



# COUNTRY PROFILE

on recycling management and water management in  
**UKRAINE**



German RETech Partnership  
Recycling & Waste Management  
Made in Germany



German Water  
Partnership



## IMPRINT

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## COUNTRY PROFILE UKRAINE

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## LIST OF ABBREVIATIONS

EU	European Union
GDP	Gross domestic product
HDPE	High density polyethylene
IFC	International Finance Corporation
IWAS	International Water Research Alliance Saxony
LDPE	Low density polyethylene
MBT	Mechanical biological treatment facility
MENR	Ministry of Ecology and Natural Resources
MinRegion	Ministry of Regional Development, Construction, Housing and Municipal Services
NCSREU	National Commission for State Regulation of Energy and Utilities
PA	Producers' Association
PCC	Paper, cardboard, card
PE	Polyethylene
PET	Polyethylene terephthalate
SEI	State Ecological Inspectorate
SME	Small and medium-sized enterprises
UAH	Hryvnja, currency in Ukraine
UFZ	Helmholtz Centre for Environmental Research
UWT	Ukrainsky Vodni Tekhnologiyi LCC
WHO	World Health Organization
WIF	Waste incineration facility

## CREDIT

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## 1. PREFACE

The environmental technology export initiative of the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMUB) aims to disseminate and strengthen the knowledge and application of environmental and climate protection technologies and innovative (green) infrastructures in the target countries. In terms of spreading knowledge, activities should be promoted to help small and medium-sized enterprises (SMEs) – who are in great need of support with internationalising their “green” service portfolio – to tap into the constantly growing worldwide demand for environmental, climate protection and efficiency technologies. This also includes information management in the companies, which can be supported by the provision of market information.

The associations German RETech Partnership and German Water Partnership have found that individual companies have often had difficulties accessing well-founded economic, legal, political, market-relevant and competition-related information for a relevant target market that is also tailored to SMEs and could be used as a basis for making an investment decision. Particularly when supporting SMEs with limited staff and financial resources it is essential to have a solid and practical information base to encourage companies to pursue new markets. This is also a requirement so that further export promotion measures can have their desired effects.

The companies behind this proposal, RETech and GWP, and the energy and environmental technology consulting company eclareon have already worked closely together on this issue in 2014 and 2015. This collaboration was part of a study regarding the existing tools to promote exports, which was created by eclareon, as part of an export initiative on environmental technologies on behalf of the German Federal Ministry for Economic Affairs and Energy.

When it comes to advising the public bodies responsible for the organisation of waste management in the respective target countries, German municipalities also play a substantial role and are very often asked for support. Just like the SMEs, they require well-founded knowledge about the contextual framework of the relevant target countries. Uve GmbH for management consultation has a comprehensive municipal network and established knowledge with regard to the necessary conditions for establishing waste management structures and has contributed this.

During the formulation of recommendations for action for the German government on the possible form of an export initiative in the course of the above-mentioned study, common priority countries were first defined for recycling and water management regarding the development of well-founded market information that is tailored to the needs of the industries. This is precisely where our project comes in for the conception, development and distribution of country profiles in Ukraine, Jordan, Serbia, United Arab Emirates, Saudi Arabia and Cuba. This project draws on the recommendations for action from 2015 and, for the first time, creates joint market analyses in the form of country profiles for German recycling and water management, distributes this in both industries, and on the basis of this, draws up a common market access strategy for these countries.



In the context of a grant project with support from the BMUB


- a common structure for such country profiles was drafted,
- which was developed for a general, cross-industry section and the respective industry-related section,
- and the research, analyses and preparations from consultancy companies with experience in these countries were implemented.

During the selection of the target countries for these measures, foreign markets were chosen that were currently interesting for both industries, but were still lacking in transparency.

The results of the work are made available in this publication for companies from both industries and all those interested for free. Because of the positive experiences of both associations, the progression of the project currently is being worked on with new countries being ready for publication in 2018.



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## 2. SUMMARY

With its 44.6 million inhabitants, Ukraine is an extremely interesting market for German companies in the recycling and water management sectors – for either providing planning and engineering services or supplying equipment. Ukraine is also interesting as a production location. The free trade agreement with the EU, the proximity to the Western and Eastern European markets, the well educated workforce and the relatively low wage costs are just some advantages of the country. However, it is important that reforms in the country are carried out consistently. As well as budgetary consolidation, there is also a particular need to fight against corruption and reform the justice system. The implementation of declared reforms or previously passed laws is slow in several areas, including recycling and water management.

