthy environment. This may require redefining wealth in a way that values more free time, a rich and diverse culture, vibrant communities, a less stressful working life, and more meaningful personal relationships. Such a society would reject the "just-in-time" production culture and destructive consumerism every bit as much as it would reject poverty and hardship that are today rampant in many parts of the world. For the half of humanity still living in extreme poverty, the task must be to largely 'decarbonise' development and to prioritise basic needs like decent jobs, health care, education, good quality services and safe communities.

While recognising the immense dangers posed by climate change, the ITF should also see the crisis as a massive opportunity for trade unions to partner with each other and with other social movements to bring to birth a different world - a world that ends once and for all the common abuse suffered by both people and the environment. The political and social solutions that need to be applied to address both the causes and effects of climate change can also be used to redistribute wealth more fairly and thus allow us to tackle mass poverty, malnutrition, unemployment, insecurity, poor health and other social inequalities suffered by a large portion of humanity.

The ITF should join other organisations in the world which believe the climate crisis is so severe that bold solutions are needed. The ITF should stand with a growing number of unions and social movements who understand that global warming emissions are a symptom of a systemic problem. We suggest that what is needed is a new economy that is driven by broad social and environmental priorities, one held together by human cooperation and social solidarity. This is a world worth fighting for, for this generation and for future generations. It is an effort that must be guided by a clear commitment to equity and solidarity that embraces the needs and concerns of workers from the global South and North. However, bringing it about will require sustained involvement by our members, the international trade union community, and workers everywhere. Another economy is necessary; it is also possible. The ITF should be ready to play its part.

THIS DOCUMENT CONSISTS OF THREE PARTS:

PART 1 – THE CHALLENGE.

Here we review what the scientific community is saying about climate change and what needs to be done to avoid catastrophic climate change. It also shows the transport sector's contribution to the emissions problem. Finally, it deals with the political challenge we face – and explains why the battle against emissions in transport and across society is currently being lost.

PART 2 – THE SOLUTIONS.

Here we offer a global scenario for the dramatic reduction of emissions from transport, based on a “Reduce – Shift – Improve” framework. We examine three main strategies for reducing transport emissions: reducing the unnecessary movement of goods and people that is based on unsustainable social and environmental conditions; shifting the movement of people and goods from high-carbon to low-carbon modes of transport; and the technological possibilities for reducing transport emissions. These strategies encompass broad policy options driven by a “whole economy” perspective on reducing emissions. As a global organisation of workers, we should seek solutions that unite workers both in the developed and developing world, fully understanding that countries and regions have different capacities and responsibilities - across industries and across public and private sectors.

PART 3 – THE STRATEGY.

ITF affiliates should be part of a long-term and global effort to build truly sustainable, low-carbon transport systems. Here we offer some ideas and proposals that are consistent with the ITF's existing policies. These proposals are shaped with five goals in mind – to advance climate protection policies and solutions; to improve the working and living conditions of our members; to educate and mobilise our members; to increase the size and strength of our unions; and to build durable alliances with other movements who share our vision of a low-carbon and sustainable world.

PART ONE

THE CHALLENGE: SCIENCE, POLITICS AND TRANSPORT

The scientific community has made clear what needs to be done if human society is to have a reasonable chance of stabilising and reducing global warming and thus avoiding potentially catastrophic climate change. First and foremost, the volume of greenhouse gas emissions (GHGs) entering our atmosphere needs to be sharply and quickly reduced. According to the UN's Intergovernmental Panel on Climate Change (IPCC), GHG emissions must peak globally by 2015 and be cut by 50 - 80 percent by 2050 based on 1990 levels. In order to reach this global target developed nations should achieve 25 - 40 percent cuts by 2020.¹

In climate policy circles, the main conversation has revolved around the need to limit the increase in global warming to below 2 degrees Celsius based on pre-industrial levels.²

This has created the idea that 2 degrees of warming is more or less acceptable, and anything higher than that puts the world in serious danger. However, it is necessary to note that the 2 degree target is essentially a political construct, and not one that has emerged from the scientific data. According to the IPCC's 2007 report, the effects of a rise in temperature of just one degree will itself be very serious. For example, 300,000 people will die of malaria, severe food disruptions will hit Africa, extreme weather events will increase and glacier melt will accelerate. Between 1 and 2 degrees

of warming is expected to harm crop productivity by up to 50 percent in the tropics and low altitudes. And 1 to 3 degrees of warming will generate widespread coral bleaching (up to 80 percent potentially) and reef mortality. At about 2 degrees, the IPCC warns of severe water shortages affecting 1 billion people; tropical forest ecosystems collapsing; 40 - 60 million more people being exposed to malaria; and 10 million people being endangered by coastal flooding.

The ITF should recognise that a 2 degree average increase in temperature will be devastating to vulnerable countries and communities.

Just 2 degrees of warming would also acidify the world's oceans, wiping out much of the plankton upon which the marine ecosystem depends.³ The IPCC notes that the earth's temperature has already risen to 0.7 degrees Celsius above pre-industrial levels.⁴ Even if emissions were to be stabilized to 2000 levels, temperatures are likely to rise another 0.6 degrees by the end of the century.⁵

The ITF should recognise that a 2 degree average increase in temperature will be devastating to vulnerable countries and communities. Currently, the accelerating levels of arctic warming and other climate impacts are enough to indicate that we are already outside the 'safe zone', and more drastic reductions in emissions are therefore necessary.⁶

¹ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Synthesis Report. Contribution of Working Group I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Geneva, Switzerland: IPCC) Hereafter: Fourth Assessment Review (FAR 2007)

² For example, see statement of G8 Nations, L'Aquila, Italy, July 8, 2009

³ United Kingdom's Royal Society, 'Ocean Acidification Due to Increasing Atmospheric Carbon Dioxide', Policy Document June 2005

⁴ IPCC, FAR 2007

⁵ IPCC: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-7.html

⁶ The scientist most associated with this perspective is NASA scientist James Hansen. According to Hansen, the 'safe' level of warming is 1.5 degrees Celsius or less.

⁷ IPCC (2007) *Climate Change 2007: Synthesis Report. Contribution of Working Group I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Geneva, Switzerland: IPCC);

⁸ From 1958 to 2008 the number of cars increased from 86 million to 620 million. The number of air passengers skyrocketed from 68 million in 1955 to 2 billion in 2005. See Worldwatch Institute, *State of the World Report*, 2010.

⁹ Ibid. p 87).

¹⁰ New Economics Foundation, *Growth Isn't Working* (2006) <http://www.neweconomics.org/publications/growth-isn%E2%80%99t-working/s/growth-isn%E2%80%99t-working>

¹¹ New Economics Foundation, *Growth Isn't Possible*, (2010) http://www.neweconomics.org/sites/neweconomics.org/files/Growth_Isnt_Possible.pdf

EMISSIONS, GROWTH AND DEVELOPMENT

The severity of the climate crisis compels us to take a fresh and critical look at concepts like ‘growth’ and ‘development’. Two and a half centuries of economic activity have released cumulatively more than 1800 gigatons (Gt) of CO₂ into the atmosphere.⁷ Today the world economy is five times bigger than it was in 1950. During this time the number of cars on the roads has grown almost eightfold.⁸ In 2008 alone, 68 million vehicles were sold.⁹ As consumption levels increase, so do emissions. In many countries, efficiencies have been introduced that have meant that less energy is used per unit of growth, but that has not stopped the rise in emissions. To illustrate, growth may be 3 percent a year, but energy use may grow by only 2 percent – but the end result is the same: emissions increase with economic growth. From an environmental standpoint the present development model is unsustainable.

The present development model is also unsustainable from a social standpoint. Rising levels of consumption have not altered the fact that roughly half of the world’s population still lives on less than US\$2 per day, almost 1 billion people are seriously underfed, and similar numbers lack access to fresh water and electrical power.¹⁰ Moreover, it is the poorest people in the poorest regions of the world who are today affected by global warming and degradation of the environment generally. Clearly, the present model is bereft of any universal or reliable mechanisms for distributing wealth fairly and more growth is unlikely to solve most of the world’s major social problems and will actually make them worse due to the economic damage caused by the added stress inflicted on our ecosystems.¹¹ The kind of growth that is needed – social growth grounded in environmental sustainability – is an issue we return to in Part 3.

CHEAP TRANSPORT DRIVES EMISSIONS UPWARD

The ITF is keenly aware that for almost thirty years multinational corporations and political leaders have embraced policies and practices that have led to accelerated levels of emissions in all sectors with emissions from transport leading the upward charge. Cheap transport is the blood that runs through the veins of the liberalised global economy. It has been achieved in part by removing government regulations on transport, by lowering the pay and conditions of transport workers, and by subsidising fuel costs.¹² The environmental and social price of cheap transportation is then paid by workers and communities in the form of lower wages, precarious work, long hours, poor health, as well as noise, pollution, and now climate change.¹³ While data on global job growth in transportation is sketchy, the number of jobs in transportation has almost certainly risen sharply in the last two decades or so. However, the ITF is acutely aware that in most instances the quality of jobs created in the transport sector are very poor in terms of income, stability, and safety. Furthermore, because of their role in defending transport workers’ pay and conditions, unions have come under attack in many areas of the world. In the US, motor carriers have competed for business by cutting wages, not raising efficiency. Since deregulation began in 1980, 79 percent of the total cost savings can be attributed to wage and benefit cuts alone, and the proportion of drivers belonging to unions has plummeted from 60 percent to just 11 percent.¹⁴ In aviation, British Airways’ recent move to end the travel benefits of cabin crews is just the latest in a long series of cost-cutting measures.¹⁵ In 2005, the airline catering company Gate Gourmet hired non-union workers in an effort to drive out the Transport and General Workers’ Union, an ITF affiliate.¹⁶

Clearly, the present model is bereft of any universal or reliable mechanisms for distributing wealth fairly and more growth is unlikely to solve most of the world’s major social problems

¹² Unite the Union, Sustainable Transport and the Environment, (2009); European Transport Workers Federation, Towards a Trade Union Vision on Sustainable Transport (TRUST), Strategy Paper, Brussels, February 2008.

¹³ European Transport Workers Federation, TRUST Strategy Paper. TRUST lists: Extending working time and even violating the existing legislation on working time; increasing work intensity and flexibility; lowering wages through replacing quality jobs by precarious working conditions (part time, fixed term contracts; agency workers); out-sourcing and sub-contracting; (Bogus) self-employment; social dumping by undermining national/regional standards; reducing investments in training and qualification; reducing investments in health and safety standards; discouraging the employment of EU nationals so as to apply the terms and conditions from the country of origin in the maritime sector. origin in the maritime sector.

¹⁴ David Bensman, “Moving the Goods: The Case for Federal Freight Regulation and Investment” (Demos – draft, forthcoming). See also Michael Belzer, “Paying the Toll,” Economic Policy Institute, 1994. Also see, Michael Belzer, “Collective Bargaining under Deregulation: Do the Teamsters Still Count?”, Industrial and Labor Relations Review, Volume 48, Issue 4, July, 1995. See also Belzer, Sweatshops on Wheels: Winners and Losers in Trucking Deregulation, New York, Oxford University Press, 2000, p. 100; “Media Note,” American Trucking Association, <http://www.truckingline.com/StateIndustry/Documents/ATADriverShortageStudy05.pdf>, accessed Feb. 19, 2009.

¹⁵ Unite the Union, http://www.unite-theunion.com/news_events/latest_news/ba_bullying_backfiring_as_crew.aspx

¹⁶ See ITF, <http://www.itfglobal.org/solidarity/gategourmet.cfm>

Neoliberal policies have therefore exacerbated both the emissions problem and the social problems, and this is especially true in the case of transportation. A measure of this is the 29 percent increase in emissions from fossil fuels that occurred between 2000 and 2008. This dramatic increase is partially explained by increased motorisation of the global South and sharp increases in global trade that took place during the same period.¹⁷ The estimates for total freight costs for all modes of transport are just 5.9 percent of the value of imports; the share is lower in developed countries (4.8 percent) and higher in developing countries (7.7 percent).¹⁸ The low cost of moving goods is therefore a major driver of globalisation.

While much attention has been paid to the increase in global trade, it is also important to note that neoliberal policies have also seen an increase in the use of the most polluting means of moving goods. For example, driven by subsidies and neglected infrastructure, US freight moved by road has increased at the expense of freight moved by rail. This not only generates more emissions, it impairs efficiency and safety and exacts a high cost in terms of public health.¹⁹ Today the U.S. transport system emits more CO₂ than the entire economy of any other nation, excluding only China.²⁰

As we look towards developing solutions to both the environmental and social problems associated with today's transport systems, it is important to recognise that the "growth imperative" in the economy existed long before the neoliberal period and will continue even in the event of a significant policy shift to correct the excesses of free-market ideology. Rising emissions and climate change are therefore symptoms of a deep disharmony between the dynamics of global capitalism and our fragile ecosystems. The stability of one is seemingly incompatible with the stability of the other. Therefore any alternative policy framework that fails to intercept and reverse the systemic drive for traditional growth and accumulation, (where most of the benefits are enjoyed by a minority) will simply replace one failed model with another.

MITIGATION AND ADAPTATION

In the world of climate policy, the measures and actions taken to reduce emissions are known as "mitigation," while efforts to minimise the effects of global warming are known as "adaptation." The need for adaptation flows from the fact that climate change is happening now. Moreover, the impacts are already being felt by millions of people, especially in the poorer countries. Poor people and women are particularly affected by such things as failed crops and the spread of killer diseases like malaria. Melting glaciers lead to loss of fresh water supplies in summer time; droughts disrupt agriculture; and rising sea levels wreak havoc on coastal communities. These and other consequences of global warming add to the numbers of displaced "climate refugees" who are forced to try to relocate and survive somewhere else. These communities suffer a double inequity – they did not cause global warming, but they are the first ones to feel its effects. In the decades to come, these effects will grow more severe and will affect many more people.

This document mostly deals with mitigation – how to reduce emissions – although the ITF should recognise the importance of adaptation and its implications for transport workers and human civilisation as a whole. Certainly, transport systems will need to be more climate resistant in the years ahead, and policies must be developed now in order to ensure that infrastructure built today will be able to handle warmer temperatures and more extreme weather events. The need to both reduce emissions while at the same time adequately preparing for the challenges and disruptions brought about by a warming world is therefore clear, both in scientific and human terms.

¹⁷ Corinne Le Quéré, Michael R. Raupach, Joseph G. Canadell, Gregg Marland et al, "Trends in the sources and sinks of carbon dioxide," *Nature Geoscience* 2, 831 - 836 (2009) Published online, November 2009, <http://www.nature.com/ngo/journal/v2/n12/abs/ngo689.html>

¹⁸ UNCTAD, 2007 Review of Maritime Transport, NY, Geneva

¹⁹ Transportation for America, See also Bensman DRAFT

²⁰ Transportation for America, Platform, Page 22 Cited by Bensman DRAFT

RESPONSIBILITIES OF DEVELOPED AND DEVELOPING COUNTRIES

The global debate on reducing emissions has been framed in terms of determining appropriate national reduction commitments; establishing who is responsible for what levels of reductions, and in what time frame. The UN's Framework Convention on Climate Change (UNFCCC) has worked with the principle that governments should act to protect the climate system "on the basis of equality and in accordance with their common but differentiated responsibilities and respective capabilities."²¹ In terms of responsibilities, rich countries today are responsible for more than 60 percent of annual emissions even though only 20 percent of the global population lives in those countries. Moreover, the life cycle of CO₂ is such that any carbon put into the atmosphere in the past several decades will have an impact on our climate for another century or so. Therefore developed countries are responsible for 80 percent of the cumulative emissions bringing about climate change today and into the future. Since 1950, the US has emitted a cumulative total of roughly 50.7 billion tons of carbon, while China (4.6 times more populous) and India (3.5 times more populous) have emitted only 15.7 and 4.2 billion tons respectively.²² In addition to this double responsibility, reflected in both annual and cumulative emissions levels, developed countries also have greater political, technological and financial capability to reduce emissions than many countries in the developing world.

However, emissions are also growing rapidly in the larger developing countries. China is today the largest emitter, and most of the future growth in emissions will come from the developing world. Responding to climate change will therefore require that actions be taken by developing countries to first slow their emissions trajectories and then reduce emissions over the longer term.

While political leaders argue about emissions and who should make what reductions, emissions nevertheless continue to rise. Between 1990 and 2007 CO₂ emissions rose 19 percent globally. This rise has been driven by surging emissions from China (73 percent increase) and India (88 percent increase) as well as the United States (20 percent increase) and Japan (15 percent increase). Europe's emissions (European Monetary Union countries) climbed by 3 percent over the same period.²³ Despite rapid growth in India and China, per capita emissions still lag far behind those of Europe and the United States. Fossil fuels continue to be the dominant source of energy, responsible for generating 66 percent of electricity worldwide.

Therefore developed countries are responsible for 80 percent of the cumulative emissions bringing about climate change today and into the future.

21 UNFCCC

22 World Resources Institute, "Climate Change and Developing Countries". See: <http://archive.wri.org/page.cfm?id=1284&z=?>

23 World Bank, 2007
[http://siteresources.worldbank.org/INTDATA/64199955-1178226923002/21322619/LGDB2007.pdf](http://siteresources.worldbank.org/INTDATA/64199955-1178226923002/21322619/LGDB2007.pdf226923002/21322619/LGDB2007.pdf)

TRANSPORT'S CONTRIBUTION TO EMISSIONS

It is important for transport unions to have a clear sense of transport's contribution to the overall volume of emissions, including the part played by different modes of transport today and into the future, and what can be done to reduce emissions. Furthermore, it is necessary to look at the economy as a whole in order to identify the connections between transport-based emissions and the way the economy operates and functions.

According to the IPCC, transport-based emissions are presently 13.1 percent of total GHG emissions. In high-income economies, transportation's share of GHG emissions is even higher – 26 percent in the United States and nearly 19 percent in the European Union. Importantly, emissions from transportation have increased by 120 percent over the past 30 years and are increasing in all regions of the world.²⁴ Transport is also the fastest growing consumer of energy in developing countries.²⁵ The IPCC and climate policy makers already recognise that reducing transport-related emissions is a particularly tough nut to crack. Not only are transport-related emissions growing faster than is the case with any other sector, but technological improvements are at best only a weapon in the war against emissions, and not a strategy – a fact acknowledged by the IPCC itself.²⁶ It concludes: “Only with sharp changes in economic growth, major behavioral shifts, and/or major policy interventions would transport GHG emissions decrease substantially.”²⁷

Table 1 shows the steep growth in road and non-road transport energy consumption and emissions from 1971 to 2000, by OECD and non-OECD countries.

As Table 1 makes clear, the developed countries of the OECD, while representing approximately 20 percent of the global population, account for the bulk of transport-related emissions – around two-thirds of the total. Furthermore, road transport currently accounts for 74 percent of all emissions from transport and the ratio of road and non-road emissions is similar in both the developed countries of the OECD and the developing world. Moreover, emissions from road freight are growing at a faster rate than passenger transport.

The remainder of transport-based emissions comes from several sectors. Domestic and international aviation account for 12 percent of the total, and these emissions are also growing rapidly. Emissions from shipping and water-based transport presently stand at 10 percent of the whole. Rail is responsible for 2 percent of emissions according to the IEA.

Tables 2 and 3 show that transportation is a significant and growing contributor to GHGs and energy consumption. Transport activity is responsible for 13.1 percent of all greenhouse gas emissions and 23 percent of CO₂ emissions from fossil fuel combustion – 30 percent in OECD countries.

Overall, the data presented above present a clear picture. Emissions from transport and other sectors

are rising globally and in most countries of the world. Transport-related emissions are growing at a faster rate than emissions as a whole. And almost 75 percent of transport emissions are from road transport – especially cars and trucks. Rapid motorisation of the global South is currently underway and, if not apprehended, emissions from transport will continue to rise.

According to the IPCC, transport-based emissions are presently 13.1 percent of total GHG emissions. In high-income economies, transportation's share of GHG emissions is even higher

²⁴ UN Development Program, Human Development Report, 2007/8). See also ITF Executive Board Apr 08/9(b)

²⁵ Unite the Union, Sustainable Transport and the Environment, (2009) DRAFT page 11

²⁶ IPCC, cited by UNEP, http://www.grida.no/publications/other/ipcc_sr/?src=/Climate/ipcc/tectran/16.htm

²⁷ IPCC Transport and its Infrastructure, 2007: 336

²⁸ IEA, 2006c: Energy Balances of Non-OECD countries, 2003-2004. International Energy Agency, Paris, 468pp.
IEA, 2006d: CO₂ Emissions from Fuel Combustion 1971-2004. International Energy Agency, Paris, 548pp.

