



INTERNATIONAL UNION
OF RAILWAYS

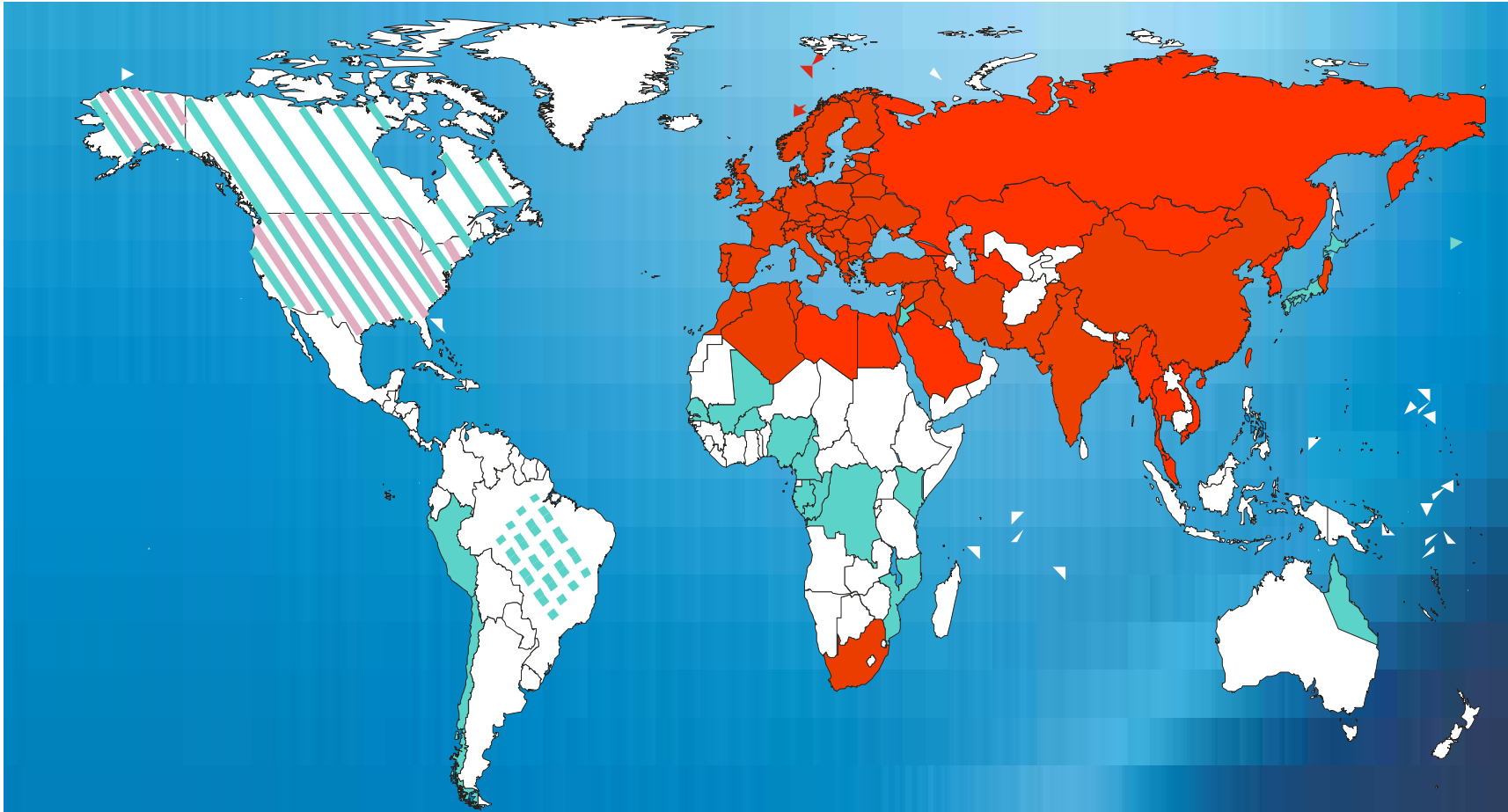
unity, solidarity, universality

ARISCC

Adaptating Rail Infrastructure to Climate Change

*by Jerzy Wisniewski, Director Fundamental Values Dpt., UIC
for UNECE, Geneva , 8th of September 2010*

UIC – a global association with almost 200 members around the world



Members: **82** Active **82** Associate **35** Affiliate



UIC Mission



INTERNATIONAL UNION
OF RAILWAYS

unity, solidarity, universality

Promoting the development of rail transport at world level,
in order to meet challenges
of mobility and sustainable development

UIC – working for and with the members:

UIC is the global organisation for cooperation between and promotion of railways.

UIC has a strong tradition of working on sustainability issues, both in supporting members in improving their sustainability performance as well as communicating on the sector level towards external key stakeholders.





