We support the shipping through far-sighted, visionary and dynamic service.
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1

The Moselle Commission

1.1

Serving the river.
The profile

It is three countries that the Moselle passes through on its 520 kilometre journey to the river’s mouth. Three countries which have a claim to the economic potential of the river. Water is precious. That of the River Moselle is, too. It was precious at the time of the ancient Romans, it is today. Representing the interests of one’s country therefore carries great responsibility and an obligation to maintain peaceful and friendly relations. Taking proper care of the river will only be possible if all countries cooperate. That is why the Moselle Commission brings together France, Germany and Luxembourg, acting in the spirit of Europe, to ensure that the Moselle remains an efficient waterway and is continually improved. We are here to serve the river, now and in future.

From its source at Col de Bussang in France, the Moselle runs through France, Luxembourg and Germany, where it finally flows into the Rhine at Koblenz.
1.2

A fresh start was possible!

History

Times were difficult after the Second World War. It was an exceptional political achievement, therefore, when the Convention on the Canalisation of the Moselle, usually simply called "the Moselle Convention", was signed by the riparian states, France, Germany and Luxembourg, only eleven years after the war had ended. The driving force behind the Convention was the fact that all three countries were interested in structurally improving the river and turning it into a large-vessel waterway; for decades politicians had dreamed of reaping the economic benefits of such a waterway. But, just as importantly, the Convention was also a sign of reconciliation, of friendship, of the will to let bygones be bygones and to make a fresh start. The negotiations leading up to the signing of the Convention on 27 October 1956 were characterised by farsighted debates and a great diplomatic effort. Many of those involved contributed individually to the successful conclusion of the negotiations by combining an open and generous mind with the visionary thinking of a statesman.
A historic moment in our history:
On 27 October 1956 the French foreign minister, Christian Pineau, his German counterpart, Heinrich von Brentano, and Joseph Bech, President of the Government and Foreign Minister of Luxembourg, signed the Convention on the Canalisation of the Moselle.
1.3 We have a mission.
Aims

The Moselle Commission’s first and foremost duty is to represent the interests of shipping on the Moselle. The people we represent include ships operators and shipping companies, of course, but also facilities like the ports of the Saar-Lor-Lux Greater Region. We operate within a regulatory framework, which for instance includes the Moselle Waterway Police Ordinance and the Moselle Tariff of Shipping Dues, and we amend these rules and regulations to take account of changed circumstances regularly. We have set ourselves the task of ensuring that shipping traffic flows safely and easily, and that shipping on the Moselle benefits from a good navigational environment. The modernisation of structural works is part of the Moselle Commission’s duties. What benefits may be derived from the lifting of certain bridges? What impact would the doubling of all lock chambers on the Moselle in Germany have on shipping? Questions like these will be debated within our organisation and also discussed with the relevant public authorities. Our mission is to act as a service provider and as the choice point of contact for shipping.

1.4 Well-regulated cooperation.
The legal basis

Balancing the interests of three different countries naturally required a legal basis. This was provided by the signing of the Moselle Convention on 27 October 1956. Our inaugural meeting took place on 21 December 1962, one and a half years before the Moselle large-vessel waterway was completed. We have held an ordinary meeting twice a year ever since. Each of our three member states sends two permanent delegates to these meetings, and each delegate can be backed up by a deputy delegate. The member states can also nominate experts. Once a year, the assembly elects the President of our Commission. The rule is that each of the three states holds the chair in succession, and in alphabetical order: France, Germany and Luxembourg. Topics on the agenda are discussed on the basis of preparatory work done by our special committees. Any decision by the plenary meeting must be taken unanimously. Votes cast by the delegates count as having been cast by the country they represent. Each country is therefore bound by the votes cast by its delegates to enact and issue, according to the relevant national legislation, the rules established by the Commission. This guarantees long-term cooperation. The way the three countries pay their fair share also shows our cooperative spirit: each country bears one third of the budgeted costs.
1.5

To Get to the Point!
The committees

It is essential that our meetings be well prepared. Twice a year, our delegates are asked to take a considerable number of decisions at such a meeting. The preparatory work is carried out by our special committees who expertly and diligently prepare all the topics on the agenda. This effectively enables the Moselle Commission to reach its decisions by mutual agreement.

The Legal Affairs Committee examines all legal matters, for instance those relating to the Moselle Convention.

The Technical Committee examines all planned construction projects on the Moselle. It particularly checks whether a project is compatible with the interests of shipping. A topic that is currently being discussed, for instance, is the doubling of the locks in the German section of the Moselle. Projects with a medium-term planning horizon include the Saône-Moselle-Saône-Rhine connection, which is being debated by the French Government and also being discussed by the Technical Committee. It determines the annual closing periods of the locks as well.

The regulations that apply on the Moselle to ensure that traffic flows easily and safely are drafted by the Waterway Police and Waterway Marking Committee. All regulations are enshrined in the Moselle Waterway Police Ordinance.

The Shipping Dues Committee, as the name suggests, works out the conditions that apply to the levying of shipping dues. Always with an eye to creating incentives to use the Moselle waterway.

We should also mention our Board of Appeal. This is a panel with at least one judge from each member state. It may be resorted to if a party wants to appeal against a decision in a civil or criminal case taken by the relevant national navigational court for the Moselle. If the Board of Appeal is resorted to, it will take the place of the national court of appeal that normally has jurisdiction.

