

ANNUAL REPORT

FOUNDATION
AUTO RECYCLING
SWITZERLAND

2016



1 RETROSPECTIVE AND OUTLOOK

Against a background of persistently low scrap metal prices, only a relatively small quantity of shredded vehicles were available again in 2016. On the other hand, vehicle exports rose significantly. Scrap prices did not recover to a reasonable level until late in the year.

In our last annual report, we called attention to the negative impact of the low scrap metal price and strong Swiss franc. That situation has not changed greatly in 2016. New vehicle imports and the previously used car trade benefited from the currency situation because vehicle prices proved very attractive. On the other hand, the recycling branch was badly affected by weak demand for scrap metal from steelworks all over Europe and the accompanying low prices. If scrap metal does not fetch a good price, end-of-life vehicles tend increasingly to be exported or stored until the situation improves.

VEHICLE RECYCLERS

Structural changes are occurring at the vehicle recyclers. Some long-established firms have completed a generation change or are about to do so while others are looking for a purchaser or threatened with closure. At all events, the golden years are now a thing of the past. Only reasonably sized firms benefiting from a good market position can survive in the long-term. As mentioned repeatedly in the report, economic success depends in large measure on the prices that can be achieved for secondary metals and spare parts. In the case of spare parts, competition from

SHREDDER SCRAP PRICES 1999 – 2016

CHF/TONNE



(SOURCE: EUROFER, EUWID)



The Foundation Auto Recycling Switzerland has a permanent presence in the Umwelt Arena Schweiz.

cheap new components made in Asia is strong. Moreover, the many exports of older vehicles are resulting in lower demand for spare parts in Switzerland itself. The adoption and implementation of minimum standards for the treatment and storage of vehicles are important for the environment. In that regard, some companies still have certain reservations. Here, implementation by the cantons is necessary because statutory provisions do already exist at every level.

SHREDDER PLANTS

With ever more stringent environmental criteria, the shredder plants are investing in noise abatement measures and in the reduction of harmful substance emissions. Noise abatement measures are necessary at shredder plants which find themselves in ever-closer proximity to residential zones. To prevent pollutant substances from reaching the outgoing air, removal of fluids from old vehicles is particularly important. That is why the shredder plants are investing in their own fluid removal stations to prevent pollutant substances from reaching the shredders. Gas-powered vehicles are causing problems today. Even the makers' own agents do not have the necessary equipment to drain the gas tanks.

RECYCLING THE AUTOMOBILE SHREDDER RESIDUE (ASR)

One-quarter of the automobile shredder residue still comes from end-of-life vehicles. This means that the average composition of ASR is no longer necessarily dependent upon the composition of the vehicles themselves. That fact must be taken into account. For precisely twenty years, ASR has undergone thermal recycling in Switzerland in municipal waste incineration plants (MWIP). Thermorecycling has proved successful in principle and is certainly in no way inferior to material recycling. A requirement is efficient post-treatment of the combustion residues. As explained in previous reports, the potential of the valuable substances which are still present in MWIP slag and fly ash is well known. Many processing plants exist both in Switzerland and in other countries.

Pioneering work was done in Switzerland by the Zürcher Oberland waste incinerator with dry slag discharge followed by the slag processing facility (see Section 2B). The IGENASS Interest Grouping with further MWIP and landfill operators continue to follow the development of wet discharge with the corresponding slag processing. There will certainly not be a choice in this case but rather the adoption of both techniques. Thermal recycling of ASR is bound to benefit because the remaining residual metals will be separated out and returned to the material cycle.

PYROLYSIS METHOD

The Foundation Auto Recycling Switzerland regularly finds itself confronted with processes which can purportedly convert practically any waste material into substances suitable for re-use. These are generally pyrolysis techniques in which ideally synthesis gas, pyrolysis oil and coke are obtained from organic waste at a high temperature and with the exclusion of oxygen. But however good this may sound, practical implementation poses great problems. Pyrolysis is suitable only for a few types of homogeneous waste. The composition of ASR is too heterogeneous and the harmful substances cannot simply be dissolved out. Even tyres present a great challenge for pyrolysis.