²⁹ World Business Council on Sustainable Development, Meeting the Challenges to Sustainability (2004)

TABLE 1: ENERGY CONSUMPTION AND CO₂ EMISSIONS IN THE TRANSPORT SECTOR.²⁸

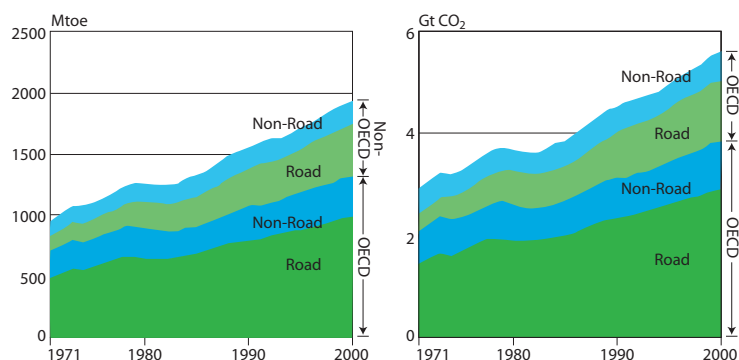


TABLE 3: PROJECTION OF TRANSPORT ENERGY CONSUMPTION BY REGION AND MODE. (SOURCE: WBCSD, 2004A).²⁹

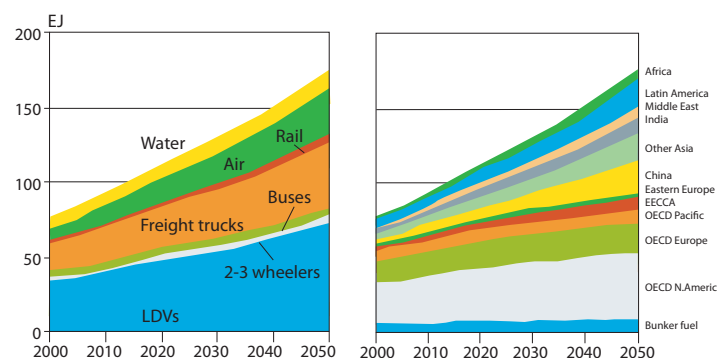
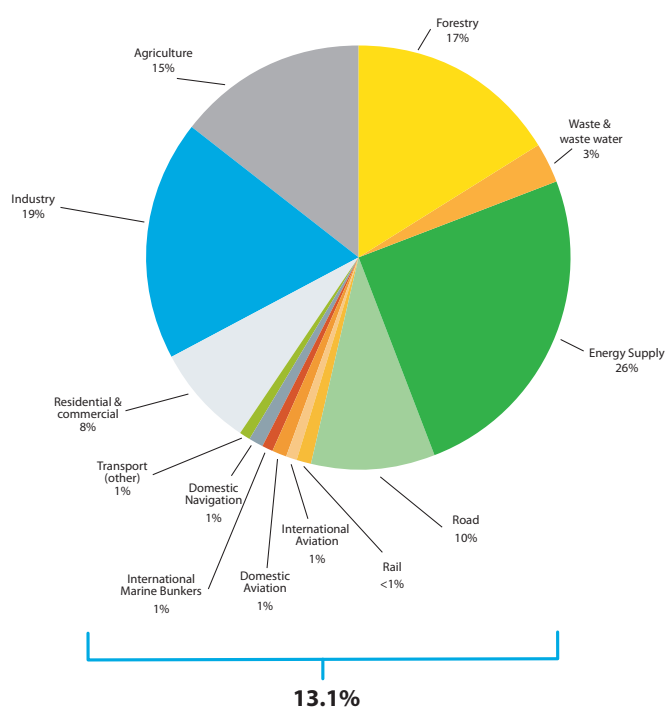


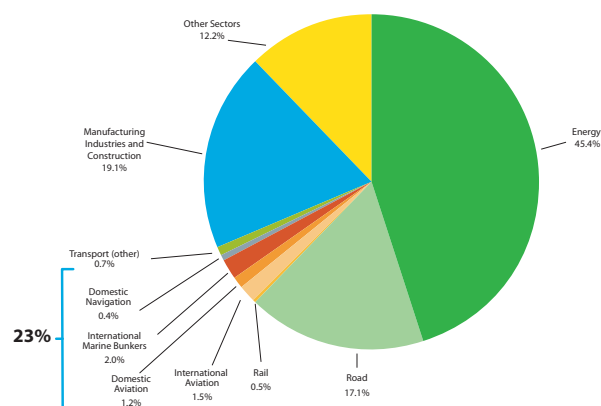
TABLE 2: CO₂ EMISSIONS BY SECTOR AND CO₂ EMISSIONS FROM FUEL COMBUSTION

(SOURCE: IEA 2007 AND NATIONAL REPORTS TO UNFCCC)

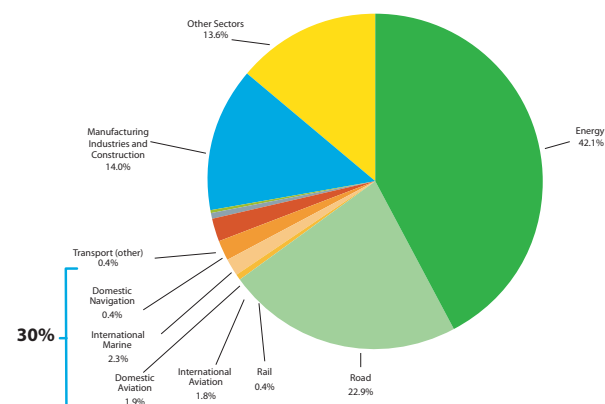
WORLD GHG EMISSIONS BY SECTOR: 2004



CO₂ EMISSIONS FROM FUEL COMBUSTION: 2008



OECD (49.6% OF THE WORLD CO₂ EMISSIONS FROM FUEL COMBUSTION)



GLOBAL INSTITUTIONS AND POLICIES

Part of coming to terms with the climate challenge involves recognising that recent and existing efforts to reduce emissions have failed and will probably continue to fail, and that a new approach is needed. This is not, as is often described, merely a problem of “political will”. It is more a systemic problem – we live in an economy that is driven by growth, profit, competition and consumption. These dynamics shape political options that operate within the confines of a completely unsustainable economic system.

Important policy and financial institutions like the World Bank and the International Monetary Fund reflect the contradictions. They acknowledge climate change, but they continue to promote neoliberal, trade-led globalisation that has seen emissions levels accelerate in recent years.³⁰ The Bank’s 2006 *Transport for Development* report recognises that emissions are a serious problem – but it invests considerable faith in technological solutions that enhance fuel efficiency. Unfortunately, the report then goes on to prescribe a suite of policies that will lead to the excessive building of roads, more vehicles to fill those roads, more movement of goods across borders, and thus more shipping and air travel. All of this leads to more emissions, not less. The Bank’s development model also contributes to deforestation and the movement of people away from smallholder agriculture which, in turn, seriously reduces the earth’s capacity to absorb carbon from the atmosphere.³¹ Similarly, within the EU, policy commitments to advance sustainable transport have failed to meet their targets and deadlines because the push for further economic liberalisation negates any progress that might be made in the direction of sustainability.³² World Bank projects have been met by fierce opposition and resistance in many countries, and in recent years, this has forced the Bank to admit that liberalisation and privatisation do not always work, and that the public sector does indeed have an important role to play in the provision of transport services. However, a neoliberal approach is still the order of the day in the Bank, and a decisive change of course is clearly necessary.³³

POLITICAL IMPASSE

The drive for ever more growth, consumption and profit explains why political efforts to fight global warming continue to trail a long distance behind both scientific necessity and technical possibilities. What must be done, and can be done, is simply not being done. Emissions continue to rise even as the scientific data on what is happening to our climate gets more and more disturbing. While some of the developed countries who were mandated to introduce emissions reductions under the Kyoto agreement will probably meet their targets (collectively 5.2 percent below 1990 levels) by 2012,³⁴ countries with a Kyoto target only comprised 20 percent of global emissions in 2005. The achievement of some countries therefore needs to be viewed in the context of accelerating levels of emissions, especially during the period before the 2008 recession, and far more disturbing scientific reports regarding the seriousness of the climate crisis.³⁵

As the Kyoto agreement comes close to its 2012 expiration date, political efforts to both include more countries in the effort to reduce emissions and to make the kind of reductions that can actually help the fight against global warming have run into serious trouble. The 2009 UN meeting in Copenhagen did not produce a fair and legally-binding global agreement and as of this writing the UN process is in danger of collapse. The “Copenhagen Accord” distributed at the end of the Conference – which was ‘noted’ rather than approved as a UNFCCC document – failed to establish strong science-based targets for emissions. Meanwhile, national reduction commitments made under the Accord have tended to fall far short of what science says is needed, and these commitments have themselves, of course, yet to be realised.

30 According to Frances C. Moore (2007) of the Earth Policy Institute, “Emissions from the burning of fossil fuels stood at a record 8.38 gigatons of carbon (GtC) in 2006, 20 percent above the level in 2000. Emissions grew 3.1 percent a year between 2000 and 2006, more than twice the rate of growth during the 1990s. Carbon dioxide emissions have been growing steadily for 200 years, since fossil-fuel burning began on a large scale at the start of the Industrial Revolution.” See <http://www.earthpolicy.org/index.php?/indicators/CS2/>

31 World Bank, Transport Sector Board, “Safe, Clean and Affordable...Transport for Development: An Update on the World Bank’s transport sector priorities for the period 2007-2013.” (Autumn 2006) World Bank, Washington, DC.

32 As the ETF’s TRUST report notes, “The rise of containerization in freight transport or the creation of hub systems in passenger transport, entail a division of the transport chain between the various modes. A container is transported successively by one or several trains, boats or airplanes, barges, lorries from one end to the other end of the supply chain whereas a passenger may use a car or a taxi, a train, a subway, a plane, a bus from one to the other end of his/her journey. Transport corporations are increasingly multimodal in order to control the whole supply chain. These networking tendencies are being challenged by short-term profit ambitions and deregulation which have reinforced the modal transfers onto the road. To re-regulate means to rehabilitate public policies, from the local up to the global level, with a view to promoting, within the supply chains, modal shifts towards economically, environmentally and socially more relevant modes.” ETF, TRUST, op cit.

33 World Bank, “Safe, Clean and Affordable...” op. cit. As the World Bank also notes, transport investment in Latin America has collapsed from its 1980s level—a region that has privatised most of its railways and ports. See also ITF, “Comments on the World Bank draft paper, Safe, Clean and Affordable: Transport for Development, (July 2006) p 3

34 The Kyoto Protocol saw industrialised countries (described as “Annex I countries”) commit to cut greenhouse gas emissions by 2012 to a level 5.2 percent lower than those of 1990.

35 For date on the Kyoto targets, see: <http://www.pbl.nl/en/dossiers/COP13/Bali/moreinfo/Industrialised-countries-will-collectively-meet-2010-Kyoto-target.html>

AVIATION AND SHIPPING

In an effort to address emissions from aviation and shipping (which are not covered by the Kyoto Protocol or national commitments) the UN partnered with the International Civil Aviation Authority (ICAO) and the International Maritime Organization (IMO). The UNFCCC has openly expressed frustration with the IMO and ICAO for their lack of action on emissions, and pledged to include both shipping and aviation in the post-2012 treaty. However, neither shipping nor aviation is referred to in the Copenhagen Accord.

Meanwhile ICAO has pointed to the progress made by aviation in reducing the impact of engine emissions over the past 40 years. In October, a high-level meeting of the 190 ICAO Member States, representing 93 percent of global commercial air traffic, reached agreement on further reducing aviation's impact on climate change. Looking forward, ICAO seeks to reach a global goal of 2 percent annual improvement in fuel efficiency until the year 2050, to promote technology transfer to developing countries, and to develop sustainable alternative fuels.³⁶ ICAO's Committee on Aviation Environmental Protection (CAEP) has committed to a timetable for the development of a CO₂ Standard for commercial aircraft, aiming at 2013, a milestone that would establish the first global fuel-efficiency standard for any industry sector.³⁷ Meanwhile, from 2012, aviation will be brought into the EU's Emissions Trading System (EU ETS) covering all flights departing from and landing within the EU – a measure opposed by the airline companies.³⁸

In the case of shipping, developed countries were expected to pursue reductions by working through the International Maritime Organization (IMO). One of the problems lies in the contradiction between the Kyoto principle of “common but differentiated

responsibilities” that is based on different national commitments and the IMO's principle that all nations be treated equally. The “flag of convenience” system has ensured that over 50 percent of international shipping is presently flagged in developing countries, even though they are owned by and mostly carrying goods to and from developed countries. Under Kyoto developing countries were not asked to reduce emissions, and a post-2012 treaty (if one can be agreed) will expect developed countries to make the most reductions – which would mean much of shipping could escape making reductions commitments because of where ships are flagged. Meanwhile, the IMO is currently working on changes in shipping design and operational standards.

Clearly, the present model is bereft of any universal or reliable mechanisms for distributing wealth fairly and more growth is unlikely to solve most of the world's major social problems

The efforts of ICAO and the IMO to tackle emissions in, respectively, aviation and shipping need to be seen in the context of other sectors' rapidly rising emissions levels. In its Fourth Assessment Report, the IPCC reported that aviation was growing at 5.9 percent per year (2006 data) with freight traffic growing faster than passenger traffic.³⁹ Emissions from shipping

have also been growing rapidly in recent years and in the absence of regulation are predicted to reach 6 percent of the global total by 2020, more than twice the industry's present 2.7 percent share of global emissions.

The IMO has faced considerable criticism for the fact that, in the 13 years since the Kyoto Protocol was adopted, it has only in recent years agreed on binding regulatory measures. During the same period, emissions from shipping are described as having risen by roughly 50 percent.⁴⁰ The IMO is presently looking at the mitigation potential of market based measures like an Emissions Trading System for International Shipping (ETSIS) or a charge on bunker fuel (perhaps \$45 per ton of fuel) as a means of incentivising technical and operational changes across the industry

36 International Civil Aviation Organization, ICAO, <http://www.icao.int/newscentre>

37 ICAO, <http://icaopressroom.wordpress.com/2010/02>

38 Unite the Union, “Aviation and the Environment,” July 2009

39 The IPCC noted that Airbus and Boeing projected “passenger traffic growth trends of 5.3 % and 4.9 % respectively, and freight trends at 5.9% and 6.1% respectively over the next 20 or 25 years”. It concluded that “these forecasts and others predict a global average annual passenger traffic growth of around 5% – passenger traffic doubling in 15 years – with freight traffic growing at a faster rate than passenger traffic, although from a smaller base.” See IPCC, FAR, 2007

40 See Friends of the Earth/ Greenpeace/World Wildlife Foundation, Submission to the Marine Environment Protection Committee of the IMO, 22 May 2009

to save fuel.⁴¹ However, the results of an IMO-commissioned study have concluded that given the anticipated increase in seagoing trade, at best, these measures can deliver a 15 percent reduction based on 1990 levels by 2050, and that deeper cuts would require the industry utilising large volumes of offsets through the Clean Development Mechanism established under the Kyoto Protocol – which essentially means the industry will pay for others to reduce their emissions but have those reductions attributed to reductions made from shipping.⁴² In the lead up to the talks in Copenhagen, there were calls for marine bunker fuels to be brought into a new agreement, but with major uncertainties surrounding the global negotiations, these actions to control and reduce emissions from shipping seem a long way off.

The internalisation of these costs (“true cost pricing”) will factor into consumer prices the full costs of environmental damage. This, in turn, would create greater market transparency and the use of fewer resources would make products cheaper.

ECOLOGICAL MODERNISATION AND “GREEN CAPITALISM”

The actions (and inactions) of governments and industry need to be fully comprehended if solutions to climate change are to be seriously pursued in the future. Thus far the approach to climate protection taken by governments, policy makers and business has been guided by the idea of “ecological modernisation” – or “green capitalism” – which maintains that economies can continue to grow, but that growth needs to be decoupled from the generation of more emissions and more environmental damage. As fossil fuels and most other natural resources are limited and dwindling, businesses will have to figure out how to do more with less.⁴³ Green capitalism therefore brings into alignment profits, people and the planet – known as the “triple bottom line.”

Just as the neoliberal model was inspired by the “limited state” ideas of Austrian economist Friedrich von Hayek and then proselytised by the “Chicago School” economists around Milton Friedman, the intellectual roots of “green capitalism” can be traced to a few major works, such as Paul Hawken’s *The Ecology of Commerce* and Amory and L. Hunter Lovins’ *Natural Capitalism: Creating the Next Industrial Revolution*.⁴⁴ Perhaps the core argument of green capitalism is that the old industrial capitalism neglects to assign any value to the largest stocks of capital it employs, namely “the natural resources and living systems, as well as the social and cultural systems that are the basis of human capital.”⁴⁵ This allows for the externalisation of costs onto the environment and into the future. The internalisation of these costs (“true cost pricing”) will factor into consumer prices the full costs of environmental damage. This, in turn, would create greater market transparency and the use of fewer resources would make products cheaper. Consumers would gravitate toward the least expensive products – thus compelling other producers to follow suit. Therefore government policy should be aimed at ensuring true cost pricing, but once that has happened the (now improved) markets would be able to function on their own, free of government interference.

41 IMO, Marine Environment Protection Committee, “Prevention of Air Pollution in Ships,” Jan 15, 2010.

42 Ibid, p 9

43 A number of well known commentators have championed this perspective. For examples, see: Thomas Friedman, *Flat, Hot and Crowded*; Daniel C. Esty and Andrew S. Winston’s *Green to Gold*, and the older work *Cradle to Cradle* by William McDonough and Michael Braungart.

44 Paul Hawken and Amory and L. Hunter Lovins’ *Natural Capitalism: Creating the Next Industrial Revolution*. (Little, Brown and Company, 1999)

45 Hawken et al, Chapter 1, for an online copy of Chapter 1, see: <http://www.natcap.org/sitepages/pid57.php>

PROFITS AND POLICY

A full critique of the idea of ecological modernisation or green capitalism is beyond the scope of this report. However, a number of points need to be raised in order for ITF affiliates, and unions everywhere to be able to separate out false hopes from genuine possibilities for change. Firstly, as its name implies, green capitalism puts forward “market solutions” to climate change and other environmental problems. This entails putting a cash value on nature in order to then internalise the damage inflicted on the atmosphere and the biosphere as a whole – something that is intrinsically impossible to do. Secondly, the technical and social solutions to emissions must first be seen to be profitable in order for them to be pursued. Reducing emissions from transport and across the whole economy must make money or it simply will not happen. This is a crucial point for transport and all trade unions to grasp, and we return to it several times throughout this report.

“Private firms focus on private costs to satisfy their shareholders. But this can lead to a greater emphasis on short-term profit and reduce the emphasis on innovations and other low-carbon investments that would lead to long-term environmental improvements.” – Stern Review⁵⁰

Meanwhile, the impact of this perspective on existing policy approaches to climate change cannot be understated. The hugely influential Stern Review and the subsequent writings of its main author, Lord Nicholas Stern, a former chief economist of the World Bank, speak to the dominant role of market-based solutions in today’s discussion of climate change. There are a number of fundamental problems with this growth-focused and market-led approach that will not simply go away. Firstly, for private companies, controlling emissions is a cost in the same way as paying decent wages and providing decent working conditions are also costs. In a highly competitive economy, there is a strong incentive to avoid such costs and thus preserve profit margins. Upsetting though it is to the proponents of green capitalism, efforts to implement “true cost pricing” have met fierce resistance from the capitalists themselves. Clearly, any climate protection policies or

agreements that impede growth and consumption often meet forceful opposition. In the case of transportation, the EU’s “Lisbon Strategy”, (2000) provides a good illustration of how the aspirations of ecological modernisation and green capitalism are seemingly incompatible with the present economic system. The Lisbon Strategy set out to achieve “sustainable levels of transport energy use and reduce transport greenhouse gas emissions” and “decouple economic growth and the demand for transport with the aim of reducing environmental impacts.”⁴⁶ However, by 2008

only Germany and Japan had managed to grow and reduce transport emissions at the same time, and in both cases the growth was weak and the emissions reductions were modest when measured against what needs to be done.⁴⁷ (In fact, Japan’s economy-wide emissions have grown almost 10 percent from 1990 to 2007.⁴⁸) In April 2010 the European Environment Agency reported that GHGs from transport grew by 28 percent between 1990 and 2007 across the 32 European countries, with increases in freight leading the charge. The largest freight increases were recorded in road (43

percent) and air (35 percent) across the 27 EU member states. Passenger air travel grew by 48 percent between 1997 and 2007.⁴⁹

Secondly, the emphasis on technological solutions draws attention away from the reality that technology alone cannot reduce emissions to the levels demanded by science – technological change must be accompanied by major changes in the way economic and social life is organised. Thirdly, the levels of investments needed as a down payment on a low carbon future need to be far higher than they are at present – the fact that they lag far behind the required levels also speaks to the fact that green capitalism is perhaps not regarded a safe bet for the major institutional investors looking for faster and more guaranteed returns.

⁴⁶ Eurostat, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Sustainable_development_indicators

⁴⁷ Cited OECD, “Reducing Transport GHG emissions”

⁴⁸ Wall Street Journal, <http://online.wsj.com/article/SB125243462206993159.html>

⁴⁹ See: Euractiv, “Europe’s Transport Emissions Keep Rising,” (May 3, 2010). <http://www.euractiv.com/en/climate-environment/europes-transport-emissions-keep-rising-news-488648>

⁵⁰ Stern, N. (2006). “Stern Review on The Economics of Climate Change (pre-publication edition). Executive Summary”. HM Treasury, London. <http://www.webcitation.org/5nCYEYjr>. Retrieved 2010-01

Some corporations have indeed taken significant strides towards making their own operations more sustainable and to pursue climate-related business opportunities. But the growth of green business, while impressive on its own terms, does not mean that the whole economy is, or will ever be, truly low carbon and sustainable.⁵¹ Crucially, the behaviour of the major emitters in oil, coal and gas, aviation and motor vehicle manufacturing has barely changed.⁵² Power generation companies continue to direct huge sums of money towards further fossil fuel extraction and towards conventional utility projects.⁵³ Meanwhile, investments in green technologies in power generation, transportation, and energy use are insufficient. Globally, private sector RD&D (research, development and deployment) in these technologies is falling. Public RD&D has also been falling – down 50 percent from 1980 - 2004.⁵⁴ The lack of investment in transportation is particularly striking. For example in Latin America, over the last two decades, total investment in transport has halved. And as a portion of GDP, investment in public transport in Latin America is at one-third of its mid-eighties' level.

The existing market-based policies have clearly failed to reduce emissions and the distance between what is being done and what needs to be done grows wider with every passing year. A new approach is needed, one that is grounded in the primacy of social and environmental priorities over the imperatives of private profit.

A WHOLE ECONOMY APPROACH

The ITF should take a “whole economy” approach to climate change and emissions reductions. It should view the growth in emissions from transport as a reflection of what is going on in today's global economy *in toto*, and recognise that reducing emissions in transportation will require changes across all sectors. Different sectors should therefore be viewed as part of a whole and not in isolation from each other. Decisions made in power generation, industry, buildings and the urban environment, food and agriculture, etc, will have an impact on

transportation emissions, and the ITF should work with unions and social movements involved in these different sectors in order to reinforce the effects of mitigation efforts taken across the economy.

Such a “whole economy” approach should require the ITF to be concerned, for example, with how energy is produced – especially the kind of energy used in motor vehicles, ships and airplanes. Will the electrical vehicles of the future be propelled by electricity generated from renewable sources? Or will the electricity come from power plants fired by fossil fuels? Coal-generated electricity for vehicles will be of little or no benefit to the climate, but vehicles run on wind and solar power will allow for large emissions reductions. The emissions profile of each option is vastly different, and the ITF should add its voice to those who are fighting for real solutions. Similarly, emissions from the world's food and agriculture system (measured in CO₂ equivalent) today far exceed those generated by transportation.⁵⁵ Indeed, according to the FAO, when emissions from land use are included, livestock alone generates more CO₂ equivalent than all the world's cars, trains and buses.⁵⁶ Both transport and agriculture share a dependency on finite supplies of oil and other fossil fuels. Buildings, too, are a major source of emissions – so climate-friendly urban planning, and the role of transport systems in connecting work and living spaces is also crucially important. Such an approach requires unions and their social allies to work together in developing and fighting for solutions that complement and reinforce one another.

51 Speth, cited in Worldwatch Institute, State of the World Report, 2010

52 A survey conducted by the Economist Intelligence Unit (EIU) asked CEOs to identify “major barriers to making further progress on climate change in your organisation.” The largest single response (38 percent) pointed to “risk that environmental practices will raise your costs in comparison to competitors.” Economist Intelligence Unit, “Countdown to Copenhagen: Government, Business, and the Battle Against Climate Change,” (2009). US car companies spent \$15.6 billion on advertisements in 2008, \$67 million on lobbying, and \$19 million on campaign contributions. See also Worldwatch Institute, op. Cit. 2010, p14.;

53 A good example of this is the tar sands extraction in Alberta, Canada, a project that The Guardian has described as the world's biggest ever ecological disaster. Led by Royal Dutch Shell, \$24 billion was invested between 1996 and 2002, and a further \$100 billion will be invested between now and 2015. BP in 2007 announced \$2 billion more. Much is made about the fourfold growth in investment in renewable energy, but this has more to do with the rise in the price of oil than any desire to reduce emissions. Today more than 80 percent of investments in energy generation remain in fossil fuels.