If the situation calls for a joint effort, we also set up so-called mixed committees. The Technical and Legal Affairs committees, for instance, can pool their expert knowledge in such a committee in order to reach a more informed decision.

If a topic requires specific technical expertise, we will set up working groups. The three riparian states will then invite experts from the relevant technical fields to share information and discuss the topics at hand. The Drainage Management Working Group, for instance, was founded at the instigation of the Technical Committee. Another example is the working group "Modern Information Exchange Services and Systems/MIB-MOVES", which was set up by the Waterway Police and Waterway Marking Committee.
1.6
We're open for business.
The Permanent Administrative Office

The Administrative Office in Trier, Germany, is responsible for managing the smooth exchange of information and efficient coordination between the three member states. Without it the Moselle Commission simply could not function properly. Its range of duties includes preparing and following up the meetings in full, and translating all documents into French and German, the two official languages. It is also the central point of contact for the Moselle Commission’s delegates and experts as well as for all users of the waterway. In addition, the Administrative Office carries out a whole range of targeted activities that help to make the Commission a vital and vibrant institution. On the one hand, the close liaison and cooperation with national administrative departments and other intergovernmental bodies, on the other hand always with an ear to the pulse of the times – with the economic actors, the transport sector, associations and unions of the shipping industry and the shipping industry itself. All this makes the work of our Administrative Office so valuable and enables us to act as a hands-on modern service provider for the shipping industry.

1.7
Interlinked.
Joint initiatives

In order to increase the attractiveness of inland navigation and to maintain and continually improve all aspects of the Moselle that mark it out as a modern and efficient waterway, we continuously exchange information and cooperate with a number of other bodies as, for instance, the Central Commission for the Navigation of the Rhine (CCNR). Its mission is very similar to ours, and we very often base our rules and regulations on the CCNR’s rules. After all, Rhine and Moselle come together at Deutsches Eck in Koblenz, so it seems only reasonable that the provisions and regulations that apply to the users of the waterway for example, should be harmonised too.

Another cooperation is that with the International Commissions for the Protection of the Moselle and the Saar (ICPMS), and we also cooperate closely with the United Nations Economic Commission for Europe (UNECE) and with organisations and programmes of the European Union (EU), e.g. Eurostat and PLATINA. These important contacts for the benefit of the Moselle waterway are always maintained by the Administrative Office in a far-sighted and cooperative manner.
1.8 Connecting people. Public relations

Public relations is another essential part of our institution’s work, and the Administrative Office is at the centre of our public relations efforts. Taking part in conferences and other events organised by the shipping industry, in workshops organised by the water and shipping authorities, and closely liaising with the transport sector – all this puts the Moselle Commission centre stage as a service provider. This close contact increases the Commission’s awareness for the wishes and suggestions that arise from the routines of the shipping industry. Public relations activities include publishing press releases, and monitoring and documenting the way in which the daily and trade press report on the River Moselle. The outcome of these activities is summarized in a “Press Review” publication at the end of each year: The Moselle Commission’s Annual Report and Traffic Report are also prepared by the Administrative Office; the publication of informative and user-friendly leaflets and brochures round off the spectrum of public relations.

1.9 Information at the click of a mouse. Services available on the internet

It isn’t only for the dictionary or the glossary, the shipping-related phrases in various languages, the currently valid amendment of the Moselle Waterway Police Ordinance or the lock closure times that users of the Moselle waterway go to the Moselle Commission’s website. It is mostly for the interactive information tool that was recently added to the website’s home page. Its special feature: a click on any lock, bridge or place on the diagram of the Moselle provides you with up-to-date traffic news for each specific location. Information on upcoming issues such as dredging or construction work, rowing regattas or water firework displays enables ships operators to plan their route in a more specific and efficient manner. And they appreciate it!
As a further service to our customers, important parts of our website are now available in English.
2
The Moselle – waterway for large-vessels

2.1 Where does it come from, where does it go.
Geographical features

The source of the Moselle lies 730 metres (2,400 feet) above sea level in France near the Col de Bussang in the Vosges. The river then runs for 520 kilometres (323 miles), until it flows into the Rhine at Deutsches Eck in Koblenz, Germany. Being the greatest tributary of the Rhine, it has a number of tributaries itself, amongst which the Meurthe, Seille, Madon, Orne, Sauer and Saar are the six greatest. Its drainage basin covers an area of at least 28,286 square kilometres (10,921 square miles). The longest stretch of the Moselle lies in France: 278 kilometres (172 miles). Its length on German territory is 206 kilometres (128 miles). Along a stretch of 36 kilometres (22.4 miles), the Moselle is a Luxembourg-German area of joint sovereignty (condominium). From its source in France to the town of Mertert in Luxembourg, the river winds peacefully in broad loops. After the Moselle has passed Trier, one can marvel at the river’s numerous meanders, the steeply sloping valleys and terraced