OTHER MATTERS

Since autumn 2013, the Foundation Auto Recycling Switzerland has occupied a stand at the Umwelt Arena Schweiz, which has attracted great attention. Through its exhibits, the Foundation shows the parts of an end-of-life vehicle which can be recycled. In 2016, 125,000 persons visited this platform for environment in Spreitenbach.

2 ACTIVITIES OF THE FOUNDATION

Statistical data help to provide a comprehensive overview of events connected with the recycling of end-of-life vehicles. Reconciliation of the reported data with the Swiss Federal waste database permits an effective plausibility check on end-of-life vehicle movements and the pathways for disposal of the automobile shredder residue.

A) VEHICLE UND ASR RECYCLING

Sales of new vehicles remained surprisingly high in 2016. The automobile importers sold 317,318 new passenger cars, just 2 per cent fewer than in the very good previous year. Prices of new cars remain highly attractive because of the currency exchange rate and the economic situation in Switzerland can also be described as good. A further 32,000 vehicles crossed the national border as previously used vehicles. It is therefore hardly surprising that the number of passenger cars on the road increased by a further 70,000 to reach 4,571,994. The trade in previously used vehicles was also strong with 873,586 ownership changes.

Official export statistics supplied by the Federal Customs Administration show that 131,319 vehicles were exported to an impressive total of 139 countries. The number of vehicles which should be available for recycling in Switzerland can be calculated from these figures. There were 150,000 end-of-life vehicles but in the year under review, as in previous years, far fewer vehicles than this were in fact shredded. In 2016, the figure was just 76,112. One main reason for this resides in the low scrap prices which are attributable to the sluggish world economy, overproduction of cheap steel and resulting low demand for scrap metal. Practically no payment was available for end-of-life vehicles. Different disposal channels were therefore

PASSENGER CAR STATISTICS SWITZERLAND

auto-schweiz imports:
295,476

Direct imports: 21,842

Other imports: 32,115

Switzerland and
Principality of Liechtenstein

Total imports shown in
foreign trade statistics:
349,433

Vehicles on the road:
4,571,994
Increase:
68,129

Exports shown in foreign
trade statistics:
131,319

Shredded: 76,112

Unknown: 73,873

(SOURCES: AUTO-SCHWEIZ/FEDRO/FCA)

Key figures for Swiss MWIPs show that energy from the automobile shredder residue

COVERS THE
POWER CONSUMPTION
OF 6,000
HOUSEHOLDS

sought or stocks built up. Over 61,000 tonnes of shredder residue were accumulated in the shredder plants. However, of that total, just 17,000 tonnes or so came from end-of-life vehicles. ASR is fully recycled thermally in modern MWIPs. Swiss MWIPs disposed of 62 per cent while the remainder went to three German and one French plants. On average, the shredder plants paid an incineration price of CHF 150.– while the price in Switzerland was around CHF 158.–. The Auto Recycling Switzerland Foundation paid a contribution of CHF 22.– per shredded vehicle towards the disposal costs of the shredder residue from end-of-life vehicles. The Solenthaler Recycling AG company of Gossau SG, has recently begun to shred end-of-life

vehicles from the neighbouring car recycling facility on a relatively small scale. The Foundation Auto Recycling Switzerland now has contracts with eight shredder plants for the disposal of ASR. For verification purposes, the Foundation requires the shredder plants to present the cancelled vehicle logbooks and evidence from the disposal facilities. In addition, it reconciles the data with that provided by the Federal Office for the Environment (FOEN). End-of-life vehicles are classified as «other waste subject to control», while ASR is treated as special waste. Both these fractions must be entered in the VeVA (ordinance on movements of waste) waste database upon disposal.

ASR RECYCLING (IN METRIC TONNES)

