THE 2001 CAPE TOWN CONVENTION
ON INTERNATIONAL INTERESTS IN MOBILE EQUIPMENT

RAIL WORKING GROUP

Combating global climate change

How the Luxembourg Rail Protocol to the Cape Town Convention will help to battle global climate change

A "green" paper

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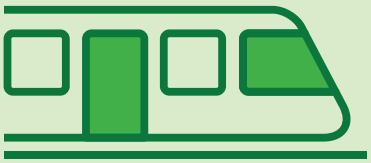
Executive summary

This study from the Rail Working Group examines how the Luxembourg Protocol to the 2001 Cape Town Convention on International Interests in Mobile Equipment (the Luxembourg Rail Protocol), once adopted, will play a significant role in combating global climate change and promoting sustainable growth.

Climate action is one of the United Nation´s Sustainable Development Goals. Furthermore, as outlined in *Mobilizing Sustainable Transport for Development*, the 2016 report by the UN Secretary General's High-Level Advisory Group on Sustainable Transport, partnerships between state and non-state actors, and the promotion of diversified funding sources and private sector investment, are critical for scaling up sustainable transport. This is precisely what the Luxembourg Rail Protocol will facilitate.



> The international community has acknowledged that rail is the backbone of sustainable, climate-friendly transport.

> Due to the lack of sufficient public resources, rehabilitation and expansion of the railways will only be possible with private sector support.

Our core arguments are:

> The Luxembourg Rail Protocol to the Cape Town Convention is an international treaty that, once in force, will make it easier and cheaper for the private sector to finance railway rolling stock without state guarantees, allowing governments to focus their resources on infrastructure.

> By enabling vastly expanded private sector funding for railway rolling stock, the Protocol will drive the growth of a much larger and more dynamic rail sector on every continent, which will be particularly important in countries currently under-served by rail.

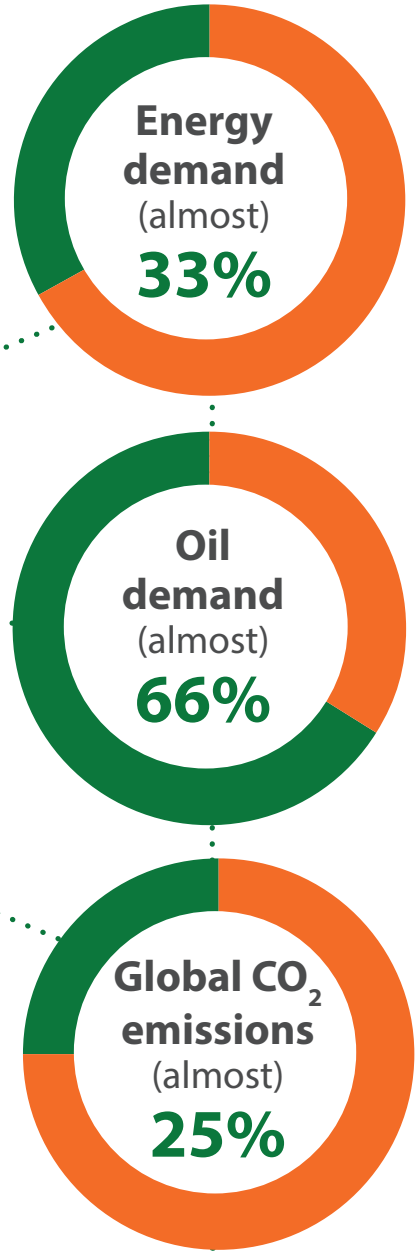
> By supporting a modal shift from high-carbon, greenhouse gas-emitting forms of transport (e.g. cars, trucks and aircraft) to railways, the Protocol will make a significant contribution to combating global climate change.

