REPORT ON THE APPLICATION OF THE EUROVIGNETTE DIRECTIVE

Synthesis and status report on the application of the Eurovignette Directive 1999/62/EC as modified by 2011/76/EU

Transport Working Group of the Alpine Convention

Mandate 2021-2022

ALPENKONVENTION
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IMPRINT

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1. BACKGROUND AND PURPOSE

The actual mandate 2021/2022 of the Working Group on Transport (WGT) of the Alpine Convention[1] also deals with article 14 of the Transport Protocol[2] and the implementation of the polluters pay principle in road freight transport in Alpine countries. It continues the work on the external costs of transport in the Alpine area.

In this context, Switzerland (CH) has taken over the task to write a short report on the progress since the last status report in 2016[3]. Another aspect of the mandate is to analyse, to which extent the Eurovignette Directive[4] is in line with the provisions of article 14.

In order to be able to proceed to this analysis, Member States were asked to indicate their experiences made with respect to the implementation of the Eurovignette Directive 2011/76/EU. For this purpose, the questionnaire in the Annex 2, elaborated initially by Austria (AUT) in 2013, was refined and updated by Switzerland and sent to the Member States in July of 2021 to be filled out during the summer months.

This task had to be finalised until the XVII Alpine Conference on 26-27 October 2022, in Brig, Switzerland, under Swiss Presidency of the Alpine Convention.

2. STATUS ON IMPLEMENTATION OF EUROVIGNETTE 2011/76/EU DIRECTIVE

2.1. Result of the updated survey 2021

2.1.1. Scope

In application of article 14 of the Transport Protocol of the Alpine Convention, the WGT is – after 2016 - again updating the synthesis on the present application of the Eurovignette Directive and similar tolling systems and, in more general terms, the implementation of real costs, including external costs, in the Alpine countries.

The scope of the Swiss survey and questionnaire is the gathering of information about

- tolling modalities,
- level of tolls,
- differentiation by emission classes or other categories,
- tolling network,
- mark ups, and
- the use and earmarking of toll revenues.

The information sent back to Switzerland by all Member States provided answers to the sixteen questions of the survey. The following main points emerged from the survey, listed more detailed in Annex 1.

[1] Transport_WG_Mandate_2021-22_en.pdf (alpconv.org)

[2] Protocol_Transport_EN.pdf (alpconv.org)

[3] See here: Annex_1_Synthesis Eurovignette_with_questionnaires-AT-CH-DE-FR (alpconv.org)

[4] Consolidated version of Directive 2011/76/EU of the European Parliament and of the Council of 27 September 2011 on the charging of heavy good vehicles for the use of certain infrastructures EUR-Lex - 32011L0076 - EN - EUR-Lex (europa.eu)

2.1.2. Implementation at legal level

The implementation of legal principles/rules is various, be it through the Constitution, federal laws, regulations or road acts. In most of the countries, implementation of tolling rules is regulated by national laws and regulations. In Switzerland, the principle of tolling is even based on the Federal Constitution (art. 36 quarter).

2.1.3. Tolling network

The survey displays that in all countries except Switzerland, the perimeter of application concerns the national tolling network such as the highways and trunk roads. As for CH, the entire road network is at hand.

In **Germany**, an important extension of the tolled network was operated to other trunk roads/Bundesfernstrassen in July 2018 (approx. 52,000 km tolling network).

The level of toll for a Euro 6 vehicle varies between 0.2 €/km and 0.42 €/km regarding the four+ axles. More precisely, the toll is of 18.3 cts/km in Germany, involving the infrastructure costs (16.9), air pollution costs (1.2) and the noise costs (0.2); of 27.6 cts/km on average in France, taking into consideration the infrastructure costs only; of 41.702 cts/km during the day in Austria, involving the infrastructure (40.299), air pollution (1.2) and the noise (0.203) costs; of 42.8356 cts/km in SLO, including an adjustment factor of 0.6 and finally of 2.28 cts/tkm in CH/FL including the overall costs, namely infrastructure and external costs.

In **Italy**[5], the toll variation is between 0.15 €/km and 0.20 €/km (for different vehicle categories based on number of axles), without any differentiation of Euro classes. Only few sections of the Italian highway network apply a fixed lump sum on so-called “open systems” on highway stretches like A8 Milan–Laghi or A12 Rome–Civitavecchia, where the customer does not need to take a ticket, but just has to pay a pre-established distance-amount applying a lump sum approved by the awarding body (ANAS). The majority of the network is operated in a "closed system", where the customer takes a ticket on entering the highway and returns it on exiting, paying toll on the basis of the route covered[6].

In **France**, a similar system is operated by concessionary companies applying on the majority of the network also a closed system, where users take a ticket entering the highway stretch and pay at the exit. As in Italy, an electronic tolling system based on On Board Units (OBU) and automatic registration units at toll stations allow also digital recording and payment instead of manual ticketing and payment. Few highway stretches are also operated as open systems with lump sum payment for each vehicle category. Two motorway concessions, Atlandes (104 km) and Albea (17.8 km) vary toll rates according to EURO emission classes. The concessions ARCOS (24 km) and ALIAE (88 km), which will respectively open in 2021 and 2022, will also vary toll rates according to EURO emission classes. One concession, CEVM – operating the famous bridge “Viaduc de Millau’ (2.5 kilometers long), varies toll rates depending on the season (summer / not summer). Two concessions (Cofiroute- A86 duplex and SANEF on motorway A1) vary toll rates depending on the time of day. One concession (Cofiroute-

[5] Home - Autostrade per l'Italia

[6] Network map: Italy toll roads map - Italy highway map (Southern Europe - Europe) (maps-italy.com)

A86duplex) varies toll rates depending on the type of day (Saturday, Sunday, holyday and day before a holyday, business day in august).

All concession contracts allow the use of different tolls according to the time of day should the state allow or demand it.

2.1.4. Level of toll and differentiation

For **Switzerland**, including the **Principality of Liechtenstein**, the specificity to distinguish the tolling level compared to the other Alpine countries is the fact that the toll rate is calculated by vkm and tons (maximum allowed weight of the vehicle according to registration document), not only by vkm. The Swiss heavy vehicle fee is registered and collected by an OBU, which is compulsory for Swiss vehicles, allowing automatic distance registration and payment. Foreign vehicles must be registered when they first enter in Switzerland. At registration, an "ID CARD" is provided to the driver, containing all information on the vehicle. The card should be kept with the driver for all future journeys to Switzerland. Declaration of distance performed by the registered vehicle (weight, emission class) at the exit of Switzerland is operated by mean of this ID-Card at specific terminals. Hauliers, which often run through Switzerland, may install the Swiss OBU for easier automatic distance declaration and payment.

The specific performance related HGV fee (distance, max. allowed total weight, emission class) is calculated, as an example, for the 300 km trip through Switzerland, in comparison to the German toll system, for a 40 ton Euro 6 vehicle generates the following toll costs:

Switzerland: 300 (km) x 2.28 cts x 40 (t) = 273.6 CHF = 260.5 € [by exchange rate of 1.05]

Germany: 300 (km) x 18.3 €cts = 57.29 CHF = 54.9 €

Compared to other Alpine crossings like the French-Italian crossing by Mont Blanc or Fréjus, the usual toll rates as well as the tunnel fees representing only infrastructure maintenance costs need to be taken into account.

The following comparison of Alpine Crossing sections linking France – Italy, transit through Switzerland and Germany-Austria-Italy shows the different level of tolls (incl. highway tolls, tunnel tolls, special tolling sections ("Sondermautstrecken")):

Toll-level comparison 2014 / 2021 for a 40t HGV (emission category 5 for 2014 and 6 for 2021)

France – Italy by Fréjus: Lyon-Santhia (350 km)

Toll / fee	2014 € without VAT	2021 € without VAT	sources
Tunnelfee Fréjus (F->It)	194.40	222.58	2014: http://www.tunneldufrejus.com/doc/commerciales/tariftun2014.pdf (Half of the return-ticket at reduced price which is the most favorite-one,minus 20% VAT France) 2021: https://www.sftrf.fr/InfoliveDocuments/tarifs/tarifs_tunnel_au_1er_janvier_2021.pdf
Highway toll (A43 France)	65.60	71.58	http://www.autoroutes.fr/fr/itineraires.htm (Lyon-Valfréjus; abzügl. 20% MWST Frankeich)
Highway toll (A32 and A4 Italy)	39.10	46.97	https://www.autostrade.it/autostrade-gis/ricercaPercorso.do?tipo=P&equivalenzaClassi=5&dscDa=bardonecchia&dtxpDa=11118&dscA=santhia&dtxpA=21125 (Bardonecchia-Santhia; abzügl. 22% MWST Italien)
TOTAL 2014	**299.10**		**vKM (length ~350 km): 0.85 €/km**
TOTAL 2021		**341.13**	**0.97 €/km**

Transit through Switzerland: Basel-Chiasso (300 km)

Toll / fee	2014 € without VAT	2021 € without VAT	sources
HGV fee per km and per ton of max. authorized weight of vehicle, Euro 5 in 2014 and Euro 6 in 2021			HGVF in CHF: 0.0228CHFx40 [t] x 300[km]= 273.60 CHF (without VAT) HVC - General / Rates (admin.ch)
TOTAL 2014	**228**		2014 average exchange rate: 1€ = 1.20 CHF) **vKM (length ~300 km): 0.76 €/km**
TOTAL 2021		**251.33**	Same level of fee for Euro 6 vehicle in 2021 as for Euro 5 vehicle in 2014 2021 average exchange rate: 1€ = 1.08 **0.84€/km**

Transit through Austria until northern Italy Verona: Kufstein-Verona (341 km)

Toll / fee	2014 € without VAT	2021 € without VAT	sources
Highway toll (A12, A13 Austria	92.34	83.90	http://services.asfinag.at/mautkalkulator-light (A12 Kufstein to A13 national border line Brennerpass; incl. Sondermaut - section; minus. 20% VAT Austria); day-time tariff, see also note[1] [https://mautkalkulator-light.go-maut.at/de/, average day / night tarif]
Highway toll(A22 Italy)	30.96	32.95	https://www.autostrade.it/autostrade-gis/ricercaPercorso.do?tipo=P&equivalenzaClassi=5&dscDa=Brennero&dtxpDa=305&dscA=Verona&dtxpA=15030 (A22 Brennero-Modena - Verona-Nord; minus. 22% VAT Italy)
TOTAL 2014	**123.30**		**vkm (length ~341 km): 0.36 €/km**
TOTAL 2021		**116.85**	**0.34 €/km**

[1] In 2014 the infrastructure charge in AT was differentiated according to the EURO emission class in a revenue neutral way. While the differentiation factor for EURO IV and V in 2014 was 1,05, it was 0,92 for EURO VI. In 2021 for EURO VI vehicles a factor of 0,985 on the infrastructure charge was applied (= toll bonus of 1,5% compared to all other EURO emission classes). In 2016 the toll rates on the A 13 Brenner Autobahn had to be adjusted.

Concerning the current toll rates, the survey shows that some of the countries (DE, CH) do not include VAT in their stated rates. Austria has five separate toll rate networks in terms of infrastructure charges. Furthermore, Austria has an external cost charge for air pollution, and external cost charge for noise pollution. Germany has a similar approach. The toll rate calculation takes into account the air pollution, noise pollution, and the infrastructure costs. Switzerland presents overall rates, which include infrastructure costs and external costs, differentiated in three categories according to the emission classes, Slovenia defines also different emission classes. The toll rates in France include the VAT and vary from one motorway concession to another. In Italy the Highway Concessionary companies apply toll rates for three categories of heavy vehicles (Class III: Vehicles with three axles; Class IV: Vehicles with four axles; Class V: Vehicles with five and more axle) according to the specific stretches and VAT of 22%.