INCINERATION PLANT	2012	2013	2014	2015	2016
Hinwil	17,775	14,016	13,645	13,322	12,283
Winterthur	685	4,053	6,113	7,110	6,936
Zürich Fernwärme	2,884	3,164	2,733	3,820	3,982
Zürich Hagenholz	5,408	2,987	3,957	2,378	3,774
Thun	1,238	2,360	3,886	3,492	3,512
Weinfelden	3,933	2,173	718	1,916	3,053
Niederurnen	3,214	3,271	2,850	2,510	1,844
Buchs SG	292	435	425	356	704
Monthey	124	514	1,354	637	664
Perlen				24	579
Colombier				575	405
St. Gallen					255
Zuchwil	1,771	899	555	199	72
Bern	786				
Posieux	1,012				
Trimmis	426				
Mannheim D	17,227	17,852	16,158	11,902	14,161
Bremen D		2,308	4,163	4,377	3,481
Magdeburg D				649	2,841
Espenhain D (SRW)	1,375	1,910	3,126	4,730	
Ingolstadt D	3,122	2,044	1,681	330	
Helmstedt D	1,053	3,364	6,080		
Weissenhorn D	1,358	2,651	2,033		
Olching D	2,432	2,281			
Iserlohn D	1,269	1,737			
Salaise F (Tredi)	1,259	683		1,276	2,673
Total	68,643	68,702	69,476	59,603	61,219

(SOURCE: AUTO RECYCLING SWITZERLAND FOUNDATION)

The calculation from the key energy figures from Swiss MWIPs for the year 2015 shows that energy from ASR is sufficient to cover the power consumption of 6000 households, assuming that disposal of the entire vehicle light shredder fraction takes place in Swiss MWIPs. The situation does not seem to have changed greatly in 2016. It is reasonable to assume that energy use efficiency will increase in years to come.

B) «MWIP RESIDUE PROCESSING» PROJECTS

The Federal Office for the Environment estimates the potential valuable substance content of all the MWIP slag produced in Switzerland at 75,000 tonnes of iron, 17,000 tonnes of aluminium, 6000 tonnes of copper and 300 kg of gold. Part of this, if only a rather small share, comes from ASR. Operating in this area is one of the main challenges facing the Foundation Auto Recycling Switzerland. It is of course impossible to exploit the full potential of valuable substances from MWIP residues. Nevertheless, recovery efforts are worthwhile because secondary use of the valuable substances saves a great deal of energy and primary raw materials. Another positive aspect is the fact that fewer harmful substances and a smaller quantity of materials reach the landfill sites.

Centre for Sustainable Waste and Resource Utilisation ZAR:

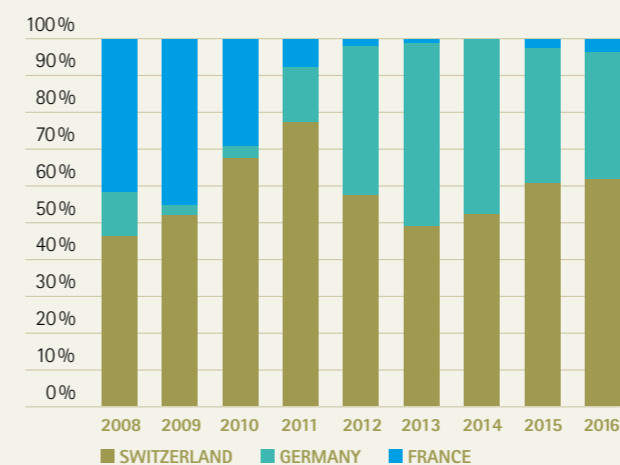
After great efforts and success in overcoming many technical challenges, the ZAV Recycling AG slag processing facility was officially inaugurated in May 2016. But in reality, an innovative plant of that kind can never be fully completed. To begin with, the usual teething problems have to be resolved and further optimisation steps then taken. For that reason, the planned tests with ASR have been postponed until next year. Nevertheless, a great success has been achieved: in the middle of the year, the capacity stood at 40,000 tonnes but this had risen to 100,000 tonnes by the year-end. Step by step the incineration plants at Horgen, Zuchwil, Monthey and Zurich are delivering their dry slag residue to ZAV Recycling AG. The slag is divided up into five different grain sizes which are treated separately. This results in ten metal fractions suitable for recycling, which account for 17 per cent of the input. The residual slag to be dumped in landfill sites represents 83 per cent. With the thermal recycling of just under 2000 tonnes of ASR, a total of some 330 tonnes of metal were therefore returned to the material cycle. ZAR now continues to review the partial processing of the residual slag to obtain a recycled mineral construction material. ZAR is also working intensively on the recovery of phosphorous from sewage sludge ash and zinc from hydroxide sludges and fly ash. Both development areas are third party contracts and are being driven forward at the second ZAR site with KVA Zuchwil (KEBAG). KEBAG is already producing nearly one tonne of high purity zinc every day.