Recycling management has good business prospects across the entire value chain for municipal waste. The fleets and container systems of the majority of waste collectors are outdated. The fact that only approx. 70 % of the population has public disposal makes the potential for suppliers of collection systems clear. Efforts to make the separate collection of recyclable material and residual waste widespread also means great business potential for suppliers of collection systems and downstream sorting and treatment technology. In the waste disposal industry, business opportunities present themselves in the remediation and reinforcing of existing landfills, in gas collection and conversion into energy, and in building new landfill sites with suitable sealing as well as gas and leachate collection systems. As well as the resolute implementation of passed legislation, the creation of financial aids, such as a packaging tax that makes investing in modernising waste management more attractive for municipalities and waste collectors, is a requirement for the modernisation of Ukrainian waste disposal.

For German companies in the water sector, there is great business potential in Ukraine for both component manufacturers and facility manufacturers, and also for consultants and engineering companies. Outdated and run-down pipeline networks, pumps and systems in the drinking and wastewater sector in Ukraine cause a considerable wastage of water (around 38 %). This presents huge business opportunities for recording the state of pipeline and sewer systems, and renovating and building new systems. A lack of capacity for the stabilisation and storage of sewage sludge also creates demand for building sludge treatment facilities. The drastic increase in the previously subsidised water tariffs also promotes investments in energy-efficient solutions for processes in drinking water treatment, sewage treatment facilities and sludge treatment. As well as business prospects in technical modernisation and efficiency enhancement, there is a particular need for training and further education of qualified personnel and consultation regarding planning, construction management and operations for water and wastewater facilities. And lastly, there are also good business prospects in decentralised facilities for water supply and wastewater management.

### 3. COUNTRY-SPECIFIC BASIC INFORMATION

#### 3.1. GEOGRAPHY AND DEMOGRAPHICS

##### Area and population density

In terms of size, Ukraine is the second largest country in Europe after Russia with an area of 603,500 km<sup>2</sup>. It ranks 7th place in Europe with a population of 44.6 million inhabitants [1]. Disregarding the peninsula of Crimea, the population currently stands at 42.7 million [2]. Bordering countries are Russia, Belarus, Poland, Slovakia, Hungary, Romania and Moldova. The Black Sea borders to the south and the Sea of Azov borders to the south east.



Figure 3.1: Map with individual regions (oblasts)

Source: [wikimedia.org](https://commons.wikimedia.org/wiki/File:Ukraine_regions_ukr), 2016

The 2,285 km long Dnipro (Dnieper) splits the country into east and west. The large dams along the river give the country its water and energy supply. Central and Eastern Ukraine is dominated by forest and grassland. There are also particularly nutrient-rich fields of black earth in this area, making Ukraine the world's largest exporter of sunflower oil and the third biggest exporter of grain. To the west of the country, along the border with Slovakia and Romania, the Carpathian forest contains the largest primeval forest in central Europe. Ukraine's largest mountain is the Hoverla at 2061 m.

## Climate

The majority of Ukraine has a temperate climate. The north and north east has a continental climate with cold winters and warm summers. Most of the precipitation occurs in the west and the north, with less rain in the east and south east. Winters are cool around the Black Sea and cold inland. Summers are mainly warm, and can often be hot in the south [3].