Regarding the topic of charged vehicle categories and the tariffs applied, the survey unveils that the differences of principles of charging by axles, by total weight and by emission class between countries remain mostly the same as in the former activity report.

Most of the countries declare that charges vary according to factors such the emission, time and season. However, France underlines that only a small fraction of the network makes a differentiation regarding the emission classes. In Italy, no differentiation between Euro emission classes is made. Concerning the implemented differentiation, the countries proceed as follows. CH grounds its differentiation on the Euro emission classes, so does Slovenia while adding a distance adjustment factor. Germany implements differentiation based on emission as well as weight. In France, the differentiation varies from one concession to the other. In Austria, the differentiation varies with the number of axles, the Euro emission classes and the

time of the day. Furthermore, except Slovenia and Italy, a monitoring is implemented. The tools in order to do so vary from one country to the other.

2.1.5. Mark ups and use of revenues

Austria and Slovenia report having a mark-up for financing specific projects of high interest for Europe. Austria does so in order to cross-finance parts of the Brenner Base tunnel and Slovenia in order to finance the rail section Divaca-Koper.

In Italy, where highway concessionary companies are levying specific infrastructure tolls, only on the highway section of A22 between Modena and Brenner a mountain rate (”tariffa di montagna”) is operated.

Concerning monitoring measures, in France, impacts are being monitored in the two concessions, which use differentiation of Euro emission classes (Atlandes and Albea) following the rules of the articles 25 of those contracts:

https://www.ecologie.gouv.fr/sites/default/files/Atlandes%20Cahier%20des%20charges%20vf.pdf
https://www.ecologie.gouv.fr/sites/default/files/ALBEA_contrat_consolid_vf.pdf

They will also be monitored in the two future concessions ARCOS and ALIAE following the rules of the articles 25 of those contracts: https://www.ecologie.gouv.fr/sites/default/files/ARCOS_contrat_consolide_vf.pdf
https://www.autoroute-a79.fr/le-concessionnaire/

The impact of these toll differentiations provide no additional income for the motorway concession. Vehicles may pay up to 10% more or less according to their Euro classes on air pollution.

On the subject of the impact on interurban road network, only Germany and Switzerland observe an impact. France does not, whereas Austria and Slovenia have no view on the subject.

Concerning the charging revenue earmarked for transport sector and its extension, the surveys displays that it concerns for France, Germany, Slovenia and Switzerland some of it, whereas for Austria it concerns all of it.

2.1.6. Modal shift effects

Germany, and Switzerland report observing a shift from road to rail. Germany reports that the influence on modal shift is minor, but that it has positive effect on emission classes, use of capacities and diminution of empty trips. Switzerland observes an emission reduction, a HGV traffic reduction in numbers, and an incentive on vehicle technology renewal. Whereas France does not and Slovenia has no view upon the question. As positive effects, Austria mentions that toll measures like charging external costs and applying a mark-up could build incentives, which help to achieve the objectives of art. 14 by contributing to encourage the use of more environmentally friendly vehicles and a modal shift from road to rail.

Most of the countries with the exception of Slovenia and Italy plan additional measures. AUT recently has raised the bonus on the infrastructure charge from 50% to 75% for E/H2-vehicles since 1 September 2021 and may implement further measures depending on the provisions of a new Eurovignette Directive. FR plans new regulations allowing local authorities to implement

toll on non-tolled motorways. CH is looking further into a new system of a so-called mobility pricing (charging road and rail passenger as well as freight transport), planning pilot projects for 2027 as well as a further development of HGV fee, which will eventually include CO_2 emissions and alternatives to fuels and propulsion systems.

In Italy, the highway concessionary companies keep concessions based on provisions dated a long time ago with long duration. The concessionary companies will therefore have to implement new provisions of the Eurovignette Directive only following the renewal of the existing concession, which implies an average deadline in the next 15-20 years.

Finally, Austria, Germany, and Switzerland plan to or already charge external costs in their tolling schemes. For further details, see 13.b.

3. EU PROGRESS SINCE LAST STATUS OF 2016

3.1. Progress concerning principles of charging, tolling network, vehicle categories

Regarding the topic of charged vehicle categories and the tariffs applied, the survey unveils that the differences of principles of charging by axles, by total weight and by emission class between countries remain mostly the same as in the former activity report.

Germany:

An important progress concerning the tolled network is stated in Germany since July 2018, where the tolled network was extended to other trunk roads (Bundesfernstrassen), total length of the tolled network 52,000 km.

Since October 2015, the tolled vehicle categories were changed: the limit of vehicle weight of tolling was lowered from 12 tons to 7.5 tons, which extended considerably the number of tolled vehicles.

Switzerland:

In Switzerland, the three categories containing the different vehicle emission classes are regularly updated. Currently, the categories, emission classes, and tariffs are as follows, presenting the specificity that the second category remains empty as no newer emission category than Euro 6 could be added:

Category	Euro emission class	Tariff
I	Euro 0 to 5	3.10 Rp./tkm
II	-	2.69 Rp./tkm
III	Euro 6	2.28 Rp./tkm

The Swiss system of categories containing the different emission classes and the tariffs, decided by the government, needs the approval of the European Commission in the framework of the Joint Committee of the Landtransport Agreement EU-CH.

Italy:

The concessionary system for the main highway network covers most of the regions of the country.

3.2. Progress concerning distinction of various external cost factors in tolling rate

A most important element since the last review concerning implementation of the polluter pays principle and true costs is the fact that several countries introduced explicitly external cost factors in the overall toll rates.

In Austria for instance, a vehicle with four or more axles is tolled according to the following factors in comparison to a vehicle with two axles: infrastructure: 2.1; air: 1.6; noise: 2.9. In terms of the external cost charge for traffic-based air pollution distinctions are also made between the Euro emission classes. The external cost charge for traffic-based noise pollution distinguishes between day- and nighttime.

Also in Germany, the overall toll rate includes since 2017 explicitly beside the infrastructure use a factor for air pollution and noise.

The general overview looks as follows for a 40t Euro 6 emission vehicle:

Toll: infrastructure /+ external costs :

- DE: infra + air poll + noise -> 16.94 + 1.2 + 0.2 = 18.3 cts/vkm (since Oct 2021)
- FR: 27.6 cts/vkm (average) only infrastructure (concessionary companies)
- AT: infra + air poll.+ noise -> 40.299 + 1.2 + 0.203 = 41.702 cts/vkm (daytime)
- (mark up sections +25% / no ext. cost elements)
- SI: 42.8356 cts/vkm with adjustment factor 0.6 = 25.7 cts/vkm
- IT: only infrastructure : average 0.20 €/vkm (concessionary companies)
- CH/FL: 2.28 cts(CHF)/tkm (overall cost: infra + external costs)

3.3. Progress concerning use of revenues and earmarking

Since the last status report, in some countries an evolution concerning the use of revenues and earmarking took place.

While in the former period in almost all countries except Switzerland the revenues were affected specifically to road infrastructure investments only, the scope was widened in France and parts of the road tolling revenues from the concession companies are affected to the infrastructure financing Agency for all modes of transport,

Also in Slovenia, mark ups from tolling are used for the rail network extension (second rail Divaca–Koper).

In Italy, revenues from tolling generated by HGV are used by Highway Concessionary companies beside maintenance for safety and sustainability measures of road infrastructure (bridges, tunnels etc). Moreover, on the access highway to the Brenner A22, a mountain tariff is applied.

The reimbursement system for hauliers in Italy will be changed: reimbursement of tolls to the Haulage Companies will be differentiated on the basis of Euro classes of commercial vehicles (no reimbursement for < euro IV trucks – maximum reimbursement for Euro VI / alternative fuels trucks).

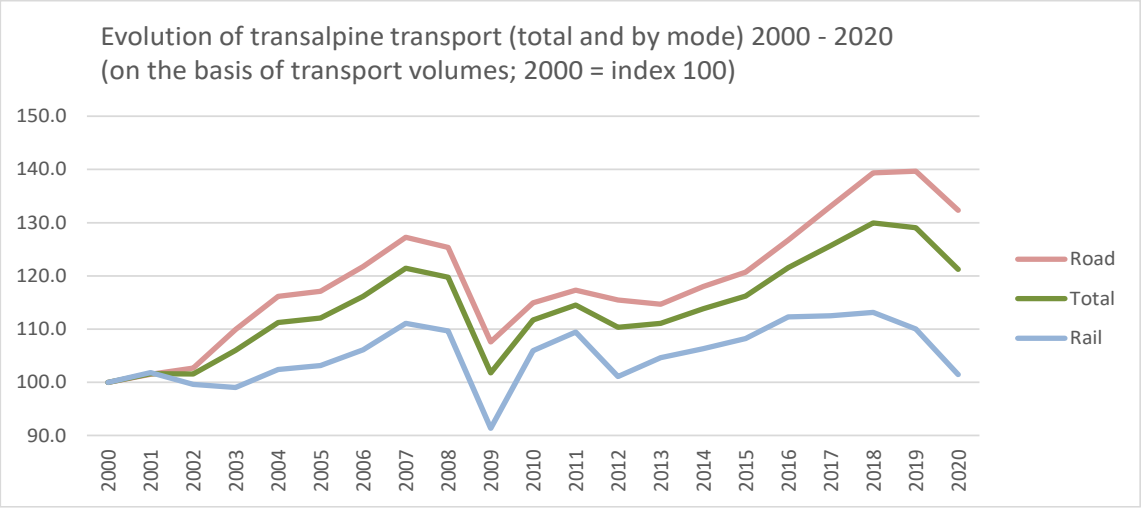
In Germany, revenues are not only reinvested in road infrastructure, but also in programs for employment, qualification, environment, security and safety of the road haulage transport branch as well as for EETS.

In Switzerland, the former "FinöV-infrastructure Fund" (reinvestment in projects of NEAT/alptransit, rail links to high-speed network, rail noise emission protection measures) was transformed 2016 into a general rail infrastructure fund (BIF) for new projects as well as for maintenance; 2/3 of HGV revenues are contributing to this fund, 1/3 is feeding cantonal budgets.

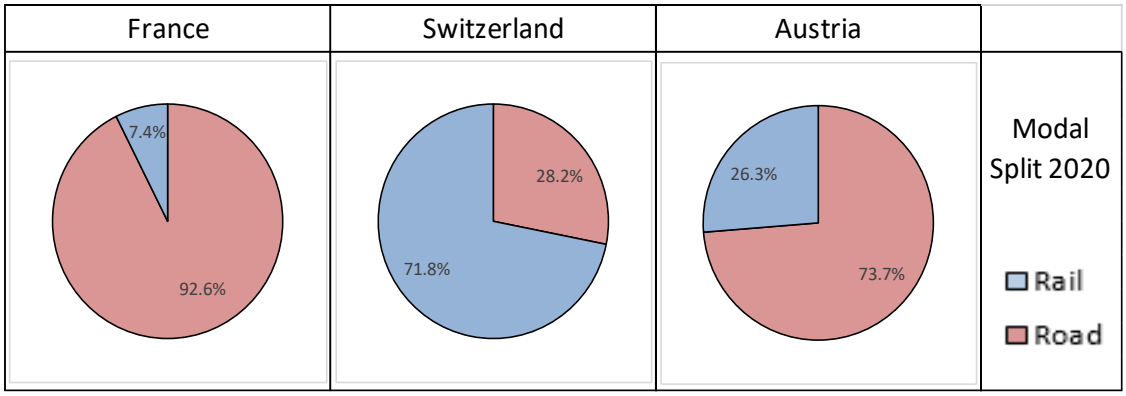
3.4. Overview of transalpine freight transportation (road and rail)

The analysis and results from the transalpine freight traffic Observatory Switzerland – EU provide an overview about the development over the last 20 years (up to 2020, an update concerning the figures from 2021 will be operated further on).