IGENASS Wet Discharge Interest Grouping:

The thermo-re technique of the ZAR Initiative only works with dry discharged MWIP slag. IGENASS was set up to improve our state of knowledge of the composition and behaviour of wet discharged slag. Since its incorporation in February 2015, the UMTEC Institute as the research pool acting for IGENASS has been engaged primarily in fundamental research in the areas of sample preparation, slag comminution, wet characteristics and influence of ASR on the behaviour of the eluate. In the latter case, initial results suggest that in the presence of PVC, significantly higher copper values are present in the eluate. This problem is the subject of more detailed investigation.

New slag discharge systems, representing a combination of dry and wet discharge, are another area of interest. The fine fraction is either blown back into the combustion chamber or discharged in the final furnace section before the coarse slag drops into the wet slag extractor.

ASR RECOVERY BY COUNTRY



(SOURCE: AUTO RECYCLING SWITZERLAND FOUNDATION)

C) «VEHICLE ELECTRONICS» PROJECT

This project could not be taken forward as anticipated for several reasons. The working group defined the further project steps and secured the necessary financing. The Foundation Auto Recycling Switzerland is taking its responsibility and making a substantial contribution. Representatives of workshop disposal operators are now also participating in the working group. The fact is that some of the defective electrical and electronic vehicle components collected in the workshops are already going for recycling today. The advantage is that dismantling is generally paid for by the vehicle owner in such cases. One project step will look at this theme area in more detail. A further step is examining the cost and implications of preliminary dismantling of such devices from end-of-life vehicles. From the ecological standpoint, it is already clear that the recovery of mass metals such as iron, aluminium and copper makes a higher environmental contribution than the recovery of rare earths. However, six components from the two areas have been identified for further investigation of their removal from end-of-life vehicles. This trial will run in the first quarter of 2017. The working group is planning an experiment with ASR at the Hinwil MWIP in combination with the slag processing facility operated by ZAV Recycling AG. That trial had to be postponed until April/May 2017 for technical reasons relating to the plant. The aim is to determine the extent to which rare technical metals can be recovered from the MWIP residues.

D) PUBLICATIONS

The annual report distributed widely in the automobile and waste sectors led to further publications. In every case, the Foundation stresses the ecological benefits of vehicle recycling.

- Globalisation – prismatically unfolded, 06.2016
«The Business Case; the Disposal of Old Cars»
- Yearbook «klimafreundliche Schweiz 2016» (Climate-friendly Switzerland), 06.2016
«Automobilrecycling – das Rad bleibt nicht stehen (Vehicle recycling – the wheel does not stand still)»
- EUWID Recycling and disposal, 02.08.2016
«Schweiz: Weniger Altfahrzeuge in die Verwertung und Projekte zur Demontage von Geräten» (Switzerland: fewer end-of-life vehicles for recycling and projects for dismantling devices)
- Recycling Magazine, 10.08.2016
«Franken bremst Autorecycling» (The Swiss franc is impeding vehicle recycling)
- Eurotax Auto Information, 12.08.2016
«Die Branche steht unter Druck» (The branch is under pressure)
- Umwelttechnik Schweiz, 27.09.2016
«Autorecycling behauptet sich» (Vehicle recycling is gaining ground)
- Swiss Green Economy Symposium, 14.11.2016
«Was jeder kennt und niemand weiss – Automobile sind fahrende Rohstofflager» (What everybody realises and nobody knows – Automobiles are travelling raw material stores)



3 LAWS AND REGULATIONS

Often, new laws or amended laws give rise to more discussion before they are adopted than after their entry into force. For instance, the planned implementation aid under the new regulation on the avoidance and disposal of waste (VVEA) plays a key role for an individual business or an entire branch. The economic circles which are directly concerned made an extremely important contribution to the drafting of this text.

