TRANSPORT

Low Carbon Rail Transport Challenge

Action Plan

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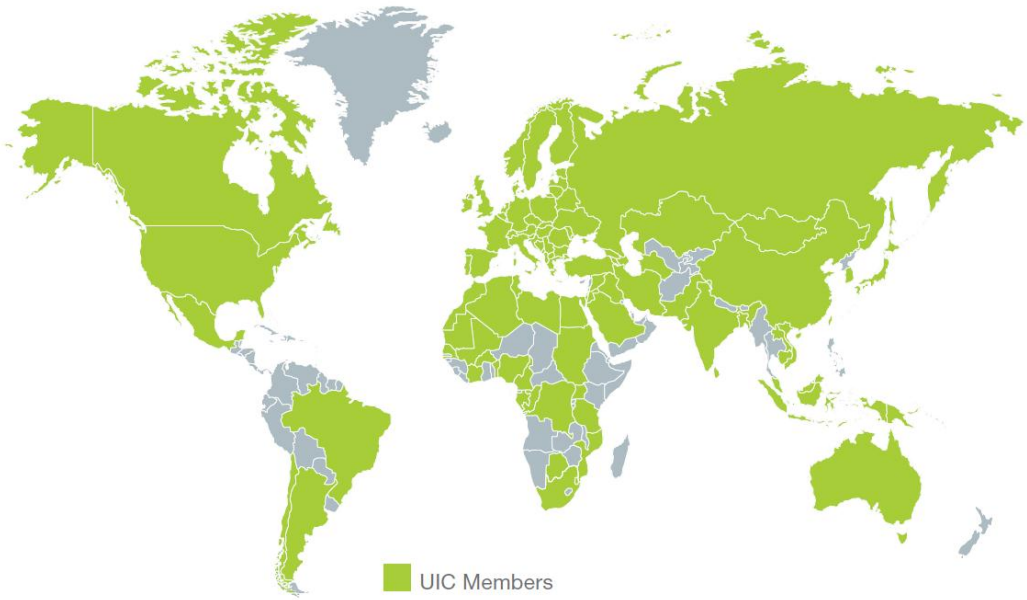
Action Plan

Low Carbon Rail Transport Challenge

UIC, the International Railway Association (240 members worldwide, see annex 2), is proposing a *transport sector challenge* in the framework of the green growth agenda and climate change perspective for 2030 and 2050. This challenge sets out ambitious but achievable targets for improvement of rail sector energy efficiency, reductions in green house gas (GHG) emissions and a more sustainable balance between transport modes.



Transport is a key sector of the green economy. Large increases in the demand for transport have been forecast for the coming years, particularly in developing countries. There is a consensus amongst transport research papers and studies (eg UNEP, OECD, IEA) indicating the problem of the "business as usual" pattern and highlighting the need for a more sustainable direction, in particular shifting activity away from high-carbon modes (eg road and air) through medium-long term investments in rail and public transport (modal shift).

More sustainable transport systems are required if we want to reach *green growth*: an acceptable level of GHG reductions (IEA 2012), lower externalities (CE Delft/Fraunhofer ISI/INNFRAS 2011), creation of green jobs (UNEP/ILO 2011, less health costs (WHO 2006 and 2011) social inclusion and economical growth (UNEP,2011).

Energy consumption and carbon intensity

As a first step of the challenge, the world railway sector has set itself ambitious 2030 and 2050 targets for energy consumption and CO2 emissions:

- Reduction in **specific final energy consumption** from train operations:

  50% reduction by 2030 (relative to a 1990 baseline)
  60% reduction by 2050 (relative to a 1990 baseline)

- Reduction in **specific average CO2 emissions** from train operations:
  50% reduction by 2030 (relative to a 1990 baseline)
  75% reduction by 2050 (relative to a 1990 baseline)

These targets will be achieved by railway companies across the world through electrification of existing lines, decarbonization of electricity supply, improving load factors, procurement of more efficient rolling stock, energy management systems and efficient driving.