UIC & Climate Change

A systematic approach: Mitigation & Adaptation Strategy – Improvement – Communication



Strategy:



 The Voice of European Railways
 unity, security, universality

**Moving towards Sustainable Mobility:
 Rail Sector Strategy 2030 and beyond**
 – Europe –


Draft
 Version 4, March 10th 2010

Improvement:

**Process,
 Power,
 People**
 Energy Efficiency for

UIC CODE 930
 1st edition, September 2009
 Original **R**

Exchange of data for cross-border railway energy settlement
Echange de données pour la facturation énergétique ferroviaire transfrontalière
 Datenaustausch für die Bahnstromabrechnung im grenzüberschreitenden Schienenverkehr


 UNION INTERNATIONALE DES CHEMINS DE FER
 INTERNATIONAL UNION OF RAILWAYS

Communication:




Keeping Climate Change Solutions on Track:
 The Role of Rail
 A Global Position Paper





www.ecotransit.org

www.ecopassenger.org

Calculate the environmental impact of your personal journeys through Europe
 Compare the energy consumption, CO₂ and exhaust atmospheric emissions for planes, cars and trains for passenger transport in Europe

Choose your route
 From:
 To:

Modos de transporte:

- Camión
- Tren
- Barco fluvial
- Marítimo
- Avión
- Transporte combinado / Ruta asignada individualmente



UIC & Climate Change

Adaptating Rail Infrastructure to Climate Change

Background

Adapting to the growing risks that the increasingly higher frequency of extreme weather events (with increasing higher intensity) is a newer challenge for society and for the rail sector.

ARISCC is about preparing rail infrastructure for when 'today's extreme weather becomes tomorrow's normal weather' !

(John Dora, Network Rail)

The results are needed by:

- Governments for long term planning and financing infrastructure projects,
- Infrastructure managers for planning and managing the risks,
- Companies within the risk assurance and construction business.

Adaptating Rail Infrastructure to Climate Change

Why ARISCC?

Railways have an extremely long life time and are constructed to withstand natural hazards, such as i.e. the 50 years flood. However, as number and intensity of incidents will arise, also the pressure on the capacity of the rail system will rise together with the costs of the sector in the future.

If the right measures are taken at the right time, the risk will be bearable!

International cooperation and coordination are needed for example when impacts that might be new for one region, already are well handled in other regions.

Better knowledge will help the rail sector to take the right decisions - and take the right concrete measures at the right time!

Adaptating Rail Infrastructure to Climate Change

Possible consequences and events caused by extreme weather



dry and hot summer



extreme storm events



high and low water periods



freeze spell with increasing wet snow

Adaptating Rail Infrastructure to Climate Change

Examples on extreme weather events' impact on rail infrastructure

Factor	Effect	Impact on Railways/Assets
Temperature		
High temperatures and heat waves	overheating	infrastructure & rolling stock equipment
Sudden temperature changes	tension	track buckling
Intense sunlight	overheating	track buckling, slope fires, signaling problems
Precipitation		
Intense rainfall	soil erosion, land sides, flooding	damage to embankments, earthwork
Extended rain periods	slower drainage, soil erosion	other infrastructure assets, operation
Flooding: coastal, surface water, fluvial	landslides	drainage systems, tunnels, bridges
Drought	desiccation	earthworks desiccation
Wind		
Storm/gale (inland)	higher wind forces	damage to installations, catenary
	uprooting of trees	restrictions/disruption of train operation
Coastal storms & sea level raise	Coastal flooding	embankments, earthwork, operation
Lightning strikes & thunderstorms	Overvoltage	catenary and signaling
Vegetation	Faster plant growth, new plants	vegetation management

Adaptating Rail Infrastructure to Climate Change

How ARISCC?

ARISCC is combining existing expertise and management under today's weather conditions and to use these to build a new level of nature hazard management and expertise, including solutions and strategies to prepare for the changing weather and climate conditions of the future, as well as cooperation with meteorological institutes.

- Identify risks/ vulnerabilities,
- Manage quantitative risk assessments,
- Classify and prioritise risks
- Learn from good practice

Adaptating Rail Infrastructure to Climate Change

How ARISCC?

ARISCC focuses on integrating management of weather and climate related natural hazards

such as flooding, severe storms, landslides, rock fall, avalanches, etc.

in a way that strengthen the railway infrastructure performance and avoids or minimizes damage to railway infrastructure assets.



Danger processes for railway infrastructure



Christian Rachoy

Risks from impacts by climate and natural hazards are already handled by the railways - example from Austria

ARISCC: Deliverables

D 1 Guidelines: Risk Analysis & Adaptation Measures

(guidance for integrated natural hazard management, easy to use document, example for concrete line)

D 2 Solutions and Examples

for Natural Hazard Management & Early Warning Systems (monitoring, impact assessment, vulnerability mapping, early warning, risk assessment)

D 3 Exchange of good practise:

Knowledge Base & Exchange Platform (good practice, pilot projects, competence mapping, country profiles, contacts...)

D 4 D5 Standards for new and existing Infrastructure(integration of climate change into standards, different procedures in Europe)

D 5 Case Studies: UK West Coast, Rhine Valley, [Global Case Study](#)

(mapping, risk & costs assessment, cost scenarios 2030 with/without adaptation) – [Seeking for partners!](#)

■ ■ ■ Thank you for your kind attention

Jerzy Wisniewski (wisniewski@uic.org), Fundamental Values Director UIC