54 Stern Review, op. cit

55 Food and Agriculture Organization, (FAO) cited in A Harvest of Heat: Agribusiness and Climate Change How Six Food Industry Giants Are Warming the Planet Agribusiness Action Initiatives – North America Spring 2010p 12

56 Ibid.

COAL AND OIL

The question of coal and oil use is particularly important to climate protection. Firstly, the emissions generated by coal in generating electrical power and for industrial use are enormous, and should be the concern of all. For example, coal use in the US and China is alone responsible for 20 percent of global CO₂ emissions.⁵⁷ Secondly, the continued use of coal threatens to completely eradicate any progress on emissions cuts in other sectors, such as transportation. But it is also true that many ITF members make their living transporting oil and moving coal from mines to power stations, and any reduction in coal and oil use could mean a loss of jobs – so the right approach to these resources is critically important. Many unions around the world support the development of carbon capture and storage (CCS) and other clean coal technologies. (Proposals for how the ITF should approach these technologies, as well as the use of biofuels, will be developed in Part 3.)

The ongoing use of oil should now also become a major ITF concern. The twin challenges of climate change and “peak oil” mean that alternatives to oil must be found sooner or later. As with coal, this is not purely a technical question. The economic and political power of “Big Oil” is such that any proposed alternatives to oil – theoretical or practical – have thus far been opposed by the industry and this is unlikely to change. Oil remains a highly lucrative business. In 2009, of the ten largest companies in the world by revenue, seven were oil companies. Only 23 countries have GDPs larger than the revenues of either Shell or Exxon Mobil. In 2006, Exxon Mobil posted the largest annual profit made by any company in the history of the world – \$39.5 billion. In 2005 it made \$36.13 billion. Oil companies typically reap a return on capital of 46 percent for

upstream drilling and production operations, plus a 32 percent return for refining and marketing.⁵⁸ Meanwhile, these companies are doing little or nothing to develop alternative fuels or energy sources. Shell no longer invests in renewable energy such as wind, solar and hydropower. In 2009 BP closed its alternative energy headquarters in London,⁵⁹ and Exxon Mobil has made it clear it has no intention of developing renewable alternatives. Moreover, private oil industry and other fossil fuel interests still receive more subsidies than those dedicated to the development of renewable energy.⁶⁰

TOWARDS SOLUTIONS

Clearly, existing approaches to reducing emissions have by and large failed. Continuing along the same path is therefore no longer an option. Fortunately, there are ways to reduce emissions across the economy that can help stabilise our climate and help create a genuinely sustainable and altogether better society.

*“Only with sharp changes in economic growth, major behavioural shifts, and/or major policy intervention would transport GHG emissions decrease substantially.”
– IPCC*

Reducing emissions from transport will take a bold but also long-term approach. The IPCC’s conclusion, cited above, bears repeating: “Only with sharp changes in economic growth, major behavioural shifts, and/or major policy intervention would transport GHG emissions decrease substantially.”⁶¹ In Part 2 we offer a global scenario for the dramatic reduction of emissions from transport, based on a “Reduce – Shift – Improve” framework that can realise the substantial emissions reductions the IPCC regards as necessary to stabilise the climate. Such a framework

will be contingent on major changes at the level of policy, and a decisive shift towards ensuring that social and environmental priorities drive economic life, rather than economic priorities driving social and environmental conditions. The transition will take decades, but the work must begin immediately.

57 Pew Center on Global Climate Change, “Coal and Climate Facts,” <http://www.pewclimate.org/global-warming-basics/coalfacts.cfm>

58 From Public Citizen, USA

59 <http://www.guardian.co.uk/business/2009/jun/28/bp-alternative-energy>. “In April (2009) the company closed a range of solar power manufacturing plants in Spain and the US with the loss of 620 jobs and (BP chief executive Tony) Hayward has publicly questioned whether solar would ever become competitive with fossil fuels”.

60 Environmental Law Institute, “U.S. Tax Breaks Subsidize Foreign Oil Production” September 18, 2009 <http://www.eli.org/pressdetail.cfm?ID=205>

61 IPCC Transport and its Infrastructure, 2007: 336

PART TWO

THE SOLUTIONS: TOWARDS MAJOR REDUCTION IN TRANSPORT EMISSIONS

In Part 2 we look at how emissions from transport might be reduced. We offer a framework for serious cuts in transport-related emissions based on the “Reduce – Shift – Improve” (RSI) model, the essential features of which are described in some detail below. RSI has received the endorsement of many civil society organisations committed to sustainable transport and low-carbon emissions. It is also consistent with the “whole economy” approach to climate protection outlined in Part One, an approach that sees the environmental impact of transport as inseparable from the question of how transport is controlled and organised in today’s world.¹

We begin this section with a critical review of some of the main conclusions and assumptions of some of the more major studies on reducing emissions from transport.

MAJOR EMISSIONS REDUCTIONS SCÉNARIOS

There are presently only a few major studies of how GHG emissions can be reduced in the transport sector. Most studies only cover transport emissions at the national or sub-national level, not at a global level. However, the International Energy Agency (IEA) and the World Business Council on Sustainable Development (WBCSD) have offered global-level emissions reduction scenarios for the transport sector. Below we review three major emissions reduction scenarios for the transport sector. These are:

1) *Transport, Energy and CO₂: Moving Towards Sustainability*, International Energy Agency, 2009;

2) *Mobility 2030: Meeting the Challenges to Sustainability*, World Business Council on Sustainable Development (WBCSD), 2004;

3) *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions*, Cambridge Systematics, Inc., 2009.

Table 4 summarises each of these scenarios, and it also includes projections for emissions reductions from two further studies conducted by the *PEW Center on Global Climate Change* (2009) study and the *IPCC* (2007).

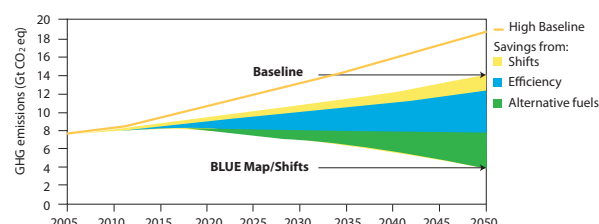
¹ See also ITF Executive Board Apr 08/9(b).

Transport, Energy and CO₂: Moving Towards Sustainability, International Energy Agency, 2009

This major study offers a number of scenarios for emissions reductions, of which the most ambitious is titled the “Blue Map/Shifts” scenario. According to this scenario, a combination of moderate modal shift from high-carbon to low-carbon modes of transport, plus improvements in vehicle efficiency, and the deployment of advanced fuel and vehicle technologies, could reduce CO₂ emissions from transport by as much as 40 percent below 2005 levels by 2050.² The scenario also assumes an increase in the use of alternative fuels³; and the commercial development of advanced vehicle technology by 2020.⁴

Table 1 illustrates the GHG reductions expected from the IEA Blue Maps/Shifts scenario from 2005 to 2050, including the GHG reductions that can be made from modal shifts (yellow), fuel and vehicle efficiency (black) and alternative fuels (blue). Taken together, the emissions reductions from modal shift, fuel and vehicle efficiency and alternative fuels make up the Blue Map/Shifts scenario. The red baseline represents the projected growth in transport emissions if no action is taken to reduce emissions.

TABLE 1. CONTRIBUTION OF EMISSIONS REDUCTIONS OPTIONS IN BLUE MAP/SHIFTS SCENARIO, 2005 - 50. (IEA, 2009)



2 The IEA projects that by using fuel economy technologies, LDVs fuel use and CO₂ emissions could be cut 30% below 2005 levels by 2020 and 50% below by 2030.

3 For alternative fuels under the Blue Maps/Shifts scenario, 50% of fuels are replaced by biofuels, hydrogen, and electricity in 2050. The baseline scenario for IEA assumes that 90% of fuels are still petroleum-based fuels in 2050. In order to achieve this reduction, a 20-fold increase in biofuels is needed.

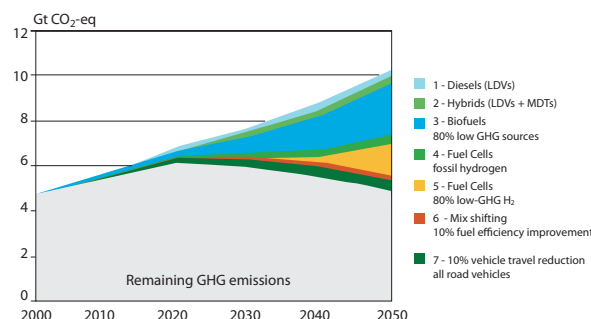
4 Under the IEA Blue Maps/Shifts scenario, EVs and PHEVs are released in 2010 and more than a million are sold per year by 2020. The other vehicle technology included under in this scenario is FCVs. Like EVs, FCVs are not expected to play a significant role in GHG reductions in the near term. In fact, FCVs won't take a significant share of the vehicle market until 2030. The IEA Blue Map/Shifts scenario is based on air and LDV travel decreasing 25% below 2050 baseline projections, and freight trucking decreasing 50% below the 2050 baseline by shifting truck freight to rail freight.

5 In the WBCSD scenario, hydrogen starts out as fossil-fuel based but shifts to 80% carbon-neutral by 2050.

Mobility 2030: Meeting the Challenges to Sustainability, World Business Council on Sustainable Development (WBCSD), 2004

The WBCSD's most ambitious emissions reduction scenario, which only looks at road vehicles, achieves a 50 percent reduction from road transport emissions on 2000 levels by 2050. These reductions are obtained through greatly increasing the market penetration of all fuel efficient technologies, and by assuming a switch in consumer preference towards smaller vehicles and improved traffic flows. This study assumes that 45 percent of light-duty vehicles (LDVs) and medium trucks will be diesel powered by 2030, 33 percent of all fuel is (mostly advanced) biofuels by 2050, and 50 percent of LDVs and medium truck sales are fuel cell powered by 2050.⁵ This scenario also assumes that better traffic flow and other efficiencies can reduce GHGs by a further 10 percent by 2050. Table 2 demonstrates the emissions reductions that the study suggests can be achieved through advanced vehicle and alternative fuel technologies.

TABLE 2. WBCSD (2004) EMISSIONS REDUCTION SCENARIO



The IEA and WBCSD studies are significant in two respects. Firstly, the most ambitious emissions reduction scenarios of the IEA (2009) and WBCSD (2004) studies each rely heavily on advanced technologies and alternatives fuels for reducing GHGs. Secondly, the emissions reductions achieved through these scenarios – 40 percent below 2005 levels by 2050 (IEA) and 50 percent below 2000 levels by 2050 (WBCSD) – fall far short of the range of the science-based emissions reductions targets discussed in Part One.

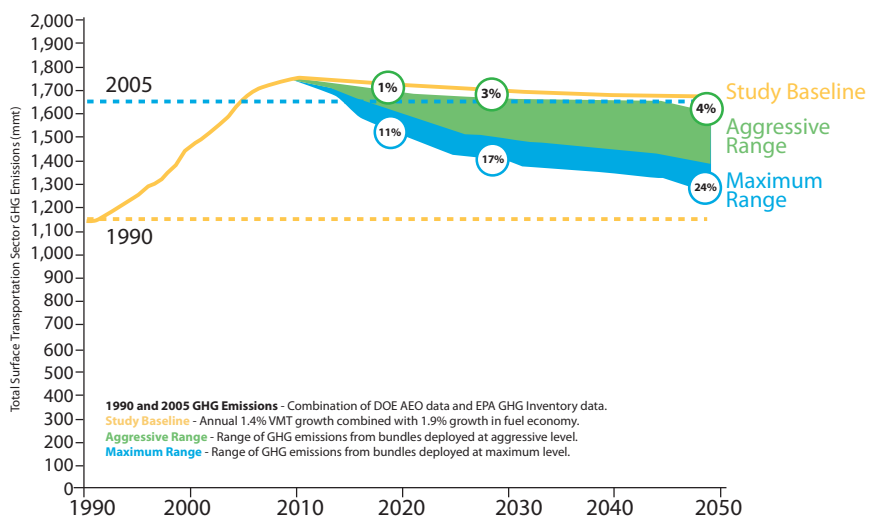
Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, Cambridge Systematics, Inc, 2009

The Moving Cooler scenario, while it only applies to transport emissions in the US, distinguishes itself from the IEA and WBCSD studies, in that it focusses its attention on how transport emissions can be lowered by reducing the level of vehicle miles travelled; by shifting to low-carbon modes of transport, and by improving the efficiency of the transport network “so that a larger share of vehicle operations occur in favorable conditions, with respect to speed and smoothness of traffic flow, resulting in more fuel efficient vehicle operations” (Moving Cooler 2009: 1). Moving Cooler examines nine different types of strategies to reduce transport emissions, namely, pricing and taxes; land use and smart growth; non-motorised transport; public transport improvements; ride-sharing, car-sharing, and various additional commuting strategies; regulatory strategies; operational and intelligent transportation system strategies (ITS); capacity expansion and bottleneck relief; and multimodal freight sector strategies.

By grouping these different strategies, the most aggressive Moving Cooler scenario found transport emissions in the US could be reduced 24 percent below the baseline projections for 2050. The study found six strategies contributed to the greatest emissions savings: local and regional pricing and regulatory strategies that increase the costs of single occupancy vehicle travel; regulatory strategies that reduce and enforce speed limits; educational strategies to encourage eco-driving behavior that achieves better fuel efficiency; land use and “smart growth” strategies that reduce travel distances; multimodal strategies that expand travel options; and combinations of strategies like land use changes combined with expanded transit services.

Table 3 depicts the range of annual GHG emissions reductions projected by the Moving Cooler study using six strategy bundles at aggressive and maximum deployment levels.

TABLE 3. RANGE OF ANNUAL GHG EMISSION REDUCTIONS OF SIX STRATEGY BUNDLES AT AGGRESSIVE AND MAXIMUM DEPLOYMENT LEVELS



Moving Cooler’s 24 percent reduction below 2005 baselines is noteworthy because it does not include any emissions reduction from advanced vehicle or fuel technologies. It achieves a 24 percent reduction below 2005 baselines solely through the non-technology-based measures listed above. These data suggest that non-technological strategies can make an important contribution to reducing emissions from transport. When these data are combined with the emissions reductions anticipated by way of greater vehicle and fuel efficiency found by the IEA and WBCSD studies, then it is possible to fall within range of the reductions demanded by science.

However, there is still a heavy dependency on technology-driven efficiencies and alternative fuels – and the realisation of both seems highly problematical. There is simply no guarantee that the investments to drive either the development of the efficiency technologies or generate large volumes of sustainable biofuels will actually occur. We return to these issues in Part 3.

TABLE 4. SUMMARY OF MAJOR EMISSIONS REDUCTIONS SCENARIOS

Major Transport Emissions Reductions Studies	Area of Study	Sector	CO ₂ Reduction (%)	Mitigation Technique(s)
Intergovernmental Panel on Climate Change, 2007	World	Shipping	5 - 30% (new ships), 4-20% (old ships)	
		New LDVs	50% by 2030	
		Rail	A few % to 40%	
		Air		
International Energy Agency, 2009	World	Surface Transport	40% below 2005 levels by 2050	Technological; Modal Shifts
PEW Center on Global Climate Change, 2009	World	Shipping	60% below BAU by 2050	Technological; Operational
		Aviation	50% below BAU by 2050	
WBCSD, 2004a	World-Road Transport	Diesels (LDVs)	1.8% by 2050	Technological; Operational; slight modal shift (10% vehicle travel reduction of all vehicles)
		Hybrids (LDVs and MDTs)	6.1% by 2050	
		Biofuels (80% low GHG sources)	29.5% by 2050	
		Fuel Cells- fossil hydrogen	32.7% by 2050	
		Fuel Cells- 80% low GHG hydrogen	45.5% by 2050	
		Mix Shifting 10% FE improvement	47.3% by 2050	
Moving Cooler	USA			Reduce VMT; modal shift; improve efficiency of transportation network
			24% below BAU by 2050	

THE IPCC'S ASSESSMENT

The approach of the IEA and WBCSD studies has drawn some criticism from the IPCC for their “optimistic assumptions about future technology costs” and for not considering the “trade-offs between vehicle efficiency and other (valued) vehicle characteristics.”⁶ In other words, the IEA and WBCSD studies assume that vehicle fuel and energy efficiency improvements will have greater impact on reducing emissions than the IPCC currently considers realistic.

The main technologies that are being relied upon to improve vehicle efficiency are electric-drive technologies, including battery electric vehicles, hydrogen fuel cells, and hybrid-electric power trains. According to the IPCC, even if it is feasible for these advances in vehicle efficiency to penetrate the market, it is projected that the majority of transport energy use will still come from fossil fuels for the next several decades. As a result, GHG emissions from the transport sector will continue to rise. An International Association of Public Transport study suggests that “even if zero carbon vehicles were introduced starting in 2010 with 200,000 units, and growing by 20% per annum thereafter, it would still take until 2030 for there to be a significant drop in emissions from road vehicles.”⁷ Indeed a number of studies conclude that fuel and energy efficiency improvements alone, without other measures or behavioural shifts, would not reduce emissions from the transport sector until 2040.⁸ In addition, improvements to vehicle and fuel efficiency would not address other major transportation problems like congestion, black carbon, road safety or public health and fitness. Actually, improvements in fuel efficiency often cause a “rebound effect” whereby vehicle kilometres travelled increase because fuel efficiency reduces the per-kilometre cost of driving.⁹

The IPCC goes on to say that “only with sharp changes in economic growth, major behavioral shifts, and/or major policy intervention would transport GHG emissions decrease substantially.”¹⁰ Major behavioural shifts will require changing the current urban land use structure so that travel demand is reduced and use of

6 IPCC Transport and its Infrastructure 2007: 357.

7 International Association of Public Transit 2007.

8 International Association of Public Transit 2007.

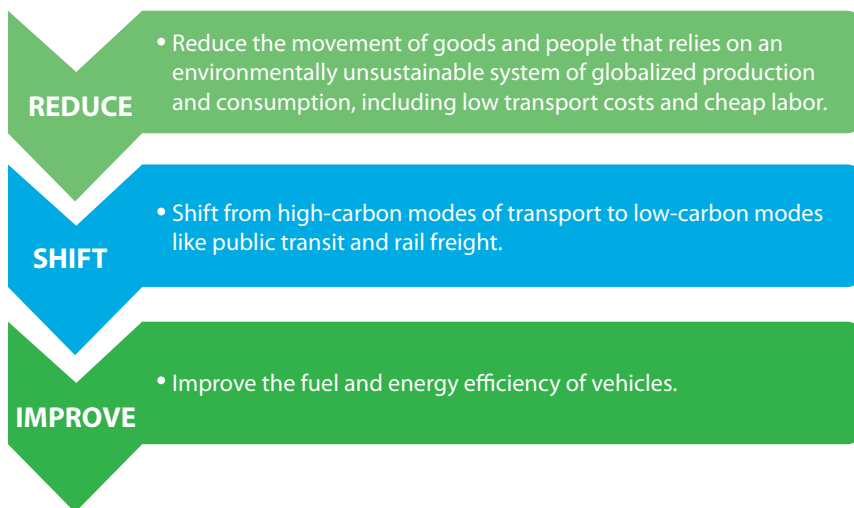
9 International Association of Public Transit 2007.

10 IPCC Transport and its Infrastructure, 2007: 336.

public transport is increased. Policy interventions include transport demand management measures such as parking “cash out”, road pricing, inner city entry charges, etc. A more comprehensive emissions reductions strategy is therefore needed, one that includes reducing vehicle kilometres travelled, creating a modal shift from high-carbon to low-carbon modes of transport, improving the efficiency of the transport network, as well as improving fuel and vehicle efficiency. This comprehensive approach to reducing transport emissions is encompassed in a Reduce – Shift – Improve scenario; an approach that relies on both vehicle and fuel efficiency improvements and efforts to reduce travel by high-carbon modes of transport. This approach is explained below.

REDUCE – SHIFT – IMPROVE (RSI) FRAMEWORK: MEETING THE EMISSIONS REDUCTIONS THAT SCIENCE DEMANDS FOR THE TRANSPORT SECTOR

For transport, the most promising scenario for reducing emissions is based on a “Reduce – Shift – Improve” (RSI) framework. The framework is grounded in the hard reality that the kinds of reductions demanded by science (80 percent reduction on 1990 levels by 2050) will require three main strategies: less movement of goods and people (“reduce” movement); a shift in the way people and goods move from high-carbon modes to low-carbon modes of transport (modal “shift”); and new methods and technologies to promote energy and fuel efficiency (“improve”). This framework is tied together by an intermodal approach to moving people and goods that uses a combination of transport modes based on cost, capability, route, speed and CO₂ emissions. The RSI framework proposed here is based on an “Avoid and Shift” approach crafted by low-carbon transportation advocates such as the International Association of Public Transport, GTZ and Smart Growth coalitions.¹¹ The “Avoid and Shift” framework was originally developed in order to place greater emphasis on the need to shift the focus away from vehicle and fuel efficiency towards measures that might reduce travel overall and shift to low-carbon modes of transport like public transit, walking and bicycling.



The Challenge: Reduce – Shift – Improve

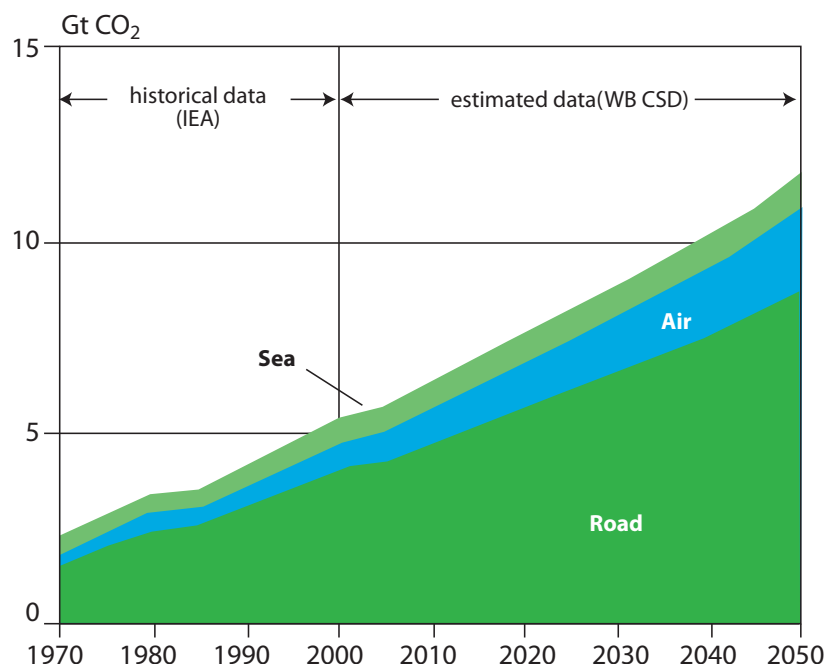
The problem of rising emissions from transport presents the RSI model with a serious challenge. To achieve the level of emissions’ cuts required by science will therefore entail more emphasis on “reduce” and “shift” strategies in order to compensate for the fact the mitigation potential of new technologies and alternative fuels can only go so far. Certainly, there are co-benefits associated with this model that are also important. Reducing the number of vehicles on the road and shifting to low and no-carbon modes of transit also lessens pollution and congestion and is more socially inclusive and safe. However, little research has thus far been conducted on the potential for transportation actions and strategies to reduce the need to move goods and people or to shift the ways goods and people get around to more climate-friendly transport modes. Moreover, it is hard to measure what emissions reductions might be achieved by reducing travel and creating a modal shift from high-carbon to low-carbon modes of transport because it depends on behavioral changes. It is nonetheless clear that meeting science-based reduction targets requires a decrease in the use of road vehicles, including light-duty and heavy-duty vehicles. Table 5 demonstrates that the vast majority of emissions from the transport sector come from road vehicles (passenger cars and lorries). Even when only running at 50 percent of their capacity, rail and water freight and public transit are far more efficient than light-duty (LDVs) and heavy-duty vehicles (HDVs).¹² Therefore only by reducing the use of LDVs and HDVs will transport emissions be significantly reduced.