2.2 Responsibility, delivered.
The national administrative bodies

A lot of work is required to maintain the Moselle large-vessel waterway to a safe and high standard, and to upgrade and improve it. Regular on-the-spot work. In principle, each country is responsible for maintaining its own stretch of the river. The duties of each country include operating, servicing, repairing and modernising the Moselle waterway, including the shipping installations and the waterway structures, i.e. things like weirs and locks, shelter harbours, pumping stations or bridges. From an administrative point of view, day-to-day work is carried out “to ensure that shipping traffic flows safely and easily”. In practice this means that navigation marks have to be installed and checked, the water depth has to be monitored on a regular basis, and obstacles need to be marked and must be removed as quickly as possible. The reason for regularly carrying out this kind of work is that a navigation channel with a depth of 3 metres and a width of at least 40 metres has been guaranteed to all ships. A country’s duties also include approval, as well as subsequent monitoring, of third party installations, e.g. bridges, landing places or river retaining walls. The countries operate stream gauging stations at strategically favourable and important places, and also provide services that report on water levels, flood waters and ice. And should a very cold winter lead to the Moselle completely freezing over, so-called “icebreakers” will break the ice and let it drain away.
2.3

28. Damming stages

It was the building of damming stages that turned the Moselle into an efficient and modern large-vessel waterway. The first generation damming structures were all constructed in the 1960s. Today, a total of 28 damming stages exist on the 394 river kilometres that are navigable by large vessels: 10 in the German section, 2 in the section under joint sovereignty (condominium) and 16 in the French section. The total difference in altitude that the damming stages bridge is 161 metres (528 feet). The lowest difference in elevation is 2.7 metres (8.85 feet) at Pompey-Frouard, and the highest is 9 metres (30 feet) at Detzem in Germany. With the exception of the damming stages at Detzem and Koenigsmacker, all damming structures have been constructed so that the lock, weir and power plant are located right next to each other, either on or immediately adjacent to the river. The two exceptions to this rule are due to the difficult geographical location, which required putting the lock and weir structures in separate places.

On average, a damming stage’s tailwater has a length of 20 kilometres (12 miles). The determining factors for choosing the location for each damming stage were: the location of nearby settlements, the river course at the location under consideration, and, of course, the aim of building these structures to interfere as little as possible with the beautiful Moselle countryside.

2.4

Approved. Their design

The damming stages are always constructed to the same design. A damming structure consists of a lock, mostly with a boat lock for smaller vessels added on, a weir, a fishway, and a power plant. Some installations also provide a so-called boat lane or canoe slide, where the difference in height is bridged by a sort of slide that is fed with water.

The weir structure, which is situated between the lock and the power plant and connects both, has an inspection tunnel that is located beneath the surface of the water and provides access to the individual weir fields (also called “sectors”). This tunnel may have a length of up to 130 metres (426 feet).

There are different types of weir along the Moselle, and some weirs are also wider than others. The weirs in France have weir shutters and radial gates fitted. Hinged crest gates have been installed in the German-Luxembourg and the German stretches of the river, because this type of weir enables a low-built design, one that will blend well into the countryside. Downstream from the mouth of the Saar and the Sauer, a weir consists of three weir fields, each with a length of 40 metres (131 feet). Upstream from these places, a weir consists of only two fields, because the river there carries less water.

The damming stage at Koblenz still has two weir fields that are fitted with roller weirs.

Different types of weirs can be found along the Moselle. In France, as you can see in the center and from the right-hand picture, the weirs are fitted with shutters and radial gates. The hinged crest gate is the dominant type of weir on the rest of the Moselle.
The lock chambers of the first generation all have a usable length of 170 metres (557 feet) and a width of 12 metres (40 feet); they provide enough space for a single modern cargo motor ship to be locked through. As an alternative, a number of smaller ships can be passed through the lock at the same time. Barge convoy sets with up to two pushed barges often have a length of 172.5 metres (565 feet) nowadays. These ships are passed through the lock by using the existing 2 metres (6 feet) of reserve space; special safety measures apply to this type of locking cycle. Since the trend is towards larger and larger ships, and because traffic on the Moselle keeps growing, the construction of a second and larger lock chamber on all German Moselle damming stages was ultimately classified as an “urgent requirement” by the Federal Transport Infrastructure Plan in 2003.

The second-generation lock chambers have a length of 210 metres (689 feet) and a width of 12.5 metres (41 feet). One second lock is already operational, at the Zeltingen damming stage; at the Fankel damming stage, trial operations are scheduled to begin in 2012; construction of the second lock in Trier will begin shortly.

**Comparison between the sizes of the lock chambers**

1. **Second-generation large-vessel lock:**
   - Length 210 metres; width 12.5 metres

2. **Large-vessel lock:**
   - Length 170 metres; width 12 metres

3. **2nd smaller lock in Koblenz:**
   - Length 122.5 metres; width 12 metres

4. **Thionville, Richemont, Talange and Metz:**
   - Length 40.5 metres; width 6 metres

5. **Boat locks:**
   - Length 18 metres; width 3.5 metres
2.6

Time is of the essence.
Lock closures

Nearly half a century in operation, used practically every day - in order to ensure the waterway users’ safety, once a year the structure of all locks has to be fully serviced and repaired, and a technical inspection has to be carried out. This is done during official lock closure times, which are determined by us, or, to be more precise, by our Technical Committee. Each year’s closure time is scheduled many years in advance, and, of course, you can find out these closure times on the Moselle Commission’s website. This gives both commercial shipping and recreational navigation the utmost certainty when planning ahead. The annual closure period in the German and Luxembourg sections of the river usually lasts eight days; in the French section it usually lasts ten days. A very tight schedule, indeed! Work must be carried out without delay, with complete accuracy and up to a high standard, in order to get the lock working again as quickly as possible. Sometimes the lock is completely drained during maintenance. Other jobs include replacing the upper and lower gate, repairing parts of the structure, closing cracks, or renewing joints.
During this time, continuous shipping traffic on the Moselle is suspended. Up till now, at least. But with every lock that gets a second chamber, we come a little closer to uninterrupted, year-round navigation in the German section.