The targets were discussed and unanimously approved at the UIC General Assembly on 27 June 2014 (including the major railways of Europe, China, Russia, India & the USA). UIC will monitor and report the progress by the rail sector towards achieving these goals using a dedicated Reporting System managed centrally by UIC and externally verified by an independent body. Results will be published on yearly basis on a dedicated internet site (www.CO2data.org)

Modal shift

The second pillar of the challenge concerns shifting transport activity towards low carbon rail transport (modal shift). The targets are informed by the International Energy Agency (IEA) transport analysis and constitute a key component required to achieve the 2 degrees scenario (2DS) referenced also by the International Panel on Climate Change (IPCC):

- Railway **share of passenger transport** (passenger/km):

  50% increase by 2030 (relative to a 2010 baseline)
  100% increase (doubling) by 2050 (relative to a 2010 baseline)

- Railway share of **freight land transport** (tonne/km):

  equal with road by 2030
  50% greater than road by 2050

This challenge is designed to be ambitious but achievable in a *green economy perspective.* The targets represent a saving in total transport expenditure (on a LCA basis, including infrastructure, maintenance and fuel costs) over the business as usual 4 degrees scenario, and constitute a minimum requirement of the 2 degrees scenario.

Technology is expected to deliver some improvement in road sector performance, in spite of this a shift to rail is essential given the expected explosion in transport activity, in particular in emerging economies.

All technical aspects of the Challenge are examined in detail in the UIC "Low carbon rail challenge Technical Report".

Partnerships

UIC is seeking partnerships to achieve these targets and help to secure the 2DS. These include;

A) partnerships with the private sector to support innovation and greater energy efficiency
B) partnerships with national governments & International Institutions to support modal shift

National governments and international institutions can support this challenge through *enabling actions and green investments* including: investment in new rail projects (in particular urban rail services and freight corridors), investment in existing rail infrastructure (eg electrification & removal of bottlenecks), internalization of external costs (eg via road pricing, carbon tax, eco-taxation, subsidies), providing the right environment for private finance, smart land use and planning, support stations as intermodal hubs, financial support for procurement of new rolling stock.

UIC will collect and regularly publish the "Register of modal shift projects 2015-2050", linked to the Climate Summit Initiative, with updated information related to expected GHG reduction, traffic figures, financial and occupational data of all activities.

The initiative will seek to develop new partnerships during and after the Climate Summit.

Annex 1: Regional perspectives

Asia accounts for the majority of the projected growth in transport demand and presents the greatest opportunities for meeting the modal share targets through investment in low carbon rail transport.

In countries like China and India, it is necessary to balance the growth of private motorised vehicles and road freight (coupled with economical growth) with strong investment in rail and public transport.

Today, China alone represents more than 25% of worldwide rail freight tone/km's, and India represents one third of worldwide passenger traffic with one of the highest market shares for rail.

The challenge lies in moving to low carbon energy sources whilst maintaining and consolidating this strong position for rail, in spite of the growing demand for less sustainable modes.

In 2050 **Africa** will be the second most populous continent with 20% of the world's population. Whilst commercial exchange between African countries is currently low, it is developing rapidly. More efficient multimodal corridors are essential to support the development of remote regions and landlocked countries.

The continent has examples of successful passenger services and a number of high speed rail projects in advanced stages (eg South Africa and Morocco). In addition to these there are a number of profitable freight lines, in particular those associated with mining.

The main challenge lies in making better use of the existing infrastructure through high quality asset management, upgrading technology and effective franchising. This should be supported with strategic investments to expand / connect networks and improve efficiency (eg electrification). Fair pricing of competing transport (road tolls & fuel) has been identified and an important supporting action.

Middle East All Scenarios on population growth, GDP growth, expansion of big cities and international trade, show the Middle East as one of the areas with highest potential for development of both passenger and freight rail transport.

Turkey and Iran, who account for more than 70% of existing railway infrastructure in the Middle East area, have developed important plans for railway expansion, including fright corridors, high speed rail and urban passenger services. Notable project include the recently opened tunnel connecting Europe to Asia at Istanbul, planned expansion of the Iranian rail network to 25,000 km by 2025 and high speed and freight projects under construction on the Arabian Peninsula.