Transport and the environment

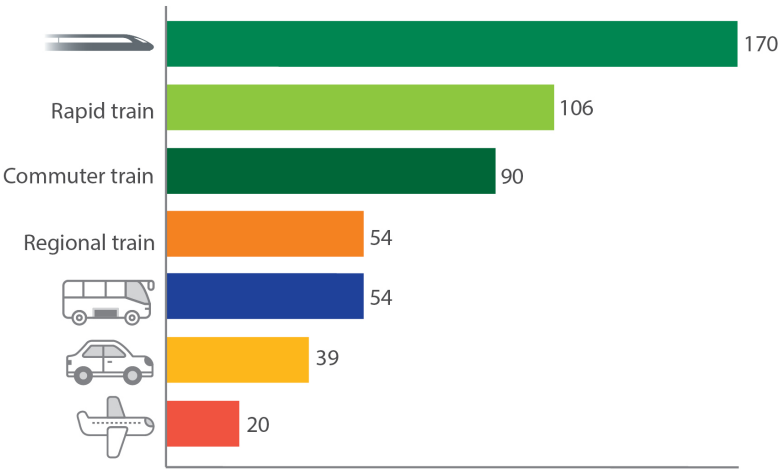
Our need for a greener future is urgent and unavoidable, as the work of the UN's Intergovernmental Panel on Climate Change (IPCC) and the Paris Agreement makes clear. Carbon dioxide and greenhouse gas emissions continue to rise, and their growing impact on the world's climate cannot be ignored.

The challenge is unmistakable: how to move towards low- or zero emissions without sacrificing economic growth? There is no doubt that the transport industry must be at the centre of any solution. Why?

According to the International Energy Agency (IEA), the transport sector overall is responsible for:



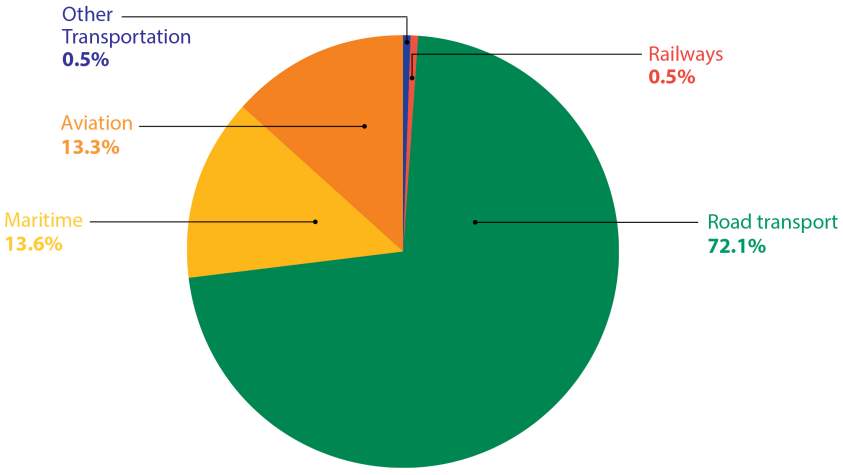
Energy Efficiency
Passenger-kilometres carried per unit of energy (1kwh = 0.086kep)
Source: EEA (2018)



This makes transport a key focus for reducing energy use. But it is important to note that not all modes of transport are the same in terms of **energy efficiency** and emissions.

Private vehicles, which mostly run on petrol or diesel fuel, are the main contributors to climate change through their emissions of long-lived carbon dioxide and short-lived black carbon (generally the product of diesel vehicles). Black carbon emissions not only have a comparatively stronger warming effect, but also disproportionately contribute to particulate matter pollution, which is "most closely associated with increased air-pollution related mortality."[1] The World Health Organization reports that the transport sector "is the fastest growing contributor to climate emissions."[2] Emissions from transportation increased by 2.5% annually from 2010 to 2015.[3]

EU (Convention) —
Share of transport greenhouse gas emissions
Source: EEA (2018)



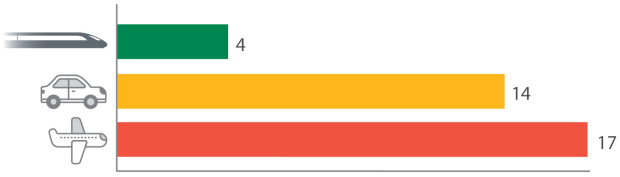
Rail transport is low emission

The rail sector, however, is bucking this trend, and the gradual increase of freight and passenger transportation by rail is making an important contribution to the reduction of overall emission levels.