¹¹ “Transport and Climate Change.” Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities, Module 5e: 2009. Deutsche Gesellschaft für Technische Zusammenarbeit. Division 44: Environment and Infrastructure.

¹² “Transport and Climate Change.” Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities, Module 5e: 2009. Deutsche Gesellschaft für Technische Zusammenarbeit. Division 44: Environment and Infrastructure.

¹³ UN Habitat, 2008; Mitlin, Diana and Satterthwaite, David. Empowering Squatter Citizen: Local Government, Civil Society, and Urban Poverty Reduction. Earthscan: 2004.

TABLE 5. HISTORICAL AND PROJECTED CO₂ EMISSIONS FROM TRANSPORT BY MODE, 1970-2050. (IEA 2005)



Reduce the Need and Desire to Travel: Compact, Mixed Land Use

Making the movement of goods and people safe, efficient, and environmentally-friendly is extremely important, but serious cuts in transport-related emissions will require much less travel overall, both of people and goods. Reducing vehicle kilometres travelled (VKTs) or the need to travel are typically viewed as long-term solutions to transport's rising emissions. However, steps to make these things happen needs to be taken immediately. Reducing travel will require a major shift in cities' land use planning so that people can accomplish more while driving less. Shortening the length of both global and domestic supply chains in order to reduce the movement of goods will require a shift in global policy and power relations. Just because these changes will take a long time to complete does not mean we have all the time in the world before we have to get started. Nothing could be further from the truth.

At the city and city-region level, land use planning that reduces the need to travel is critical to reducing

transport emissions. For the first time in history, over half the world's population, about 3 billion people, live in cities.¹³ The process of urbanisation is also intensifying, particularly in the Global South. According to UN projections, in the next 25 to 30 years, virtually all population growth will occur in urban areas. Currently, cities in the Global South are gaining an average of 5 million new residents every month.¹⁴ Unfortunately, rapid motorisation is accompanying the process of urbanisation, significantly driving up emissions from urban areas.¹⁵ In fact, cities consume 75 percent of the world's energy and produce 80 percent of its greenhouse gases emissions.¹⁶ Improving the efficiency of vehicles and fuels is important, but in many countries these improvements are likely to be offset by continuing, robust growth in VKTs.¹⁷ Therefore, urban land use planning that reduces the need to travel is essential to creating a long-term, sustainable solution to reducing emissions from the transport sector.

Compact, mixed land use planning in cities reduces the need to travel (or the distances travelled) by "mixing" the various forms of land use (residential, offices, shops, public services, etc.) together in close proximity so that residents can meet all their basic needs and desires without driving, or at least by driving shorter distances. In parts of the developed world where VKTs have grown much faster than the population, the idea of mixed-use, compact development has seen a major resurgence in the last decade. This type of development goes by several names, such as locational efficiency, smart growth, new urbanism, transit-oriented development (TOD), and infill and brownfield development. Numerous studies demonstrate that mixed-use, compact development is critical to reducing emissions from the transport sector as VKTs begin to fall.¹⁸

Table 6 shows that land use planning that creates high-density development where residential areas, workplaces and key services are close together, significantly reduces the need to travel and, consequently, reduces energy consumption and emissions. Hong Kong, with an urban density of 300 people per hectare, uses less than 5 gigajoules per

¹⁴ This is not hard to imagine given the emergence of mega-cities, like Tokyo with 27 million residents, Sao Paulo with 16.4 million and Bombay with 15 million residents. (UN Habitat, 2008).

¹⁵ China displaced the US as the largest auto market in the world in January 2009 and as the largest greenhouse gas emitter in 2007. The production of very affordable vehicles, such as the \$2,500 Nano in India, will also rapidly increase the rates of car ownership in the Global South. "At present only 10% of urban citizens living in the developing world own cars – yet there are already high levels of local pollution, congestion and wasted energy by this small percentage of the population" (International Association of Public Transit 2007).

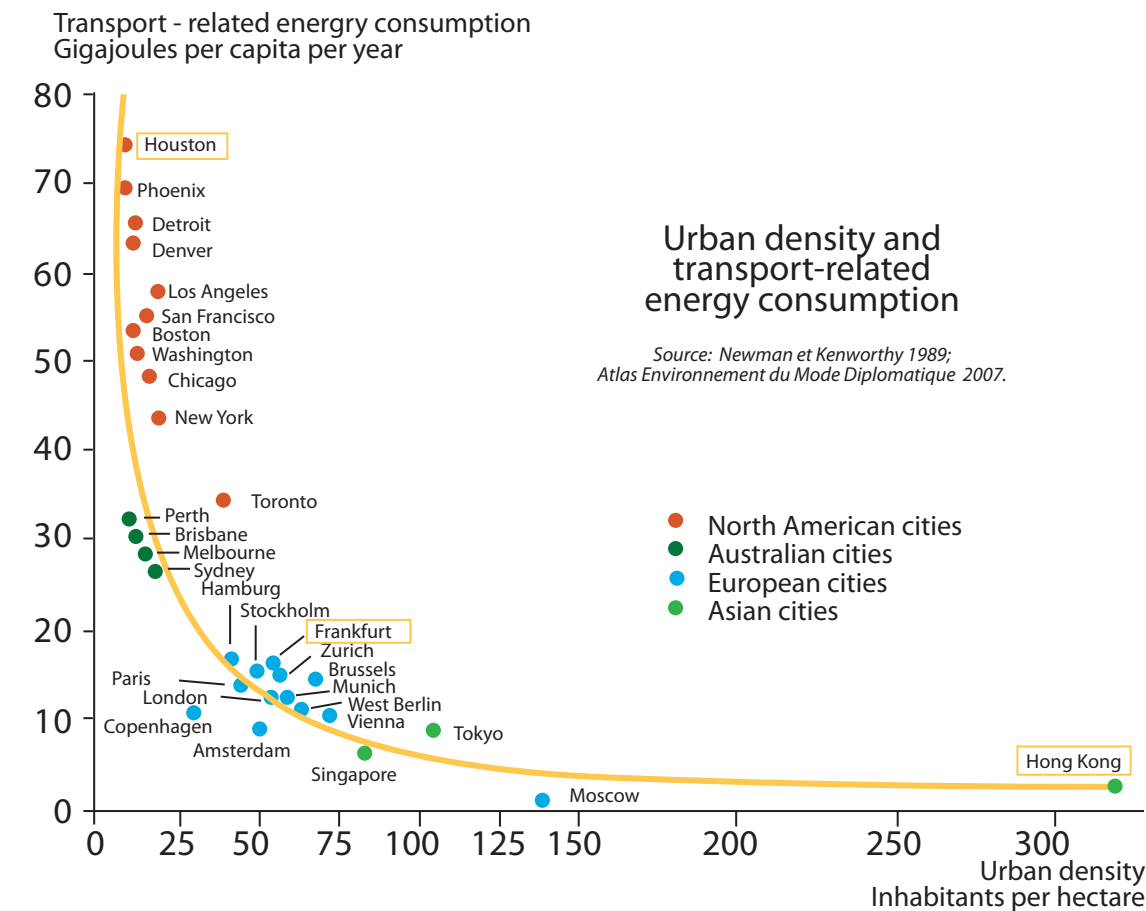
¹⁶ Fitzgerald, Joan. *Emerald Cities: Urban Sustainability and Economic Development*. Oxford University Press 2010:11.

¹⁷ In the US, VMT has grown five times faster than population, or 151% between 1977 and 2001. (Ewing, Reid, Bartholomew, Keith, Winkelman, Steve, Walters, Jerry, and Don Chen with Barbara McCann and David Goldberg. *Growing Cooler: Evidence on Urban Development and Climate Change*, 2009: 2. Smart Growth America.)

¹⁸ Every gallon of gasoline burned produces 20 pounds of CO₂ emissions). (Ibid.)

capita per year, compared to much less dense cities that use more than 70 gigajoules per capita per year. Additionally, the efficiency of public transportation can be optimised in high density areas with better integration of public and non-motorised transport. Conversely, in a low density area, energy consumption and emissions are high because it is difficult to access critical services without using a private vehicle — an issue that disproportionately affects working families, women and people of colour who have to spend a larger percentage of their budget on transportation costs.

TABLE 6. AMOUNT OF TRANSPORT-RELATED ENERGY CONSUMED IN RELATION TO URBAN DENSITY.¹⁹



¹⁹ "Transport and Climate Change." Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities, Module 5e: 2009. Deutsche Gesellschaft für Technische Zusammenarbeit. Division 44: Environment and Infrastructure.

It is possible to organise cities in ways that dramatically reduce the need for travel, particularly travel by passenger car and freight movement by road. US cities use four times as much transport fuel per person as European cities and five times as much as Singapore, Tokyo, and Hong Kong. “Transit-oriented developments” - where housing, workplaces and other critical services are centred around public transit stations - have been shown to cut residential car use in half, and residents save 20 percent on their household income by having one less car per household.

Reducing Emissions Through Compact, Mixed Land Use

As the US population grows towards 400 million, a Virginia Tech study projects that 89 million new or replaced homes - and 190 billion square feet of new offices, institutions, stores, and other non-residential buildings - will be constructed by 2050. This means that “2/3 of the development on the ground in 2050 will be built between now and then.”²⁰ However, if 60 percent of this new growth was shifted to compact, mixed use development, 85 million metric tons of CO₂ would be saved annually by 2030.

The principles of compact, mixed-use planning need to guide both the redevelopment and revitalisation of cities and suburbs in the developed world and the new urban development in the developing world where urbanisation continues to intensify. Recent studies demonstrate that compact development of urban areas can reduce vehicle kilometres travelled by 30 percent, and as a result, also reduce GHG emission from transport; adding complementary measures to discourage driving would reduce VMT and emissions even further.²¹ Additionally, focussing on compact development now will provide a permanent climate benefit that compounds over time.²² Other measures to reduce transport emissions such as higher fuel prices and carbon taxes do not have an enduring climate benefit. Compact development has other benefits too — it helps protect water quality, improves health by encouraging walking, bicycling and other physical activities, preserves open space and farmland, reduces the amount taxpayers spend on road, water and sewer infrastructure, and reduces the amount families spend on transportation costs. Moreover, the “technology”

of compact development is already available and indeed, has been used for thousands of years by various societies.

Reduce and Shift Best Practices

Curitiba, Brazil

Beginning in the late 1990s, Curitiba, Brazil built an expansive public bus system that “designated several main roadways as structural axes for bus-ways, and created multiple bus-only lanes;” it also includes large bus shelters and transfer stations, a uniform fare regardless of trip length, and routes that link companies and housing. Curitiba is a model for good land use planning and good public transit. 75 percent of Curitiba’s residents use public transit and although the population of Curitiba has doubled, traffic has declined by 30 percent.

Jakarta, Indonesia

In a city with notoriously bad congestion and pollution, and projected to be the fifth largest city in the world by 2015, the TransJakarta Bus Rapid Transit (BRT) system began operating in 2004. Now, TransJakarta serves 160,000 passengers a day and “travel time across the entire corridor has dropped by one hour during the peak period” (ITDP 2010). The TransJakarta system has spurred over 20 percent of its passengers to switch from private car to bus, resulting in a 20,000 metric ton reduction in emissions per year.

Cities in the Developing World “Leapfrog” to Low-Carbon Urban Development

The 2010 Sustainable Transport Awards, for the first time in their history, recognised all cities in developing nations for their development and expansion of good land use and public transit systems. Guadalajara, Mexico, and Cali, Colombia both completed BRT systems - Guadalajara completed its system in two years and the articulated, clean buses for Cali’s BRT system were manufactured in Colombia, providing local employment. Johannesburg, South Africa, was the first city in Africa to implement BRT and in the process has set up training programs for taxi drivers to gain employment within the BRT system to help address job loss within the taxi industry due to the BRT

²⁰ Ewing, Reid, Bartholomew, Keith, Winkelman, Steve, Walters, Jerry, and Don Chen with Barbara McCann and David Goldberg. Growing Cooler: Evidence on Urban Development and Climate Change, 2009: 2. Smart Growth America.

²¹ Ibid.

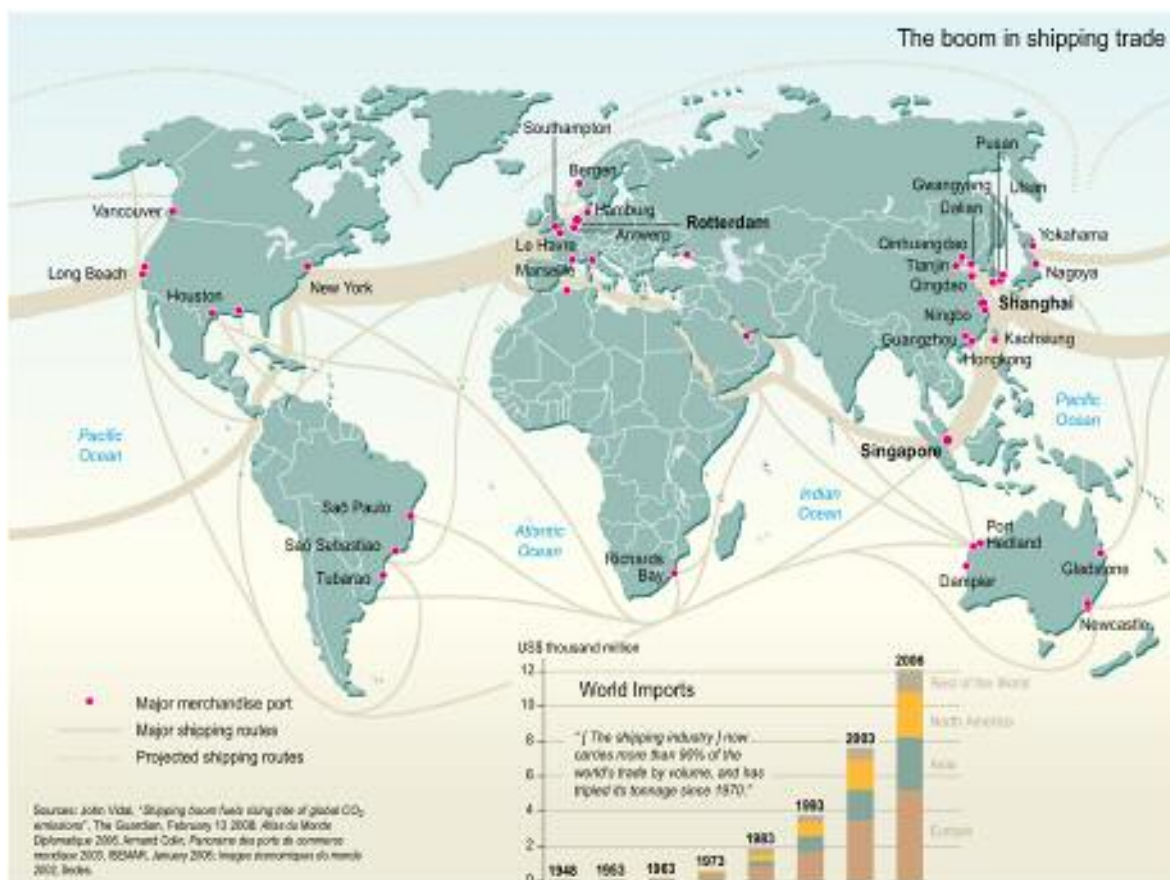
²² Ibid.

system. With assistance from the South African government, taxi drivers once employed in the informal sector under poor working conditions are transitioned to quality employment in the formal sector. These fast-growing cities in the developing world are “leapfrogging” low-density, sprawl development that encourages motorcar dependence and as a result, are building long-term, sustainable transportation solutions that reduce emissions and congestion, and at the same time, improve residents’ mobility, health and safety.²³

REDUCE THE ENVIRONMENTALLY AND SOCIALLY UNSUSTAINABLE MOVEMENT OF GOODS: LOCALISATION

Just as good land use planning reduces the need for travel by placing critical services near people’s homes and work sites, a restructuring of our production and

consumption system is needed to reduce the movement of goods as well. Over the past several decades, the transport system has drastically changed to accompany a trade-based model of economic growth that is based on the competitive needs of multinational corporations. Thus, just-in-time production and other strategies to reduce labour and resource costs are used at the cost of workers and the environment. The great acceleration of goods movement over the last fifty years has huge carbon implications. A number of studies show that the amount of carbon embedded in international trade is enormous – perhaps as much as 25 percent of all the carbon emitted. Driven by cheap fuel and transportation costs, the global supply chains of manufactured goods and food now extend thousands of miles. Locally available products, like bottled water, are imported from Fiji to France, expending exorbitant amounts of carbon in the process. Table 7 demonstrates the great increase in shipping trade from 1948 - 2006.²⁴



23 Institution for Transportation and Development Policy, 2010. http://www.itdp.org/index.php/program_areas/detail/developing_high_quality_low_cost_mass_transit/

24 UNEP/GRID-Arendal. <http://maps.grida.no/go/graphic/the-boom-in-shipping-trade/>

Food Miles

The growing share of goods travelling vast distances is showcased by “food miles”, and the consequent rise in emissions related to moving food products. In 1998, the value of agricultural goods traded across borders reached \$456 billion, three times more than 20 years earlier.²⁵ In 2007 the figure reached \$700 billion.²⁶ As an example of this “great food swap,” Britain imports 240,000 tons of pork from the Netherlands each year; and then exports 195,000 tons back each year. Meanwhile, the importation of food to the UK quadrupled between 1992 and 2007, and food transport accounts for a significant and growing share of both air and road transport. (DEFRA)²⁷ A 2005 DEFRA study on food miles discovered that food transport produces 10 million tons of carbon dioxide annually.²⁸

With similar trends of goods movement in other economic sectors, reducing the distance that goods are shipped is key to reducing emissions in the transport sector. A relocalisation of the economy, where more goods and services are produced and provided locally is important to reducing freight travel. Moreover, reducing freight travel will require a re-evaluation of what goods and services imported from outside one’s region are actually necessary. Reducing the unnecessary movement of goods is directly linked to creating a more equitable society overall which includes democratic control of the economy, regulation of the market, better working conditions, and transport users covering the full cost of transport, including the social and environmental costs that society currently pays for.

Clearly, the first step in reducing emissions from the transport sector is beginning today to restructure our cities and towns, and to set in motion changes in our economic system in ways that reduce the unnecessary movement of goods and people. Making this transition now is important because it permanently reduces emissions from the movement of goods and people, and has a lasting and compounding climate benefit. Such a transition will also begin to address the urgent need to improve the working conditions of transport workers and the living conditions of working families.

MODAL SHIFT: SHIFTING MOVEMENT FROM HIGH-CARBON TO LOW-CARBON MODES OF TRANSPORTATION

A critical complement to reducing the need for transport is shifting remaining travel demand to low-carbon or zero-carbon modes of transit. In order to reduce emissions from the transport sector, three main modal shifts need to occur: (1) Private vehicle use needs to shift to public transit (buses, rail, light rail, metro and underground systems) and non-motorised transport; (2) Air travel need to shift to high-speed rail; and (3) Road freight needs to shift to freight rail, shipping and inland waterways. For passenger travel, low-carbon and zero-carbon modes of transit include public transit, walking and cycling. In terms of freight, low-carbon modes of transport are shipping, rail freight, and inland waterways.

MODAL SHIFT I: SHIFTING FROM PRIVATE VEHICLES TO PUBLIC TRANSIT AND NON-MOTORISED TRANSPORT

Passenger cars emit more than half of global transport emissions; therefore reducing the use of personal vehicles is critical to reducing transport emissions overall. Per passenger kilometre, public transport emits far fewer emissions than an average single-occupancy vehicle (SOVs). Heavy rail public transport and subways produce 75 percent less greenhouse gas emissions than SOVs; light rail emits 57 percent less and bus transit emits 32 percent less. Furthermore, LDVs, along with heavy-duty vehicles (HDVs) for road freight, are the major contributors to congestion, pollution, and traffic injuries and fatalities. Shifting the use of private vehicles to public transit and non-motorised transport is therefore essential to building a safe, equitable, and environmentally-friendly transportation system. But the shift from private vehicles to public and non-motorised transport will only occur if high levels of mobility and accessibility can be provided by other means. Individual decisions regarding transport are highly dependent upon the availability, speed, convenience, and safety of each

²⁵ “A not-so-perfect market: Trade barriers of many kinds are making agriculture less efficient than it could be” The Economist, U.S. Edition, March 25, 2000

²⁶ Presentation by Ron Oswald, General Secretary, IUUF, “High-Level Panel on the Food Crisis, Production, Investment and Decent Work” - 97th ILO International Labour Conference, Geneva, June 11, 2008

²⁷ Martin Hickman, Food miles’ soared by 31% in a year, study reveals, The Independent, (October 26, 2007). <http://environment.independent.co.uk/climate_change/article3098855.ece>

²⁸ Defra, Win-win company policies in food logistics systems, University of Westminster and Heriot-Watt University. <<http://statistics.defra.gov.uk/esg/reports/foodmiles/annex4.pdf>>

mode. In other words, public and non-motorised transport need to be as accessible, quick, convenient, and as safe as passenger vehicles. Unfortunately, from 1975 to 2004, the overall cost of private vehicle ownership fell by 11 percent, while the real cost of bus and rail fare increased in the same time period by 66 percent and 70 percent, respectively.²⁹ However, many studies have found that when public transit is affordable, accessible, safe and quick, people prefer public transit to the private vehicle.³⁰ In fact, between 1995 and 2000, when New York City reduced the price of its weekly and monthly public train and bus passes, passenger levels increased by 31 percent. The growth in passenger numbers included a large number of people who had hitherto used private vehicles in order to travel.³¹

Strategies to shift movement from private vehicles to public transit must also explore opportunities to reduce emissions from public transport itself. Reducing emissions from public transport will become more important as demand for public transport increases. Opportunities to reduce emissions from public transport include electrification of rail systems that utilise renewable energy sources and buses that use liquid natural gas, hybrid-electric buses or potentially, alternative fuels. New hybrid-electric buses, in comparison to older diesel buses, consume 15-40 percent less fuel and reduce GHGs by similar percentage range. In an effort to reduce emissions from public transit, the Transport Workers Union of Australia have called for the Australian Government to “work toward having all buses - public and private - running off clean natural gas by 2012” (TWU Australia Climate Change Briefings).