Lock closures 2012 - 2019
(for maintenance and repairs)

<table>
<thead>
<tr>
<th>Year</th>
<th>Germany</th>
<th>Luxembourg</th>
<th>France</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>12 - 19 June</td>
<td>11 - 20 June</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>04 - 11 June</td>
<td>03 - 12 June</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>20 - 27 May</td>
<td>19 - 28 May</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>09 - 16 June</td>
<td>08 - 17 June</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>31 May - 07 June</td>
<td>30 May - 08 June</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>16 - 23 May</td>
<td>15 - 24 May</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>05 - 12 June</td>
<td>04 - 13 June</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>21 - 28 May</td>
<td>20 - 29 May</td>
<td></td>
</tr>
</tbody>
</table>
2.7

Unforeseen events.
 Unscheduled closures

Normal closure times are scheduled many years in advance. That’s the easy bit. But you have to be prepared for unpredictable events: floods, strikes, ship accidents or breakdowns as well as social or sporting events, all of which may require the locks or sections of the waterway to be closed. Unforeseen repair work that cannot be delayed may also lead to closure. No matter what the cause, the shipping administration that is in charge will do its utmost to reopen the waterway as quickly as possible.

<table>
<thead>
<tr>
<th>River closures on the Moselle in 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>(along the entire length of the Moselle)</td>
</tr>
<tr>
<td>Events: 7 %</td>
</tr>
<tr>
<td>Ship accidents; breakdowns; obstacles: 13 %</td>
</tr>
<tr>
<td>Works; repairs: 20 %</td>
</tr>
<tr>
<td>Flooding: 23 %</td>
</tr>
<tr>
<td>Regular lock closures: 37 %</td>
</tr>
</tbody>
</table>

*Waterway Police orders evaluated by the Administrative Office of the Moselle Commission using data from the following sources:*
- Local Offices for Waterways and Shipping in Koblenz and Trier (WSA Koblenz; WSA Trier)
- Waterways Electronic Information Service (ELWIS)
- Waterways of France (VNF Nancy)
- Office for Waterways in Grevenmacher (SN Grevenmacher)
2.8

How much water is there?
Hydrology and gauging stations

The amount of water carried by the Moselle constantly changes. That is completely normal, as it is directly affected by precipitation and temperature. How much rain has fallen? When will the snow begin to melt, and when will it become “flow-producing”, as the experts say? It is important to monitor these changes; that is why the Moselle has 37 stream gauging stations in the various sections of the river: 7 in the French part, 4 in the Luxembourg one, and 26 in the German section. The stations constantly monitor the river's current water level. These data are analysed and have many different uses. You can, for instance, find out the depth of the available navigation channel from the data, which in turn determines the loaded draught of ships and the clearance height of bridges. The gauging stations are also important for forecasting floods. On the Moselle, and especially in the narrow Moselle valley around Trier, the water rises quite abruptly and steeply during extreme precipitation. For people living near the banks of the Moselle, checking their water gauge has always been part of daily life. They can also use the services of the Flood Warning Centre of the Rhineland-Palatinate. Shipping is continuously informed about the relevant water levels by the Nautical Information Service (NIF).

And if ice forms on the Moselle during a very cold winter, the Ice Warning Service compiles a so-called “ice situation report”, published on the internet at www.elwis.de, which contains information on the thickness of the ice, the type of ice, and the areas affected by it. If necessary, the ice is broken with icebreakers that navigate up the Moselle, starting from Koblenz. These icebreakers are operated by the water and shipping authorities.

Fig. 1: A hinged crest gate during normal drainage: A hinged crest gate is used to regulate water discharge by rotating each wall section round its axis (coloured red in the picture).

Fig. 2: A hinged crest gate during a flood: The wall sections have been lowered as far as possible in order to ensure the greatest possible drainage.
**Left-hand picture:** Measuring the depth of the navigation channel with the help of a sounding vessel.

**Middle and right-hand pictures:** In the event of flooding, weir-level control is handed over from the RWE power-plant control room to the local Lock and Weir Control Centre (the one at Fankel can be seen here).