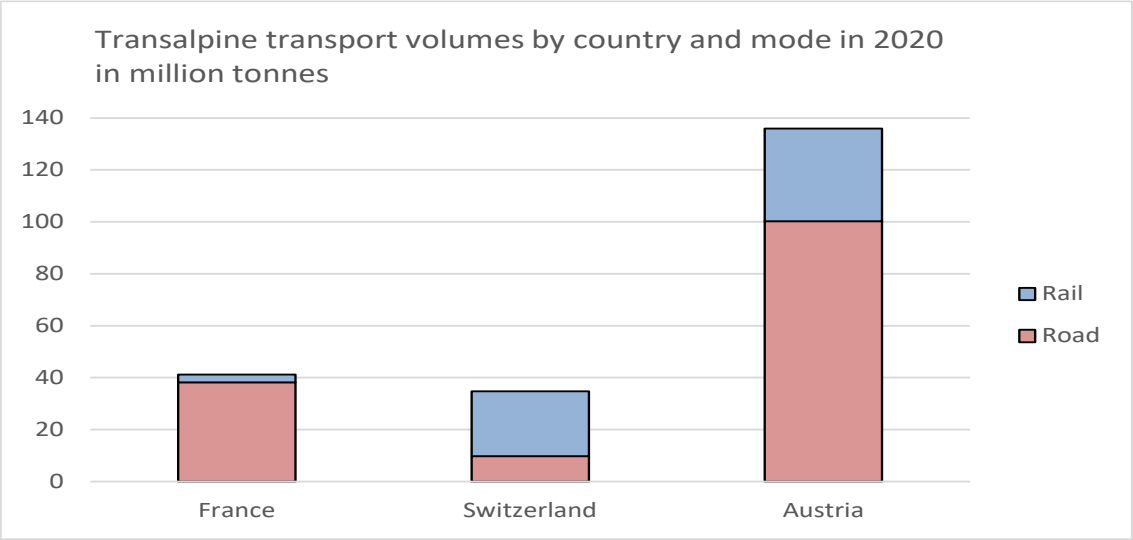
Evolution 2000 - 2020 of transalpine transport (basis index 100 in 2000):



Modal split figures for transalpine goods transportation:

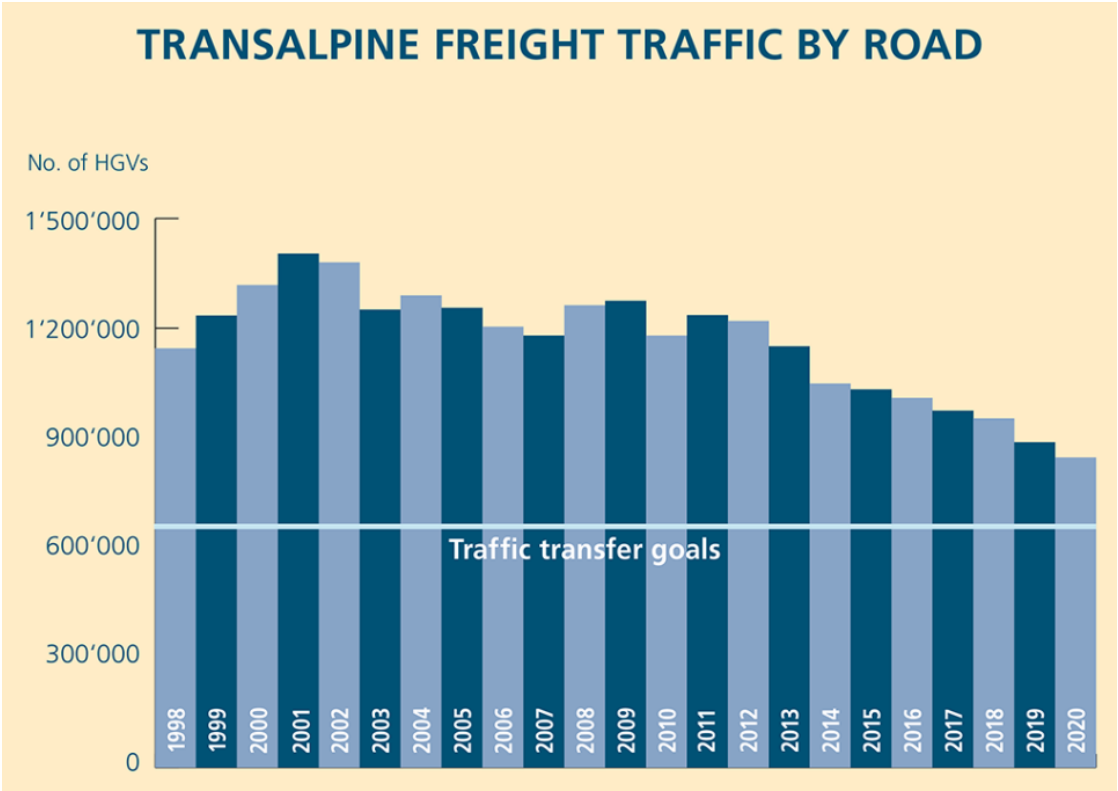


Transalpine transport volumes by country and mode:

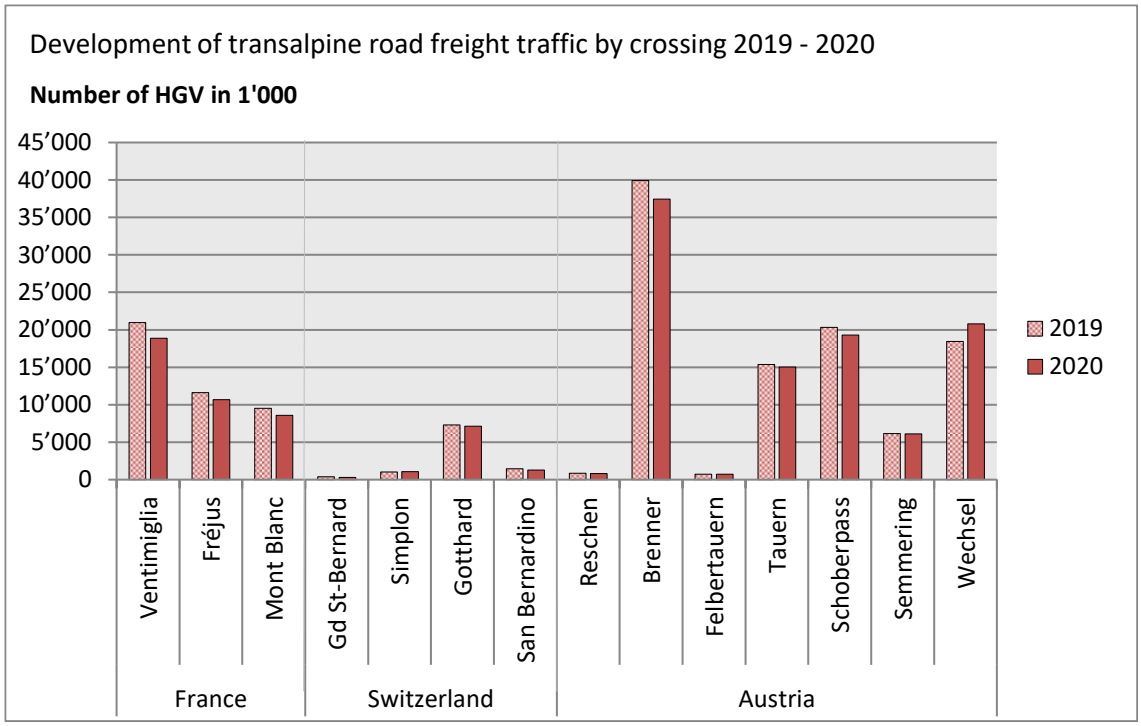


The specific case of transalpine transport through Switzerland shows the modal shift effect of a bundle of measures implemented over the last 20 years (HGV fee, railway reform, new important railway infrastructure in form of the three rail base tunnels Loetschberg, Gotthard and Ceneri, promotion of rail freight measures by different instruments and flanking measures):

The transfer goal for heavy goods vehicles is the number of 650,000 vehicles/year, not yet achieved, but on the way to reach it in a near future

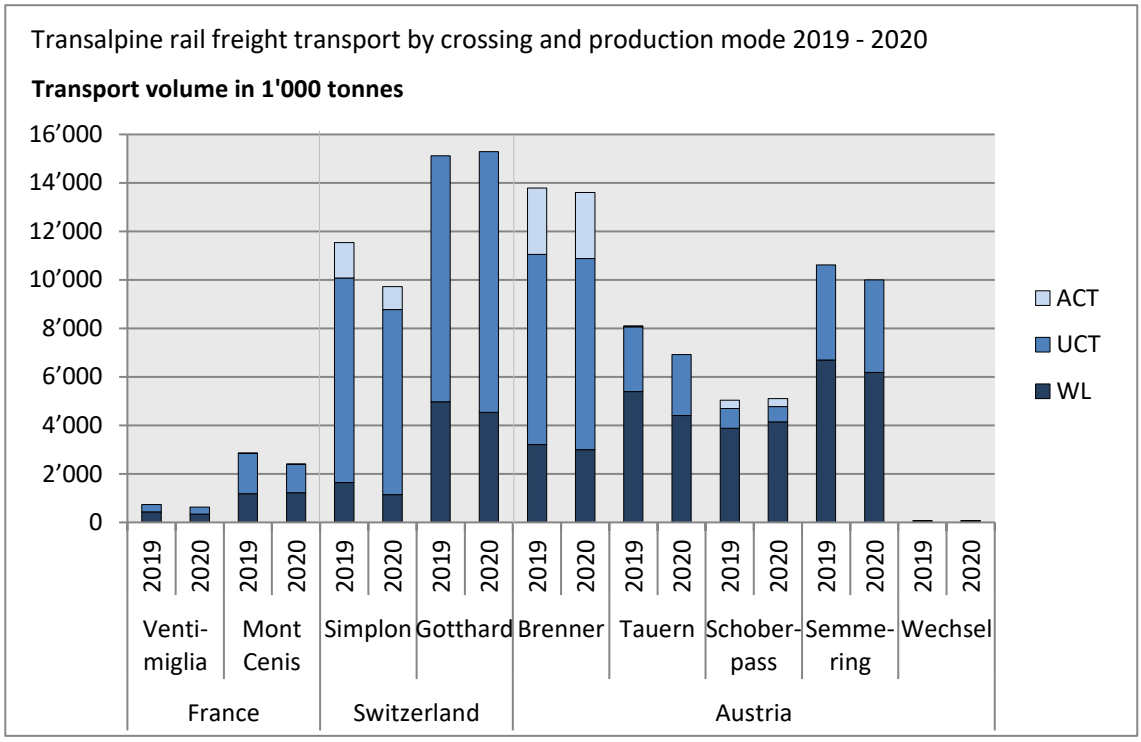


Road transport 2019 - 2020 by crossing:



Rail transport 2019 - 2020 by crossing and production mode (ACT, UCT, WL):

(Accompanied Combined Transport, Unaccompanied Combined Transport, Waggon Load)



Transalpine Road freight transport: Euro-emission classes of vehicles / shares by country[7]

France – Italy (Fréjus / Mont Blanc) :