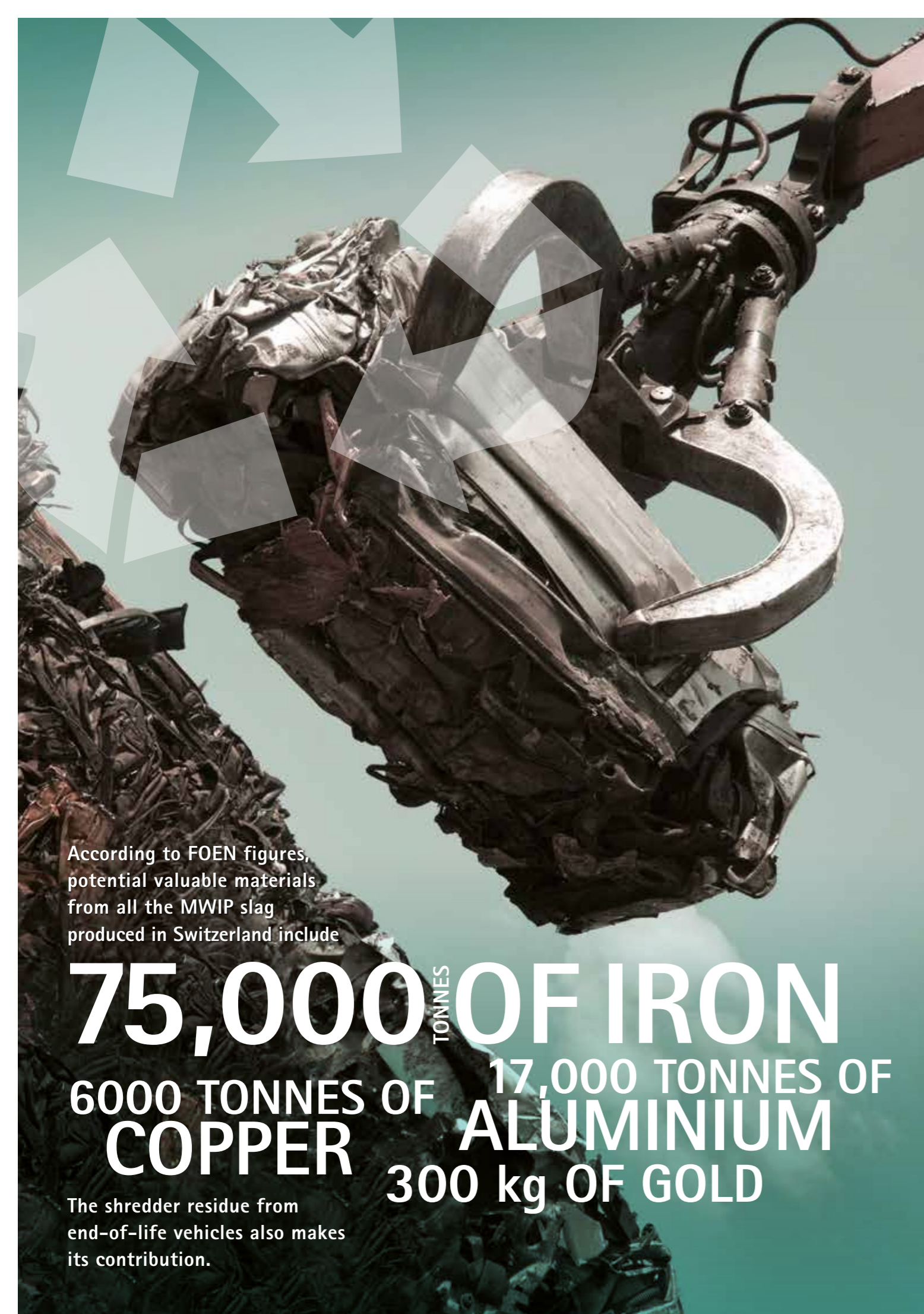
In September 2016, the Swiss people voted down the popular initiative for a sustainable and resource-efficient economy known for short as the «green economy» by a clear majority. Nevertheless, the green economy is playing an important role in the Swiss Federal Council and Federal Office for the Environment. However, targets for the reduction of environmental pollution and the completion of cycles should reasonably not be imposed by regulation but put into effect through voluntary cooperation between the economy, science and the public authorities. The new VVEA moves in that direction and the efforts of the vehicle electronics project (see Section 2C) must also be understood in that sense.