Whereas a lorry requires approximately 2.214 megajoules (MJ)[4] of energy expenditure per kilometre to move 1 ton of goods, a freight train only needs 0.295 MJ. Even a crammed four-person car-pool is 58% more polluting (in terms of kilograms of CO_2 per passenger kilometre) than light rail at full occupancy.[5]

With further investment and research, rail looks set to become the first zero-emission mode of transport. Professor Markus Hecht, a rail specialist teaching at the Technical University of Berlin, argues that the ongoing introduction of automatic coupling and four-axle bogies could more than double the current power of regenerative braking systems. This would inevitably lead to large reductions in braking emissions, as well as increased energy efficiency.[6]

CO_2 Emissions
Kilograms of CO_2 emissions per 100 passenger-kilometres
Source: EEA (2018)



Rail is the backbone of sustainable transport

Amongst the various forms of motorized transport in operation, rail is accepted today as the basis for environmentally sustainable transport, with a core contribution to make towards mitigating climate change.[7]

Rail uniquely provides transport of both people and freight that is environmentally sustainable, safe, efficient, reliable and affordable. It thus follows that improved and extended rail networks are essential for reducing climate change.

Three more climate-friendly advantages of rail

High capacity, low footprint

Rail requires much less space to move people and goods than roads. One conventional freight train can carry the same load as 50 trucks. In October 2019, Transnet in South Africa ran a 375-wagon train. A 9m-wide metro railway track can carry the same number of passengers as a 175m-wide road used by cars. The potential benefits for protecting the environment and reducing smog are evident.

Available now

Full deployment of electric vehicles (EVs) and connected and automated vehicles (CAVs) will take several years. Rail solutions, however, can provide immediate and proven answers to the challenges of reducing urban pollution and improving air quality.[8] Simply put, rail is the best way to reverse climate change sooner rather than later.

The environmental and health benefits don't stop there. While the adoption of electric road vehicles must be encouraged, they are not fully green technologies. Road vehicle tyres and brakes produce significant particulate air pollution.

Resource-saving

The durability and longer lifetime of rolling stock is another important factor. When compared with private passenger cars, rolling stock typically has a longer service life, with an average lifespan of 30-35 years. There are also many 60-year-old reconditioned locomotives still operating. Furthermore, the annual mileage of rolling stock is often a high multiple of that of a car.

Shifting from cars to rail will result in a massive reduction in raw material requirements. More people and freight will be transported using fewer resources. The potential benefits to the environment are undeniable.

Rail is part of the solution to climate change

Unlike other types of transport, the rail sector is part of the solution to climate change – not part of the problem. For example, while the rail sector carries 8% of the world's passengers and 7% of global freight, it uses only 2% of total transport energy, proving its exceptional energy efficiency credentials.[9]

As IEA Executive Director Dr Fatih Birol has stated, "The rail sector can provide substantial benefit to the energy sector as well as the environment. By diversifying energy sources and providing more efficient mobility, rail can lower transport energy use and reduce carbon dioxide and local pollutant emissions."[10]

Rail is responsible for just

2%
of CO_2 emissions for passenger transport [12]

3%
of emissions for freight transport [12]

Rail´s environmental advantages are clear:

Since 1990, railway energy consumption has improved by

37% per transport unit [11]

Railway carbon emissions have improved by

30% per transport unit [11]

This is on target to meet the objectives of the Paris Agreement on Climate Change, as well as the voluntary targets announced in the UIC Low Carbon Rail Transport Challenge presented at the 2014 UN Climate Summit.[11]

Electrification has expanded to cover

33%
of the global rail network [10]

Electricity now powers almost

45%*
of all rail activity [10]

Renewable energy powers over

20%
of electric powered trains [10]

* Obviously, the key here is to switch to non-fossil sources of electricity.

Today, rail is

6x
more energy efficient [13]

9x
less CO_2 intensive than road for freight and air travel for passengers [14]

By using electric or battery locomotives running on green energy from hydroelectricity, wind, waves, solar power or hydrogen fuel cells, railways can become zero carbon operators.[14]