Calgary, Canada

The operation of the city's Light-Rail Transit, the C-Train, began in 1981 and currently consists of two lines, 36 stations and 116 vehicles. Downtown Calgary is a free fare zone, but travel outside the city requires a fare. In 2001, Calgary Transit partnered with ENMAX and Vision Quest Wind Electric Inc. to develop the Ride the Wind programme which procures wind-generated electricity to power the C-Trains. Windmills located in Southern Alberta generate the

*wind power, with the equivalent amount of power used by the C-Train sent to the main power grid. Using wind-generated power currently reduces CO₂ emissions by 26,000 tons annually.*³²

A modal shift from private vehicle usage to public transport requires a major behavioural shift for many societies. For this shift to occur, two main things must be achieved: (1) public transit systems and services must be expanded; and (2) public transit systems and services also need to be improved. Many cities of the Global South and smaller cities of the Global North are expanding their public transit systems with Bus Rapid Transit (BRT), a lower-cost alternative to light rail transit (LRT)³³. In Portland, Oregon, US, the construction of a complete light-rail transit system has reduced vehicle kilometres travelled in the city by 20 percent below the national average for US cities. Coupled with building efficiency programmes and large-scale tree planting, Portland's greenhouse gas emissions have decreased 13 percent over the last ten years to 1 percent below 1990 levels.³⁴ Table 8 demonstrates the GHG emissions saving of public transit per average passenger kilometre over individual modes of transit.

TABLE 8. GHG EMISSIONS PER AVERAGE PASSENGER KILOMETRE.

Mode of transport	Maximum capacity (passengers per vehicle)	Average capacity (passengers per vehicle)	GHG emissions per vehicle-kilometre	GHG emissions per average passenger-kilometre
Pedestrian	1	1.0	0	0
Bicycle	2	1.1	0	0
Gasoline Scooter (two-stroke)	2	1.2	118	98
Gasoline Scooter (four-stroke)	2	1.2	70	64
Gasoline Car	5	1.2	293	244
Diesel Car	5	1.2	172	143
Diesel Minibus	20	15.0	750	50
Diesel Bus	80	65.0	963	15
Compressed Natural Gas Bus	80	65.0	1,050	16
Diesel Articulated Bus	80	160.0	1,000	7

Source: Hook and Wright, 2002

29 “Who says there is no alternative?” RMT (National Union of Rail, Maritime and Transport Workers): July 25, 2008.

30 Ewing, Reid, Bartholomew, Keith, Winkelman, Steve, Walters, Jerry, and Don Chen with Barbara McCann and David Goldberg. Growing Cooler: Evidence on Urban Development and Climate Change, 2009: 2. Smart Growth America.

31 Ibid.

32 Transport Outlook 2008: Focusing on CO₂ Emissions from Road Vehicles, Joint Transport Research Centre, Discussion Paper No. 2008-13, May 2008 and http://www.calgarytransit.com/html/about_ct.html

33 BRT systems typically cost 1-15 million US\$/km, while elevated rail systems and underground metro systems cost from 50 million US\$/km to over 200 million US\$/km. (Wright, L. (n.d.). Sustainable Transport: A Sourcebook for Policy-Makers in Developing Cities. Vol. Module 3b: Bus Rapid Transit. Washington, D.C.: Institute for Transportation and Development Policy.).

34 The complete Christian Science Monitor article is available at the following URL: <http://abcnews.go.com/international/CSM/story?id=1253582>

There are also several ways to improve the systems' service and operation of public transport to facilitate the modal shift from private cars to public transport. These include splitting routes, transfer improvements, coordination of schedules through ticketing, and increased frequency of transit vehicles. Improving passenger amenities is also key to attracting passenger car users to mass transit; these improved amenities include bus shelters, station improvements, safety and security enhancements, vehicle comfort improvements, signposting and elderly/mobility impaired access. Finally, public transport is made more accessible and convenient for users by fully integrating the physical infrastructure and fare systems of public and other transport systems.

When considering the emissions reduction potential related to a modal shift from private cars to public transport, it is important to note that passenger levels of public transport are an important factor in determining the level of emissions reduction that can be realised by this shift.

Furthermore, projections for reducing emissions by shifting users from private cars to public transport must consider the possibility of the "rebound effect." In some cases, as public transport systems are enhanced and improved and induce a shift from the private car to public transit, the resultant reduced congestion on roads initially attracts additional drivers.

Because short-distance trips (under 3.2 kilometres or 2.0 miles) make up the majority of private vehicle trips, shifting these trips to public transit and non-motorised mobility is important. Short distance car trips disproportionately pollute because emissions are highest when engines first start. To reduce transport emissions, the shift from private cars to non-motorised modes of transport is important for replacing short-distance vehicle trips. However, facilitating a shift

from cars to cycling and walking is highly dependent upon local conditions. Land use design that shortens journeys and provides safe and convenient infrastructure for walking and cycling largely affects the extent to which a shift to non-motorised transport can reduce GHG emissions.

Public and non-motorised transport also provides some of the solutions to the problem of out-of-control motorisation in the global South – a trend that has hugely negative consequences for millions of poor people and is rapidly contributing to global emissions.

Improving passenger amenities is also key to attracting passenger car users to mass transit; these improved amenities include bus shelters, station improvements, safety and security enhancements, vehicle comfort improvements, signposting and elderly/mobility impaired access.

In most cities in the so-called developing world, a large percentage of people walk to work. The poor who rely on transport generally use public transport.³⁵ At a middle-income level, there is increased reliance on small motorised transport, such as jitneys, scooters or motorcycles. It is only at high-income levels that private car vehicle use emerges. But it is the low and middle income households that spend the most on transportation; up to 30 percent of their income in urban areas.³⁶ As a result, it is the poor households who suffer disproportionately from

higher transportation costs. Thus, poor households are vulnerable to the costs and availability of public transportation systems, which are often under-funded and limited; consequently, access to public transit has a significant factor on rates of labor participation and employment of inner-city residents.³⁷ Re-directing rapid motorisation in the Global South to mass and non-motorised transit by expanding and improving transit systems and walking and cycling infrastructure, and integrating transit with efficient land use can reduce emissions, as well as address the other negative consequences of increased private car use in parts of the Global South mentioned above.

35 Baker, Judy, Rakhi Basu, Maureen Cropper, Somik Lall and Akie Tkeuchi. 2005. "Urban Poverty and Transport: The Case of Mumbai." World Bank Policy Research Working Paper 3693. The World Bank, Washington DC.

36 Sperling, Daniel and Salon, Deborah. 2002. Transportation in Developing Countries: An Overview of Greenhouse Gas Reduction Strategies. Prepared for the Pew Center on Global Climate Change.

37 (UNEP GGND) Sanchez, Thomas W. 1999. "The Connection Between Public Transit and Employment." Journal of the American Planning Association 65(3):284-296.

MODAL SHIFT 2: SHIFTING FROM AIR TRAVEL TO HIGH SPEED RAIL (HSR)

Railways are an energy-efficient carrier of people and goods and hence produce a lower volume of emissions per passenger than other modes. Switching short-haul airplane journeys to rail would be particularly beneficial since short haul flights produce a higher proportion of harmful emissions than long-haul flights and are particularly fuel inefficient because take offs and landings account for 25 percent of overall fuel usage. Moreover, HSR uses 65 – 80 percent less energy per passenger-mile than air travel and emits 8 – 10 times less CO₂ than air travel.³⁸ The efficiency of rail is also demonstrated by the fact that rail accounts for only 1.6 percent of total transport emissions but transports 6 percent of all passengers.³⁹

While it is not feasible for HSR travel to replace long-haul flights, it is short-haul flights that have increased the most in recent years. The emergence of low-cost carriers has spurred the consumption of cheap, mainly domestic, short-haul flights even in cases where there is a rail alternative. While the cost of airfare and motoring has typically decreased in the last decade, the cost of public transit, in real terms, has increased. At Heathrow International Airport in London, UK, more than one-third of the flights are short-haul flights and in Europe in general, 45 percent of flights are within Europe or 500km or less in length. 100,000 out of 473,000 flights leaving Heathrow International Airport serve destinations that are already serviced by a rail alternative. However, when there is an affordable, temporally competitive rail alternative, studies show that passengers often prefer to take rail when a trip is under 4 – 4 ½ hours. For example, the majority of trips between London and Paris and London and Brussels are now taken by Eurostar rail rather than air — a huge achievement in relation to emissions because air passengers “who fly between London, Paris and Brussels generate ten times more CO₂ emissions than

those who use Eurostar” according to the RMT. In Spain, where the government has made significant investments in HSR, rail is once again becoming a main mode of transit. Spain intends to have 10,000 kilometers (6,200 miles) of high-speed track by 2020; with this expanded system 90 percent of the population will be within 30 miles of a train station.

MODAL SHIFT 3: SHIFTING ROAD FREIGHT TO RAIL, SEA AND INLAND WATERWAYS

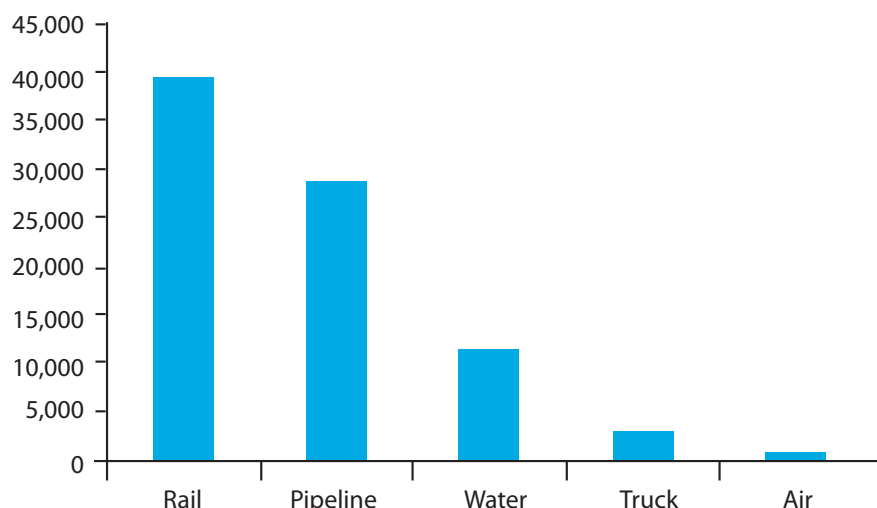
The third major shift that needs to occur to reduce transport emissions is from road freight to more low-carbon modes of freight transit like rail, sea, and inland waterways. Road freight accounts for more than 30 percent of global transport emissions, and is rising. Rail, on the other hand, is a very efficient form of transport, and is more jobs-intensive than road transport, both in terms of day to day operations and the construction and maintenance of rail infrastructure. Shipping can also help reduce emissions from road transport, as shipping is even more efficient per tonne of freight than rail transport. Inland waterways, which are currently underutilised, are an especially good alternative to moving goods by road. Unfortunately, a level playing field does not exist between road freight and other freight modes in terms of costs; a study on the environmental and social costs of heavy goods vehicles in the UK found that heavy goods vehicles only pay for around 59-69 percent of the full social and environmental costs they impose upon society.⁴⁰

38 McCollum, David, Gould, Gregory and David Green. Greenhouse Gas Emissions from Aviation and Marine Transportation: Mitigation Potential and Policies. PEW Center on Global Climate Change, December 2009.

39 Krohn, O., Ledbury, M., Schwarz, H. 2009. Railways and the Environment, Belgium. Community of European Railway and Infrastructure Companies (CER). [online]. path: http://www.cer.be/index.php?option=com_publications&task=category§ionid=&id=54&Itemid=62. [cited 01.10.2009].

40 Environmental and Social Costs of Heavy Goods Vehicles and Options for Reforming the Fiscal System. Oxford Economic Research Associates, 1999.

TABLE 9. CO₂-EQUIVALENT PER TON-MILE FOR DIFFERENT MODES OF TRANSPORT.



More specifically, rail produces between five and ten times less emissions than road transport, per tonne and requires four to seven times less energy than road transport.⁴¹ Rail accounts for 1.6 percent of total transport emissions but transports 10.3 percent of all freight. In real terms, one freight train can replace 150 semi-trailers.⁴² While road transport is more practical and efficient for short hauls and for the “last mile” between regional distribution centers to market, to bring transport emissions down, medium and long distance hauls need to be moved from trucks to rail or to waterways. France has begun this important modal shift by setting a goal of increasing rail’s modal share of freight to 25 percent by 2012 as part of their national emissions reductions programme. Germany has also set a goal of increasing rail’s share of freight transport from 17 percent to 25 percent by 2015 in order to meet its national emissions targets.⁴³

For the environmental benefits of shifting from road to rail freight to be truly realised, electrification of the rail system powered by low-carbon, renewable energy sources is necessary. Although rail is currently far more energy and fuel efficient than road freight, many rail systems around the world rely on fossil-fuel –based diesel locomotive engines that produce harmful

pollution and emissions. The concentration of diesel pollution around rail yards from trains, trucks and cargo handling equipment is a serious concern for transport workers and the communities surrounding these areas.

The modal shift in transportation is a long term proposition, but the process must begin immediately. A modal shift to reduce transport emissions should require ITF industrial sections to work together to create a high-quality, low-carbon intermodal approach to moving people and goods that utilises the most efficient and low-carbon mode of transport for each segment of a journey. For example, taking a container or mega-trailer off the road and putting it on a long-distance freight train, using trucks only for short pre- and post-carriage links, cuts specific energy consumption by almost half.⁴⁴ This shift should also require ITF industrial sections to collectively demand better working conditions and an internalisation of all social and environmental costs for each transport mode.

41 ASLEF (train drivers union). <http://www.aslef.org.uk/information/100012/107535/105442/105143/freight/>

42 Australian Rail Tram and Bus Worker, 2005.

43 Umwelt Bundes Amt. <http://www.umweltbundesamt.de/index-e.htm>

44 Krohn, O., Ledbury, M., Schwarz, H. 2009. Railways and the Environment, Belgium. Community of European Railway and Infrastructure Companies (CER). [online]. path: http://www.cer.be/index.php?option=com_publications&task=category§ionid=&id=54&Itemid=62. [cited 01.10.2009].

IMPROVE: IMPROVING EFFICIENCY TO REDUCE GHGs IN THE TRANSPORT SECTOR

Improving the energy efficiency of transport modes and vehicle technology is the third step in the Reduce-Shift-Improve model. While reducing and shifting travel demand to low and zero carbon modes of transit holds more promise in the overarching and long-term goal for reducing transport emissions, vehicle and fuel efficiency is important to short-term reductions and for reducing GHGs in developing countries where vehicle stock is growing rapidly. As developing countries increase their use of motorised transport modes, they may “leapfrog” more polluting technologies by adopting more advanced, clean technology to meet their transport needs.

Light-Duty Vehicles

With the total stock of LDVs quickly increasing (from 700 million in 2005 to nearly 2 billion by 2050), improving the efficiency of LDVs is critical to bringing emissions from this sector down in the short-term.⁴⁵ While shifts to public transit may occur more quickly, shifts in the density of a city so that people may access important services with private cars will take longer. There are three main avenues for increasing the efficiency of LDVs: vehicle efficiency improvements; alternative fuels; and advanced vehicle technologies.

Because internal combustion engines currently dominate the world fleet, improving the efficiency of these motors is a low-cost, short-term method for reducing transport emissions. The main methods for improving the efficiency of combustion engines are hybridised drivetrains, engine down-sizing, turbo-charging, weight reduction, and new engine configurations and combustion regimes.⁴⁶

Advanced vehicle technologies based on grid-based electricity or electro-chemical energy propulsion systems will increase their share of the world vehicle stock in 25 - 50 years. More specifically, these include plug-in hybrids, fuel-cell and full electric vehicles (EVs).

Rail

Rail is already one of the most energy efficient modes of transport. Besides attracting the movement of goods and people to rail by improving service and expanding routes, there are some energy efficiency improvements that can be made to trains themselves. These include reducing aerodynamic drag, lowering train weight, and developing higher efficiency propulsion. The IPCC projects that these efficiency improvements could result in a few percent to a 40 percent improvement in rail energy efficiency. In the US, rail fuel efficiency has increased 38% since 1990 through advanced monitoring systems, lighter freight cars, and more efficient locomotive engines. In contrast, road fuel efficiency has only increased 11 percent since 1990. In effect, rail now transports twice the amount of freight tonnage as it did in 1980 while consuming about the same amount of fuel.

Shipping

Like rail, shipping is also a very energy efficient mode of transport. As a result, about 90 percent of global merchandise is transported by sea, using ships with diesel engines (about 96 percent have diesel motors). Most studies agree that the only near term option for reducing shipping emissions is speed reduction, however this is not feasible for all ships. Some studies estimate that emissions from bulk, container and tanker shipping could be reduced by 30 percent by using current oversupply to reduce

“Improving traditional internal combustion engine vehicle fuel economy is a key low-transport GHG reduction strategy — there is a clear opportunity to improve new car fuel economy 30% or more by 2020 and 50% by 2030 at low costs taking into account lifetime fuel savings.” (International Transport Forum, 2009).

speed.⁴⁷ Generally, fuel use and speed are related by a third-power function, so a 10 percent reduction in speed corresponds to a drop in emissions of

45 IEA, 2009

46 IEA, 2009

47 Seas At Risk: Going Slow to Reduce Emissions, 2010. <http://www.seas-at-risk.org/>

approximately 27 percent per unit of time or 19 percent per unit of distance. In reality, the reduction in emissions will be a little higher than 19 percent per unit of distance as ships sail only a part of their time at their optimal speed. Reducing shipping speeds is a particularly attractive form of increasing efficiency and reducing emissions because it may not require any major modifications to the ship and, theoretically, could be introduced overnight.

The efficiency of ships can be increased through new ship concepts, larger ship sizes, hull, superstructure and propeller design optimisation, more efficient power and propulsion systems, and low-resistance hull coatings. The IPCC projects that by implementing these energy efficiency improvements new ships could see a 5 - 30 percent reduction in their CO₂ emissions and old ships might achieve a 4 - 20 percent reduction. Alternative fuels may be a long-term mitigation solution for ships. The Second IMO GHG Study (2009) argues that renewable energy, like wind power, may also help to reduce shipping emissions (from 1 - 10 percent) in the future. In the medium to long-term, the operating efficiency of ships could be improved by optimisation of shipping logistics, routing and maintenance.

Although shipping is a very efficient form of transportation, the bunker fuels used in ship motors are highly polluting. In order for shipping to significantly reduce its greenhouse gas equivalent emissions (bunker fuels emit high levels of sulphur), low-sulphur fuels need to replace bunker fuels or expensive abatement systems need to be installed. There are also increasing limitations on Nox emissions and this is generally being addressed by improved engine technologies.

Aviation

Given the expected growth in flights between now and 2050, greater efficiency of planes will be important even if flight demand is reduced through other mechanisms (availability of rail, cost prohibitions on flights, etc). Near-term mitigation options for aviation include improvements to the aviation system like advanced communication, navigation and surveillance

(CNS), and air traffic management (ATM). These improvements could help decrease fuel consumption, shorten travel distances, and reduce congestion on the ground and in the air. GHG emissions from aviation could also be reduced by shortening flight route distances, minimising taxi time, flying at optimum cruising altitude, limiting holding and stacking, performing operational changes to reduce contrails, reduced vertical separation minimum (RVSM), and lower flight speeds.

Several medium to long-term options for increasing the energy efficiency of planes include improving the aerodynamics of the airframe (including blended wing body), engine technological developments, weight reduction, drag reduction, and the use of alternative fuels (primary fuel source for planes currently is kerosene).

JOB IMPLICATIONS OF A REDUCE – SHIFT – IMPROVE STRATEGY

What will a determined approach to RSI mean for employment opportunities in the transport sector? As noted in Part 1, jobs in transportation have grown in number, but the quality of the employment has generally declined. However, even the growth in job numbers appears precarious, as hyper-competition has seen, for example, huge financial losses for both motor vehicle manufacturers and airline companies. Further consolidation is seemingly inevitable.

Meanwhile, a number of studies of Reduce – Shift – Improve policies suggest that more jobs will be created in transport than lost by these policies.⁴⁸ But it will be up to the ITF and affiliates to ensure that these are high-quality, secure union jobs that provide equal opportunities for women, people of colour and other marginalised social groups in terms of occupation, pay, training and benefits. However, RSI policies may cause changes in existing jobs and potential job losses. Therefore, unions need to account for these changes in their organising strategies — looking ahead to how workers will be affected by climate change and climate protection policies.

48. Green jobs: toward decent work in a sustainable, low-carbon world. UNEP/ILO/ITUC. Martin Cames et al., Hauptgewinn Zukunft: Neue Arbeitsplätze durch umweltverträglichen Verkehr (Freiburg and Bonn: Öko-Institut und Verkehrsclub Deutschland, 1998). (Tim Jenkins, Less Traffic, More Jobs (London: Friends of the Earth Trust, May 1997).

One major source of job creation from RSI policies is the modal shift from private vehicles to public transport which would entail a large expansion and improvement of public transport systems. Currently, public transport agencies are major employers. According to the International Association of Public Transport (UITP), an estimated 900,000 people are employed in urban public transport in the 25 member states of the EU. In Paris, RATP employs 43,000 people and in New York City, public transportation employs 43,000 subway and bus drivers – as well as thousands of administrative and supervisory staff. Public transport investments in Europe have an average job multiplier of 2 to 2.5 (but reaching as high as 4.1 in some cases). Studies in Europe and the United States show that about 30 jobs are created for each 1 million Euros invested in public transport infrastructure, and 57 jobs for the same level of investment on the transport operations side.⁴⁹ A recent US study of stimulus spending on transportation found that investment in public transport creates twice as many jobs per dollar as new road construction. Overall, several studies have shown that investment in public transportation projects creates more jobs than investment in new road construction and a greater variety of jobs, including in transit construction, operation, maintenance, administration and housing, retail and commercial construction near new transit.

The shift from road-to-rail and air-to-rail could also create many jobs. As well as being more fuel efficient, rail transport is also more labour-intensive than road transport.⁵⁰ German studies suggest that this is true for track construction relative to road construction as well. Indeed, highway construction generates the fewest jobs of any public infrastructure investment.⁵¹ Furthermore, freight rail jobs are typically higher paying and of better quality than road freight jobs. For example, in the US the rail industry is 85% unionised and rail workers earn “30% more than the mean US annual income and 74% more than workers in the transport sector as a whole.”⁵² In addition, 7,800 jobs are created for every \$1.8 billion invested in freight rail in the US; these jobs include direct employment in freight rail as well as employment in manufacturing (locomotives, freight railcars, shop machinery), construction (rail roadway buildings, warehouses, grading), the iron and steel industries

(rail and over-the-road track materials), and more.⁵³ In general, modal shift promises to create more jobs in the manufacturing of buses, light rail, underground rail and railways; in the provision of the required infrastructure for these modes of transport (including tracks, signals, stations, etc); and in planning, running, and maintaining transport systems (bus drivers, conductors, other operators, route planners, maintenance staff, etc).

In the EU-25, a total of 8.2 million people were employed in all transport services combined in 2004. However, railway transport accounted for just 11 percent, or 900,000 jobs. Rail employment has fallen in the last few decades; in just the short span of time between 2000 and 2004, the number of jobs was cut by 14 percent even as value added grew 3 percent. Road passenger and freight transport jobs, by contrast, number some 4.3 million, and air transport jobs number 400,000.⁵⁴ The development of rail could reverse these jobs losses in a relatively short period of time.