<table>
<thead>
<tr>
<th>Discharge of water above the mouth of the River Sauer in m³/sec</th>
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</thead>
<tbody>
<tr>
<td>minimum discharge (05/07/1976)</td>
</tr>
<tr>
<td>mean discharge (1931 - 2005)</td>
</tr>
<tr>
<td>maximum navigable discharge</td>
</tr>
<tr>
<td>maximum discharge after canalisation of the Moselle (12/24/1977)</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>162</td>
</tr>
<tr>
<td>800</td>
</tr>
<tr>
<td>2290</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discharge of water below the mouth of the River Saar in m³/sec</th>
</tr>
</thead>
<tbody>
<tr>
<td>minimum discharge (03/07/1976)</td>
</tr>
<tr>
<td>mean discharge (1931 - 2005)</td>
</tr>
<tr>
<td>maximum navigable</td>
</tr>
<tr>
<td>maximum discharge after canalisation of the Moselle (21/12/1933)</td>
</tr>
<tr>
<td>21</td>
</tr>
<tr>
<td>320</td>
</tr>
<tr>
<td>1420</td>
</tr>
<tr>
<td>3930</td>
</tr>
</tbody>
</table>
River economics
3.1 It's good to have.
The Moselle economic area

A river. 520 kilometres. Three countries. Hence, an economic factor of very great importance. Whether it is the Moselle’s classification as a waterway of international significance (it is one of the most heavily used waterways in Europe), or whether it is the river landscape which draws a large number of tourists – the exploitation of the economic potential of the Moselle river has been the basis for thousands of jobs. Many companies that benefit from the river for their industrial production, like the world’s biggest steel producing company, have established plants along the banks of the waterway, thus providing employment for a large number of people. The Luxembourg Agricultural Centre, which to date only has one plant in Colmar-Berg, is planning to build a further site at Perl in the German Land of Saarland, because this location will provide it with cost-effective and efficient access to the Moselle waterway. The employees of the water and shipping authorities of all three countries, the businesses inside and outside the ports, tourist companies that operate on land and on the river, and also the growers of the renowned Moselle wines – the people along the Moselle are well aware of the many ways in which they benefit from the river. We, too, are aware of the great importance of the Moselle economic area, and our mission is to develop the economic aspects of this area in a responsible manner.

3.2 Having fun.
Tourism

Water is one of the most fascinating elements, perhaps even the most fascinating. For all people. The possibilities for resting, relaxing and having fun in and on a river, or on its banks, are as varied as people’s needs; and this is most definitely true for the Moselle. You can go for walks, go hiking, or go for a bicycle tour along an excellent network of paths and ways that stretches for miles along the banks of the Moselle. The beautiful Moselle landscape is renowned for its castles and ruins that speak of bygone ages. An angler may cast his rod in many places along the Moselle and be rewarded for his quiet pursuit by a rich catch of the many different types of fish that live in the river, e.g. trout, pike, perch, chub, carp, tench, zander and eel. Recreational navigation activities exist to suit all tastes: you can go for a peaceful round trip on the Moselle; there is leisure boating, for which hundreds of jetties have been built along the German section of the river alone; water and jet skiing is allowed on certain stretches of the Moselle; and for people of a more peaceful frame of mind a canoe trip along the river’s weak current. Many different events are held along the Moselle, especially in the summer months, e.g. swimming in the river, either in daytime or, lit up by torches, at night time, and sailing or rowing regattas. So the Moselle is not only good for jobs. It’s good fun too.

The Moselle provides many jobs. Those engaged in industry and commerce, tourism and wine growing, recreational navigation and commercial shipping – they all owe the river a lot.
3.3

A success story.
Traffic on the Moselle

The structural improvement to the Moselle that turned the river into a large-vessel waterway kicked off a real success story. The three riparian countries decided to improve the waterway so as to enable ships with a maximum hauling capacity of 1,500 metric tons to navigate the river – 1,500 tonnes was the usual and maximum cargo capacity in the 1960s. From then on, all projections of the volume of cargo that was expected to be transported on the river were exceeded in rapid succession. The initial long-term expectation was 10 million metric tons of cargo, but in 1970, six years after the opening of the large-vessel waterway, this volume had already been exceeded. At the beginning of the 1980s over 12 million tonnes of cargo were being transported on the Moselle (this figure uses the lock at Koblenz as its reference point) and in 1988, after the opening of the Saar large-vessel waterway, the volume of cargo increased further. In the 1990s, the depth of the navigation channel was increased in two stages from 2.7 to 3 metres on the stretch from Koblenz to Frouard near Nancy, which enabled larger ships to navigate the Moselle. Demand for transportation and the volume of cargo still kept on rising. In 2000 all records were broken, when over 15 million metric tons of cargo were transported (measured passing through Koblenz lock). Tourism on the Moselle, for instance river cruises, has contributed to the rise in traffic. So there was ample justification for declaring the planned construction of a second lock chamber on all Moselle damming stages in Germany to be an official project in 2003; in that year the planned doubling of locks was classified as an “urgent requirement” in the Federal Transport Infrastructure Plan. Today, approximately 12,000 cargo ships navigate the Moselle every year and also 5,000 passenger ships, with and without cabins.