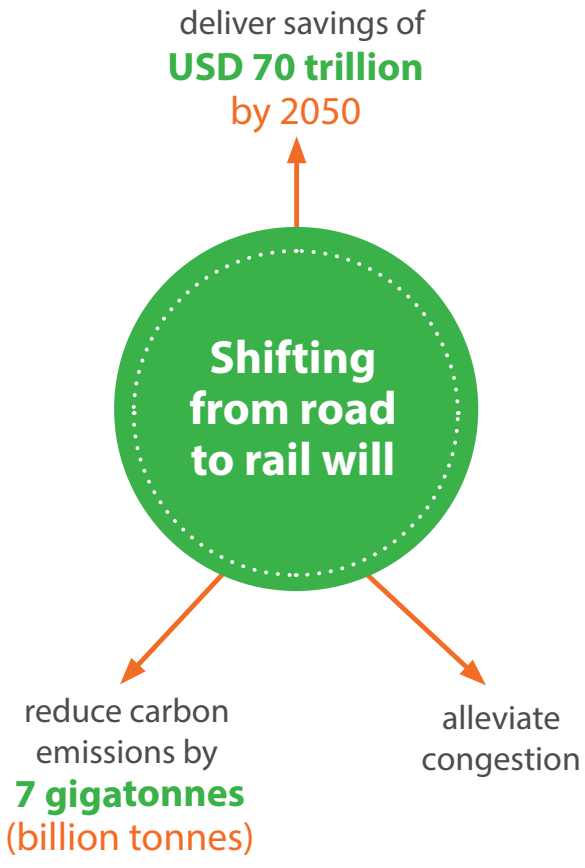
By comparison with roads and motorways, rail systems also use far less land, thus not only improving resource efficiency but also helping to maintain biodiversity.

The modal shift

It is crucial for the rail sector to increase its market share so that future transport demand can be met without further damaging the environment. This means a modal shift from road traffic and other high-carbon and greenhouse gas emitters to rail.

According to the IEA, taking into consideration full transport costs including fuel, operational expenses and vehicles, through shifting from road to rail, sustainable transport can deliver savings of USD 70 trillion by 2050, while reducing carbon emissions by 7 gigatonnes (billion tonnes) and alleviating congestion.[15]

A shift from road to rail will also increase safety and remove a source of pollution that shortens millions of lives.



Investment in railways is urgently needed

The International Union of Railways, UIC, comments in its 2017 analysis of global rail projects[16]: "While investments in high-speed and metro networks are already going in the right direction, there appears to be a significant lack of investment for regular heavy rail, particularly commuter rail. The investment gap is especially large for low- and mid-income countries with quickly urbanising societies…"

Governments cannot carry the financial burden alone

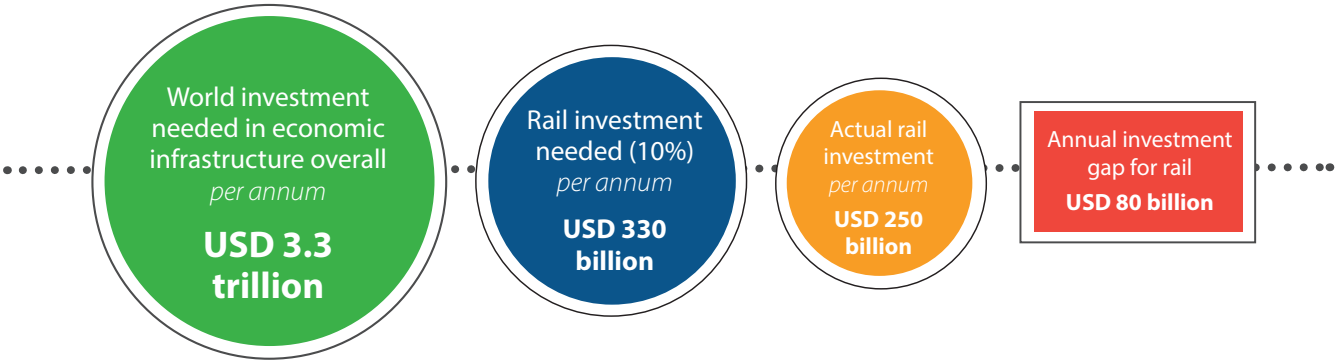
So there is broad acceptance that new rail infrastructure and equipment is urgently needed, particularly in developing countries. Given rising state indebtedness around the globe, however, it is also evident that governments cannot shoulder the financial burden alone. Indeed, a 2019 report carried out for the Rail Working Group by global strategy consultants Roland Berger reveals the steady but limited withdrawal of state funding in Europe for the procurement of new rolling stock.[17]

While infrastructure usually requires state involvement, by contrast railway rolling stock, like cars and trucks, does not have to be state financed or underwritten. It is here that private sector financing can relieve governments of a major financial burden.