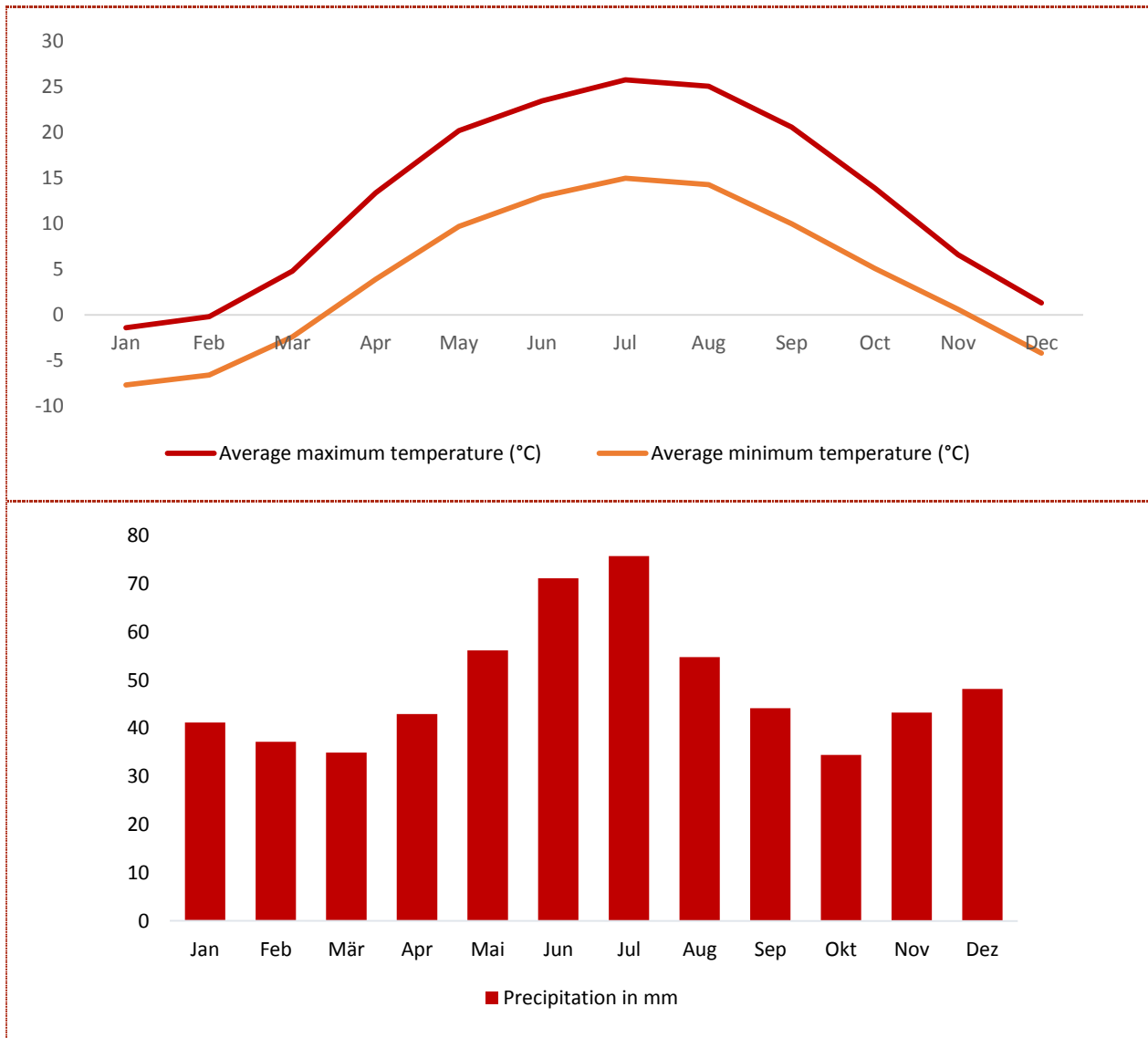


Figure 3.2: Average temperatures and precipitation

Source: [wetter.de](http://wetter.de), 2016 [4]

## Age structure and urbanity

The population has been decreasing consistently since the beginning of the 90s because of low birth rates. In 1991, the population was 51.4 million [5]. The population density is considerably less than in Germany (231.5 per km<sup>2</sup>) with 77.0 inhabitants per km<sup>2</sup>.

In 2015, around 15 % of the population was between 0 and 14 years old, 70 % between 15 and 64, and 15 % 65 and above [6].

Around 70 % of the population lives in cities. This is somewhat below the German level of 75 % [7]. The capital city of Kiev has 2.8 million inhabitants. Other cities with inhabitants in the millions are Kharkiv, Dnipropetrovsk, Donetsk, and Odessa.

Table 3.1: Population of the 10 biggest cities

Kiev	2,797,553
Kharkiv	1,430,885
Dnipropetrovsk	1,032,822
Donetsk	1,024,700
Odessa	1,001,558
Zaporizhia	796,217
Lviv	717,803
Kryvyj Rih	652,380
Mykolaiv	510,840
Mariupol	481,626

Source: World Population Review, 2016 [8]

### Ethnic, linguistic and religious groups

Ukraine is a country of many ethnicities, in which ethnic Ukrainians make up almost 78 % of the population, while Russians are the largest minority at over 17 %. The regional distribution of the Russian population is very heterogeneous. In Crimea and in the easterly areas of Ukraine, the Russian population is a majority, whereas in the western and majority of central areas, excluding Kiev, they are only a small minority [9].

The vast majority of the population speak both Ukrainian and Russian. Both languages have east Slavic origins and so speakers of them can usually understand the other. In the last census from 2001, 67.5 % of those asked cited Ukrainian as their native language and 29.6 % stated Russian. In the western and northern areas, Ukrainian is mainly or mostly spoken; in the southern and eastern regions it is mostly Russian [10]. After independence in 1991, Ukrainian was made the only official language. Ukrainian uses a variant of the Cyrillic alphabet.