Source: Waterways and Shipping Directorate (WSD) Southwest, Mainz

<table>
<thead>
<tr>
<th>Volume of freight carried on the Moselle</th>
<th>in millions of tonnes per year (through Koblenz lock)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Thanks to freight shipping and pleasure craft, there has been a steady increase in traffic on the Moselle since construction of the large-vessel waterway.
3.4

Watching them go by.
Types of ship on the Moselle

Sitting on the banks of the Moselle, you can watch giant cargo ships carrying ore or coal glide by at a leisurely pace. Or you can follow the route of a multi-storey passenger ship, its guests relaxing on board; or you can observe the energetic captain of a nimble pleasure craft sail by. The dry statistics, on the other hand, will inform you about the number of vessels of each ship type that navigate the Moselle. A clear trend can be spotted: cargo ships with a length of 135 metres (442 feet) are increasingly common on the Moselle, in part doubtlessly due to a change to the Moselle Waterway Police Ordinance that was introduced in January 2010. This change allows a 135 metre ship to be navigated without a special permit, provided it meets certain conditions. The most common type of ship is still the 87 to 110 metre class, followed by the 68 to 86 metre class. Barge convoy sets or breasted-up formations that may have a length of up to 172 metres (564 feet) are still less frequent on the river, but their number is on the increase, nevertheless.
Breasted-up formation
Length: circa 172 metres
Width: circa 11.4 metres
maximum 4,000 tonnes

Passenger ship (Princesse Marie-Astrid)
Length: circa 30 metres
Width: circa 11.4 metres
500 passengers

Comparison between the types of ships

Cargo motor ship of the “Spitz”-type
Length: circa 58 metres;
width: circa 5 metres; 400 tonnes

Barge convey set
Length: circa 172 meters; width:
circa 11.4 metres; approx. 3,200 tonnes

Cargo motor ship of the “large Rhine barge”
Length: circa 110 metres; width: circa 11.4 metres; approx. 2,500 tonnes

Passenger ship
Length: circa 60 metres;
width: circa 11.2 metres;
500 passengers

Cargo motor ship of the “RHK”-type (Rhine-Herne-Canal)
Length: circa 90 metres; width: circa 9.5 metres;
approx. 1,500 tonnes

Powered tank ship
Length: circa 110 metres
Width: circa 11.4 metres
Circa 2,500 tonnes

Pleasure motor yacht
Length: circa 10 metres
Width: circa 3.5 metres
circa 10 tonnes
3.5

Flying the flag.
Cargo transport by country

<table>
<thead>
<tr>
<th>Cargo transport by country / market share in percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
</tr>
<tr>
<td>2010</td>
</tr>
<tr>
<td>2009</td>
</tr>
<tr>
<td>2008</td>
</tr>
<tr>
<td>2007</td>
</tr>
<tr>
<td>2006</td>
</tr>
</tbody>
</table>

Source: Waterways and Shipping Directorate (WSD) Southwest, Mainz

3.6

Realising potential.
Plans and visions

The Moselle Commission naturally also pays attention to the "big picture". And, of course, the interests of shipping are what counts for us. We need to focus on the potential offered by inland navigation on a European scale. This means planning ahead for high-capacity and modern infrastructure of 21st century Europe. It also means looking at the efficiency and cost-effectiveness of the transport sector, and at the ecological footprint that comes with it. Today, sea shipping accounts for 90 per cent of world trade transport and nearly 95 per cent of the European Union's external trade. Inland navigation is the most competitive and environmentally friendly means of transport, so, based on our global view of things, we should be further promoting the excellent possibilities this mode of transport has to offer. Our long-term objective is to use the European network of waterways, which has an overall length of 36,000 kilometres (over 22,000 miles), in a more efficient way. Visionary planning and practical measures may differ in scope and planning horizon, but they both help to realise the huge potential of inland navigation, bit by bit. In moving closer to realising our potential we are also aided by EU action programmes like NAIADES, TEN-T or "Marco Polo".

It is also interesting to compare the amount of cargo each country transports on the Moselle. For many years now, ships sailing under the Dutch flag have clearly dominated commercial shipping. In 2011, Dutch ships transported 50 per cent of all cargo on the Moselle. Second place went to ships sailing under the Belgian flag, which had a market share of 26 per cent. Ships sailing under the German flag had a share of the market of 11 per cent, ranking them in third place. The overall ranking has been more or less stable for many years now.
Lifting of bridges
The lifting of bridges in the French section of the Moselle is an example of a recent project. In the past, because the clearance height of the French bridges was too low, only two layers of containers could be transported on this stretch of the river. By lifting the bridges up to 55 centimetres (nearly 23 inches), the clearance of the bridges is 6.17 metres (20 feet) on about 300 days per year now. Depending on how they are loaded, three-layered container transports are now possible on the entire International Moselle between Metz and Koblenz.

Doubling of locks
The doubling of all locks in the German section of the Moselle is a project that has been ongoing for some time. The reason for this is, as mentioned, that the traffic on the Moselle waterway has been on the increase for years. With more goods being transported and a large number of tourist ships navigating the river, it had become more and more obvious in recent years that the situation needed to be improved. Today, the second lock in Zeltingen is already operational. The second lock in Fankel has been built and is ready for trial operations; construction of the second lock chamber at Trier will begin shortly. All the new structures are scheduled to be completed by 2030 at the latest, and will ensure that traffic flows freely on the Moselle waterway.

Saône-Moselle-Saône-Rhine connection
An ambitious and visionary project and a great leap forward in securing inland navigation's premier place within the European transport sector is the planned joining of the Rhône and Rhine basins. The two river basins could be linked by a European large-vessel waterway that joins together the Saône and the Moselle and, at the same time, connects the Saône to the Rhine. This waterway would provide a direct transport link from the Mediterranean ports of Marseille and Sète to the North Sea ports of Rotterdam and Antwerp.