Slow progress on private financing

The theory is sound, and the Berger report indicates a growing trend for the private sector to provide additional finance into the rail industry. But progress is far too slow. According to the report, over three quarters of European rolling stock procurement is still either state financed or underwritten, and this is restricting necessary investment because of government budgetary constraints and borrowing limits. In other parts of the world, but outside North America, the level of state involvement is even higher. Why is there so little private financing?

The investment gap



Based on figures from the McKinsey Global Institute

Risk is holding back private investment

The main reason is that the private sector is being asked to carry risks that are either unquantifiable or unduly burdensome. As a result, without strong state or commercial guarantees, private sector secured lenders and lessors are either reluctant to provide finance, or it becomes prohibitively expensive, especially if the assets being financed move across national borders.

The solution to this is for creditors to have a legal framework that enables them to:

> Enforce their rights and security in the financed assets

> Repossess these assets on debtor non-payment or insolvency no matter where the assets are located, and independent of state guarantees

There are two other associated factors currently holding back private investment:

> Absence of a unique global identification system for railway rolling stock

> Lack of any public registry to record security interests in railway rolling stock

This is where the Luxembourg Rail Protocol to the Cape Town Convention comes in, because it substantially reduces the risks for private investors.

The Luxembourg Rail Protocol delivers private sector financing for railway rolling stock

The Luxembourg Rail Protocol is a new international treaty due to come into force in 2020, which creates a worldwide legal framework to protect private sector investment in railway rolling stock. It will establish an international registry to record security interests, accessible 24/7 online, and facilitate the registrar allocating a unique vehicle identifier for any item of rolling stock worldwide under a new unique rail vehicle identification system (URVIS).

As such, the Luxembourg Rail Protocol is a 'package of solutions' designed in cooperation with the rail industry and the finance community for a new era of railway expansion.

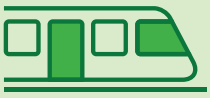
Because it removes the major hurdles to private sector investment in a key part of the rail industry, when adopted, the Luxembourg Rail Protocol will attract more private investors (such as banks, pension funds, insurance companies, and private equity funds) to the rail transportation sector.

The availability of cheaper, more abundant, and more accessible funding for railway rolling stock will enable the expansion of railway networks and the purchase of railway rolling stock of all kinds – from high-speed trains, to freight and passenger trains, to metros, light rail, trams, and even cableways, gantries and cranes on rails.

In this way, the Luxembourg Rail Protocol will make a significant, direct contribution towards creating a rail-oriented, climate-friendly future.

A rail-oriented, climate-friendly future

The Luxembourg Rail Protocol



By stimulating growth in rail, particularly if the locomotives used are powered by environmentally friendly sources, the Luxembourg Rail Protocol will provide an ecologically sustainable alternative to road transport that reduces CO_2 and dangerous air pollution (from both gases and particulate matter) and contributes towards fighting climate change.

Once in place, by reducing creditor and operator risk, the Luxembourg Rail Protocol will facilitate more and cheaper private finance to support new rolling stock procurement and help lower barriers to entry for smaller, lightly capitalised operators.

It will also create choice and flexibility for public and private operators on the cost and type of funding, and enable governments to deleverage state operators' rolling stock portfolios by refinancing with private capital.

Furthermore, based on experience with the long-established Aircraft Protocol to the Cape Town Convention, export credit agencies should offer a discount on their risk premiums of at least 10% in relation to debtors located in countries that have signed up to the Luxembourg Rail Protocol.

This will make a decisive contribution towards strengthening the rail sector and increasing its market share.

Manufacturing and new technologies

Railway rolling stock manufacturers are constantly innovating. Cutting-edge technologies include not only better, more environmentally friendly and energy efficient wagons and locomotives, but also improved signalling and communication through direct incorporation into the driver´s cab.

Some state-of-the-art examples of climate friendly innovations:

Hybrid, clean diesel & hydrogen/fuel cell
the ultimate low carbon transport (when hydrogen is produced using green electricity

Regenerative braking
which returns energy to the grid when trains slow down

Artificial intelligence and platooning
when several train sets run on the same track just 50m apart, possible thanks to AI controls

High-speed trains
which are the most energy efficient and lowest emitting trains

Supercapacitor trams
which run on recharge-able batteries and eliminate expensive overhead catenary

The Luxembourg Rail Protocol will attract more domestic and foreign capital investment into the rail industry, which will enable the purchase of more efficient rolling stock and stimulate the development and manufacture of innovative wagons and locomotives with new technologies to meet the industry´s environmental sustainability goals.