The employment effects of an RSI approach to emissions for the auto industry is more complicated. Over several decades, a major shift away from private passenger vehicles and heavy-duty vehicles might decrease employment in the manufacturing, maintenance and repair of vehicles, as well as road construction and maintenance. However, because restructuring the current land use system to reduce travel is a medium to long-term shift and because there will always be a certain demand for private vehicles, especially in rural areas where the capacity to serve residents with public transit is limited, the need for clean car manufacturing, maintenance and operation is significant. A study of the US clean car market found that policies regulating greater fuel economy would spur demand for clean cars and by “supplying the U.S. automobile market with more efficient cars could provide a net gain of over 190,000 new jobs [globally] from improvements to fuel economy alone”.⁵⁵ Furthermore, construction, maintenance and operation of the infrastructure to support hybrid-electric, electric and hydrogen-cell vehicles will also create employment. Finally, the auto industry is well set up to transition, or “retool” to manufacturing buses and trains for public transport, as well as railcars for freight rail.

49 WWF note 103; also Öko-Institut study – WWF 104 and Denmark study WWF 105

50 WWF note 110

51 111 German studies from Michael Renner, *Jobs in a Sustainable Economy*, Worldwatch Paper 104; Washington, DC : Worldwatch Institute, September 1991, p. 33

52 Full Speed Ahead: Creating Green Jobs Through Freight Rail Expansion. Blue Green Alliance and Economic Policy Institute, 2010.

53 Full Speed Ahead: Creating Green Jobs Through Freight Rail Expansion. Blue Green Alliance and Economic Policy Institute, 2010

54 European Commission, *Panorama of Transport Edition*. 2007. Brussels: Eurostat Statistical Books: p. 154.

55 Driving Growth: How Clean Cars and Climate Policy Can Create Jobs. Natural Resources Defense Council, Center for American Progress and United Auto Workers, 2010.

POLICY STRATEGIES TO REDUCE TRANSPORT EMISSIONS

Compact, Mixed Use Development: Reduces vehicle kilometres travelled by locating essential services - housing, employment, retail - in close proximity. Compact development also concentrates development in existing areas (infill or brownfield development) in order to protect open spaces, forests and farmland.

- ▶ Integrated transportation and land use planning that includes multimodal transportation strategies.
- ▶ Require local, comprehensive climate action plans that inventory greenhouse gases and analyse emissions reduction strategies, including prioritisation of projects that support growth in transit, reduce vehicle kilometres travelled, and reduce greenhouse gases.
- ▶ Require, or provide financial incentives, for smart growth or “smart location” projects- areas where kilometres miles travelled generation will be minimised.
- ▶ Require, or provide financial incentives, for transit-oriented development (TOD) or “transit villages” ³/₄ where housing and employment are adjacent to public transit.

Reduce Vehicle Kilometres Travelled

- ▶ Invest in new public transit and greatly expand and improve existing public transit systems for commuter, intercity, rapid and light rail transit.
- ▶ Low emission zones/ Physical restraint measures - areas where access is permitted only to vehicles or classes of vehicles meeting a prescribed standard of emissions.
- ▶ Traffic management measures - smooth traffic flow which reduces congestion and increases fuel efficiency and reducing emissions.
- ▶ Regulation of parking supply - renders car use unattractive and encourages a modal shift to public transit or non-motorised modes.
- ▶ Speed restrictions - lower speeds generally equal greater fuel efficiency and thus, lower emissions.
- ▶ Pricing mechanisms to reduce vehicle use and vehicle kilometers traveled - road pricing, fuel tax implementation/increases, fuel standards, vehicle taxation, parking pricing, congestion charges, high occupancy toll lanes, variable pricing for peak and off peak travel, pay as you drive insurance and other per-mile user fees, and provide incentives for commuters to travel to work by transit, bike or other motorcar alternatives.
- ▶ “Complete streets” and other traffic calming measures that equally prioritise vehicles, public transit and biking and walking.
- ▶ Ride-sharing, car-sharing, and other commuting strategies.
- ▶ Telecommute, Live-Near-Your-Work, and Compressed Work Week.
- ▶ Integrated aviation, rail and bus networks.

Freight Transport

- ▶ Multimodal freight sector strategies, such as: incentivising investments to expand rail and inland waterways; intermodal facilities; feeder barge container services; increase rail capacity and rail freight system bottlenecks; truck stop electrification.
- ▶ Clean and Healthy Ports Strategy – ports replace old, diesel polluting trucks with clean or retrofitted trucks; limit the amount of time a docked ship can run their engine and use AMP (or “cold-ironing”) so that ships can plug into a dockside electrical power source from renewable energy; use renewable energy sources to power port vehicles and other port equipment; require ships to reduce their speed when arriving and leaving the port; require ships to use low-sulphur fuels; move cargo by low-emitting rail like magnetic levitation; ports or companies employ and are responsible for port truck drivers and the maintenance of their trucks.
- ▶ Heavy-Duty Vehicle Incentives and Disincentives: to obtain new, more efficient equipment and retire less efficient vehicles; maintenance and driver training; procure efficient heavy-duty fleet vehicles; anti-idling enforcement measures;

The Reduce – Shift – Improve framework offers the best chance we have to counter the rise of emissions from transport. Reducing unnecessary travel – based on full internalisation of costs – is a good thing for transport unions. Similarly, transport unions have much to gain from a modal shift from high-carbon to low-carbon modes of transport. Improving the fuel and energy efficiency of different modes of transport is also an important component of the RSI approach, and can also bring health and employment benefits to workers and communities everywhere.

Transport unions can therefore feel confident that there are ways to fight emissions from transport that make a real contribution to the global effort to stabilise our climate and protect both our planet and ourselves at the same time.

However, RSI should be seen as part of a much larger “economy wide” strategy to fight climate change. In Part 3 we make suggestions about what needs to be done to develop and implement such a strategy, and how the ITF, its affiliates, and its individual members can each play a part.

PART THREE

STRATEGY: TRANSPORT UNIONS AND CLIMATE PROTECTION

REDUCE – SHIFT – IMPROVE: REINFORCING ITF POLICY AND STRATEGIC GOALS

In the final section of this report we consider what might assist the further development of an ITF strategy that responds to the challenge of climate change and the urgent need for sustainable mobility. For convenience, we have divided the areas of action into three – the industry; the policy world, and movement-building – while fully cognisant of the fact that there is considerable overlap between each of the three areas.

What follows is consistent with many of the ITF's existing positions and overall approach to global questions. Transport unions have always been internationalist and committed to solidarity and alliance-building. The global and all-encompassing nature of the climate crisis compels us to draw on the rich experience and historical traditions of transport unions as we face the struggles ahead.

Taking action on climate can also serve the strategic goals of the ITF, including the effort to increase membership participation in their unions, and advance our organising and campaigning work. The crucial role of transport workers to the functioning of the global economy, as key operators in global and regional hubs and sensitive global supply chains, presents an opportunity for transport unions to exercise an influence on the process of change that is disproportionate to our numbers. And championing the long-term objective of stabilising our climate will actually strengthen our efforts to fight for the interests

of transport workers' pay and conditions in the here and now. These should be viewed as complementary to one another, and not as separate issues.

However, we should also acknowledge that the systemic and profound nature of the climate challenge means that many of the things that need to be done to reduce emissions and establish a sustainable economy fall outside of both the purview and direct sphere of influence of transport unions, at least as traditionally understood. Global warming calls for global solutions – and the ITF can play a role in enabling members of transport unions to speak with one voice on climate change policies, and should add this voice to the growing chorus of civil society organisations that are demanding concerted action. The climate challenge should compel transport unions to seek durable alliances with those who share our vision of a low carbon and sustainable world. But it needs to be recognised that, like most unions, ITF affiliates are perhaps only just beginning to develop workplace-level and bargaining strategies to promote climate protection. The largely undeveloped nature of the “immediate action” proposals offered here reflects the fact that a lot more thinking needs to be done in this respect. What follows is a basis for an overall strategy that will hopefully stimulate more and better developed ideas for ways to engage this issue on a day to day basis.

The overall framework presented below nevertheless rests on the solid understanding that a bold Reduce – Shift – Improve (RSI) approach to transport can make a major contribution to reducing emissions in the years

ahead and create millions of new, good quality jobs at the same time. The RSI framework can, if implemented, reduce emissions to levels that are more consistent with those demanded by science. Each of the three objectives – reduce, shift, and improve – are important, but reducing mobility that involves generating emissions would appear to be the key variable, especially when viewed over the longer term. As explained in Part 2, reducing transport need not lead to a decrease in quality transport jobs, but may in fact increase them and build union strength at the same time.

Moreover, the RSI approach is consistent with the ITF's core policy priorities. The transport system that today wreaks havoc on our atmosphere simultaneously inflicts severe damage both on the health and welfare of transport workers and on the quality of life of countless communities in many parts of the world. This makes the implementation of ITF policies doubly essential.

The ITF's climate protection strategy should therefore be built around three broad and overlapping arenas for potential action, embracing industry, policy and society. These are:

► **Industry: *Polluters must Pay – Reduce Emissions by Improving Wages and Conditions of Transport Workers***.

The full cost of transport must be 'internalised' and not dumped on the backs of workers, communities and the environment. Wages and working conditions of transport workers should rather be improved, as this will both reduce emissions and help build healthier and more sustainable communities. Transport workers should serve as stewards of the environment by pushing for and helping to implement technical and operational changes that can both reduce emissions and serve workers and communities.

► **Policy: *Strategic Government Interventions***.

Private markets dedicated to profit and increased consumption are causing emissions to rise at ever faster rates. Market-based measures have not, and will not, succeed in reducing emissions to the levels required by science. This is an emergency situation. States must take decisive action, both individually and collectively, to reduce emissions and restructure economic life in a way that is equitable, democratic, and guided by the need to advance social and environmental priorities. For transport, this will require governments develop and then drive the implementation of RSI policies with clear interim goals and targets.

► **Society: *In the Movement, on the Streets – Involve Members, Build and Sustain Alliances***.

ITF affiliates and their members, as well as trade unions everywhere, should help to build a broad and international movement for real change and genuine sustainability. Such a movement is already happening in countless communities of the North and South. Without a vibrant and powerful movement demanding change, climate protection measures will be perpetually delayed and obstructed. Every member can be asked to play a part in this effort, in the workplace or in the community.

I. INDUSTRY: POLLUTERS MUST PAY – REDUCE EMISSIONS BY IMPROVING WAGES AND CONDITIONS OF TRANSPORT WORKERS.

Polluters Must Pay - Internalise Social and Environmental Costs of Transport

As noted in Part 1, the deregulation and overall liberalisation of transport has degraded jobs while at the same time making a major contribution to rising emissions. The ITF should insist on a *moratorium on the further liberalisation of transport*. The commitments of institutions like the World Bank and the European Commission to sustainable transport are meaningless as long as neoliberal assumptions dictate policy options.

A moratorium on the further liberalisation of transport needs to be accompanied by a pricing policy for transport that is based on “user pays” and “polluter pays” principles. As the European Transport Workers Federation notes, “Air pollution, noise related health problems, greenhouse gas emissions, congestion, accidents, etc, are generating costs which are today largely paid by the public in general and not by the users/polluters.”¹ For example, road transport companies can be charged user fees that defray the full public cost of GHGs, diesel particulates, highway accidents, and congestion. Trucking companies rarely pay their rightful share of highway maintenance and repair costs, and should be made to do so.² Furthermore, protecting and restoring workers’ standards is presently contingent on the introduction of tighter rules for access to the industry, the relaxation of which has led to over-capacity and destructive competition. The internalisation of costs should serve as an incentive to develop green technologies and the use of more sustainable transport

modes – such as moving more goods by rail and fewer goods by trucks.³

The full internalisation of transport costs is, however, not an end in itself but an important milestone on a much longer road to sustainability. Thus it should not prevent governments from organising collectively-financed universal public services. Moreover, internalising costs need not and should not have an adverse impact on low income families. Policies can be implemented that can protect those in hardship from rising transport costs.

In the case of shipping, efforts need to be stepped up in order to draw to a close the present flags of convenience system. This system allows owners to escape regulation at national level, thereby depriving workers of basic rights and minimum levels of pay. Instead, priority should be given to protecting and improving the working environment faced by seafarers and establishing a genuine link between ownership and the flag a ship flies. This may in turn stimulate technological and operational changes to boost efficiency and lead to emissions avoidance. In aviation, the relentless drive to cut costs have taken its toll on the lives of pilots, cabin crews, baggage handlers and workers hired by catering companies like Gate Gourmet. Cost cutting has made flights cheaper and generated more emissions, but

those who fly more than once a year tend to be earning higher incomes or they are flying for business purposes.⁴ In the industry as a whole, achieving environmental goals goes hand in hand with achieving just and decent work.⁵

While the ITF should support re-regulation and other policy instruments to promote internalisation of the social and environmental costs of transport, it should also recognise that the full internalisation of these costs

As the European Transport Workers’ Federation notes, “Air pollution, noise related health problems, greenhouse gas emissions, congestion, accidents, etc, are generating costs which are today largely paid by the public in general and not by the users/polluters.”

1 European Transport Workers Federation, Resolutions Adopted at the ETF 2009 Congress, Resolution I, A Trade Union Strategy for Sustainable Transport, See: <http://www.itfglobal.org/etf/congress-2009-resolutions.cfm>

2 See David Bensman, “Moving the Goods: The Case for Federal Freight Regulation and Investment” (Demos – draft, forthcoming, quoted by permission of author).

3 ETF Resolution I, 2009.

4 Environmental Change Institute, Predict and Decide: Aviation, climate change and UK policy (authored by Cairns, et. al., (2006) ECI Research Reports. <http://www.eci.ox.ac.uk/publications/2006.php>

5 David Cockroft, “Greening the World of Work,” Global Unions, 2009. <http://www.global-unions.org/spip.php?article306>

will put serious stress on the present economic system. A 2009 UN study estimated that accounting for the environmental damage of the world's 3,000 largest corporations would cost \$2.2 trillion and wipe out one-third of their profits.⁶ Many would be forced into bankruptcy, especially in hyper-competitive industries like transport, where profit margins are often razor thin.⁷ Such a scenario would be devastating to workers and small businesses that supply the larger companies – if no alternatives for employment or income are put in place (an issue we return to below). A 'just transition' is therefore needed to deal with the negative effects of internalisation. However, a phased-in internalisation would also spark innovation aimed at greater efficiency and diversification.

The ITF should take the view that internalisation need not involve putting a monetary value on nature, as the proposed market-based model both presumes and demands. Treating both the lives and feelings of people and the ecosystems upon which we all depend as mere commodities with a price tag for trading purposes flies in the face of basic human values and will not solve either the social or the environmental crises we face. Can a price be put on a glacier that once supplied water to farms and villages that has now disappeared forever? Can a price be put on the lives of children who die of malaria as a result of global warming? The commodification of the natural world – so called natural capital – is what got us into this crisis to begin with. Thus there is no alternative but to progressively liberate key sectors of economic life from the imperatives of profit and consumption. For transport, this means protecting essential services and responsible mobility within an RSI framework.

Carbon Trading – Neither Effective nor Equitable

The need to resist the commodification of nature should inform the ITF's approach to carbon trading. Carbon trading is regarded as a key climate policy option, one that flows from the "flexibility mechanisms" embodied in the Kyoto Protocol. While the ITF should support the equity principles embodied in the UNFCCC and the Kyoto Protocol, there is no reason to believe that carbon trading and the Clean Development Mechanism will produce the reductions

we need in the time frame in which they are needed. It is worth noting that the equity principles in the Kyoto Protocol and the UNFCCC, which are widely supported by trade unions and social movements around the world, remain largely paper commitments. Funds for adaptation to climate change and for technology transfer, despite the many promises, have not materialised. In contrast, the business-driven effort to expand carbon markets has moved forward at considerable speed.⁸

Climate change cannot be tackled without fundamental structural changes in our economy and society. The logic of carbon trading is that CO₂ and other GHGs are viewed as "externalities" that need to be priced, and carbon markets purportedly allow for "flexibility," and reduce polluters' costs in ways that carbon taxes and regulations do not. The constant referencing of the need to "incentivise" actions to gradually reduce emissions speaks volumes. Action not driven by the profit motive therefore becomes unimaginable. Carbon trading has also led to a reliance on offsetting – which essentially delays or halts action to protect the climate in one place in order to take 'actions' somewhere else – in the name of flexibility and gradual adjustment. These actions often involve minor technical improvements and seldom reduce CO₂. Such an approach has also been shown to be vulnerable to fraud and speculation, and is indicative of a tendency to do anything possible to avoid getting to the root of the problem. Actually assessing and implementing offset and trading schemes have been shown to be enormously difficult.⁹

The policy focus on carbon markets has also distracted attention from the need to pursue measures to reduce emissions which might be quicker and more effective. Conventional regulations and taxes have a role to play, as do the removal of subsidies for fossil fuels. Public investments in energy efficiency in order to reduce demand for electrical power are also needed. These could be self-financing, create employment, and reduce emissions at the same time. The expansion of social and democratic ownership of industries that produce emissions is also necessary in order to prevent further damage to people and the environment and to

6 Guardian, "World's top firms cause \$2.2tn of environmental damage, report estimates", <http://www.guardian.co.uk/environment/2010/feb/18/worlds-top-firms-environmental-damage>

7 Andrew Simms, "Carbon addicts and climate debt" Contribution to the BBC website, <http://news.bbc.co.uk/2/hi/science/nature/4696924.stm> Feb. 9, 2006

8 According to one study, the EU's Emissions Trading System "captured private sector attention like no other climate initiative, and its rapid introduction and impact contrasted with a decade of dispute over (failed) attempts to introduce a European carbon tax." See German Marshall Fund of the United States, "Climate Policy and Industrial Competitiveness: Ten Insights From Europe on the EU Emissions Trading System," Climate and Energy Paper Series 09. Executive Summary.

9 Regarding fraud, the Canadian Broadcasting Corporation, (April 10, 2010) reports: "In December 2009, Interpol announced it had uncovered a sophisticated carbon trading fraud ring that had made off with more than \$7 billion over the preceding 18 months. The scam was essentially an old-fashioned tax-evasion scheme, made possible by the nebulous nature of international carbon markets. The fraudsters set up numerous trading accounts on the ETS, then bought credits tax-free on exchanges in countries outside Europe. Those credits were transferred into the European accounts and the fraudsters collected tax on the transactions, but the monies were never paid to any European tax agencies. ...With competing carbon trading systems and no centralized authority tasked with policing, similar abuses could still happen. A recent report by auditor firm Deloitte warned that fraud, bribery and money laundering could be the norm in the \$132 billion international carbon market." See: <http://www.cbc.ca/money/story/2010/04/20/f-carbon-trading.html>

plan an equitable and orderly transition to a low carbon economy.

Such an approach would be far more effective than trying to set up regional and national carbon markets and then, some day far in the future, a global carbon market. The world's most developed carbon market, the EU's European Trading System (EU-ETS), presently covers only 40 percent of the EU15's economy. An MIT study estimates that the EU-ETS has reduced European emissions by 2 percent below what they might have been had the EU-ETS not been established, or 5 percent of the emissions generated by the sectors covered.¹⁰ These modest reductions also came at a price. Industry lobbyists pressured governments to issue an excessive volume of pollution permits, resulting in the largest polluters making windfall profits.

These problems have been dismissed as teething troubles that can be solved in Phase Two of the EU-ETS in a "learning by doing" fashion.¹¹ However, airline companies are expected to receive 87 percent of their allowances for free when they join the EU-ETS in 2012, thus prompting speculation that companies continue to dictate the terms in a way that protects profits and obstructs serious action on emissions.¹²

In theory, the cap on emissions could be set low enough to achieve emissions reductions, and 100 percent of pollution permits could be auctioned and the revenues used by governments to invest in renewable sources of power, energy conservation, and public transportation systems. However, transportation is normally excluded from carbon trading schemes (although the International Maritime Organization (IMO) is presently exploring an emissions trading system for international shipping, (ETSIS). Overall,

"Emissions trading does not inevitably impose net costs on industry. Indeed, despite initially opposing the EU-ETS, all participating industrial sectors in Europe have in aggregate profited from its operation to date – perhaps excessively."

From: Climate Policy and Industrial Competitiveness: Ten Insights From Europe on the EU Emissions Trading System, (German Marshall Fund of the United States, Climate and Energy Paper Series 09.) Executive Summary.

these schemes have thus far tended to focus on the large industrial emitters, and not small individual sources of emissions even though these often add up to huge levels of GHGs. Moreover, many corporations and states pushed for the inclusion of large volumes of offsets in carbon trade markets as a means to escape their responsibility to reduce their own emissions.

Meanwhile, the price of carbon has in recent times been so low that it has not served as an incentive for companies to innovate and reduce their emissions.¹³ Most of the major studies that examine how emissions can be reduced (in transport and other sectors) assume that the demand for pollution credits will keep going up to levels around \$200 per ton.¹⁴ At that price, investments in carbon-reducing technologies might make

sense – but what if the price continues to stay much lower? An IMO-commissioned study underscores the point: "The level of reductions of CO₂ emissions depends on the carbon price contribution per tonne of bunker fuel. The higher the carbon price, the more CO₂ emissions will be reduced. However, high carbon prices (nominal price of more than \$1000 per tonne of CO₂) are required to reduce emissions by 50 percent or more."¹⁵

The ITF should share the concerns of others in civil society that carbon trading is neither equitable nor effective. Yes, carbon markets could be designed better and could perform better. But there are too many risks, too much potential for fraud and abuse, and the development of carbon markets is too slow a process.¹⁶

A better alternative to carbon trading is the stringent regulation of CO₂ and other GHGs. Experience shows that companies which dedicate capital in order to

¹⁰ Ibid, Executive Summary

¹¹ Ibid.

¹² The Carbon Trust warns that the same mistakes are being made in terms of bringing aviation into the EU-ETS. According to Peter Lockley, head of transport policy at WWF-UK, "We have always argued that airlines would make windfall profits from free allowances, just as the power sector did. We hope the EU will quickly move to require airlines to pay for 100% of their emissions allowances." See "Fasten Your Seat: Airlines and Cap and Trade," <http://www.carbontrust.co.uk/Publications/pages/publicationdetail.aspx?id=CTC764>

¹³ Meanwhile, the events in Copenhagen and in the US Congress led to a carbon market crash in December 2009. Carbon markets are currently worth around \$130 billion/year, but had Copenhagen and congressional initiatives succeeded, they were expected to soar to \$3 trillion in annual turnover by 2020, not counting derivatives. The failure of the US Congress to introduce a "cap and trade" system will have a chilling effect on carbon markets in Australia, Japan, Canada, and eventually even Europe. See: Patrick Bond, response to Robin Hahnel's "Has the Left Missed the Boat on Climate Change," Znet. <http://www.zcommunications.org/znet/viewArticle/23656>

¹⁴ Patrick Bond, *ibid*. See also Ted Nordhaus and Michael Shellenberger, "The End of Magical Climate Thinking," Foreign Policy (13 January 2010) See: http://www.foreignpolicy.com/articles/2010/01/13/the_end_of_magical_climate_thinking?page=0.0

¹⁵ IMO, Marine Environment Protection Committee, "Prevention of Air Pollution in Ships," Jan 15, 2010.