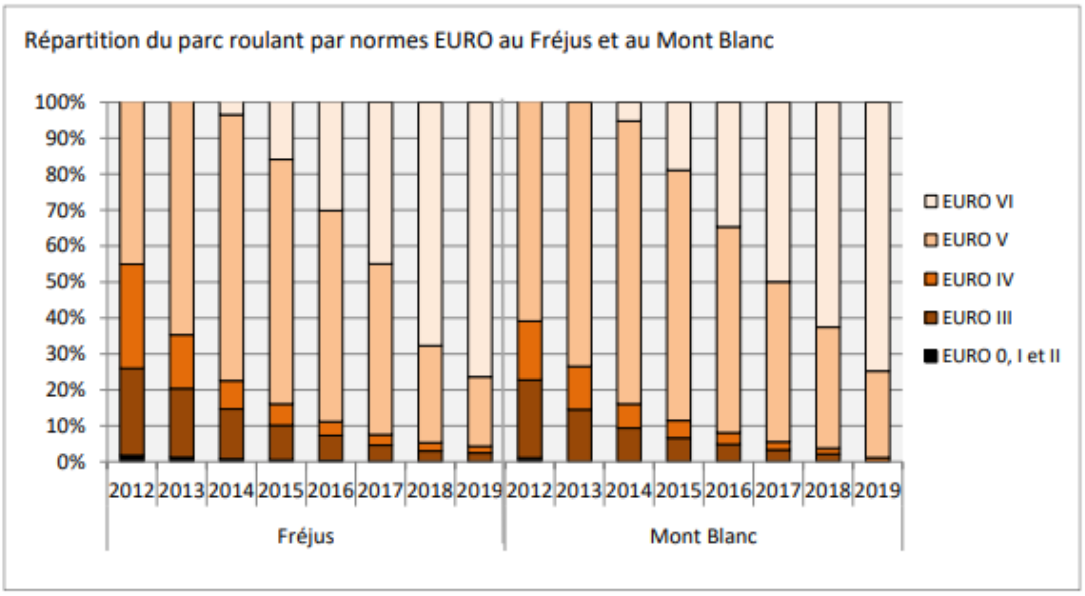


Figure 20: Répartition du parc roulant par normes EURO aux passages du Fréjus et du Mont Blanc

Switzerland :

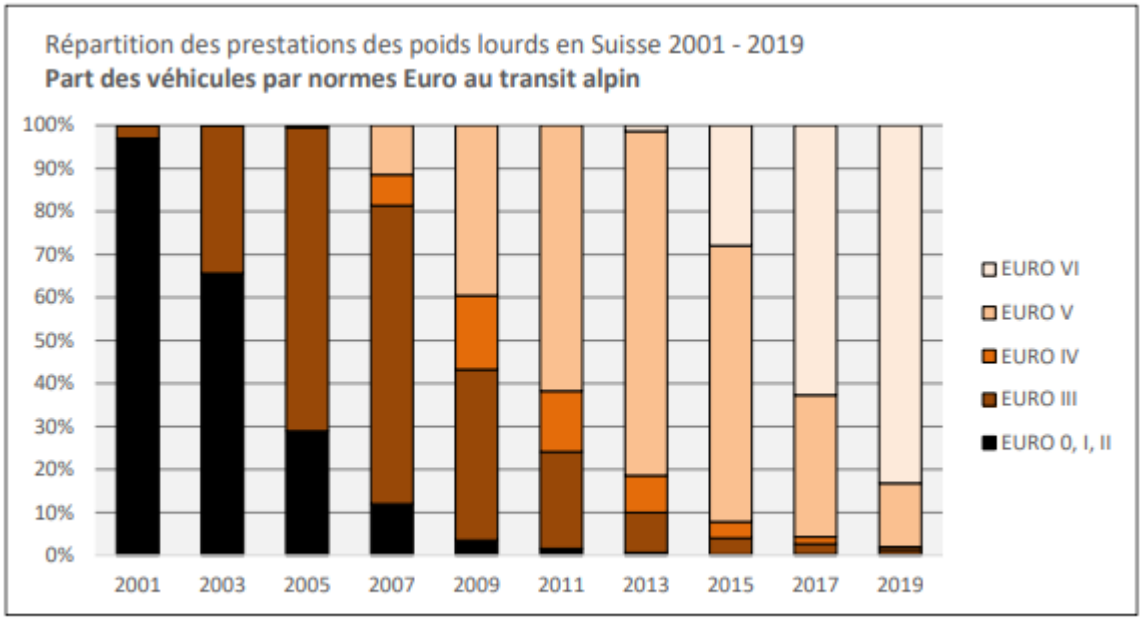


Figure 21: Répartition des poids lourds en trafic transalpin suisse selon normes EURO 2001 - 2019

[7] Figures from 2019 in Annual report Observatory CH-EU: https://www.bav.admin.ch/dam/bav/de/dokumente/themen/verlagerung/alpenobservatorium-2019.pdf.download.pdf/RA_2019_V5_0.pdf

Austria, 2011-2019, distribution on the different axis:

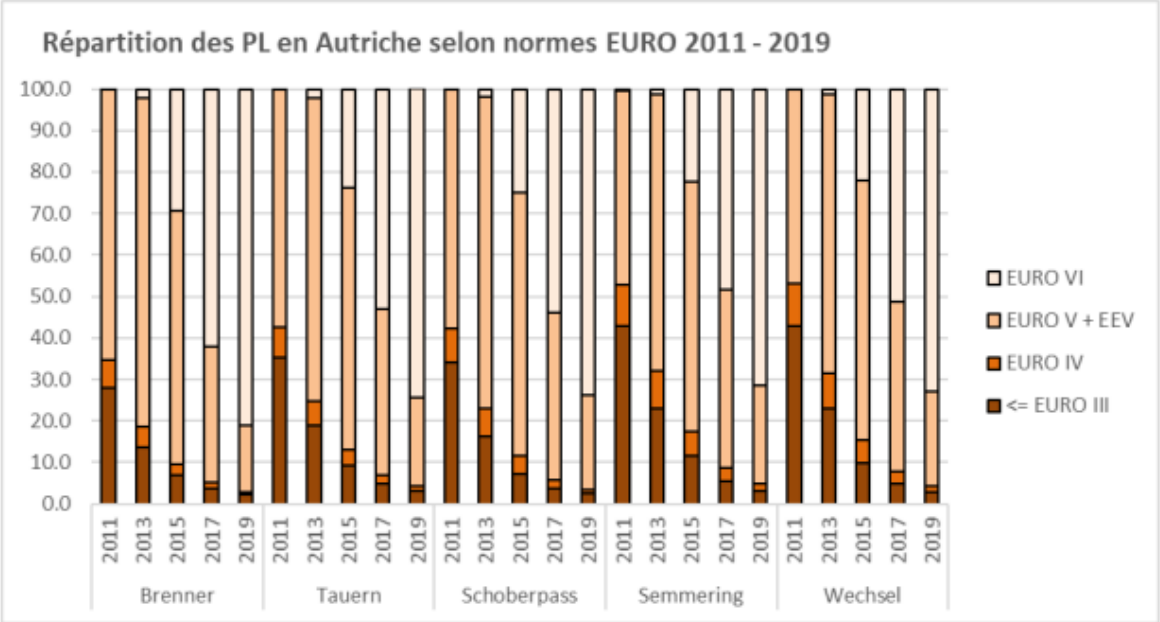
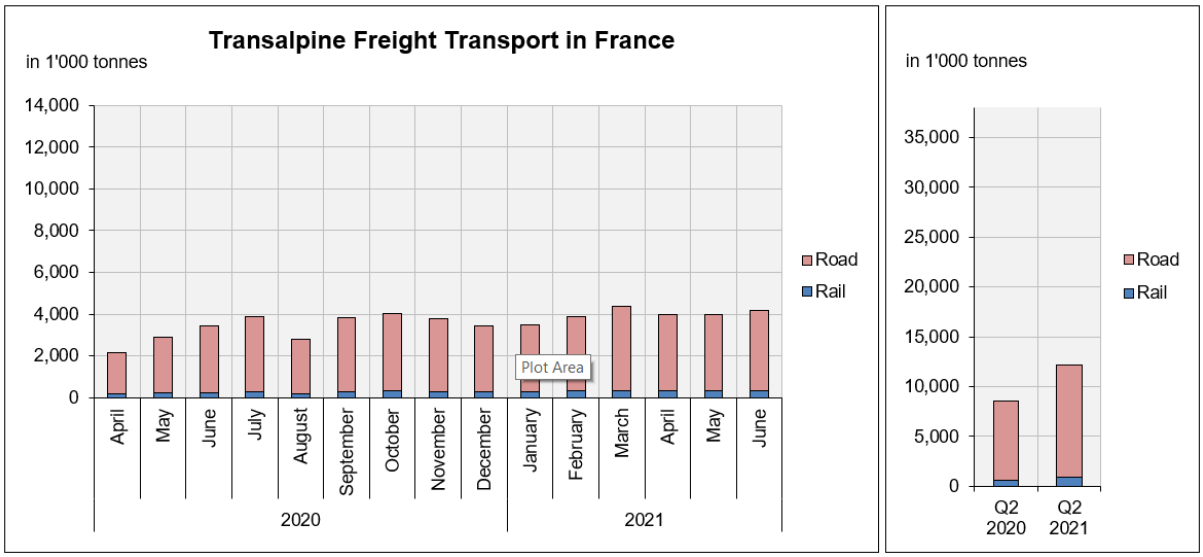


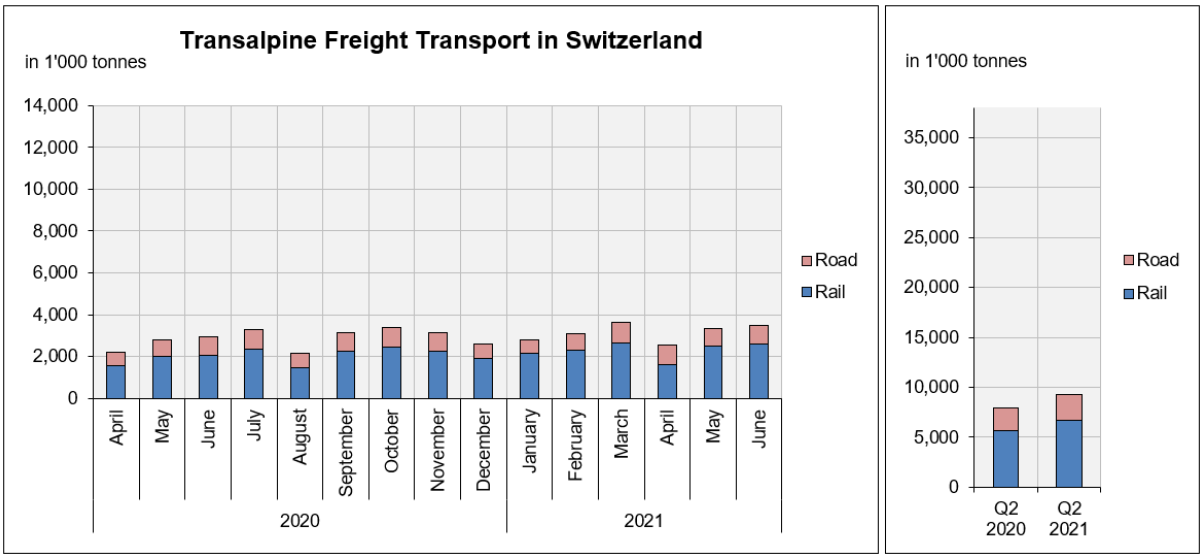
Figure 22: Répartition des poids lourds en Autriche selon normes EURO 2011 - 2019