71 % of Ukrainians are members of a church; 68 % of this number would describe themselves as orthodox Christians in turn. 8 % are members of the Greek-Catholic Church. Catholics are most prominent in the western provinces of Lviv, Ternopil and Ivano-Frankivsk [11].

## Education

In 2011, a total of 6.2 % of the GDP in Ukraine was used for education expenses (compare with Germany's 4.8 % in the same year) [12].

Since independence in Ukraine at the beginning of the 90s, there has been a considerable alignment with the European education system. The twelve-year school education in Ukraine is compulsory and is divided into three stages: Primary school (years 1 to 4), middle school (years 5 to 9) and secondary school (years 10 to 12) [13]. The first foreign language (which is generally English) is compulsory from year 1, with a second from year 5.

At the beginning of the academic year 2014/2015, Ukraine had 175 universities and around 100 other higher education institutions. As well as this, there are 387 vocational institutions in total. Of the approx. 590,000 people who graduated in 2014, 40 % completed their studies in sociology, economics and law, and 21 % did engineering [14]. The number of students per 100,000 inhabitants is 4,769. (compare with Germany with 3,611 students in the same year) [15].

In Table 3.2, several universities and research institutions that work on water and recycling management are listed.

**Table 3.2: Universities and research institutions – water and recycling management**

National University of Life and Environmental Sciences of Ukraine	Kiev
The National Academy of Sciences of Ukraine	Kiev
V. N. Karazin Kharkiv National University, School of Ecology	Kharkiv
Ukrainian Scientific Research Institute of Ecological Problems	Kharkiv
National University of Water Management and Nature Resources Use	Rivne

Sources: Larive 2014 [16], independent research, as of 10/2016

## Level of development

The Human Development Index 2014 from the UN, which takes into consideration income, life expectancy and education statistics, ranked Ukraine 81 out of a total of 188 countries with 0.747 points. In comparison, Germany is in 6th place with 0.916 points [17].

## 3.2. POLITICS AND ECONOMIC DEVELOPMENT

### Form of government and current political developments

Ukraine is a parliamentary and presidential republic. The parliament (Verkhovna Rada) is elected according to a mixed system, where 225 seats are available to list candidates subject to a proportional representation voting system (5 % threshold), and 225 seats are given to direct candidates in the constituencies through a first-past-the-post system. Due to resignations and unfilled seats in Crimea and East Ukraine, the parliament currently consists of 418 representatives.

Ukraine has been governed centrally to date. The regional and municipal administrative bodies have relatively little expertise. The country is split into 27 administrative units: 24 provinces (oblasts), the cities of Kiev and Sevastopol and the Autonomous Republic of Crimea. Governors are appointed by the president and can also be dismissed by them [18].

Petro Poroshenko has been President since June 2014. In April 2016, the two largest factions in parliament, the Petro Poroshenko group (Petro Poroshenko Bloc) and the popular front (Narodny Front) agreed on a new coalition government. The Prime Minister is Volodymyr Groysman.

Ukraine is currently in a challenging position both in terms of domestic and foreign policy. For one, the peninsula of Crimea has been occupied and de facto annexed by Russia since March 2014. Pro-Russia separatists in East Ukraine have also formed the Donetsk People's Republic and the Luhansk People's Republic. There is still unrest in East Ukraine. There are around 1.7 million internally displaced persons from the crisis areas in the country [18].

At the same time, the new government is eager to continue with the reformation and decentralisation programme. This programme is based largely on the stipulations of the Association Agreement with the EU that came into effect on 01/01/2016. The reformation programme includes, for example, further privatisation, austerity measures for fiscal consolidation, adjustment of energy prices to actual market prices, reduction of the black economy and the delegation of tasks and tax revenue to the communities.

Ukraine has freedom of the press. German experts have identified the development of civil society, which is constantly growing in strength and condemns wrongdoing in the country, such as the unlawful deforestation of the Carpathian forests, as a positive [19]. It can be expected that awareness of environmental concerns will also improve within the population through the activities of civil society.

**Currency, GDP, growth, inflation**

The currency in Ukraine is the hryvnia (UAH). One hryvnia is equivalent to around €0.034 (23/09/2016); fluctuations against the euro have reached up to 10 % in the last 6 months. There are 100 kopyky in one hryvnia.