¹⁶ According to Carbon Trade Watch, "A series of scandals have spread fresh concerns about the system - including a VAT fraud that accounted for up to 90 percent of trading in some EU countries, and the "recycling" of CDM credits in Hungary, allowing their "reductions" to be counted twice." <http://www.carbontradewatch.org/articles/where-is-carbon-trading-heading.html>. April 19, 2010 See also: Marton Kruppa and Ben Garside, "Hungary sells "recycled" CERs," Point Carbon, 11 March 2010; Leigh Phillips, "EU emissions trading an "open door" for crime, Europol says," EU Observer, 10 December 2009; <http://euobserver.com/885/291324>

comply with regulations also frequently introduce methods and technologies that lead to more efficient production (either reducing inputs or increasing outputs) than the regulations themselves demand. The result often leads to greater than required emissions reductions. However, with emissions trading any company that produces excess reductions will either sell them to another company, or bank them for future use. The ITF should therefore join others in the international trade union movement in stating that carbon markets will not be able to drive the structural changes needed within the desired time frame, nor will it be able to raise or sustain the financial resources required to reduce emissions to the levels science demands.¹⁷

Regarding shipping, the ITF should also share the concern of civil society that the IMO has been too slow to introduce legislation that will reduce emissions. The ITF is currently committed to work with the IMO's process, based on a "flag blind" application, as this is the only feasible solution that does not exacerbate the flag of convenience system. The ITF is involved with the IMO's study to determine the most effective measures to give incentives for ongoing efficiencies whilst generating funds for the infrastructures of developing countries. However the ITF will continue to be critical of any action by the IMO that is not in the best interests of workers or ignores the realistic needs of developing countries.

2. POLICY: STRATEGIC GOVERNMENT INTERVENTIONS.

The need for a bold RSI approach to emissions reductions is clear, but it will not be implemented as long as private markets and corporations are left to make key decisions on investments, technologies and time frames. In fact, private markets dedicated to profit and increased consumption are causing emissions to rise at ever faster rates. This is an emergency situation which requires a broad mobilisation of trade unions and other social forces to drive a political change of course. States must be compelled to take decisive action, both individually and collectively, to reduce emissions and restructure economic life in a way that is equitable, democratic, and guided by the need to advance social and environmental priorities. For transport, this will require involvement from unions, communities, and small businesses and others to develop and then drive the implementation of RSI policies with clear interim goals and targets.

We need policies that operate on two fronts. The first front requires intercepting business as usual policies that cause further harm to people and the environment – including extending control over the remaining supplies of fossil fuels and their extraction. The second front entails shaping economic and social life around a broad vision of sustainability – of which the RSI model for transport is an important component.¹⁸ The suite of policies listed in Part 2 can begin the process of an RSI transition, and many of those policies can be supported by transport unions. However, to be effective in seriously reducing emissions from transport, RSI policies will need to be sufficiently broad and ambitious.

A full-force RSI restructuring will require that governments take more responsibility for the research, development and deployment (RD&D) of transport-related technologies, including those pertaining to the development of biofuels (discussed below), and open pathways for the transfer of environmentally friendly technologies between countries presently blocked by considerations of profit and the emphasis on establishing competitive advantage. RSI also involves

¹⁷ See Public Services International, Statement for COP 15, Dec 2009, www.world-psi.org.

¹⁸ As the ETF notes, "the role of the state cannot be limited to ensuring (fair) competition between companies and probably providing infrastructure, where it is too expensive for the market to invest. The market has severe side effects on social and ecological sustainability and does not provide sustainable infrastructure and public transport."

a major expansion of public transport systems, especially in the global South. Public investment in new grid technologies and carbon capture and storage demonstration projects is needed immediately in order to de-carbonise power generation and to ensure electrified transport by road and rail delivers real emissions reductions.

Removing Obstacles to RSI

The obstacles that currently obstruct the implementation of an RSI agenda are formidable. Many large companies are committed to a “business as usual” approach with perhaps minor or incremental modifications introduced here and there. Oil conglomerates, car companies, aircraft manufacturers and airlines, shipping and trucking companies, large retailers, etc, all want to sell more products in order to realise profit. Some companies understand that emissions need to be addressed and have made good faith efforts within certain limits, but many others simply carry on as normal. Those companies that want to address climate change (often in the hope of making money in the process) call on governments to provide an effective regulatory framework. In contrast to the views of Lord Stern and others, the ITF should regard such a regulatory framework as not an end in itself aimed at making private markets more efficient, but as a first step in a longer term project to introduce democratic direction over all levels of the economy – from the community level on up – as part of a multi-decade transition to a sustainable society. But such a regulatory framework must amount to much more than

a patchwork of incentives, grants, and emissions trading systems. It must be armed with the capacity to pass and enforce strong laws that can intercept business as usual approaches that drive emissions levels upwards.

As suggested in Part 1, the ITF takes a “whole economy” perspective on emissions. The environmental impact of transport is inseparable from the question of how transport is controlled and organised in today’s world, and how transport relates to the entire economy.¹⁹ Therefore the transition to a low carbon future will involve major changes in all economic sectors – among them power generation, manufacturing, forestry and agriculture, and building – as well as transportation. Together these sectors generate the lion’s share of global emissions.

Such an extensive programme of change will, over time, require a qualitative expansion of public ownership and democratic control, although regulation and other policy instruments can also play an important role. The strategic interventions by governments must also include the financial sector, in order to ensure that adequate volumes of capital are mobilised for the investments that will be needed to construct sustainable economies over several decades. The evidence of the last 20 years is enough to indicate that these investments will not happen if they are left to private capital markets driven by profit considerations, a fact acknowledged by the Stern Review.²⁰

The strategic interventions by governments must also include the financial sector, in order to ensure that adequate volumes of capital are mobilised for the investments that will be needed to construct sustainable economies over several decades.

¹⁹ ITF Executive Board statement, April 2008

²⁰ Nicholas Stern, “Stern Review on The Economics of Climate Change (pre-publication edition). Executive Summary”. HM Treasury, London. 2006 Archived from the original on 2010-01-31. <http://www.webcitation.org/5nCeYrJr>. Retrieved 2010-01

THE UN PROCESS – TRANSPORT AND “JUST TRANSITION”

Government interventions need to take place at the global level – in the form of emissions commitments on the part of individual nations. A new global climate agreement must be based on science-based emissions reduction targets, adequate resources for adaptation, and a commitment to the principle of “common but differentiated responsibilities.” Governments must then develop clear and long-term strategies to meet reduction targets. Both developed countries and high-emitting developing countries like China, India, Brazil and Indonesia must take decisive action. These government interventions will serve as a prerequisite for the kind of social cooperation and planning that responding to the climate crisis clearly demands.

Therefore the ITF should continue to work alongside the ITUC and other Global Union Federations for a fair, ambitious and binding global agreement under the UNFCCC/Kyoto process. Climate change is a global problem that demands global solutions – and thus a fair and equitable multilateral process is needed to ensure that all countries can fulfill their responsibilities and commitments. While recognising the severe limitations of the UNFCCC/Kyoto process to date, preserving the integrity of the UN-based effort remains important.

The ITF should consider it critically important to have transportation established as a sector in its own right under the UNFCCC in order to allow mitigation policies in transportation to receive the attention they deserve. The ITF should support proposals to establish a “Low Carbon Transport Facility” under the UNFCCC to help developing countries reverse rampant motorisation with all of its negative social and environmental implications.²¹ However, at the time of writing, it is impossible to know from which process or processes a new global agreement will emerge, via the UN process, the Copenhagen Accord, or by way of both. Either way, emissions reductions across the whole transport sector are necessary to any meaningful agreement. The Accord calls for Nationally Appropriate Mitigation Actions (NAMAs), and strategies for the local implementation of RSI proposals must be developed at the national level.²²

However, as noted above, support for the UNFCCC and the Kyoto process does not mean that unions must also give uncritical support for carbon trading and other “flexibility mechanisms” established under the Kyoto Protocol. These have been too friendly to business interests and thus have not produced results, or – like the Clean Development Mechanism – have thus far had little or no bearing on transport.²³

Any future agreement must, moreover, ensure “just transition” for workers and communities.²⁴ The trade union movement has made a just transition a top priority, including when representing workers’ interests during the UN climate negotiations. The transition to a low-carbon economy – which will transform economic and social life – needs to be conducted in a way that prevents the injustices and hardships of past transitions. Workers will never accept shouldering the burden of transition if it threatens to bring with it damaged livelihoods and increased insecurity – the prospect of which will undermine the very process of change. Trade unions demand to be involved in proposed changes and their implementation. In the lead up to the December 2009 UN meeting in Copenhagen, the ITUC was focusing on just transition as a necessary element in any global climate agreement. Trade unions all over the world are rallying behind the idea of a just transition and have sometimes been successful in turning the principle into specific policies for worker re-training, income support, relocation assistance, etc.²⁵

Meanwhile, the ITF should continue its work to oppose the trade and consumption driven development model promoted by global institutions like the World Bank, the IMF and the WTO and to replace it with a new model of development based on sufficiency, sustainability, and social solidarity.²⁶

Democratic Planning to Create and Protect Jobs

Each dimension of an RSI agenda will require bold government interventions. Reducing the need for the movement of goods and people will involve, for example, new approaches to urban planning. In order for a modal shift to happen, governments must find ways to invest in new infrastructure, particularly in rail. Some governments are already pushing fuel and

21 See the Bellagio Declaration on Transportation and Climate Change and the more detailed Common Framework to Support Sustainable and Low Carbon Transport in Developing Countries. These statements are the outputs and consensus of the discussions at a May 12-15, 2009, meeting on transportation and climate change convened by the Asian Development Bank, the Clean Air Institute, with support of the Rockefeller Foundation. See: Partnership on Sustainable, Low Carbon Transport (SLoCaT). <http://www.sutp.org/slocat/about/bellagio-process/targets-and-progress/>

22 See Bridge the Gap COP 15 paper http://www.transport2012.org/bridging/ressources/documents/1/406.Bridgingthegap_brochure_webPDF.pdf

23 With regards to the CDM, only nine of the 4,474 CDM projects in the pipeline are transport related, and only two of these have been registered (out of 1,515 registered projects at March 2009) – the other seven are at the validation stage (UNEP RISØ Centre, 2009).

24 “Just Transition” is a top priority of the ITUC and Global Unions. See, for example, ITUC: <http://www.ituc-csi.org/just-transition-for-an-ambitious.html>

25 In the US, the House of Representatives passed the “American Clean Energy and Security Act” which contained ‘just transition’ provisions. The bill has yet (May 2010) to become law.

26 As the ETF notes, global transport companies continue to pressure the WTO General Agreement on Trade in Services to include transport services in order to open up domestic aviation and shipping markets to foreign competition; port operators will be subject to enforced competition both within and between ports; the application of the most liberal air traffic agreements would apply to all international air routes through so called ‘open skies’ systems; The system of national ownership rules on which current international regulation depends would break down and flags of convenience could spread more widely throughout the maritime and the aviation industries.

operational efficiencies by way of regulation. All of this must be scaled up by several orders of magnitude if emissions from transport are to be controlled and reduced.

Over time some forms of transport – perhaps aviation, trucking, fuel refining and distribution – may atrophy while others like public transport, use of rail for passengers and freight, will enjoy steady growth. We have to ensure that transport workers in “job loss” parts of the present transportation system do not have to shoulder the burden of climate protection, while at the same time ITF affiliates in “job gain” subsectors look forward to a more secure future. Strategic government interventions, especially ones shaped by unions in the industry, community organisations, and other stakeholders, are needed to ensure a “just transition” takes place. The kind of modal shifts that are needed will take decades to fully accomplish, and natural turnover in the different sectors will mean that involuntary job losses could quite easily be avoided. A transport workers’ job directory, administered jointly by municipal authorities and unions, could incentivise (for example) truck drivers moving over to drive buses as public transport gets scaled up. The expansion of public transport can also help transform poor quality jobs in the informal economy into better quality unionised jobs in the public sector – as has been witnessed in South Africa with the building of Johannesburg’s BRT system (See Part 2). Manufacturing facilities that currently make passenger cars could be converted to produce buses, trams, and coaches. But none of this will occur without strong pressure from trade unions and their allies in society. Workers and communities have a decisive role to play in the planning and implementing of the transition.

A New Future for Public Transport

The ITF views providing public transport as a state obligation at all levels.²⁷ Aside from its many benefits to society, public transport is crucial to any serious effort to reduce transport emissions. In the global South, many countries and cities are in the process of planning investments in transport systems and infrastructure which will “lock in” transport emissions for the next 20 - 30 years.²⁸ The gradual introduction of RSI is therefore

not an option – it must be expedited and scaled up. A broad group of sustainable transport advocates recently declared, “What is required is a sector-wide approach whereby governments, international development agencies and other stakeholders coordinate and combine their efforts to design and implement policies, programs and projects to realise a low carbon sustainable transport system.”²⁹ Expansion of public sector transport in the global South faces, according to an Asian Development Bank study, “numerous barriers” that require “joined up action across all tiers of government and key institutions to overcome them. The success of any such actions will depend upon the availability of finance to support this process.”³⁰ External funding through the CDM, NAMAs and climate related funding mechanisms cannot replace the need for domestic financing in developing countries, but they may catalyse a comprehensive long term transformation of transport systems.³¹

The ITF should support policies that can encourage travellers to leave cars at home and take public transport, while at the same time expanding government support for municipal transit operation and maintenance budgets, and increasing subsidies for employer-based mass transit incentives. Nominal charges or completely free public transport services, subsidised by taxes on air travellers or private vehicle use, is one way to promote a modal shift. Shifting from income taxes to carbon taxes will actually reward those who use public transport, walk or bike while increasing the tax on those who drive and fly. The closing of tax havens is also important. Every year hundreds of billions of dollars pour out of the poorer countries in the form of unpaid taxes.³²

The ITF should support the scaling up of public transport services and the development of infrastructure in order to help counter rampant motorisation. Overall, a qualitative increase in the size and reach of the public sector is needed if dramatic emissions cuts are to be achieved economy-wide. Moreover, public regulatory agencies need to be equipped with the power to enforce climate protection laws that might reduce emissions. Adequate public investments in RD&D of promising technologies needs to be generated, following a full public and independent review of their potential

27 European Transport Workers Federation, Towards a Trade Union Vision on Sustainable Transport (TRUST), Strategy Paper, Brussels, February 2008.

28 Bellagio Declaration on Transportation and Climate Change, 16 May, 2009 – op. cit.
“Common Policy Framework to Support Sustainable, Low Carbon Transport in Developing Countries,” (Background document to Bellagio statement) op. cit

29 Ibid.

30 Asia Development Bank, “Rethinking Transport and Climate Change,” ADB Sustainable Development Working Paper Series, December 2009, page 64. See: <http://www.adb.org/documents/papers/adb-working-paper-series/ADB-WP10-Rethinking-Transport-Climate-Change.pdf>

31 Ibid.

32 For data on tax evasion and its impact on poor countries, see Tax Justice Network: http://www.taxjustice.net/cms/front_content.php?idcatart=2

contribution to reducing emissions. Public-public partnerships are also crucial to opening pathways for knowledge, experience, and technology transfer between countries and within countries.³³ ITF affiliates can enhance communication between each other around promotion of a worker-centred approach to RSI. Governments must lead, and when engaging the private sector must use powers of procurement to enforce ‘positive conditionalities’ in order to maximise the co-benefits of sustainable transport.

Taking Charge of Technology Development, Deployment and Transfer

Technology has an important – but not determinative – role to play in the effort to reduce transport-related emissions. Available today is a broad spectrum of transport technologies, both simple and complex, that can help control emissions. These technologies tend to fall under four categories – vehicle technology improvements (including for aircraft and marine vessels); fuel technology improvements (including alternative fuels); non-motorised systems; and infrastructure and system changes. Importantly, technology is not only a significant feature of the Improve dimension of RSI, it is also important to the Reduce and Shift dimensions too (improved bus seat comfort, wi-fi on buses and trains, dedicated bike lanes, improved signalling, etc). The IPCC has identified a suite of technologies for each of these four categories. Then there are transport related emissions-reducing technologies that hold considerable promise and *could* be developed in the years ahead.

The ITF should have two main concerns regarding transport technologies. Firstly, existing technologies are not being used to their full potential. Secondly, there is no guarantee that promising carbon-reducing technologies will actually be developed – these have been described as “orphan” technologies. In both cases the problem lies in the fact that, while public funds often drive the R&D, in the end private investors and companies must be convinced that deploying a certain technology makes sense from a commercial standpoint. As the IEA notes, “In the long term costs (of new transport technologies) are expected to come down... but the transition to 2050 will include deploying some

relatively high-cost options, and cost reductions are not assured.”³⁴ The implications of this statement are very serious. Clearly, climate-friendly technologies must either be attractive to investors and companies, or they will fall by the wayside.³⁵ Returns on investments are normally long term and uncertain. Steps therefore need to be taken in order to ensure that technologies that can reduce emissions are indeed developed, and this process needs to be made independent of commercial considerations. Private companies have failed to develop and/or deploy *existing* technologies that might improve efficiency, and investment levels in improving buses, coaches and rail lag behind the levels devoted to cars and trucks. Not surprisingly, levels of private investment in “green tech” are presently far lower than they need to be – a point stressed by the Stern Review.³⁶

Meanwhile, the commitments made under the UNFCCC to facilitate technology transfer between countries have not been met. Therefore many technologies used to good effect in one part of the world (normally a developed country) are not quickly deployed to areas of the world where they are needed in order to allow for developing countries to “leapfrog” older polluting technologies. The IPCC has identified scores of transport technologies that could be further developed, or have been developed but not widely deployed. The IPCC attributes the slow movement of transport-related technologies to the global South to several factors, among them being “the lack of a suitable enabling environment” in poor and capital-constrained countries. Particularly significant is the “absence of suitable facilities for training and R&D,” as well as “lack of access to capital, because most of the transport options are very expensive,” and so on. To overcome these obstacles, poor countries are advised to create “a favourable business environment” and a “stable macro-economy for technology flows.”³⁷ This essentially market-based approach has led nowhere and it will continue to lead nowhere.

The ITF should therefore call on governments to establish research centres in order to review, develop, and then – using strong regulatory instruments – deploy appropriate emission-reducing technologies that pertain to transportation as well as other economic sectors. The

33 For a discussion on the role of public-public partnerships (PUPs). See Public Services International Research Unit (PSIRU) www.psiru.org/reports/2009-03-W-PUPS.doc

34 International Energy Agency, Transport, Energy and CO₂: Moving Towards Sustainability International Energy Agency, 2009 p. 41

35 What is true in transportation is also true in other sectors. For example, in power generation wind and solar must eventually be able to compete against power generated by coal and natural gas – otherwise renewable energy has no future.

36 Stern Review, op cit.

37 “Methodological and Technological issues in Technology Transfer” IPCC online. See: (http://www.grida.no/publications/other/ipcc_sr/?src=/Climate/ipcc/tectran/166.htm p 214)

ITF therefore should support proposals for a global technology fund, administered under the UNFCCC.³⁸ Technological dumping on the global South – in the form of old buses, trucks, cars, and ships should cease and obstacles to technology transfer should be removed. A noteworthy new technology exists for the fuel-cell bus – but Brazil and China remain the only developing countries where such technology has been made available by way of individual projects sponsored by the UN’s Global Environmental Facility.³⁹

The ITF should insist that intellectual property restrictions cannot be allowed to impede the transfer of emissions-reducing technologies to the South. Large companies and business organisations have actively opposed UNFCCC-driven efforts to relax intellectual property restrictions on “environmentally friendly technologies” (EFTs). The WTO’s rules on intellectual property are designed to extend and enforce US-style patent and copyright law throughout the world. Today the developing world’s share of global R&D expenditure continues to be no more than 6 percent of the total, while 97 percent of all patents worldwide are concentrated in a handful of richer countries. However, the ITF notes that under the WTO the Trade-Related Aspects of Intellectual Property Rights (TRIPs) allow for issuing compulsory licensing for environmental reasons. Another option is to ensure that EFTs not be patented in the first place. Human society has only a few years left to begin to reduce global emissions. During World War II, individual commercial interests such as patents were suspended so as to allow for concerted action to respond to the immediate danger. The same approach is needed now. Developing countries require technologies at the cheapest possible prices. If they obtain the needed technology at one quarter the price, it will increase the rate of change to put into effect mitigation and adaptation measures four times faster and four times more effectively.⁴⁰

Multinational companies routinely “transfer” technologies as part of the global production process, but often the technologies, such as the development of more powerful engines, merely generate more emissions per mile travelled, not less. As the IPCC recognises, all too often “The transfer of vehicle technologies is limited

to subcontracting between major firms and components manufacturers, especially among components manufacturers.”⁴¹

The ITF should consider emissions reductions to be a public good. A multilateral technology transfer fund could buy up the rights to patents, as the UNDP advocates.⁴² There is also a strong argument for putting as many technologies as possible in the public domain, given the urgency of the climate crisis. Of course, even once put into the public domain, there needs to be action taken to make sure technology reaches the appropriate hands.⁴³ More effective mechanisms for technology transfer are essential to the success of a global RSI strategy.

The transfer of technology in transport will depend on cooperative R&D networks between countries, as will the development of new institutions to share information on how to remove obstacles to the wider use of public transport, new vehicle infrastructures, reporting best practices pertaining to accelerating modal shift, and comparing notes on the effectiveness (or otherwise) of different policy mechanisms to reduce motorisation. Again, governments must lead the way. Public-public partnerships to train workers to develop, manage and use climate friendly transport technologies are also clearly necessary, something the private sector has clearly failed to do.

Democratic Control and Public Ownership of Remaining Fossil Fuel Supplies

Efforts to address both transport-related and economy-wide emissions invariably face the fierce opposition of the oil companies.⁴⁴ As long as the world’s oil supplies are open to exploitation by private interests, then the fight to control and reduce emissions will remain much harder than it needs to be. Addressing the climate crisis calls for a greater degree of public ownership and democratic oversight or control in sectors of the economy that either generate the most emissions or have the most potential to reduce emissions but need to be scaled up as quickly as possible. This “democratic-ownership shift” is particularly important as a means of dealing with the oil companies that make huge sums of money from the extraction and sale of the earth’s

38 See, for example, “Proposal by the G77 & China for a Technology Mechanism Under the UNFCCC”, August 27, 2008. http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/technology_proposal_g77_8.pdf

39 Global Environmental Facility, <http://www.thegef.org/gef40> UNDP, 2007 Human Development Report, (HDR) p. 147.

41 IPCC, Methodological and Technical Issues in Technology Transfer, http://www.grida.no/publications/other/ipcc_sr/?src=/Climate/ipcc/tectran/166.htm

42 UNDP, 2007, HDR.

43 See: Third World Network. “Some Key Points on Climate Change, Access to Technology and Intellectual Property Rights. September 30, 2008. <http://unfccc.int/resource/docs/2008/smsn/ngo/037.pdf> Third World Network. “Possible Elements of an Enhanced Institutional Architecture for Cooperation on Technology Development and Transfer Under the UNFCCC”. September 30, 2008. <http://unfccc.int/resource/docs/2008/smsn/ngo/036.pdf>

44 For example, oil companies are presently (May 2010) trying to overturn California’s climate protection law. See: California Climate Law Faces Renewed Threats from Big Oil, <http://www.greenbiz.com/news/2010/05/04/californias-landmark-climate-law-challenged>

remaining fossil deposits. Reducing emissions in transport may require the electrification of motor vehicles and rail systems – but the electricity used for these purposes must be produced from non-fossil fuel sources, otherwise the benefits to the climate and the environment will be either minimal or zero.