Russia (and former Soviet Union countries) present today very high market share for railways, both in freight and in passenger services. It is necessary to consolidate this position through improving the railway network capacity, reaching greater efficiency and aiming at more specialized logistic networks.

North America has an established and thriving rail freight system operated mainly by the private sector. However there is enormous potential to further develop urban and inter-urban passenger rail efficiency & coverage (eg modal shift from air to High Speed Rail), particularly on the east and west coasts.

The challenge requires a move away from “business as usual” (rail passenger share is currently only 1%) so that by 2050 to the modal split is similar to that of leading European countries.

South America has examples of successful freight rail systems. However there is large potential to expand rails share of transport activity. Brazil, in particular, can aim at reversing the dominance of road transport over rail by developing urban passenger services and high speed connections between cities.

In **Europe** projected increases in transport demand are modest, however the extensive rail network has huge potential for increased utilization and modal share. This is highlighted by the targets set in the EU Transport White Paper: 50% freight transport- for longer distances than 300 km- shall be transported by rail or water in 2050; existing high speed rail network length should be tripled and medium distance passenger transport should be mainly on rail by 2030.

Notably the sector has a strong record for increasing electrification, procurement of renewable energy, fostering new technology and year on year improvements in efficiency.

Australia has established urban and freight rail networks. There is great potential to develop both of these with the addition of high speed inter urban transport (particularly on the east coast) and more developed networks for commuter trains within the major cities.

Annex 2: UIC members supporting the low carbon rail transport challenge

Africa

Railway Infrastructure Manager

SIPF	Société Ivoirienne de gestion du Patrimoine Ferroviaire	Ivory Coast
SOPAFER-B	Société de gestion du patrimoine ferroviaire du Burkina	Burkina Faso

Integrated Company (railway infrastructure manager and operator)

BOR	Botswana Railways	Botswana
CAMRAIL	Chemins de Fer du Cameroun	Cameroon
CFCO	Chemin de Fer Congo-Océan	Congo (Rep.)
CFMZ	Mozambique Ports and Railways	Mozambique
ENR	Egyptian National Railways	Egypt
OCBN	Organisation Commune Bénin-Niger	Benin
ONCF	Office National des Chemins de Fer	Morocco
SETRAG	Société d'Exploitation du Transgabonais	Gabon
SNCC	Société Nationale des Chemins de fer du Congo	Congo (Dem. Rep.)
SNCFT	Société Nationale des Chemins de fer Tunisiens	Tunisia
SNIM	Société Nationale Industrielle et Minière	Mauritania
SNTF	Société Nationale des Transports Ferroviaires	Algeria
SRC	Sudan Railways Corporation	Sudan
SWAZIRAIL	Swaziland Railways	Swaziland
TRC	Tanzania Railways Corporation	Tanzania

Other

COLIS EXPR	Colis Express Sarl	Tunisia
RFR	Société Tunisienne du réseau ferroviaire rapide	Tunisia

Railway Administration

ANESRIF	Agence Nationale d'Études et de Suivi de la Réalisation des Investissements Ferroviaires	Algeria
LIBYA	Libya Railway Executive Board	Libya

Railway undertaking

SITARAIL	Transport ferroviaire de personnes et de marchandises	Ivory Coast

Asia Pacific

Freight Operator

JFRC	Japan Freight Railway Company	Japan

Railway Infrastructure Manager

KRNA	Korea Rail Network Authority	South Korea

Integrated Company (railway infrastructure manager and operator)

AZ - ADDY	Azerbaijan Railways (ADDY)	Azerbaijan
BDR	Bangladesh Railways	Bangladesh
CR	China Railway Corporation	China
GR	Georgian Railway	Georgia
IR	Indian Railways	India
JR-C	Central Japan Railway Company	Japan
JR-E	East Japan Railway Company	Japan
JR-W	West Japan Railway Company	Japan
KAI	PT. KERETA API / INDONESIAN RAILWAYS	Indonesia
KTM	Keretapi Tanah Melayu Berhad	Malaysia
KTZ	Kazakhstan Railways	Kazakhstan
PR	Pakistan Railways	Pakistan
RZD	JSC Russian Railways	Russia
SCR	South Caucasus Railways CJSC	Armenia
THSRC	Taiwan High Speed Railway Corporation	Chinese Taipei
TRA	Taiwan Railways Administration	Chinese Taipei
UBTZ	ULAANBAATAR RAILWAY	Mongolia
VNR	Vietnam Railways	Vietnam