A) ORDINANCE ON THE AVOIDANCE AND DISPOSAL OF WASTE (VVEA)

The VVEA took effect on 1.1.2016 and replaced the technical ordinance on waste. The ordinance no longer seeks simply to protect human beings, fauna and flora against environmentally damaging influences caused by waste but also encourages the environmentally-friendly use of raw materials. That goal can be achieved through the avoidance of waste, for example in the production process or by completing the material cycles in cases where waste is unavoidable. In many areas, attention is called to the state of the technical art which is resulting, together with the parties involved, in an aid for implementation. That aid is being constructed on a modular basis and individual modules are already in preparation.

B) ORDINANCE ON THE RETURN, TAKE-BACK AND DISPOSAL OF ELECTRICAL AND ELECTRONIC EQUIPMENT (ORDEE)

The FOEN is planning to revise ORDEE. A number of obstacles have to be overcome in that regard. Online commerce must be involved. In addition to the existing voluntary systems, a compulsory provision must be imposed for cases where online dealers do not apply a voluntary system. The authority must assure financing. Commercial imports of household appliances, for which no data are gathered at present, fall within the same area. The automobile industry is affected by ORDEE via the «Automobile electronics» project. However, the revision of the text has no influence on the project. Only when the results of the trials become available will some individual vehicle components be placed on the ORDEE appliance list.



According to FOEN figures, potential valuable materials from all the MWIP slag produced in Switzerland include

75,000 TONNES OF IRON
6000 TONNES OF COPPER
17,000 TONNES OF ALUMINIUM
300 kg OF GOLD

The shredder residue from end-of-life vehicles also makes its contribution.

4 CONFERENCES AND WORKSHOPS

Conferences provide an opportunity to obtain information on the state of legislation, science and also on what is feasible and sensible in practice.

RECYCLING CONGRESS OF SWISS RECYCLING 14 JANUARY 2016, SOLOTHURN

The traditional event of the top level association of all the separate collection organisations always gives an idea of topical issues facing the waste economy. This year, information was provided about the introduction of the VVEA (Section 3) and the limits of recycling plastic materials from domestic waste.

INTERNATIONAL AUTOMOBILE RECYCLING CONGRESS 16 – 18 MARCH 2016, BERLIN

The Foundation supports this Congress, originally established in Switzerland, as a sponsor and is represented on the Steering Committee. Speakers from several countries across the world describe the status of automobile recycling, point to solutions in individual recycling areas, present changes to the law and call attention to future challenges. Important aspects today concern electro-mobility and the almost unimpeded outflow of older vehicles to developing countries.

FOEN: VVEA CONGRESS 1.0 31 MAY 2016, BERN

The Federal Office for the Environment organised a conference on the subject «Recycling is well worthwhile» and presented the new ordinance on the avoidance and disposal of waste (VVEA) in a number of lectures.

SENS/SWICO/SLRS-FORUM 24 AUGUST 2016, ZURICH

The three voluntary separate collecting organisations for electrical and electronic appliances as well as lighting devices organised a joint event for the first time. They reported on adaptations of their systems to future challenges summarised under the concept Recycling 4.0: Internet of Things, Robotisation of Recycling, Economy of Share.

GERMAN FEDERAL OFFICE FOR THE ENVIRONMENT (UBA) 20 OCTOBER 2016, BERLIN

The UBA discussed methods and data fundamentals for the calculation of reprocessing and recycling rates for end-of-life vehicles with a number of experts. Standardised trials with vehicle recyclers and shredder plants provide an essential basis for a relatively simple quota calculation.

SWISS GREEN ECONOMY SYMPOSIUM 14 NOVEMBER 2016, WINTERTHUR

Representatives of innovative companies which are committed to sustainability reported on their efforts and solutions to complete material cycles and ensure the economical use of resources. The foundation published an article about vehicle recycling in the conference volume of the Swiss Green Economy Forum.