According to the International Energy Agency's World Energy Outlook (WEO) 2008, around US\$550 billion needs to be invested in renewable energy and energy efficiency alone each year between now and 2030 if concentrations of CO_2 are to be brought even close to safe limits.⁴⁵ New Energy Finance's Global Futures analysis points to an average annual investment of US\$ 515 billion over an extended period. In late 2008 the volume of clean energy investment had dropped by over half from its peak at the end of 2007 to around \$100 billion.⁴⁶ It rebounded slightly in the first part of 2009, but the rebound is to some extent explained by a \$180 billion of stimulus investments aimed at the energy sector by governments.⁴⁷ As renewable energy stands starved of the investment it needs, four times as much money per year continues to be directed towards further fossil fuel extraction and towards conventional utility projects.

The 2010 tragedy in the Gulf of Mexico serves as a further reminder both of the true but incalculable cost of oil extraction and of the political power of oil companies. The world's fossil fuel resources do not, and should not, belong to the companies that extract and commodify them. These resources need to be returned to the global commons and their further use be carefully monitored as part of a planned, safe, and equitable transition away from fossil fuels to renewable energy over several decades.

Fast-Track Carbon Capture and Storage and Grid Transformation

Meanwhile, power plants powered by coal are a major source of man-made CO_2 – 30 percent of all CO_2

emitted in the US, for example—but coal companies have not invested in or deployed technologies that might make coal less damaging to the environment. Unions around the world have called for the rapid development of carbon capture and storage (CCS) in order to prevent most of the carbon emissions from both electrical power generation and some industrial processes being released into the atmosphere. CCS technologies already exist but will need to be brought to commercial scale as quickly as possible. The ITF therefore should support the development of publicly-owned demonstration projects in order to test CCS technologies, while at the same time oppose the construction of any new coal plants until CCS technologies are ready to be fully deployed.

While CCS is being developed and tested, other options should also be aggressively pursued – like those that promise to expand the use of renewable energy sources. Serious consideration should be given to

developing regional “super smart grids” (SSGs) that, through HVDC cables, link areas with solar potential to those with wind (offshore and onshore). The EU – North Africa super smart grid proposal offers a glimpse of what might be possible in other parts of the world. SSGs involve interconnected grids – smart grids for intelligently connecting and distributing electricity from renewable sources; super grids for wide-area high-voltage distribution; and all of these integrated with existing onshore grids. The networks will require advanced communication, monitoring and control systems to balance supply, demand, and storage from thousands of small renewable energy producers, in addition to existing energy companies.⁴⁸ Science-based emissions reductions targets will not be achieved without extensive infrastructure expansion for renewable energy. However, the upfront costs of modernisation and transformation of a grid system along these lines is high, but the operational costs will be much lower as a result of these investments. Moreover, the employment dividends of the super smart grid could be very considerable given the material inputs that could

As renewable energy stands starved of the investment it needs, four times as much money per year continues to be directed towards further fossil fuel extraction and towards conventional utility projects.

⁴⁵ This investment total is based on a 450 ppm target of CO_2 – one that many believe to be far too high. See Part I.

⁴⁶ The fall-off in investment has been attributed to the effects of the recession, and is therefore temporary. This remains to be seen.

⁴⁷ UNEP, et al., Global Trends in Sustainable Energy 2009, http://sefi.unep.org/fileadmin/media/sefi/docs/publications/Executive_Summary_2009_EN.pdf

⁴⁸ Renewable Energy News, May 15, 2010, Stakeholders Team Up To Expand Europe's Super-Grid, <http://www.renewableenergyworld.com/rea/news/article/2010/05/stakeholders-team-up-to-expand-europes-super-grid?cmpid=WNL-Friday-May14-2010>

open up the possibility of green supply chains.⁴⁹ In contrast, jobs building coal or nuclear power plants are temporary and require far fewer inputs.

The development of both CCS demonstration projects and grid transformation to expedite the deployment of renewable energy are both urgent matters. Globally, emissions from the electric power sector grew 28 percent between 1990 and 2004.⁵⁰ Addressing emissions in this sector is not only critical to the global effort to stabilise the climate, but it will also have an obvious bearing on transport-related emissions. Decarbonising power generation will help ensure that electrified transport by road and rail delivers real emissions reductions.

It is plainly obvious that private companies cannot normally be expected to develop these technologies themselves, and governments may need to drive the process of innovation, commercialisation and diffusion. According to the Stern Review, “private firms focus on private costs to satisfy their shareholders. But this can lead to a greater emphasis on short-term profit and reduce the emphasis on innovations and other low-carbon investments that could lead to long-term environmental improvements.”⁵¹ It is also worth noting that when global RD&D investment does occur in green technology, over 60 percent already comes from *public* funds. The urgency of the climate crisis, the size and long term nature of the investments required, and the need for social and environmental priorities to prevail over commercial considerations, puts the burden of responsibility squarely on the shoulders of governments to take charge of the pace and character of the transition to a low carbon economy.

Finally, extending democratic and social ownership of major privately-owned emitters across different sectors will provide a pathway for the profits and subsidies enjoyed by these companies to be redirected into investments in renewable energy, RSI restructuring, and energy conservation.

A Moratorium of Unsustainable Biofuels – Expedite Development of Second Generation Alternatives

Scenarios for emissions reductions from transport often invest a lot of hope in biofuels.⁵² In January 2007 the EU included a mandatory target of 10 percent of biofuel use in transport by 2020. The US has its own target. Meanwhile, global biofuel production increased threefold between 2000 - 2006.⁵³

The ITF should share the concerns of a growing number of trade unions and civil society organisations about the ecological and social implications of increased levels of biofuel production, particularly bioethanol. Three concerns stand out. Firstly, there is the impact of biofuels on food production and prices. Estimates of the range of new agricultural land required to meet a global target of a 10 percent biofuel substitution range from 118 to 508 million

hectares. This compares with the current area of arable land in the world of 1,400 million hectares.⁵⁴ According to one study, “The challenge of meeting land needs for the growing expansion of biofuel production must be considered in the context of a growing demand for food. The global population has more than doubled since 1960, and world agricultural area per person decreased 2-fold...some one-billion people are already underfed.”⁵⁵ Meeting the US’ Renewable Fuels Standard of 15 billion gallons of corn ethanol per year is expected to consume half of the country’s annual corn crop.⁵⁶

“The reality is that mining companies are “rent seeking” at the expense of taxpayers and communities like ours. That is, they are seeking a special deal that shifts their costs onto others – even though they are mostly making plenty of money. Instead of investing a bigger share of their profits into critical technologies like carbon capture and storage they are (in Australia) demanding \$10 billion in Government handouts.”

Tony Maher, General President, Australian Mining and Energy Union (CFMEU)
Coal Hard Facts: A report by the CFMEU Mining and Energy Union

49 For information on the super smart grid, see: <http://www.supersmartgrid.net/>

50 IEA, op. cit

51 Stern Review, op cit.

52 Unite the Union, Sustainable Transport and the Environment, (2009); European Transport Workers’ Federation, Towards a Trade Union Vision on Sustainable Transport (TRUST), Strategy Paper, Brussels, February 2008.

53 R.W. Howarth and S. Bringezu, editors, “Biofuels: Environmental Consequences and Interactions with Changing Land Use,” Proceedings of the Scientific Committee on Problems of the Environment (SCOPE) International Biofuels Project Rapid Assessment 22-25 September 2008, Garmisch-Partenkirchen, Germany (published 2009) Executive Summary. See: <http://cip.cornell.edu/DPubS?service=UI&version=1.0&verb=Display&handle=sc> ope

54 Ibid.

55 Ibid, page 3.

56 Harvest of Heat, op.cit., page 6. The Earth Policy Institute asserts that, even if 100 percent of US corn were used for ethanol, it would only meet 18 percent of the country’s demand for fossil fuels.

Secondly, the social implications of expanded biofuels use are also serious. The International Union of Food Workers (IUF) has pointed to the fact that more biofuels will only make worse the already huge problems facing rural workers – such as illness and death due to pesticide exposure, and poor employment prospects and displacement from rural communities.⁵⁷ Thirdly, some of today's biofuels do not actually reduce emissions and may actually increase them. Biofuel production presently relies on fossil fuel-based pesticides and fertilisers, and fossil-generated energy for the harvesting, refining, and transporting of the fuel. Recent studies based on full life cycle analysis of today's biofuels conclude that, while ethanol from sugar cane (mainly produced in Brazil) can yield serious cuts in GHGs, the savings from ethanol produced from corn (the US being the leading producer) are virtually zero.⁵⁸ Indeed, research that fully accounts for the impact of nitrous oxide (N₂O) emissions from fertilisers used in biofuel production suggest that any emissions reductions gained from substituting biofuels for petroleum are eradicated in the case of corn-based ethanol and reduced considerably in the case of rapeseed and sugar-based ethanol. Furthermore, research that accounts for the conversion of native ecosystems such as grasslands, savannahs and forests to expand biofuels points to the conclusion that biofuels, rather than helping to fight global warming, actually aggravate the problem.⁵⁹ Using irrigation to grow biofuels also consumes huge amounts of the world's increasingly scarce water supply. In 2007, water used for biofuels (45 billion cubic meters), was six times more than was used by humans for drinking water.⁶⁰

The ITF should therefore consider most of today's biofuels to be profoundly unsustainable from both a social and environmental standpoint. The ITF should add its voice to the hundreds of organisations which have called for a global moratorium on first-generation

Using irrigation to grow biofuels also consumes huge amounts of the world's increasingly scarce water supply.

biofuels.⁶¹ However, there is evidence that advanced or “second generation” biofuels, such as ethanol produced from cellulose or from “biomass to liquid” methods, could make a real contribution to reducing emissions while at the same time not depriving the world of land to grow food. The ITF should support the continuation of the search for sustainable biofuels because in some parts of the world changes in the way cities are organised – which are a core feature of an RSI strategy to reduce emissions – will take some decades to implement. The reversal of the presently powerful trend towards motorisation needs to be quickly apprehended and, in principle, alternative fuels could make a contribution to the effort to reduce transport emissions.⁶² According to the UNEP, the development of second-generation feedstock that could yield higher gasoline-equivalent fuel productivity, such as algae, castor oil, crop wastes, jatropha, lignin, perennial grasses, short rotation woody crops and forest-industry wastes, may reduce some of the social and environmental problems related to first generation biofuels. Such developments need to be complemented by the adoption and enforcement of labour and environmental regulations worldwide to improve working practices and conditions and to reduce impacts on land and water use, deforestation and the displacement of other agricultural activity, small farmers and indigenous populations.⁶³ However, the research involved must be completely independent of agribusiness concerns, must consider not just the entire emissions profile of biofuels, but also consider the impacts of biofuels production and use on all communities.

57 Peter Rossman (IUF), Powerpoint Presentation, World of Work Pavilion, December 14, 2009, Copenhagen

58 Howarth and Bringezu, op. cit., Executive Summary, op. cit.

59 Building Workers International memo to Cornell Global Labor Institute. Unpublished. July 2008.

60 Howarth and Bringezu, op. cit., Executive Summary, page 6 See also Unite the Union, op. cit.

61 Rainforest Action Network, Family Farm Defenders and Food First have called on the UN General Assembly's Human rights Committee to support a biofuel moratorium. More than 100 groups have urged the EU to do the same. See: www.familyfarmdefenders.org

62 Trades Union Congress (UK) See: <http://www.tuc.org.uk/extras/gogreena2work.pdf>. See also, Unite the Union, “Aviation and the Environment,” July 2009

63 For UNEP's assessment of biofuels and their sustainability, see: <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=599&ArticleID=6347&I=en&t=long>

3. SOCIETY: IN THE MOVEMENT, ON THE STREETS – INVOLVE MEMBERS, BUILD AND SUSTAIN ALLIANCES

The climate crisis is a reflection of the unsustainable nature of modern society. The problem is not simply about emissions, but about the deep disharmony between our economy and our ecosystems. Knowing the nature of the problem, and having some sense of the solutions is extremely important. We cannot waste any more time tinkering while the planet burns. But how can ITF affiliates and transport workers generally begin to take the kind of actions that might make a difference?

The Importance of Local and National Actions

Many of the proposals and approaches that fall under the heading “global policy” will play out at the national and local levels, where transport unions can play a significant role. However, this is not a top down process; quite the contrary. Any consensus that will drive a new global policy must first be built on the ground in national and local political spheres. Small local actions and initiatives are essential if we are to help bring about changes at the global level. Armed with a clear view of what needs to be done to reduce emissions, ITF affiliates and members should continue to apply pressure for change from the bottom up. The pressure from below needs to cohere into a powerful social movement involving trade unions and a broad spectrum of grass-roots organisations populated by millions of concerned individuals.

ITF affiliates and members should take confidence from the knowledge that such a movement is already making headway in countless communities of the North and South.⁶⁴ Without a vibrant and powerful movement fighting for change, climate protection measures will be perpetually delayed and obstructed with disastrous consequences. Every member can be asked to play a part in this movement-building effort, in the workplace, in the community, or both.

At the national and regional levels, ITF affiliates in many countries should use their influence and power

to push RSI policies. The ITF has noted that neoliberal ideas have for too long been dominant not only on the political right, but also in many of the established Labour and Social Democratic parties. Where possible, ITF affiliates should continue to promote our vision for transportation and sustainable development in the political process. In the global South, social and political movements that have over the last decade grown out of opposition to neoliberal restructuring may provide both the means and a platform for transport unions to shape the direction of their societies. Affiliates will themselves decide whether or not to partner with specific parties or projects.

Building Alliances

Productive alliances at both local and national levels can also be developed with issue-based organisations and other social movements fighting for the kind of changes sought by the ITF.⁶⁵ For example, the Climate Justice Movement has shown itself willing and often capable of mobilising young people in the streets behind demands that, for the most part, unions can support. Transport unions can learn from this movement while at the same time helping ensure that transport and social issues are given sufficient attention.⁶⁶ Another example is the movement for locally grown food and “food sovereignty.” This movement has become a global force in recent years, and its ideas on climate protection and sustainability are broadly consistent with the present approach of the ITF.

Transport unions have a proud record of working with community organisations and local government officials on improving transport services, reducing congestion and pollution, opposing “big box” retail development, and so on. As noted above, a move to local control and locally produced goods and services will need to counter the idea that cheap is always better than something that costs more. Food may be cheaper in a Tesco or a Wal Mart, but if stores in local streets are shuttered and no one walks the streets then there is a big price to pay. Moreover, a good portion of food is never eaten and clothes (cheap, but often of poor quality) are worn once or twice and then discarded.⁶⁷ The negative impact of cheap food and global supply

⁶⁴ This movement is analysed and discussed in Paul Hawken's *Blessed Unrest* (Penguin Books, 2008).

⁶⁵ Climate Justice Now!, Climate Justice Action and Klimaforum09 articulated many creative ideas and attempted to deliver those ideas to the UN Climate Change Conference through the Klimaforum09 People's Declaration and the Reclaim Power People's Assembly. Among nations, the ALBA countries, many African nations and AOSIS often echoed the messages of the climate justice movement, speaking of the need to repay climate debt, create mitigation and adaptation funds outside of neoliberal institutions such as the World Bank and IMF, and keep global temperature increase below 1.5 degrees.

⁶⁶ See: www.climate-justice-now.org

⁶⁷ UNEP, *Green Jobs: Towards Sustainable Work in a Low Carbon World*, (2008)

chains on workers and growers in the global South is well documented, and transport unions can make alliances with small farmers over issues of “food miles” and advancing intermodal shift and its co-benefits.

Meanwhile, the ITF should continue to work with the Global Union Federations and the ITUC in their own efforts to make climate protection a core trade union concern that can engage members at the grassroots. A “whole economy” approach to emissions reductions makes it imperative that the ITF continues to engage in a strategic dialogue with other trade union bodies in order to develop a coherent and shared trade union message.⁶⁸

Trade Unions and Economic Localisation

Reversing corporate globalisation and generating more local economic activity is also important to developing the Reduce dimension of the RSI framework. In transport, the ITF should play its part in developing or supporting a suite of policies (discussed in Part 2) that can shorten and “green” global and domestic supply chains in food and manufactured goods.⁶⁹ Some of these policies can be designed locally and nationally, but may also require global agreements, guidelines and targets. A first step might be the overturning of the WTO’s Agreement on Government Procurement which prohibits governments from practising “buy local” policies. Governments and communities must be granted the freedom to implement climate protections without fear of reprisal.⁷⁰

While clearly needed, a trade union approach to relocalisation has yet to be fully developed. However, a broad and diverse movement (or movements) for relocalisation has in recent years emerged around a set of core ideas and principles. These principles emphasise equity over growth, vibrant and diverse communities instead of homogeneity, sufficiency over efficiency, social solidarity before individual insecurity.⁷¹ Relocalisation also means shorter commutes for workers, and thus more “time wealth”. It is also worth noting that small scale alternatives, including small farms, are already generating most of the goods and services people need.⁷²

Asserting Social Growth over Economic Growth

Embedded in the effort to relocalise economic life is a

need to examine the very notion of economic growth and to redefine wealth. The environmental problems and social inequities of today’s growth-driven model were discussed in Part 1. For decades many trade unions in the developed world benefitted from the many positive effects of economic growth, which expanded wealth creation as a basis for redistribution and poverty eradication. However, most of the growth has been profit-driven rather than socially driven and has led to overexploitation of resources and degradation of the environment. The climate challenge and the profound crisis of our ecosystems therefore mean that we have no choice but to take a new approach to growth. Many unions now recognise the need to pursue a change of direction, one that involves working with others to bring into being a new economy based on sustainability, sufficiency, and social solidarity.

This new economy *will* still see growth – but the emphasis should be on “social growth” whereby the number of good jobs increase; the incomes of the poor are raised; the deployment of climate-friendly and other green technologies are advanced; the availability of health care becomes more widespread; and security against the risks of job displacement, old age, and disability are enhanced. Policies are needed that temper traditional economic growth while improving social and environmental wellbeing – policies establishing, for instance, increased “time wealth” by reducing the number of hours at work and lengthening vacations.⁷³ For the global South, top priority must be given to providing space for countries to develop their productive forces in an environmentally sustainable way. Many countries still lack adequate water and sanitation systems. They also need to expand electricity generation based on renewable sources, build safe and affordable public transport systems, and introduce road safety systems in order to protect both drivers and pedestrians.

This kind of social growth will only happen if economic life is made much more democratic and more responsive to social and environmental needs. Unions and their allies in society embody many of the principles around which a new economy can be built, and we must assert those principles via a major expansion of public ownership, development of the social economy, more community control, and strict regulation to enforce measures that advance sustainability.

68 While not specifically about climate change, an example of such dialogue produced The Oil and Gas Workers’ Trade Union Alliance, established under the ‘Well to Wheel’ initiative involving the ITF and the International Federation of Chemical, Energy, Mine and General Workers’ Unions (ICEM). See: ICEM, <http://www.icem.org/en/78-ICEM-InBrief/2964-ICEM-ITF-%E2%80%98Well-to-Wheel%E2%80%99-Seminar-held-in-Aqaba-Jordan>

69 The growth of freight transport (tkm) in the EU-27 between 1995 and 2006 was 2.8% per year, which exceeded the economic growth in that period of 2.4 percent. However, passengers transport grew at a lower rate of 1.7 percent. 16 ETF, TRUST report, op.cit.

70 WTO, Agreement on Government Procurement, Article VIII (b)

71 Hawken, op.cit

72 WBCSD, 2004b

73 See Gustav Speth: “Doing Business in a Post-Growth Society,” <http://hbr.org/2009/09/doing-business-in-a-postgrowth-society/ar/pr>

IMMEDIATE ACTION STEPS FOR TRANSPORT UNIONS

Membership Education and Engagement

- ▶ Make climate change routine union business. Consider making climate and environment a permanent feature of union meetings at the branch/local level.
- ▶ Consider the climate and environment generally when organising union meetings, functions and conferences
- ▶ Work with the ITF in developing a curriculum, materials and presentations that can help members make sense of the causes of climate change and what needs to be done to fight it.
- ▶ Generate a participation-building ‘green card’ for transport union members that lists what individuals can do to fight global warming

Green Bargaining

- ▶ Propose that workers be allowed to benefit from any suggestions made to improve energy efficiency and operational changes that reduce emissions. Savings can be divided between employers and the employee/s who made and implemented the energy conservation measure.
- ▶ Bargain for recognition and time off for “green reps” to partner with shop stewards. The role of these reps will be to make sure companies establish commitments to reduce emissions through energy savings, procurement policies, and honour such commitments where they exist.
- ▶ Establish a joint company-union Environment and Climate Committee to oversee heating, lighting, recycling, and equipment procurement.
- ▶ Incorporate climate protection arguments into bargaining around issues of commuting (including telecommuting) and flexible hours. Encourage employers to incentivise the use of public transport systems. Consider ways to promote bicycling and walking.
- ▶ Overtime kills. It also raises emissions levels. Convert productivity improvements into work sharing and more “wealth time”.⁷⁴
- ▶ Urge larger companies (200 or more employees)

to develop a “mobility plan” to make commutes more energy efficient and time friendly to workers.

- ▶ Insist on the right of individual members to refuse work that is damaging to the environment, or to operate equipment that fails to meet legal, environmental or efficiency standards.

Advancing Climate-Friendly Operational Changes and Technologies

- ▶ Propose ways of performing work differently in order to reduce emissions levels.
- ▶ Insist on being consulted when new equipment is being introduced. Consider both the climate and the implications for workers.
- ▶ Incorporate climate protection arguments into health and safety campaigns as a means of reinforcing the case for new procedures.
- ▶ Advocate for courses in “eco-driving” as a means of reducing emissions and promoting road safety.
- ▶ Encourage installation of anti-idling devices into cars and trucks (auto shut-off).

Alliance Building

- ▶ Keep members informed about local groups working on climate protection, sustainable transport, and creating a sustainable, local economy. Consider inviting these groups to give presentations at union meetings and events.
- ▶ Organise information and strategy sessions between the union branch and environmental and climate justice organisations, particularly around transport and city planning issues.
- ▶ Impress upon local political leaders the need to provide infrastructure for bike lanes and pedestrians. Championing these issues will enhance the reputation of the union among the younger and/or non-driving population.

⁷⁴ According to a study published in the European Heart Journal, workers who work three or more hours of overtime a day are 60 percent more likely to develop heart trouble, and potentially die of a heart attack, than those who work a normal seven-hour day. See: <http://www.guardian.co.uk/lifeandstyle/2010/may/16/health-overwork-harm-britain>

THE ITF IS AN INTERNATIONAL TRADE UNION
FEDERATION OF TRANSPORT WORKERS' UNIONS.
ANY INDEPENDENT TRADE UNION WITH
MEMBERS IN THE TRANSPORT INDUSTRY
IS ELIGIBLE FOR MEMBERSHIP OF THE ITF.

751 UNIONS REPRESENTING 4,600,000
TRANSPORT WORKERS IN 148 COUNTRIES ARE
MEMBERS OF THE ITF. IT IS ONE OF SEVERAL
GLOBAL UNION FEDERATIONS ALLIED WITH THE
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