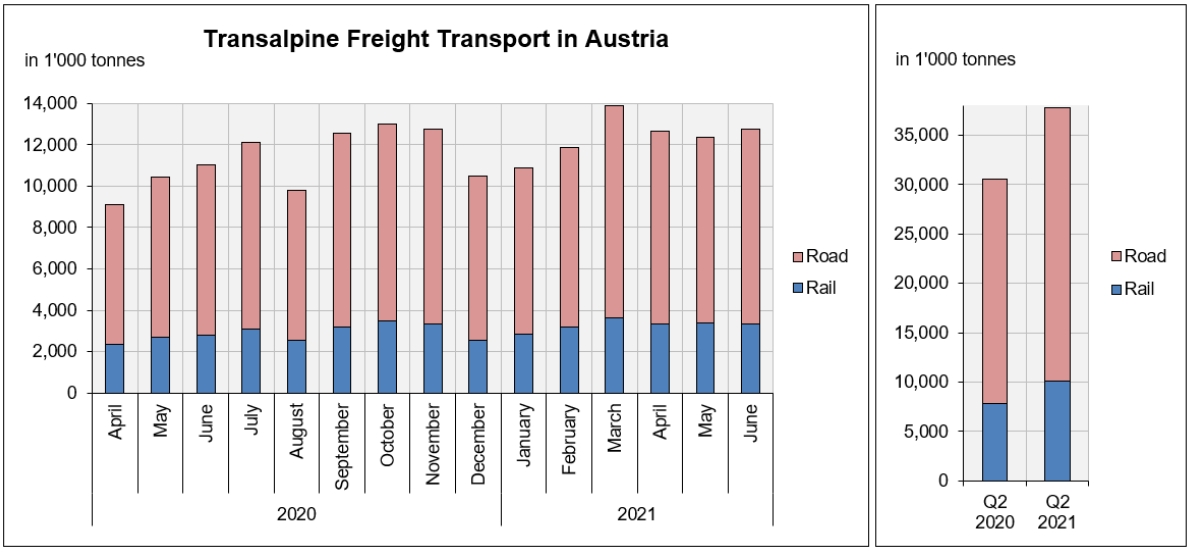
On all important crossings, where long distance international freight transport is performed, the share of Euro 6 vehicles achieves in 2019 already about ~80%, Euro 5 between 10 and 15 % and only very few lower Euro categories

3.5 Overview concerning 2021

The latest developments in transalpine freight transport (road+rail) show variations due to the Covid-19 crisis:







4. STATE OF THE ART ON EXTERNAL COSTS

In our last two mandates, we produced and looked at studies

- of France: “Assessment of external costs induced by noise in mountainous areas” (CEREMA, 2018) AlpineConvention_TransportWG_ExternalCostsNoise_112018_web (alpconv.org)
- and of the EUSALP working group 4: Study on External Costs in Mountain Areas | EUSALP (alpine-region.eu) (EUSALP, 2017)

for relevant mountain factors regarding internalisation of external costs for heavy goods traffic.

The findings (see table 19 of EUSALP study, 2017, below) show a necessity of taking into account the specific needs of the sensitive Alpine environment and of the trans-Alpine transport networks. The Alpine regions are particularly sensitive to the negative impacts of freight and passenger transport. This is due to very high shares of heavy goods vehicles (HGV), specific topographical features, limited spatial resources and highly vulnerable ecosystems.

Table 19: Mountain factors for external costs of transport

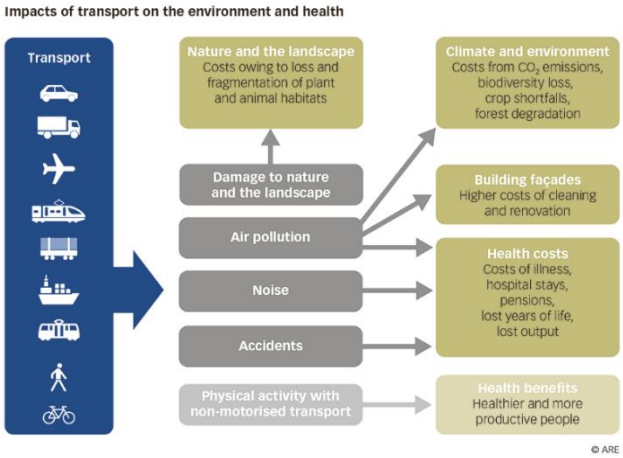
	Present EUSALP study		GRACE study (2006)	
Cost category	Road transport	Rail transport	Road transport	Rail transport
Air pollution	**4.2** (1.3 – 14.2)	**2.6** (0.9 – 6.6)	5.25 (2.4 – 19.8)	3.5 (2.1 – 5.2)
Noise	**4.1** (1.3 – 14.7)	**3.0** (1.0 – 11.25)	5.0 (2.3 – 19.8)	4.15 (2.1 – 10.4)
Nature & landscape	**1.3** (1.0 – 1.6)	**1.4** (0.8 – 2.0)	n.a.*	n.a.*
Accidents	**3.9**	n.a.	n.a.	n.a.

Switzerland

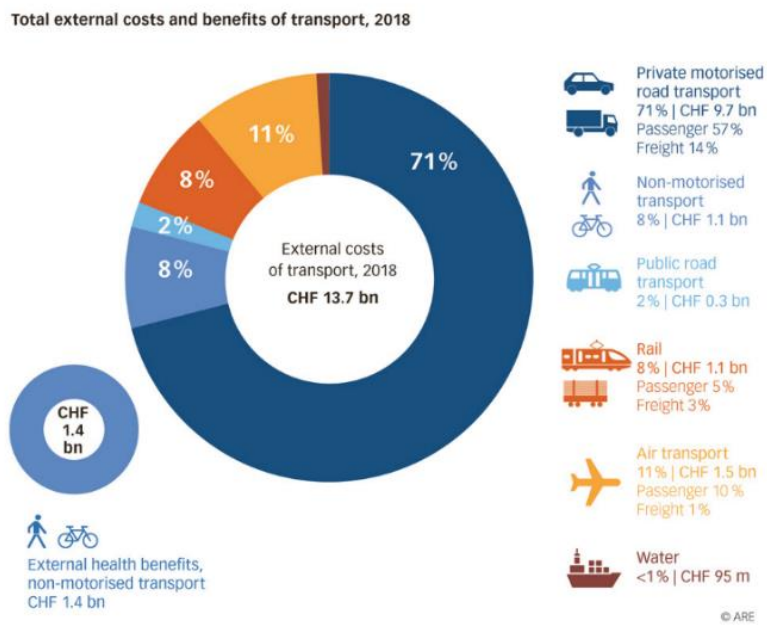
In the meantime, Switzerland has updated the external environmental, accident, and health-related effects of transport in Switzerland with results for the year 2018: External costs and benefits of transport (admin.ch).

Costs and benefits for the following areas were calculated: air pollution-related damage to health, damage to buildings, crop shortfalls, forest degradation, loss of biodiversity, noise, the climate, nature and the landscape, soil degradation, upstream and downstream processes, accidents, additional costs in urban areas, and the benefits to health of non-motorised transport. Congestion costs were estimated in a separate study.

External cost calculations in Switzerland include life-cycle emissions for vehicles and fuels, take into account a well-to-wheel analysis and all relevant processes producing emissions ahead of the operational phase, and are based on an electricity mix of electricity produced in Switzerland as well as imported electricity with the relevant CO2-emissions.



The total external costs of transport in Switzerland amount to 13.7 billion Swiss Francs (CHF) in 2018 and congestion costs to 1.4 billion Swiss Francs in 2017).



For optimum resource allocation within an economy, external costs and benefits should be internalised. In other words, they must be charged or credited to those who produce them. In Switzerland, these costs – total external and congestion costs – are also accounted for in the Swiss Heavy Vehicle Fee, successfully applied since 2001 on the entire Swiss network.

There are no mountain factors applied in the system of the Swiss Heavy Vehicle Fee (Heavy vehicle charges (performance-related and lump-sum) (admin.ch)).

The Heavy Vehicle Fee applied in Switzerland reflects an overall amount for a full cost calculation including the different external cost factors covering the entire country, meaning flatland, hills, and mountainous areas. It was designed in the 90ies and introduced in national legislation in 2001 as well as in the Landtransport Agreement CH-EU entering into force in June of 2002. In the Landtransport Agreement, the level of the fee covering the entire territory is explicitely mentioned in article 4. A splitting in a “normal” and a “mountainous” level of the fee would be difficult to apply. Nevertheless, the level of the fee, calculated in vehicle-kilometres and tons, is already reflecting an average of the external costs in the flatland, hills, and the mountainous area.

European Union

In 2008, the European Commission commissioned the first Handbook on External Costs of Transport (as part of the IMPACT study, Infras, CE Delft, ISI & University of Gdansk, 2008). In 2014, the Handbook was updated and broadened with new developments in research and policy (Ricardo-AEA, TRT, DIW Econ & CAU, 2014). The Handbook of 2019 (Handbook on the external costs of transport - Publications Office of the EU (europa.eu)) is an update of the 2008 and 2014 version, taking into account any new evidence that has become available on the methods and input values (e.g. emission factors) for estimating external costs of transport in research and policy since 2014.

This newest version of the Handbook does not only consider marginal external costs, as was the main focus of the previous Handbooks, but also total and average external costs of transport in all EU-countries, Switzerland and Norway. Furthermore, external cost figures for some non-European countries were produced to compare them with the European figures.

This updated Handbook on external costs of transport has been developed in the study 'Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities' commissioned by the European Commission DG MOVE, by a consortium led by CE Delft.

The full list of deliverables of this study are:

- **Handbook on external costs** – version 2019.
    - This report provides an overview of the methodologies and input values that can be used to provide state-of-the-art estimates for all main external costs of transport. Furthermore, the report and corresponding excel file present the total, average and marginal external costs for all relevant countries.
- **Overview of transport infrastructure expenditures and costs**.
    - This report provides an overview of the infrastructure costs of all transport modes in all relevant countries.
- **Transport taxes and charges in Europe** - An overview study of economic internalisation measures applied in Europe:
    - This study provides an overview of the structure and level of transport taxes and charges applied for the various transport modes in the EU28 Member States and other relevant countries like Switzerland. Furthermore, this study presents the total revenues from transport taxes and charges for the various transport modes and countries.
- **Summary report**.
    - Providing an overview of the main findings of the other four deliverables.
- **The state of play of internalisation in the European transport sector (EC, May 2019)**: Sustainable transport infrastructure charging and internalisation of transport externalities - Publications Office of the EU (europa.eu)
    - This report shows the extent to which external and infrastructure costs are internalised by current taxes and charges for all countries and transport modes. It also investigates recommended options for further internalisation.

This report (EC, May 2019) is a good source for more information on external costs and their internalisation in the European Union (EU 28) and for comparing, as far as possible, to our findings in the Alpine Area. See for example the report's results in the following three tables:

Table 2 - External costs in the EU28 in 2016 (all figures are PPS adjusted)

Vehicle category	Total external costs	Average external costs
Passenger transport modes	**Billion €**	**€-cent/pkm**
Passenger car	565	12.0
Bus/coach	19	3.6
Motorcycle	41	24.5
High speed train	1	1.3
Electric passenger train	11	2.6
Diesel passenger train		3.9
Aircraft	48[a]	3.4
Light commercial vehicles	**Billion €**	**€-cent/vkm**
Light Commercial vehicle	118	24.7
Freight transport modes	**Billion €**	**€-cent/tkm**
Heavy Goods Vehicle	78	4.2
Electric freight train	5	1.1
Diesel freight train		1.8
IWT vessel	3	1.9
Maritime vessel	98[a]	0.7

[a] Rough estimations. For more details, see CE Delft et al. (2019c).