Other

MTZ	Mongolian Railways	Mongolia
RZDstroy	JSC RZDstroy	Russia

Passenger Operator

FPC	JSC Federal Passenger Company	Russia

Railway Administration

ARA	Australasian Railway Association	Australia
NRA	National Rail Administration	China
PTV	Public Transport Victoria	Australia
SPAD	SURUHANJAYA PENGANGKUTAN AWAM DARAT	Malaysia

Railway Undertaking

KORAIL	Korea Railroad Corporation	South Korea

Research Centre

CARS	China Academy of Railway Sciences	China
CRC	Cooperative Research Centre for Rail Innovation	Australia
IEDT	JSC Institute of Economy & Transport Development	Russia
KRRI	Korea Railroad Research Institute	South Korea
NIIAS	Institut russe d'Informatisation et d'Automatisation	Russia
RTRI	Railway Technical Research Institute	Japan
VNIIZhT	All-Russian Railway Research Institute	Russia

University

BJTU	Beijing Jiaotong University	China

Europe

Freight Operator

AAE	Ahaus Alstätter Eisenbahn	Germany
BRC	Bulgarian Railway Company AD	Bulgaria
BULMARKET	Bulmarket	Bulgaria
CFL CARGO	CFL Cargo	Luxembourg
CFR MARFA	Societatea Nationala de Transport Feroviar de Marfa	Romania
CTV	SC Cargo Trans Vagon	Romania
FLOYD	Floyd Szolgaltato Zrt.	Hungary
FOX	FOXrail Zrt.	Hungary
GFR	Grup Feroviar Român	Romania
GREEN CARGO	Green Cargo AB	Sweden
GYSEV CARGO	GYSEV Cargo Zrt.	Hungary
HZ-Cargo	HZ Cargo	Croatia

MONTECARGO	JSC MONTECARGO Podgorica	Montenegro
RTS	Rail Transport Service GmbH	Austria
TFG	S.C. TRANSFEROVIAR GRUP S.A.	Romania
UNICOM TRANZIT	S.C. UNICOM TRANZIT S.A.	Romania
ZSSK CARGO	ZSSK Cargo	Slovakia

Railway Infrastructure Manager

ADIF	Administrator de Infraestructuras Ferroviarias	Spain
CFR-SA	CFR SA	Romania
ETS	Euskal Trenbide Sarea	Spain
EUROTUNNEL	Eurotunnel	United Kingdom
EVR	Aktsiaselts Eesti Raudtee	Estonia
FTA	Finnish Transport Agency	Finland
HS1	High Speed 1 Ltd	United Kingdom
HZ-Infrastruktura	HZ Infrastruktura	Croatia
INFRABEL	INFRABEL S.A.	Belgium
JBV	Jernbaneverket	Norway
LISEA	Ligne SEA Tours-Bordeaux	France
MZ-I	Makedonski Zeleznici Infrastructure	FYROM / Macedonia
NETWORK RAIL	Network Rail Infrastructure Limited	United Kingdom
NRIC	National Railway Infrastructure Company	Bulgaria
OSE	Hellenic Railway Organization	Greece
PRORAIL	Prorail	Netherlands
REFER	Rede Ferroviária Nacional, E.P.	Portugal
RFF	Réseau Ferré de France	France
SZDC	Správa Zeleznicní Dopravní Cesty	Czech Republic
TP FERRO	TP Ferro Concesionaria SA.	Spain
TRAFIKVERKET	Swedish Transport Administration	Sweden
ZICG	ZELJEZNICKA INFRASTRUKTURA CRNE GORE AD	Montenegro
ZSR	Zeleznice Slovenskej Republiky	Slovakia

Integrated Company (railway infrastructure manager and operator)

BC	Belarusian Railways	Belarus
BDZ	BDZ holding EAD	Bulgaria
BLS	BLS AG	Switzerland
CFL	Société Nationale des Chemins de Fer Luxembourgeois	Luxembourg
CFM	Calea Ferata din Moldova	Moldova
CIE	Coras Iompair Éireann	Ireland
DB AG	Deutsche Bahn AG	Germany