The gross domestic product was US\$ 90.6 billion in 2015. The GDP per head is US\$ 2114.96 [20].

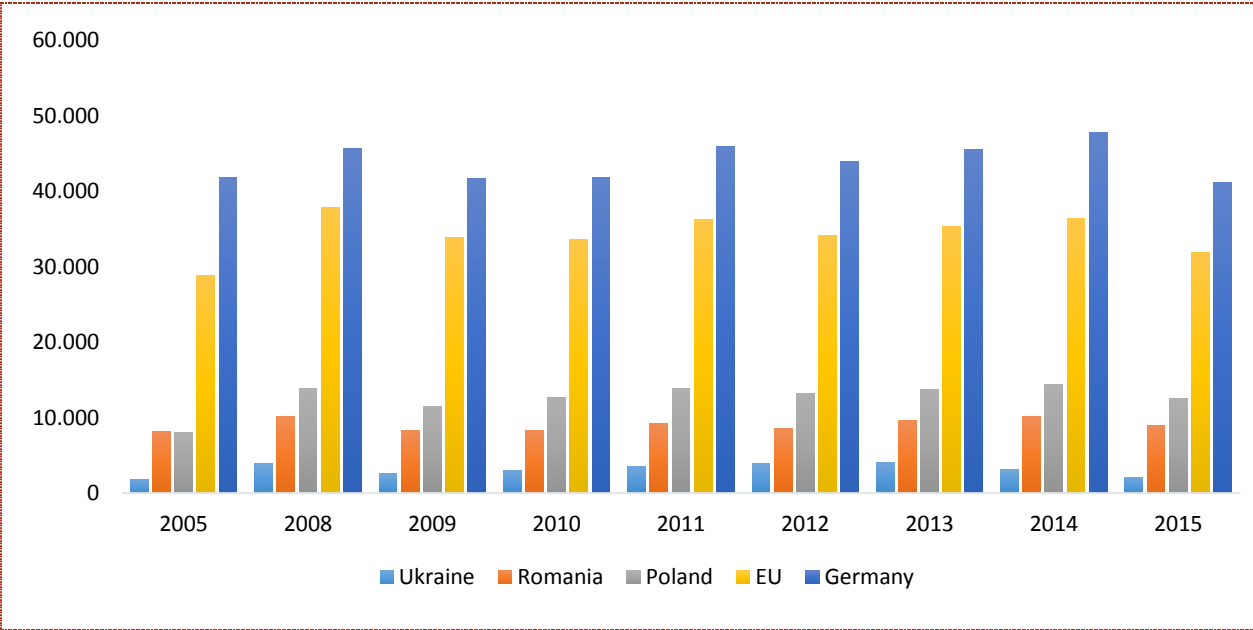


Figure 3.3: Development of GDP per inhabitant in selected countries

Source: World bank, 2016 [21]

The sound recovery of the Ukrainian economy after the economic crisis in 2008/9 was above all ruined by armed conflict in the east of the country. In 2014, the GDP fell by more than 6 % and almost 10 % in 2015. In 2016, however, the economy was able to stabilise and the first half of the year saw a rise of 0.8 % in economic performance. Because of the weak global economy and uncertainty in the east of the country, the World Bank estimates a growth of 1 % in 2016 and 2 % in 2017. If efforts towards reformation are continued and exports to the EU can be raised, then growth rates of even 3 to 4 % could be expected in the next few years [22].

The central bank of Ukraine anticipates an inflation rate of 12 % in 2016 after inflation rates of 24.9 and 43.4 % in 2014 and 2015 [23].

### **Income and employment**

The average wage in Ukraine is around €200 a month. In terms of regions, the inhabitants of the capital city of Kiev have the highest income with an average of just over €310 a month. The agricultural areas of Kirovohrad in central Ukraine, Bukovina in the west, and the Galician Ternopil region, bring up the rear with wages of approx. €145 – 150 per month. The minimum wage has been €52 a month since May 2016 [24].

In 2015, the unemployment rate was 9.5 % and youth unemployment for the age group 15 to 24 years was around 23 % [25].

### **Important industries**

Important industries in Ukraine are the metallurgical and chemical industries, as well as the agriculture and the food industry.