Studies that were published in the period 2007 to 2009 concluded that it is feasible. It also enjoys backing from politicians. Public debate on the project will be initiated in 2013. Then we will see whether the Saône-Moselle-Saône-Rhine project can become what it could be: a viable alternative to rail transport for the supply of goods to Western Europe! We would expect the link to be completed in 2025.
3.7

Stations along the way.
Ports on the Moselle

There are six public ports as well as a number of company ports and private transshipment ports on the Moselle. These places of vibrant activity act as commercial hubs and as interfaces for the various modes of transport. Incoming goods are either placed in interim storage or are processed on the spot. The goods then continue their journey by railway or heavy goods vehicle, or they are loaded onto ships for long-distance transport. Ports act as service centres and as logistical junctions that enable commercial transport to switch between land and water. Ports also generate jobs and create a healthy and strong local business environment.

Port of Trier
The Port of Trier is the only public inland port in the German section of the Moselle, and it holds a special place among the Moselle ports. All European metropolitan areas within 300 kilometres of Trier, i.e. those in the west of Germany, in Belgium, Luxembourg, the Netherlands and in France, are within easy reach. This fact helps to explain why the Port of Trier is one of the most highly developed commercial and industrial centres in the region.

Mertert Port
The next port on our trip up the Moselle is Mertert Port, the only port in the Grand Duchy of Luxembourg. Nevertheless, Mertert Port offers modern three-way intermodal transport solutions and is an important transshipment centre for bulk goods like iron, steel, coal, petroleum, building materials or cereals.

Port of Thionville-Illange
The first port one reaches after crossing the border into France is the largest domestic port in France for the transportation of metallurgic products. Road, rail and waterway are closely interconnected at this port, too. The Moselle Mining Canal, the "Canal des Mines de Fer de la Moselle", also begins at the port.

New Port of Metz
The New Port of Metz, or "Nouveau Port de Metz" in French, is located at Moselle kilometre 294. The port is the largest port for the transshipment of cereals in France and, taking into account all the goods transported, it is the sixth largest French port.

Mazerolle Port at Metz
The Mazerolle Port at Metz is situated only three kilometres up the river. This port, too, is one of the most important transshipment centres for the French trade in cereals. Like the Nouveau Port, it provides a good connection to the railway network. Both ports in Metz are considered as strategically important links for cargo transported between the north and the south as well as between the east and the west.

Port of Nancy-Frouard
Nancy-Frouard, the last of the French Moselle ports, is also the last port on the Moselle itself. Situated at the confluence of Moselle and Meurthe, Nancy-Frouard is a further important inland port and a junction between railway and waterway.
3.8

A project with a future.
The planned Moselle container line

When it was put forward, the idea of running a regular container service along the Moselle was met with keen interest by the regional industry and commerce. This regular service is meant to connect the northeast of France to the seaports of Rotterdam and Antwerp, and also to the German market. The four ports of Nancy, Metz, Thionville and Trier would be eligible as calling points, because they already offer three-way intermodal transport solutions. The feasibility of the project has been confirmed. If the plan were put into practice swiftly, the first services from French ports could be up and running as early as 2013, and the Port of Trier would be joined to the service only a short time later. This venture could be carried out by a 135-metre-ship with a capacity of 204 containers stacked in three layers.

3.9

Gateways to the North Sea.
The ARA ports

The Moselle flows into the Rhine at “Deutsches Eck” in Koblenz, and, once on the Rhine, ships can sail to the big Dutch ports of Amsterdam and Rotterdam and to the biggest Belgian port, the Port of Antwerp. These three ports are collectively known in the world of shipping as the “ARA ports”. These so-called general purpose ports handle not only containers, but all sorts of cargo that cannot be shipped in containers, e.g. project cargo, suction cargo, liquid cargo, grabbable cargo and bulk cargo. The distance from these ports to the Moselle ports is roughly 300 kilometres (186 miles). This amounts to something of a short hop compared to the 7,300 kilometres (over 4,500 miles) of the German inland waterway network, or the approximately 8,000 kilometres (4,971 miles) of the waterway network in France.
Inland navigation and the environment
4.1 Protecting what’s valuable.
The Moselle habitat

It would be difficult to find a type of transport that is more environmentally friendly than inland navigation. But inland navigation and its benefits should not be considered in isolation. The environment in which this mode of transport is carried out also needs our care and attention. There are many different jobs to be done, e.g. preserving water quality, protecting habitats along the waterway, or disposing of shipping waste. The Moselle Commission and its member states take account of environmental and water protection issues whenever they take a decision. We have strong partnerships, for instance with the International Commissions for the Protection of the Moselle and the Saar (ICPMS). Our aim is to balance shipping and environmental interests. This becomes apparent in the way structures are built or operated along the Moselle. Many compensating measures along the river, like the upgrading of fishways at all damming stages, show the responsible manner in which the Moselle habitat is being managed. We appreciate the value of both: inland navigation and the environment.