5 MOTOR VEHICLE STATISTICS

STATISTICS FOR PASSENGER CARS IN SWITZERLAND

YEAR	NEW REGISTRATIONS ¹⁾	IMPORTS ²⁾	TOTAL ON THE ROAD	TAKEN OFF ROAD ³⁾	EXPORTS ²⁾	VEHICLES CANCELLED IN SWITZERLAND ⁴⁾	VEHICLES SHREDDED IN SWITZERLAND ⁵⁾	DIFFERENCE CANCELLED SHREDDED
2000	315,398	332,880	3,545,247	254,908	73,404	181,504		
2001	317,126	330,541	3,629,713	246,075	83,319	162,756		
2002	295,109	302,763	3,700,951	231,525	90,034	141,491	166,198 ⁶⁾	-24,707
2003	271,541	288,192	3,753,890	235,253	94,682	140,571	153,412 ⁶⁾	-12,841
2004	269,211	281,588	3,811,351	224,127	108,235	115,892	147,096 ⁶⁾	-31,204
2005	259,426	287,371	3,864,994	233,728	90,354	143,374	129,704 ⁶⁾	13,670
2006	269,421	284,182	3,899,917	249,259	106,857	142,402	104,600	37,802
2007	284,674	305,102	4,002,584	202,435	131,695	70,740	88,261	-17,521
2008	288,525	310,841	4,031,205	282,220	108,205	174,015	82,195	91,820
2009	266,018	276,833	4,051,832	256,206	82,967	173,239	58,279	114,960
2010	294,239	333,808	4,119,684	265,956	91,965	173,991	78,657	95,334
2011	318,958	367,961	4,209,672	277,973	96,430	181,543	90,338	91,205
2012	328,139	374,379	4,300,036	284,015	127,806	156,209	99,448	56,761
2013	307,885	342,762	4,366,895	275,903	125,325	150,578	107,282	43,296
2014	301,942	337,653	4,430,375	274,173	120,977	153,196	105,034	48,162
2015	323,783	373,721	4,503,865	300,231	118,145	182,086	71,607	110,479
2016	317,318	349,433	4,571,994	281,304	131,319	149,985	76,112	73,873

(FEDRO/AUTO-SCHWEIZ) (FCA) (FEDRO/AUTO-SCHWEIZ) (FCA)

FEDRO: Federal Roads Office (status as of 30 September)

FCA: Federal Customs Administration (foreign trade statistics)

1) New registrations in Switzerland, including direct and parallel imports

2) All imports and exports shown in the foreign trade statistics

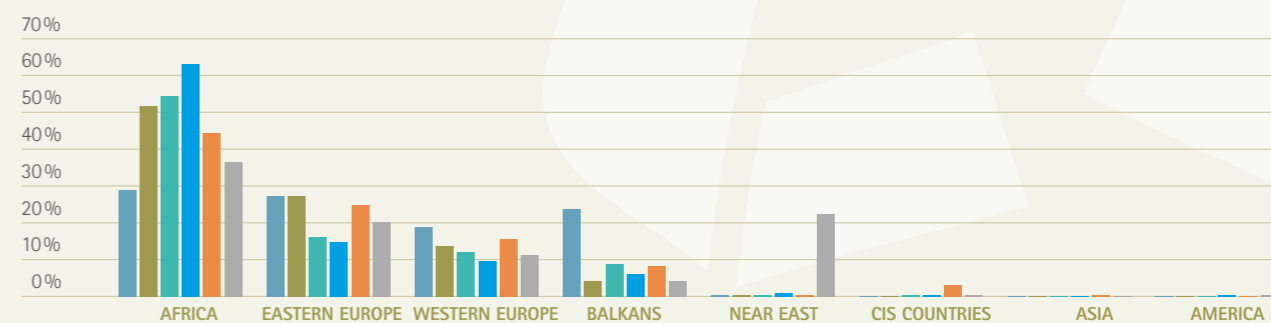
3) Calculated: imports less increase in number of vehicles on the road

4) Calculated: cancelled vehicles less exports

5) Vehicles proven to have been shredded (at present vehicle log books; up to 2005 weighing certificates)

6) Calculated from weighing certificates (850 kg/vehicle); from 2006 cancelled vehicle log books

EXPORTS OF PASSENGER CARS BY REGION



2016	29%	28%	19%	23%	1%	0%	0%	0%
2015	52%	28%	14%	5%	1%	0%	0%	0%
2014	55%	17%	13%	10%	1%	1%	0%	0%
2013	63%	15%	10%	7%	2%	1%	0.1%	0.2%
2008	45%	25%	16%	9%	1%	4%	0.2%	0.1%
2003	37%	21%	12%	5%	23%	1%	0.1%	0.4%