FGC	Ferrocarrils de la Generalitat de Catalunya	Spain
FS	Ferrovie dello Stato Italiane SpA	Italy
GKB	Graz-Köflacher Bahn und Busbetrieb GmbH	Austria
GYSEV/ RAABERBAHN	Győr-Sopron-Ebenfurti Vasút Zrt.	Hungary
HUNGRAIL	Magyar Vasúti Egyesület	Hungary
ISR	Israel Railways	Israel
LDZ	Valsts Akciju Sabiedriba "Latvijas Dzelzcels"	Latvia
LG	JSC "Lithuanian Railways"	Lithuania
MAV	MÁV Zrt.	Hungary
NIR	Northern Ireland Railways Company Ltd	United Kingdom
ÖBB	Österreichische Bundesbahnen	Austria
PKP	Polskie Koleje Panstwowe S.A.	Poland
RhB	Rhätische Bahn AG	Switzerland
RZD	JSC Russian Railways	Russia
SBB CFF FFS	Schweizerische Bundesbahnen	Switzerland
SZ	Slovenske Zeleznice d.o.o	Slovenia
TCDD	Türkiye Cumhuriyeti Devlet Demiryollari Isletmesi	Turkey
TRENORD	Gruppo Ferrovie Nord Milano	Italy
UZ	Ukrainski Zaliznytsi	Ukraine
WLB	Wiener Lokalbahnen	Austria
ZFBH	Zeljeznice Bosne I Hercegovine (ZFBiH)	Bosnia-Herzegowina
ZRS	Zeljeznice Republike Srpske	Bosnia-Herzegowina
ZS	Serbian Railways Jsc.	Serbia

Other

BCC	Bureau Central de Clearing	Belgium
EUROFIMA	Société européenne pour le financement de matériel ferroviaire	Switzerland
FCH	Fundacion Caminos de hierro para la investigacion y la ingeneria ferroviaria	Spain
FFE	Fundacion de los Ferrocariles Espanoles	Spain
HARSCO	HARSCO RAIL LTD	United Kingdom
HS2	High Speed Two Limited	United Kingdom
OPTIMA-TOURS	Optima-Tours - Reisebüro und Handels GmbH	Germany
PLASKE JSC	JSC "PLASKE"	
SYSTRA (INEXIA)	SYSTRA	France
UIR	Unione Interporti Riuniti	Italy
UTP	Union des Transports Publics	Switzerland

WSt	WagonService travel s.r.o.	Slovakia

Passenger Operator

ATOC	Association of Train Operating Companies	United Kingdom
CFR CALATORI	Societatea Nationala de Transport Feroviar de Calatori	Romania
DSB	Danske Statsbaner	Denmark
EUROSTAR I	Eurostar International Limited	United Kingdom
FPC	JSC Federal Passenger Company	Russia
GoConcept	GoConcept SRL	Italy
HZ-Passenger	HZ Putnicki Prijevoz	Croatia
KW	Koleje Wielkopolskie Sp. z.o.o.	Poland
LE	Leo Express a.s	Czech Republic
NS	N.V. Nederlandse Spoorwegen	Netherlands
NSB	Norges Statsbaner AS	Norway
NTV	Nuovo Trasporto Viaggiatori SpA	Italy
REGIOTRANS	Regiotrans S.R.L. Brasov	Romania
SAD	SAD Trasporto Locale	Italy
SJ AB	Statens Järnvägar AB	Sweden
SNCB/NMBS	Société Nationale des Chemins de fer Belges	Belgium
StudentAgency	StudentAgency holding a.s	Czech Republic
THALYS	Thalys	Belgium
WB	WestBahn	Austria
ZPCG	Railway Transport of Montenegro	Montenegro
ZSSK	Slovak Rail	Slovakia

Railway Administration

AFER	Autoritatea Feroviara Romana	Romania
NKH	National Transport Authority Hungary	Hungary
VPE	Vasúti Pályakapacitás-elosztó Kft	Hungary