Table 3 - Tax/charge revenues in the EU28 in 2016 (all figures are PPS adjusted)

Vehicle category	Total tax/charge revenues	Average tax/charge revenues
Passenger transport modes	**Billion €**	**€-cent/pkm**
Passenger car	267	5.4
Bus/Coach	7	1.2
Motorcycle	9	5.0
High speed train	4	3.0
Electric passenger train	8	2.6
Diesel passenger train	5	6.8
Aircraft[a]	14	1.5
Light commercial vehicles	**Billion €**	**€-cent/vkm**
Light Commercial vehicle	35	7.3
Freight transport modes	**Billion €**	**€-cent/tkm**
Heavy Goods Vehicle	33	1.5
Electric freight train	2	0.5
Diesel freight train	1	1.3
IWT vessel	0.4	0.3
Maritime vessel[ab]	2	n/a

[a] The figures for aviation and maritime transport refer to the 33/34 selected EU28 (air)ports.

[b] Due to a lack of data, no average tax/charge revenues (in €-cent/tkm) for maritime transport could be calculated.

Table 5 - Overview cost coverage ratios for the average cost perspective

	Overall cost coverage	Overall cost coverage excluding fixed infra costs	Variable infrastructure and external cost coverage	Total infrastructure cost coverage	Variable infrastructure cost coverage
Passenger transport					
Passenger car	51%	63%	48%	27%	417%
Bus	17%	24%	21%	3%	6%
Coach	18%	26%	23%	3%	6%
Motorcycle	19%	20%	15%	35%	576%
High speed train	26%	145%	208%	28%	394%
Electric pax train	16%	61%	70%	19%	160%
Diesel pax train	22%	91%	101%	16%	122%
Aircraft	34%	45%	46%	82%	247%
Freight transport					
LCV	43%	53%	48%	11%	153%
HGV	26%	37%	33%	14%	44%
Elec. freight train	12%	30%	35%	16%	86%
Diesel freight train	26%	55%	61%	25%	138%
IWT vessel	6%	12%	13%	12%	176%
Maritime vessel	4%	4%	4%	127%	4,571%[a]

[a] This very high cost coverage ratio can be explained by the fact that the variable share of port infrastructure costs is assumed to be low. Combined with the fact that port charges are often set to cover (most of the) total infrastructure costs, this results in very high variable infrastructure cost coverage ratios.

The report also investigates **recommended options for further internalisation** (EC, May 2019, p. 12):

"The assessment of the state-of-play of internalisation shows that there is room for improvement with respect to the internalisation of external and infrastructure costs of transport in the EU28. For that reason, a scoping analysis of potential further internalisation options has been carried out. The main results of this analysis are:

- Wider use of distance-based road charges differentiated to vehicle characteristics, location and/or time may improve the extent of internalisation for road transport. For urban areas, the use of specific urban road charging schemes may be considered to address the relatively high external costs of urban transport.

- Wider application of noise differentiations in rail access charges may be an option to further internalise the noise costs of rail transport. Mark-ups on these access charges may be used in case a larger share of the fixed infrastructure costs should be covered.
- Introducing fairway dues or higher port charges may be options to internalise a larger share of the external and infrastructure costs of IWT. Applying differentiations to air pollutant emissions in these instruments may help to address the relatively high air pollutant costs of this transport mode. Current legislation does, however, prohibit the introduction of fairway dues on the Rhine and its tributaries (the most important inland waterway(s) of the EU).
- Environmentally differentiated port charges or fairway dues may be options to further internalise the air pollution cost of maritime transport. With respect to GHG emissions of maritime transport, the EU already works with global partners in the International Maritime Organisation (IMO) on further policy instruments.
- Further policies in the field of GHG emissions from aviation are being developed in cooperation with global partners in the International Civil Aviation Organisation (ICAO). Furthermore, environmentally differentiated airport charges or aviation taxes may be options to further internalise externalities of aviation."

5. PERSPECTIVES WITH EU GREEN DEAL

The European Green Deal - with the goal of being the first climate-neutral continent by 2050 - may well support and strengthen the above mentioned recommended options for further internalisation and prove helpful for the Alpine Area as well.

In the summer of 2021, The European Commission adopted a set of proposals to make the EU's climate, energy, transport, and taxation policies **fit for reducing net greenhouse gas emissions by at least 55% by 2030 (fit for 55)**, compared to 1990 levels: A European Green Deal | European Commission (europa.eu)

"With transport contributing around 5% to EU GDP and employing more than 10 million people in Europe, **the transport system is critical to European businesses and global supply chains.** At the same time, transport is not without costs to our society: greenhouse gas and pollutant emissions, noise, road crashes and congestion.

Today, transport emissions represent around 25% of the EU's total greenhouse gas emissions, and these emissions have increased over recent years. Our goal of being the first climate-neutral continent by 2050 requires **ambitious changes in transport.** A clear path is needed to achieve **a 90% reduction in transport-related greenhouse gas emissions by 2050**.

The Green Deal for Transport is supposed to "providing efficient, safe and environmentally friendly transport by pursuing three objectives: sustainable, smart, and resilient mobility": Transport and the Green Deal | European Commission (europa.eu).

6. CONCLUSION AND RECOMMENDATION

While concluding this report, the news reaches the authors that the European Parliament adopted new rules on road charging in a final vote on 17 February 2022 Greening road transport: EU adopts new road charging rules (europa.eu): the new system will contribute to the aims of the European Green Deal and its Sustainable and Smart Mobility Strategy. The Commission tabled its proposal for the revised Eurovignette Directive in 2017. The revised Directive was signed on 4th March 2022 and published in the Official Journal of the EU, entering into force on the 20th day after publication. Member States will now have two years to enact the new rules in their national law.

The new system will improve incentives for more efficient and sustainable road transport. It will phase out time-based vignettes for heavy-duty vehicles on the core Trans-European Network by 2030, in favour of distance-based. It will also **introduce EU-wide rules to vary charges for heavy-duty vehicles based on their CO_2 emissions**. Moreover, after a 4-year transition period, **external cost charging for air pollution will become mandatory for heavy-duty vehicles**, except where it would create unintended traffic diversion.

While the existing rules cover only lorries over 3.5 tonnes with the option to exempt lorries under 12 tonnes, they will be extended to all heavy and light vehicles, making sure charges are proportionate to their use and environmental performance depending on type of vehicle. Tolling systems will also have to include the option of daily vignettes and avoid discriminating against foreign drivers. Member States will also have a new **option to apply an additional congestion charge on any section of their road network, which is affected by congestion**, with the revenues of these additional charges to be allocated to the development of sustainable transport alternatives. Road charging exemptions are included for special cases such as sparsely populated areas or disabled persons.

While the new Eurovignette Directive makes an initial contribution, there is still scope for further improvement. For instance, while the Sustainable and Smart Mobility Strategy of the European Commission points out that the costs of GHG emissions, air, noise and water pollution, accidents and road crashes, congestion and biodiversity loss affect our health and well-being, the new Eurovignette Directive (EU) 2022/362 still does not allow for internalising the traffic-based costs of water pollution, accidents and biodiversity loss.

7. ANNEXES

ANNEX 1:

Overview of national results

(separate document attached)

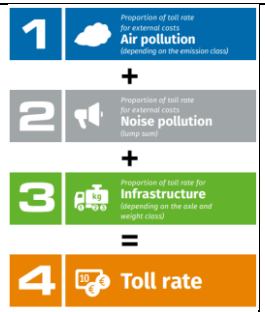
ANNEX 2:

Questionnaire sent to Member States

(separate document attached)

Annex 1: Overview of national results

Countries answering / Questions	**Austria** Maximilian Koch	**France** Christophe Mascitti	**Germany** Maximilian Joshua Klebe	**Italy** Massimo Santori	**Slovenia** Simon Novak	**Switzerland /FL** Thomas Supersaxo
1. Legal principals/ rules **Vehicles charged**	Federal Road Tolls Act 2002 Toll Rate Ordinance 2020 Tolling Regulations Toll Section Exemption Ordinance 2010 ASFINAG Act • > 3.5t	Vehicles charged > 3.5t Toll modulation according emission class ➢ 3.5t	Federal Trunk Road Toll Act HGV Toll Regulation various other regulations ➢ 7.5t (since Oct 2015)	act L.285/92: the transport of things on behalf of third parties is business activity for the provision of transport services for a specific fee ➢ 3.5t	Tolling act, various regulations ➢ 3.5t	Federal Constitution art. 85 Federal law on performance-related HGV-fee and Regulation ➢ 3.5t
2. Charging: Map of application perimeter	Map with national tolling networks	Map with national tolling network	Map with national tolling network	Map with national tolling network	Map with national tolling network	Entire road network
3. Current toll rates, including VAT or not?	VAT added to following net rates. 41.702 cts/km (4+ axles, EURO VI) during the daytime in Austria, involving the infrastructure (40.299), air	Toll rates incl. VAT Toll rates vary from one motorway concession to another	Toll rates not subject to VAT general scheme of toll rate calculation:	Highway concessionary companies Min euro 0.15 / Max euro 0.20 per Km for HDV with 4/5 and more axles	VAT added to following net rates R2 – R4 (axles) ▪ R2: 0.185346 €	Without VAT <u>Cat 1:</u> Euro 0-5: 3.10 cts/tkm <u>Cat 2:</u> - <u>Cat 3:</u>

	pollution (1.2) and the noise (0.203) costs five separate toll rate networks, each with different toll rates consisting of: ▪ infrastructure charge ▪ external cost charge for air pollution ▪ external cost charge for noise pollution See also Annex			No difference according the Euro classes VAT of 22%	▪ R3: 0.205940 € ▪ R4: 0.428356 €	Euro 6: 2.28 cts/tkm
4. Charged vehicle categories and tariffs > 4 axles	In annexes of AT questionnaire	Vehicle categories: ▪ Class 3: 2 axles ▪ Class 4: 3 axles + more Average: ▪ Class 3: 0.206€/km ▪ Class 4: 0.276€/km	See above, 18.7cts/km [Euro6]-26.1cts /km [Euro0/1]	0.15 – 0.20 €/km	R4: 0.428356 €	See under 3, differentiated toll according to Euro class and weight, toll is calculated per tkm!