More investment in rolling stock will also lead to more efficient use of existing rail infrastructure, and support both new and rehabilitated lines.

Another aspect of the Luxembourg Rail Protocol is that it will facilitate operating leases of rolling stock, which in turn is expected to lead to more standardised equipment and economies of scale for manufacturers, resulting in significant cost savings, in turn stimulating the rail sector further.

The private sector can help railways combat global warming

According to the UN, "urgent action is needed to mobilize, redirect and unlock the transformative power of trillions of dollars of private resources to deliver on sustainable development objectives. Long-term investments, including foreign direct investment, are needed in critical sectors, especially in developing countries. These include sustainable energy, infrastructure and transport …. The public sector will need to set a clear direction."[18]

The aim of the Luxembourg Rail Protocol to encourage private sector investment in the railway industry fits this focus exactly.

The developing world has long suffered from both unsustainable public sector debts and inadequate access to private credit. The Luxembourg Rail Protocol seeks to reverse this.

It will deliver a market that will be more transparent, fair, and reliable, while providing governments with private sector financial support within a legal framework that ensures flexibility and control.

The Luxembourg Rail Protocol is a protocol to a well-established international treaty, the Cape Town Convention on International Interests in Mobile Equipment. At its core is a strong, common international legal framework and two supporting structures:

1) *The introduction of a unique rail vehicle identification system (URVIS) that will:*

> *be critical for registering creditor security interests in rail equipment*

> *make it easy to track the location and status of rolling stock in real time*

> *support customized maintenance programmes*

> *let governments more effectively monitor the cross-border operation and inter-operability of railway equipment running on regional or continental rail networks*

2) *The establishment of the world's first international public registry of security interests in railway rolling stock. This will be accessible online 24/7 for financiers to register their interests in financed equipment and check for potential prior claims.*

These features of the Luxembourg Rail Protocol will produce a cheaper and more transparent system of railway financing that boosts the industry and supports its contribution to stopping climate change.

The world must battle climate change — the Luxembourg Rail Protocol will help do this

According to the UN´s former Secretary General Ban Ki-moon: "We don't have plan B because there is no planet B!"[19]

Rail is the best hope for the global transport sector to mitigate climate change while delivering sustainable environmental growth and supporting the aspirations of people and governments in all parts of the world.

Combating climate change through the railways will require massive investment, but the public sector cannot carry the burden alone. Private finance is needed, which must be at affordable rates if it is to fill the gap. This means that lenders and lessors must have security that their rights will be upheld in law, with practical systems in place to regulate and support this.

These requirements will now be met by the Luxembourg Rail Protocol.

By offering a common system worldwide, the Luxembourg Rail Protocol makes it easier for foreign investors to understand local legal conditions and thus more willing to lend at affordable rates to operators in countries they may previously have avoided.

The Luxembourg Rail Protocol will reduce the cost of both international and domestic private finance:

- *More credit will be available – from both foreign and domestic lenders – leading to a more competitive lending environment and thus to lower lender margins.*
- *Lower risks will mean that banks will have lower capital allocation requirements, which will lead to lower margins charged to borrowers.*
- *The lower risks involved thanks to the Luxembourg Rail Protocol will mean that lower rewards are required by creditors, allowing them to reduce costs for borrowers.*
- *Due to lower risks, there will also be lower export credit agency financing costs.*
- *Documentation will be easier and faster to produce – reducing transaction costs.*

Altogether, this will lower barriers to entry for rail operators and other stakeholders, making the rail industry more flexible, more competitive, and stronger - and even better able to play its part in the effort to protect the environment and save the planet.

Implementing the Luxembourg Rail Protocol to the Cape Town Convention and supporting the development of the rail industry will be a major step towards tackling one of our greatest challenges: halting climate change.

Endnotes

[1] https://www.who.int/sustainable-development/transport/health-risks/climate-impacts/en/

[2] Ibid

[3] https://www.iea.org/etp/tracking2017/transport/

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