Railway Undertaking

CD	Ceské Dráhy	Czech Republic
CP, E.P.E	Comboios de Portugal, E.P.E	Portugal
EUSKOTREN	Eusko Trenbideak - Ferrocarriles Vascos SA	Spain
GVG	Georg Verkehrsorganisation GmbH	Germany
MZ-T	Makedonski Zeleznici Transport AD Skopje	FYROM / Macedonia
RENFE	Renfe Operadora	Spain
SNCF	Société Nationale des Chemins de fer Français	France
TRAINOSE	TRAINOSE	Greece
VR	VR Group Ltd	Finland

Research Centre

IK	Instytut Kolejnictwa	Poland
ZAG	Slovenian National Building & Civil Engineering Institute	Slovenia

Shipping Company

ATTICA Group	Attica Group	Greece
BSB	Bodensee-Schiffsbetriebe GmbH	Germany
MINOAN LINES	Minoan Lines	Greece
StL HOLLAND	Stena Line Holland BV	Netherlands
StL UK	Stena Line Limited	United Kingdom

Middle-East

Freight Operator

JHR	Jordan Hejaz Railways	Jordan
NIROO	Niroo Rail Transport Co.	Iran
RPS	Rail Pardaz Seir	Iran

Integrated Company (railway infrastructure manager and operator)

ARC	Aqaba Railway Corporation	Jordan
CFS	Administration Générale des Chemins de fer Syriens	Syria
Etihad Rai	Etihad Rail	United Arab Emirates
IRR	Iraqi Republic Railways Establishment	Iraq
ISR	Israel Railways	Israel
RAI	Rah Ahan-e Djomhouri-e Eslami Iran (RAI)	Iran

SHR	Syrian Hedjaz Railways	Syria
SRO	Saudi Railways Organization	Saudi Arabia
TCDD	Türkiye Cumhuriyeti Devlet Demiryollari Isletmesi	Turkey

Other

METRA	Metra Consulting Co.	Iran

Railway Administration

AfRA	Afghanistan Railway Authority	Afghanistan
QRC	Qatar Railway Company	Qatar
UAE NTA	National Transport Authority of UAE	United Arab Emirates

North America

Integrated Company (railway infrastructure manager and operator)

AAR	Association of American Railroads	United States
VIA RAIL	Via Rail Canada Inc.	Canada

Other

CHSRA	California High Speed Authority	United States

Passenger Operator

AMTRAK	National Railroad Passenger Corporation	United States

Railway Administration

US DOT / FRA	Federal Railroad Administration	United States

South America

Integrated Company (railway infrastructure manager and operator)

ALAF	Asociación Latino Americana de Ferrocarriles	Argentina

Other

EDLP	Estacao da Luz Participacoes Ltda	Brazil
Rio Trilho	Companhia de Transportes sobre Trilhos do Estado do Rio de Janeiro	Brazil

Passenger Operator

CPTM	Companhia Paulista de Trens Metropolitanos	Brazil

Railway Administration

ANTT	Agencia Nacional de Transportes Terrestres	Brazil

Annex 3 Partnerships and supporting organizations

United Nations Framework Convention on Climate Change (UNFCCC)

Statement by Christiana Figueres, Executive Secretary of UNFCCC welcoming International Union of Railways for its bold Low-Carbon Sustainable Rail Transport Challenge, to be launched at UN Climate Summit:

The transport sector is responsible for about one quarter of global energy-related carbon emissions. Without aggressive and sustained policies, carbon dioxide emissions from the sector could double by 2050.

Ambitious climate action by railways can play a major role in bending the emissions curve and putting the world on track to reach full climate neutrality in the second half of the century. This is essential to meet the internationally agreed goal of limiting warming to less than two degrees Celsius.

I commend the International Union of Railways for its bold Low-Carbon Sustainable Rail Transport Challenge. Ambitious goals to decarbonize the electricity supply of railways can be replicated in many other sectors. The goal to attract significant passengers to rail travel from high-carbon transportation is an important step in enabling a climate neutral society.

Railways are not acting alone. The Rail Transport Challenge is part of the overall rising wave of climate action in many sectors that helps governments adopt effective climate policies.