5.a Variation of charges (Emission, time, season)	Yes	Only small fraction of network making differentiation of emission classes	Yes, emission, weight	No	Yes	Yes
5.b Implemented differentiation	two axles (factor: 1) three axles (factors: infrastructure and air: 1.4; noise: 2.3) four or more axles (factors: infrastructure: 2.1; air: 1.6; noise: 2.9) **Infrastructure charge** is varied by EURO emission classes and drive type E/H2 (purely electric drive and hydrogen fuel cell drives): • EURO 0 to V and EEV • EURO VI (1.5%-bonus) • E/H2 (currently 50%-bonus; 75%-bonus planned by	Yes. Motorway concessions Atlantes and Albea vary according emission classes, in a near future also ARCOS and ALIAE also. CEVM/Viaduc de Millau varies depending on seasons Cofiroute A86 duplex and SANEF A1	Emission + weight differentiation, see table in annex ▪ 7.5-11.99t ▪ 12-18t ▪ >18t to 3 axles ▪ >18t from 4 axles <u>Euro classes:</u> ▪ Euro 0 and 1, ▪ Euro 2 ▪ PRC1, Euro 2+, Euro 3 ▪ PRC2, Euro 3+, Euro 4 ▪ EEV, Euro 5 ▪ Euro 6	No	R2-R4, Euro emission class Distance Adjustment factors ▪ Euro IV:0.8 ▪ Euro V: 0.7 ▪ EEV and higher:0.6	Euro classes

	1st September 2021) **External cost charge for air pollution** is varied by EURO emission classes (no charges for E/H2): • EURO 0 to III • EURO IV • EURO V and EEV • EURO VI **External cost charge for noise pollution** and on the A 13 Brenner motorway the infrastructure charge for vehicles with four or more axles is varied by time of day: • daytime (05:00 - 22:00) • nighttime (22:00 - 05:00) Tolls are not varied according to type of day or season	vary on time of day Cofiroute A86 duplex varies on type of day. Differentiation of 10% in the Euro Classes for more or less air pollution				

5.c Monitoring	Yes	Yes	Yes	No	No	Yes
5.d Tools for Monitoring	In terms of revenue neutrality the differentiation according to EURO emission classes between 2010 and 2016 was monitored by ASFINAG and BMVIT (predecessor of BMK) and had been adapted in 2012, 2014 and 2015, taking into account the development of the share of the different EURO emission classes and the necessary revenue neutrality. Since 2017, external cost charges are applied.	Monitoring in two concessions with differentiation (Atlandes, Albea) and in future concessions ARCOS and ALIAE	Kilometer performance and Euro classes statistically evaluated ▪ Emission ▪ Driving performance by km ▪ Emission class	No, No implementation of Eurovignette Directive, each highway concessionary company will have to implement it following the renewal of the concession (average deadline in the next 15-20 years)	-	Statistics of customs administration for tkm per emission class, environmental Monitoring of flanking measures
6.a Mark-up planned for financing of specific projects of	Yes	-	No	Mountain tariff on Highway track A22 Modena – Brenner	Yes, +15% Koper-Ljubljana,	No

high European interest?					+5% Ljubljana-Sentrupert	
6.b If yes, what for?	A mark-up of 25% in addition to the infrastructure charge is applied • on the A 12 Inntal motorway on the Lower Inn Valley route (between the border at Kufstein and the Innsbruck-Amras intersection) and • on the whole A 13 Brenner motorway. The revenues from the mark-up are used for cross-financing the Brenner Base Tunnel. Due to the provisions of the Eurovignette directive, which currently do not allow for applying a mark-up and external cost charges	-	_		Rail Divaca-Koper	-

	cumulatively on the same road section, no external cost charges are applied on these road sections subject to a mark-up. See also Annex					
7. Development of traffic by vehicle categories	See Tables	Data available only for Atlantes and Albea (1% of network) General increase of HGV traffic (vkm) between 2011 and 2019: 19.1%	Statistics, appendix	Not identified	Not available	General Statistics, by emission class
8. Impact on interurban road network	No view	No	Yes, special reports, Marktbeobachtung BAG	No view	No view	Yes Less empty runs Slightly higher loading
9. Charging revenue earmarked for	All of it	Some of it	Some of it	See above mark up	partly	Yes, some of it

transport sector and how much						
10. Details of earmarking policy	Revenues from the infrastructure charge are used by ASFINAG for planning, construction, maintenance and refinancing of the federal road network (high- and express-ways)	Certain taxes of motorway concession companies fund/contribute to the French infrastructure financing agency (AFITF) for all transport modes	System costs, road infrastructure financing, programs for employment, qualification, environment, security and safety of the road haulage transport branch, EETS	The Highway Company have to improve security/safety and sustainability of network, bridges and tunnels Specific project to realize rail infrastructures	Mark up for cofinancing 2nd rail Divaca-Koper	Revenues feeding the Rail Infrastructure Fund in the past for NEAT/alptransit, Rail links to highspeed network, noise emission protection measures Currently new Fund BIF for rail infrastructure projects 2/ 3of HGV fee revenues, 1/3 to Cantons
11.a Shift from road to rail happening (2011/76 EU)?	Yes	No	Yes	No view	No view	Yes
11.b If yes, what are positive effects?	The application of external cost charges, where the	-	Minor influence on modals split, but positive	-	-	Emission reduction

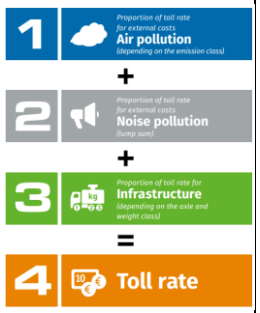
	charge for air pollution is differentiated according to EURO emission classes and thus more environmentally-friendly vehicles pay lower charges, can encourage the use of more environmentally-friendly vehicles and therefore can contribute to achieve the objectives of Art. 14 a). Since vehicles with purely electric drive and hydrogen fuel cell drives (E/H2) get a bonus on the infrastructure charge of 50% (75% planned by 1st September 2021), this measure can encourage the use of the most		effects on emission classes, use of capacities, less empty trips			HGV traffic reduction in numbers Incentive of vehicle Technology Renewal

	environmentally-friendly vehicles and thus can contribute to achieve the objectives of Art. 14 a). The mark-up of 25%, which is applied on the Brenner corridor, can contribute to incentivising a modal-shift from road to rail and can therefore contribute to encourage the use of the most environmentally-friendly modes and means of transport and to achieve a more balanced use of transport infrastructure on the Brenner corridor. Therefore, this measure can contribute to achieve					

	the objectives of Art. 14 a) and b).					
12.a Plans for additional measures	Yes	Yes	Yes	No	No	Yes
12.b If yes, which ones and timing	By 1st September 2021 the bonus for E/H2-vehicles (purely electric drive and hydrogen fuel cell drives) on the infrastructure charge will be raised from currently 50% to 75%. Further measures depend on the provisions of a new Eurovignette directive.	New regulations allowing local authorities to implement toll on non-tolled motorways, no time schedule	Revision Eurovignette Dir. Including external cost charge for CO2 or/and a variation of the infrastructure cost charg.es based on CO2	-	-	Plans for mobility pricing (road/rail), pilot projects for the future (2027) Further development of HGV fee / LSVA including CO2 emission, alternative fuels / propulsion
13.a Plans for integrating external costs	Yes	-	Yes	-	No view	Yes, already integrated
13.b Detailed information of planned measures	External cost charges for traffic-based air and noise pollution based on the maximal values	-	See point 4	The structure of highway tolls in Italy is anomalous in the European overview, due to the management of the	-	Integration of external cost factors in pricing already implemented

	according to Annex IIIb of the current Eurovignette directive are already applied on all parts of the high- and expressway network except for the Brenner corridor, where due to the provisions of the Eurovignette directive, applying a mark-up and external cost charges cumulatively on the same road section is not allowed. The Eurovignette Directive 2011/76/EU does not allow for applying additional external cost charges addressing climate change or costs due to CO2-Emissions.			network by numerous private highway cconcessionary companies, which follow different policies		since introduction of HGV fee / LSVA in 2001. Switzerland as a model and pioneer in this regard

14. Additional Comments	-	-	-	Road haulage companies are entitled to an annual reimbursement of the costs of fuel excise duties and tolls	-	EU Green Deal as leverage to this strategic target net zero by 2050, user pays principle and fair+efficient pricing
Countries answering / Questions	**Austria** Maximilian Koch	**France** Christophe Mascitti	**Germany** Maximilian Joshua Klebe	**Italy** Massimo Santori	**Slovenia** Simon Novak	**Switzerland /FL** Thomas Supersaxo
2. Legal principals/ rules **Vehicles charged**	Federal Road Tolls Act 2002 Toll Rate Ordinance 2020 Tolling Regulations Toll Section Exemption Ordinance 2010 ASFINAG Act • > 3.5t	Vehicles charged > 3.5t Toll modulation according emission class ➢ 3.5t	Federal Trunk Road Toll Act HGV Toll Regulation various other regulations ➢ 7.5t (since Oct 2015)	act L.285/92: the transport of things on behalf of third parties is business activity for the provision of transport services for a specific fee ➢ 3.5t	Tolling act, various regulations ➢ 3.5t	Federal Constitution art. 85 Federal law on performance-related HGV-fee and Regulation ➢ 3.5t
2. Charging: Map of application perimeter	Map with national tolling networks	Map with national tolling network	Map with national tolling network	Map with national tolling network	Map with national tolling network	Entire road network

3. Current toll rates, including VAT or not?	VAT added to following net rates. 41.702 cts/km (4+ axles, EURO VI) during the daytime in Austria, involving the infrastructure (40.299), air pollution (1.2) and the noise (0.203) costs five separate toll rate networks, each with different toll rates consisting of: ▪ infrastructure charge ▪ external cost charge for air pollution ▪ external cost charge for noise pollution See also Annex	Toll rates incl. VAT Toll rates vary from one motorway concession to another	Toll rates not subject to VAT general scheme of toll rate calculation: 	Highway concessionary companies Min euro 0.15 / Max euro 0.20 per Km for HDV with 4/5 and more axles No difference according the Euro classes VAT of 22%	VAT added to following net rates R2 – R4 (axles) ▪ R2: 0.185346 € ▪ R3: 0.205940 € ▪ R4: 0.428356 €	Without VAT <u>Cat 1:</u> Euro 0-5: 3.10 cts/tkm <u>Cat 2:</u> - <u>Cat 3:</u> Euro 6: 2.28 cts/tkm
4. Charged vehicle categories and tariffs > 4 axles	In annexes of AT questionnaire	Vehicle categories: ▪ Class 3: 2 axles	See above,	0.15 – 0.20 €/km	R4: 0.428356 €	See under 3, differentiated toll according to Euro class and weight,

		▪ Class 4: 3 axles + more Average: ▪ Class 3: 0.206€/km ▪ Class 4: 0.276€/km	18,7cts/km [Euro6]-26,1cts /km [Euro0/1]			toll is calculated per tkm!
5.a Variation of charges (Emission, time, season)	Yes	Only small fraction of network making differentiation of emission classes	Yes, emission, weight	No	Yes	Yes
5.b Implemented differentiation	two axles (factor: 1) three axles (factors: infrastructure and air: 1.4; noise: 2.3) four or more axles (factors: infrastructure: 2.1; air: 1.6; noise: 2.9) **Infrastructure charge** is varied by EURO emission classes and drive type E/H2 (purely	Yes. Motorway concessions Atlantes and Albea vary according emission classes, in a near future also ARCOS and ALIAE also. CEVM/Viaduc de Millau	Emission + weight differentiation, see table in annex ▪ 7.5-11.99t ▪ 12-18t ▪ >18t to 3 axles ▪ >18t from 4 axles <u>Euro classes:</u> ▪ Euro 0 and 1, ▪ Euro 2 ▪ PRC1, Euro 2+, Euro 3 ▪ PRC2, Euro 3+, Euro 4	No	R2-R4, Euro emission class Distance Adjustment factors ▪ Euro IV:0.8 ▪ Euro V: 0.7 ▪ EEV and higher:0.6	Euro classes

	electric drive and hydrogen fuel cell drives): • EURO 0 to V and EEV • EURO VI (1.5%-bonus) • E/H2 (currently 50%-bonus; 75%-bonus planned by 1st September 2021) **External cost charge for air pollution** is varied by EURO emission classes (no charges for E/H2): • EURO 0 to III • EURO IV • EURO V and EEV • EURO VI **External cost charge for noise pollution** and on the A 13 Brenner motorway the infrastructure charge for vehicles with four or more axles is	varies depending on seasons Cofiroute A86 duplex and SANEF A1 vary on time of day Cofiroute A86 duplex varies on type of day. Differentiation of 10% in the Euro Classes for more or less air pollution	▪ EEV, Euro 5 ▪ Euro 6			