(SOURCE: FEDERAL CUSTOMS ADMINISTRATION, FOREIGN TRADE STATISTICS)

EXTRACT FROM FOREIGN TRADE STATISTICS; EXPORTS OF PASSENGER CARS 2016

2016	VEHICLES	CHANGE (%)	WEIGHT (kg)	PRICE (CHF/Vehicle)
Total (140 Countries)	131,319	11.1	1,440	3,667
Poland	27,963	47.0	1,527	1,977
Bulgaria	14,067	73.3	1,512	773
Germany	12,438	53.9	1,535	10,432
Libya	12,139	-47.3	1,371	726
Togo	8,515	19.6	1,214	986
France	6,744	29.7	1,411	6,654
Serbia	6,118	343.0	1,335	1,598
Niger	5,199	-64.4	1,271	911
Macedonia	2,777	95.8	1,451	1,616
Czech Republic	2,688	40.0	1,472	5,081
Benin	2,494	-72.2	1,322	1,369
Hungary	2,246	54.3	1,394	1,598
Ivory Coast	2,188	124.6	1,260	1,308
Nigeria	1,973	1.1	1,507	1,267
Lithuania	1,958	37.5	1,601	1,243
Bosnia Herzegovina	1,889	136.1	1,366	1,733
Kosovo	1,778	66.6	1,495	2,926
Cameroon	1,534	20.9	1,301	1,153
Albania	1,421	94.4	1,223	875
Austria	1,351	23.4	1,532	8,579
Guinea	1,275	29.0	1,334	1,103
Slovakia	1,233	281.7	1,490	1,806
United Kingdom	1,172	326.2	1,540	16,030
Netherlands	1,039	273.7	1,643	32,496
Lebanon	1,021	19.1	1,450	2,308

(SOURCE: FCA)

6 DEVELOPMENTS ABROAD

High reprocessing and recycling rates are desirable and appropriate. But they must apply to everyone and the laws must be implemented uniformly. It is no use for millions of vehicles simply to disappear from the system throughout Europe and either be disposed of illegally or exported with no control whatsoever.

We do not know what happens to between 3.6 and 4.6 million passenger cars in the EU every year. To clarify matters, the appropriate EU Directorate asked the Oeko Institute to conduct a public survey of all the interested circles. The outcomes were presented to a workshop at the end of November 2016. Three fields of action were identified: a) registration and de-registration of a vehicle, b) illegal treatment of end-of-life vehicles and c) cross-border trade. It is now up to the EU Commission to introduce measures to prevent unknown and unlawful disposal and export routes. That can be done through more precise provisions in the end-of-life vehicle directive and even through financial incentives based on a kind of fund system. At all events, the illegal activities of vehicle recyclers and exporters are a serious issue. Implementation must be improved in that regard. However, additional measures to contain the problem may well be accompanied by greater bureaucracy.

As explained in Section 4, the German Federal Office for the Environment (UBA) arranged for a discussion by experts of methods and data for the calculation of reprocessing and recycling rates. It transpired that every percentage point is important given the high target values. In order to hold the cost of calculating the quotas down to a reasonable level, the UBA is working on assumptions backed by dismantling and shredder trials. Defined processes are therefore required to implement such trials. Electro-mobility accompanied by the use of lightweight materials will present similar challenges to the auto-recycling branch in future. The handling of high voltage systems, electronic complexity and the recycling of vehicle batteries will change the nature of automobile recycling. Vehicles will contain more high value materials whose recovery will be economically viable. The raw materials must be kept in Europe and made available to domestic industry – but of course not free of charge.

ANNEX

DOCUMENTATION

Publications such as press releases, annual reports, INFO newspapers etc. can be consulted on the Foundation's website: www.stiftung-autorecycling.ch

MEMBERSHIP OF THE FOUNDATION BOARD

Foundation Board Chairman auto-schweiz	Dr. iur. Hermann Bürgi* Christine Ungricht, Vice-Chairwoman* François Launaz* Walter Frey Andreas Burgener Tobias Lukas
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Swiss Commercial Vehicle Association	Adrian Amstutz
Department for the Environment, Canton of Aargau	Dr. Peter Kuhn
Swiss Shredder Association	Dr. Tobias Thommen*
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