The UN Climate Change Secretariat is showcasing sustainable transport as part of its Momentum for Change initiative, directing a spotlight at inspirational low-carbon transport projects in developing countries from China to Brazil. As a result of the challenge, we hope to shine a spotlight on new and innovative partnerships in the railway sector and inspire others to take action that moves the world closer to climate neutrality.

International Energy Agency

Recent analysis by the IEA indicates that over the next four decades global demand for transport is expected to double over 2010 levels in a business as usual scenario (IEA 4DS). If countries were to pursue 'avoid & shift' policies (IEA 2DS scenario, also including improvements of vehicle technologies), including greater investment in rail and bus rapid transport infrastructure a net saving in transport infrastructure expenditure of USD 20 trillion could be achieved.

The International Energy Agency welcome the UIC low carbon rail transport challenge and recognise this initiative as an important contribution to the 'avoid-shift-improve' strategy required to secure the climate change 2 degrees scenario (2DS).

UNIFE – The European Rail Industry

UNIFE applauds the UIC low carbon rail initiative and the ambitious targets it sets for the improvement of rail sector energy efficiency, reductions in GHG emissions and a more sustainable balance between transport modes.

Over the past two decades, the European rail industry has provided considerably more energy efficient products to its customers. In 2010, an estimated 20% energy reduction had already been obtained compared to 1990 vehicles. On certain types of vehicles, the savings could represent as much as 50%. Regenerative braking or energy storage technologies have contributed to these results.

However, further gains in energy efficiency are necessary to reduce the energy consumption and carbon intensity of the railway system, and the industry is committed to achieving this long term goal. UNIFE and its members are currently engaged in major R&D projects whose results will be translated into more even more energy efficient products:

- The MERLIN (Management of Energy for smarter RaiLway systems in Europe: an INtegrated optimisation approach) project, of which UIC is a partner, is demonstrating the viability of an integrated management system to achieve a more sustainable energy usage in European electric mainline railway systems. A 10% reduction in energy consumption is expected to be achieved where the results of the project are implemented.

- The OSIRIS (Optimal Strategies to Innovate and Reduce energy consumption In urban rail Systems) aims at implementing technological and operational solutions, whilst testing/demonstrating/assessing their benefits and returns on investment in real case scenarios. This will enable a reduction of the overall energy consumption within Europe's urban rail systems of 10% compared to current levels by 2020.

- The REFRESCO (towards a REgulatory FRamework for the usE of Structural new materials in railway passenger and freight CarbOdyshells) project, of which UIC is a partner, is setting the framework for the implementation of lighter and less energy consuming materials through the evolution of certification processes for rolling stock.

In the coming years, **SHIFT²RAIL**, a major EUR 920M public-private partnership embedded in the Horizon 2020 EU Framework programme, will feature Innovation Programmes targeted at increasing rolling stock and infrastructure energy efficiency, but also at improving the overall energy efficiency of the system.

SHIFT²RAIL will achieve its energy saving and CO2 emissions targets through the development of more efficient and innovative rail technologies which will decisively affect the shift of passengers

and goods from road to rail, in line with the modal shift targets set in the 2011 EU Transport White Paper. Energy – and consequently CO2 – savings will cover the entire railway system including operation, infrastructure, rolling stock and sub-systems.

Alstom Transportation

Alstom Transportation is proud to confirm our support for the UIC low carbon rail transport challenge. We aim to be the reference in high tech solutions for energy and transport, shaping a sustainable future for the planet. Our challenge is to provide energy and transport infrastructures which combine economic development, social progress and respect for the environment.

Alstom is committed to developing more energy efficient railway systems to support the performance improvement promoted by this UIC initiative.

Bombardier Transportation

Bombardier Transportation supports the ambitious UIC initiative to reduce energy consumption and green house gas emissions. Our ECO4 portfolio enables operators already today to reduce overall energy consumption on trains by up to 50% compared to current solutions. Such standard technology of today had alrerady brought a 20-30% improved energy effiency in comparison to products of the 1990s. We will strive to further enhance and improve those technology solutions in line with UIC's roadmap.

Annex 4: Low Carbon Rail challenge Technical Analysis

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