4.2 Benefiting the environment.
The CDNI Convention

The introduction of the so-called CDNI fee has provided a strong framework with which to manage shipping waste. The aim of the Convention on the Collection, Depositing and Acceptance of Waste in Rhine and Inland Navigation is to prevent the polluting of rivers by ships. Its signatories include Germany, France and Luxembourg. Amongst other things, the Convention provides a consistent international basis for the disposal of waste from shipping; it also provides for the disposal of waste based on the “polluter pays” principle. A system which can boast broad acceptance.

[Image of a river with text: Shallow water zones, like the “Graacher Werth” near Zeltingen photographed here, protect young fish from the wash of the waves and safeguard the free development of flora and fauna that is characteristic of their species.]
4.3

Blue turns into green.
Power plants along the Moselle

The generation of electricity by the power of water is a very environmentally friendly way of producing energy.

In 28 power plants along the river, water power is used to generate “green energy”, i.e. environmentally friendly electricity. There are 10 power plants in the German section, 2 in the joint German-Luxembourg section, and 16 in the French section. Power is generated at the damming stages, where the concentrated energy of the dammed water has the greatest effect. A power plant’s output depends on two factors: the volume of water that flows through the plant and the difference in elevation at the damming stage. It is no surprise, then, that Detzem power plant, whose damming stage, at 9 metres (30 feet), has the greatest difference in elevation on the Moselle, produces the largest amount of electricity. Its yearly output is 112 million kilowatt hours.

Detzem is followed by Wintrich, Lehmen and Enkirch damming stages, which, at 7.5 metres (24 feet), have a slightly lower difference in elevation. A power plant will produce electricity as soon as the swiftly flowing water sets its turbines in motion, making them spin. The spinning turbines will then drive a generator that produces electricity. The ten German Moselle power plants alone have a joint output of about 180,000 kilowatts, and they provide 265,000 homes with environmentally friendly energy. As the other power plants have a smaller difference in elevation and a lower rate of flow, their output is, of course, not so great.
4.4

Facts do the talking.
Comparing types of transport

The most important parameters relevant to transportation leave no room for doubt: there is virtually no other type of transport that is able to carry the same amount of cargo in the same safe and environmentally friendly manner as inland navigation. Inland navigation is top of the class when it comes to both energy consumption and carbon dioxide emissions. Shipping bulk goods by waterway, for instance, is an environmentally friendly and cost-effective way of transporting cargo. The noise emitted by an inland navigation vessel is far below permissible limits. Inland navigation is also the most economical mode of transport when it comes to comparing so-called external costs – the costs for greenhouse gases, air pollutants, accidents and noise.

Today, 25 per cent of all domestic long-distance transport services are carried out by inland navigation vessels. While road and rail services often operate at their peak capacity or actually beyond, waterways still have huge capacities to grow.

The future of inland navigation is bright.

Comparison of carbon dioxide emissions in grams per tonne-kilometre

<table>
<thead>
<tr>
<th>Mode</th>
<th>CO₂ (g/km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railway</td>
<td>48,10</td>
</tr>
<tr>
<td>Inland waterway vessel</td>
<td>33,40</td>
</tr>
<tr>
<td>HGV</td>
<td>164</td>
</tr>
</tbody>
</table>

Costs of carriage per tonne-kilometre in euros

<table>
<thead>
<tr>
<th>Mode</th>
<th>Cost (€/km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy goods vehicle</td>
<td>2.56</td>
</tr>
<tr>
<td>Railway</td>
<td>0.59</td>
</tr>
<tr>
<td>Inland waterway vessel</td>
<td>0.18</td>
</tr>
</tbody>
</table>

Costs borne by the entrepreneur have been included: e.g. costs for equipment, staff, energy etc., and also costs borne by the general public: e.g. transport infrastructure network, environmental damage, accidents etc.

Source: *The Local Offices for Waterways and Shipping in Koblenz and Trier (WSA Koblenz; WSA Trier)*
5.1

Important Waterway Signs and Marking

Prohibitory Signs
- No entry (general sign)
- Do not create wash
- No berthing (i.e. no anchoring or making fast to the bank)
- End of zone authorized for high speed navigation of small sport and pleasure craft

Mandatory Signs
- Proceed in the direction shown by the arrow
- Stop as prescribed in the regulations
- Keep a particularly sharp lookout
- Do not exceed the speed indicated (in km/h)

Restrictive Signs
- Depth of water limited
- Headroom limited
- Width of passage or channel limited

The channel lies at a distance from the right (left) bank: the figure shown on the sign indicates the distance in metres, measured from the sign, to which vessels should keep.

Recommendatory Signs
- You are recommended to proceed: In the direction shown by the arrow
  a) In both directions
  b) Only in the direction indicated (passage in the opposite direction prohibited)

Informative Signs
- Entry permitted (general sign)

NIF = Possibility of obtaining nautical information by radio-telephone on the channel indicated
- Water skiing permitted
- Turning area

5.2

Facts & Figures

Information on the waterway:
- Source:
- Confluence:
- Total length:
- Difference in elevation:
- Number of damming stages:
- Depth of navigation channel:
- Width of navigation channel:
- Loaded draft:
- Narrowest curve radius:
- Minimum clearance under bridges:
- Drainage basin:
- Waterway class:
- Main tributaries:
- Public ports:

Further technical data:
- Period of operation:
- Reporting systems:
- Number of power plants:
- Number of bridges:

Buoyage of fairway limits in the waterway

Legal notice:
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