	varied by time of day: • daytime (05:00 - 22:00) • nighttime (22:00 - 05:00) Tolls are not varied according to type of day or season					
5.c Monitoring	Yes	Yes	Yes	No	No	Yes
5.d Tools for Monitoring	In terms of revenue neutrality the differentiation according to EURO emission classes between 2010 and 2016 was monitored by ASFINAG and BMVIT (predecessor of BMK) and had been adapted in 2012, 2014 and 2015, taking into account the development of the share of the different EURO emission classes	Monitoring in two concessions with differentiation (Atlandes, Albea) and in future concessions ARCOS and ALIAE	Kilometer performance and Euro classes statistically evaluated ▪ Emission ▪ Driving performance by km ▪ Emission class	No, No implementation of Eurovignette Directive, each highway concessionary company will have to implement it following the renewal of the concession (average deadline in the next 15-20 years)	-	Statistics of customs administration for tkm per emission class, environmental Monitoring of flanking measures

	and the necessary revenue neutrality. Since 2017, external cost charges are applied.					
6.a Mark-up planned for financing of specific projects of high European interest?	Yes	-	No	Mountain tariff on Highway track A22 Modena – Brenner	Yes, +15% Koper-Ljubljana, +5% Ljubljana-Sentrupert	No
6.b If yes, what for?	A mark-up of 25% in addition to the infrastructure charge is applied • on the A 12 Inntal motorway on the Lower Inn Valley route (between the border at Kufstein and the Innsbruck-Amras intersection) and • on the whole A 13 Brenner motorway. The revenues from the mark-up are used for cross-financing the Brenner Base Tunnel.	-	_		Rail Divaca-Koper	-

	Due to the provisions of the Eurovignette directive, which currently do not allow for applying a mark-up and external cost charges cumulatively on the same road section, no external cost charges are applied on these road sections subject to a mark-up. See also Annex					
7. Development of traffic by vehicle categories	See Tables	Data available only for Atlantes and Albea (1% of network) General increase of HGV traffic (vkm) between 2011 and 2019: 19,1%	Statistics, appendix	Not identified	Not available	General Statistics, by emission class

8. Impact on interurban road network	No view	No	Yes, special reports, Marktbeobachtung BAG	No view	No view	Yes Less empty runs Slightly higher loading
9. Charging revenue earmarked for transport sector and how much	All of it	Some of it	Some of it	See above mark up	partly	Yes, some of it
10. Details of earmarking policy	Revenues from the infrastructure charge are used by ASFINAG for planning, construction, maintenance and refinancing of the federal road network (high- and express-ways)	Certain taxes of motorway concession companies fund/contribute to the French infrastructure financing agency (AFITF) for all transport modes	System costs, road infrastructure financing, programs for employment, qualification, environment, security and safety of the road haulage transport branch, EETS	The Highway Company have to improve security/safety and sustainability of network, bridges and tunnels Specific project to realize rail infrastructures	Mark up for cofinancing 2nd rail Divaca-Koper	Revenues feeding the Rail Infrastructure Fund in the past for NEAT/alptransit, Rail links to highspeed network, noise emission protection measures Currently new Fund BIF for rail infrastructure projects 2/ 3of HGV fee

						revenues, 1/3 to Cantons
11.a Shift from road to rail happening (2011/76 EU)?	Yes	No	Yes	No view	No view	Yes
11.b If yes, what are positive effects?	The application of external cost charges, where the charge for air pollution is differentiated according to EURO emission classes and thus more environmentally-friendly vehicles pay lower charges, can encourage the use of more environmentally-friendly vehicles and therefore can contribute to achieve the objectives of Art. 14 a). Since vehicles with purely electric drive and hydrogen fuel	-	Minor influence on modals split, but positive effects on emission classes, use of capacities, less empty trips	-	-	Emission reduction HGV traffic reduction in numbers Incentive of vehicle Technology Renewal

	cell drives (E/H2) get a bonus on the infrastructure charge of 50% (75% planned by 1st September 2021), this measure can encourage the use of the most environmentally-friendly vehicles and thus can contribute to achieve the objectives of Art. 14 a). The mark-up of 25%, which is applied on the Brenner corridor, can contribute to incentivising a modal-shift from road to rail and can therefore contribute to encourage the use of the most environmentally-friendly modes and means of transport					

	and to achieve a more balanced use of transport infrastructure on the Brenner corridor. Therefore, this measure can contribute to achieve the objectives of Art. 14 a) and b).					
12.a Plans for additional measures	Yes	Yes	Yes	No	No	Yes
12.b If yes, which ones and timing	By 1st September 2021 the bonus for E/H2-vehicles (purely electric drive and hydrogen fuel cell drives) on the infrastructure charge will be raised from currently 50% to 75%. Further measures depend on the provisions of a new Eurovignette directive.	New regulations allowing local authorities to implement toll on non-tolled motorways, no time schedule	Revision Eurovignette Dir. Including external cost charge for CO2 or/and a variation of the infrastructure cost charg.es based on CO2	-	-	Plans for mobility pricing (road/rail), pilot projects for the future (2027) Further development of HGV fee / LSVA including CO2 emission, alternative fuels / propulsion

13.a Plans for integrating external costs	Yes	-	Yes	-	No view	Yes, already integrated
13.b Detailed information of planned measures	External cost charges for traffic-based air and noise pollution based on the maximal values according to Annex IIIb of the current Eurovignette directive are already applied on all parts of the high- and expressway network except for the Brenner corridor, where due to the provisions of the Eurovignette directive, applying a mark-up and external cost charges cumulatively on the same road section is not allowed.	-	See point 4	The structure of highway tolls in Italy is anomalous in the European overview, due to the management of the network by numerous private highway cconcessionary companies, which follow different policies	-	Integration of external cost factors in pricing already implemented since introduction of HGV fee / LSVA in 2001. Switzerland as a model and pioneer in this regard

	The Eurovignette Directive 2011/76/EU does not allow for applying additional external cost charges addressing climate change or costs due to CO2-Emissions.					
14. Additional Comments	-	-	-	Road haulage companies are entitled to an annual reimbursement of the costs of fuel excise duties and tolls	-	EU Green Deal as leverage to this strategic target net zero by 2050, user pays principle and fair+efficient pricing

Annex 2: Questionnaire sent to Member States

National survey on the application of the Eurovignette Directive 1999/62/EC as modified by 2011/76/EU

Background and purpose

The actual mandate 2021/2022 of the Working Group on Transport (WGT) of the Alpine Convention also deals with article 14 of the transport protocol and the implementation of the polluters pay principle in road freight transport in Alpine countries. It continues the work on the external costs of transport in the Alpine area.

In this context, Switzerland has taken over the task to write a short report on the progress since the last status report in 2016, see here: Annex_1_Synthesis Eurovignette_with_questionnaires-AT-CH-DE-FR (alpconv.org).

This task should be finalised until the XVIIth Alpine Conference in October 2022 in Brig, Switzerland.

Another aspect of the mandate is to analyse to which extent the Eurovignette Directive is in line with the provisions of article 14. In order to be able to proceed to this analysis, Member States are asked to indicate their experiences made with respect to the implementation of the Eurovignette Directive 2011/76/EU. The following questionnaire was elaborated in 2013 by Austria and updated by Switzerland in 2021.

Please, give all relevant information as short and concise as possible. It will be used to get an overview on the national challenges, special circumstances, benefits, difficulties and obstacles with respect to the implementation of the EU-Directive. If you consider it useful, you may also indicate relevant web-links.

Please send the completed survey to Matthias.Rinderknecht@bav.admin.ch and Franziska.BorerBlindenbacher@are.admin.ch by **13th of August 2021 at the latest.**

The consolidated version of Directive 2011/76/EU of the European Parliament and of the Council of 27 September 2011 on the charging of heavy good vehicles for the use of certain infrastructures can be downloaded here EUR-Lex - 32011L0076 - EN - EUR-Lex (europa.eu).

Contact details

Name of person responsible for completing the questionnaire	
Name of Authority	
E-Mail	
Telephone	

Questionnaire

1.	Please provide the most relevant national legal principles and rules for vehicles weighing more than 3.5 tonnes maximum permissible laden weight (MPW) in your country.

2.	Please attach a map (e.g. a pdf-document) showing where tolls and user charges are collected/applied in your country.

3.	One of the main benefits of this survey should be to identify and compare the current toll rates and/or levels of user charges for vehicles weighing more than 3.5 tonnes maximum permissible laden weight (MPW). Therefore, please indicate the current toll rates and/or user charges for vehicles weighing more than 3.5 tonnes maximum permissible laden weight (MPW) applied in your country. Please indicate also, if toll rates and/or user charges are subject to the value added tax (VAT) in your country and if yes, if the VAT is included in the listed rates.

4.	In order to be able to compare toll rates and/or user charges for the different categories of vehicles, please indicate the toll rates and user charges for vehicles weighing more than 3.5 tonnes maximum permissible laden weight (MPW) with more than 4 axles, EURO III, V and VI.

5.a	Does your country vary toll rates according to EURO emission classes and/or the time of day, type of day or season?
	☐ Yes ☐ No
5.b	If yes to 5.a, please provide information about how this differentiation is implemented in your country.
5.c	Are the impacts of the differentiation of infrastructure charges according to EURO classes on air pollution being monitored?
	☐ Yes ☐ No
5.d	If yes to 5.c, please specify how they are being/will be monitored and whether you are able to provide us with link to related documents.

6.a	Toll rates may in exceptional cases be subject to a mark-up for the financing of specific projects of high European interest. If your country does not already apply this exception, does it have any plans to do so?
	☐ Yes ☐ No
6.b	If yes to 6.a, please provide information, on how this exception will be applied in your country (respective project, planned timetable for implementation and level of toll rates for each vehicle category).

7.	Please provide information on the development of traffic by vehicle categories on the tolled/charged road network and, if available, the development of the shares of EURO classes of HGV´s on this network since getting into force of the EU-Directive 2011/76/EU.

8.	Are you able to provide information about whether infrastructure charging has had an impact on freight traffic on the interurban road network (e.g. traffic performance, degree of loading or empty runs)?
	☐ Yes ☐ No ☐ Don't know / No view

9.	Is revenue from infrastructure charging earmarked for reinvestment in the transport sector in your Member State?
	☐ All of it ☐ Some of it ☐ None of it ☐ Don't know

10.	Please provide details about your country's policy (and practice) in terms of earmarking infrastructure charging revenue.

11.a	One of the main strategic objectives of the transport protocol of the Alpine Convention is shifting freight from road to rail. Did the implementation of the EU-Directive 2011/76/EU or of similar measures contribute to achieve the objectives of a, b and c of Article 14 of the Transport Protocol?
	☐ Yes ☐ No ☐ Don't know / No view
11.b	If yes to 11.a, please provide a short summary of these positive effects.

12.a	Are there any plans in your country to implement additional measures in the field of tolls and/or user charges?
	☐ Yes ☐ No ☐ Don't know / No view
12.b	If yes to 12.a, please provide information which measures are planned and the schedule for their implementation.

13.a	Is your country planning to implement the relevant provisions of the latest Eurovignette Directive 2011/76/EU for better reflecting the external costs of traffic-based air and noise pollution and climate change?
	☐ Yes ☐ No ☐ Don't know / No view
13.b	If yes to 13.a, please provide information, which measures are planned and the schedule for their implementation.

14.	Do you have any additional comments?

Thank you for your time and support!