With a steel production of 22.9 million tonnes in 2015, Ukraine occupies 10th place globally for steel producing countries [26]. A large proportion of this production is exported, mainly as crude steel and in the form of semi-finished products. The core of the industry is made up of privatised metallurgical consortiums, predominantly located in Dnipropetrovsk, Luhansk, Donetsk and Zaporizhia, and controlled by large Ukrainian companies. ArcelorMittal, the largest steel producer in the world, took over the “Kryvyj Rih metallurgical consortium” as early as 2005. The industry has a large accumulated demand for modern technologies, especially in the energy efficiency field [27]. Since 2013, steel production has fallen by around 30 % because of the conflict in Donetsk and Luhansk [28].

The chemical industry in Ukraine consists of around 200 larger companies with approx. 350,000 employees, which makes it one of the biggest contributors to the export volumes in the country. It is heavily oriented around the production of oil derivatives and nitrogen fertilisers and is dependent on the competitiveness of domestic gas prices [29].

In 2015, agriculture made up 10.7 % of the GDP and 38.2 % of the country’s exports. Ukraine is the third biggest exporter of grains in the world and the global market leader for growing and processing sunflowers. The excellent black earth and the temperate climate greatly benefit Ukrainian agriculture. The Black Sea ports enable year-round access to the world markets [30]. In 2015, 2.9 million people were employed in the agriculture and forestry industries [31].

### **International economic relations**

German-Ukrainian trade made up €4.6 billion in 2015. While imports from Ukraine continued their steady growth (2 %), German exports fell by 18 %. In the first half of 2016, however, German exports to Ukraine grew by almost 31 percent. Germany mainly supplies chemical products, machines and vehicles and vehicle parts to Ukraine, and is the second most important supplier for Ukraine after Russia. The most important imports for Germany from Ukraine are electronics, raw materials, iron and steel as well as foods [32].



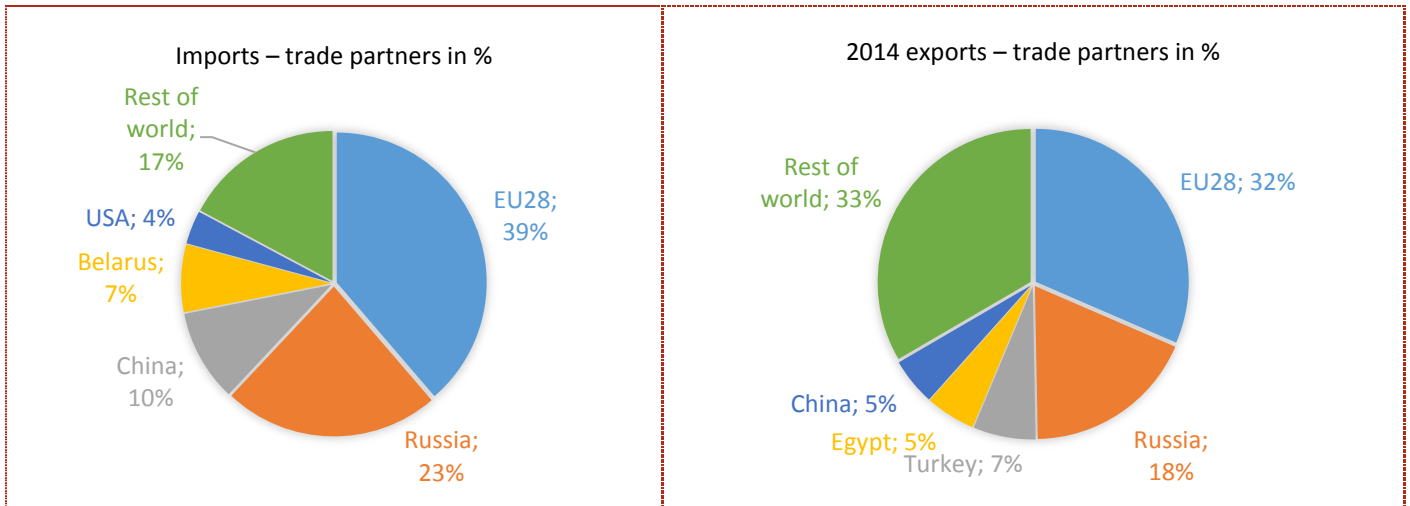


Figure 3.4: Important trade partners for Ukraine

Source: WTO, 2014 [33]

In terms of foreign direct investors in the country, Germany took third place in 2015, behind Cyprus and the Netherlands, with investments of 5.4 billion US dollars. The total foreign direct investment at the end of 2015 was 43.4 billion US dollars [34].

### Infrastructure

The traffic infrastructure of the country is in need of modernisation in some areas. International financial institutes, especially the World Bank, the European Investment Bank and the EBRD, support the modernisation of major roads.

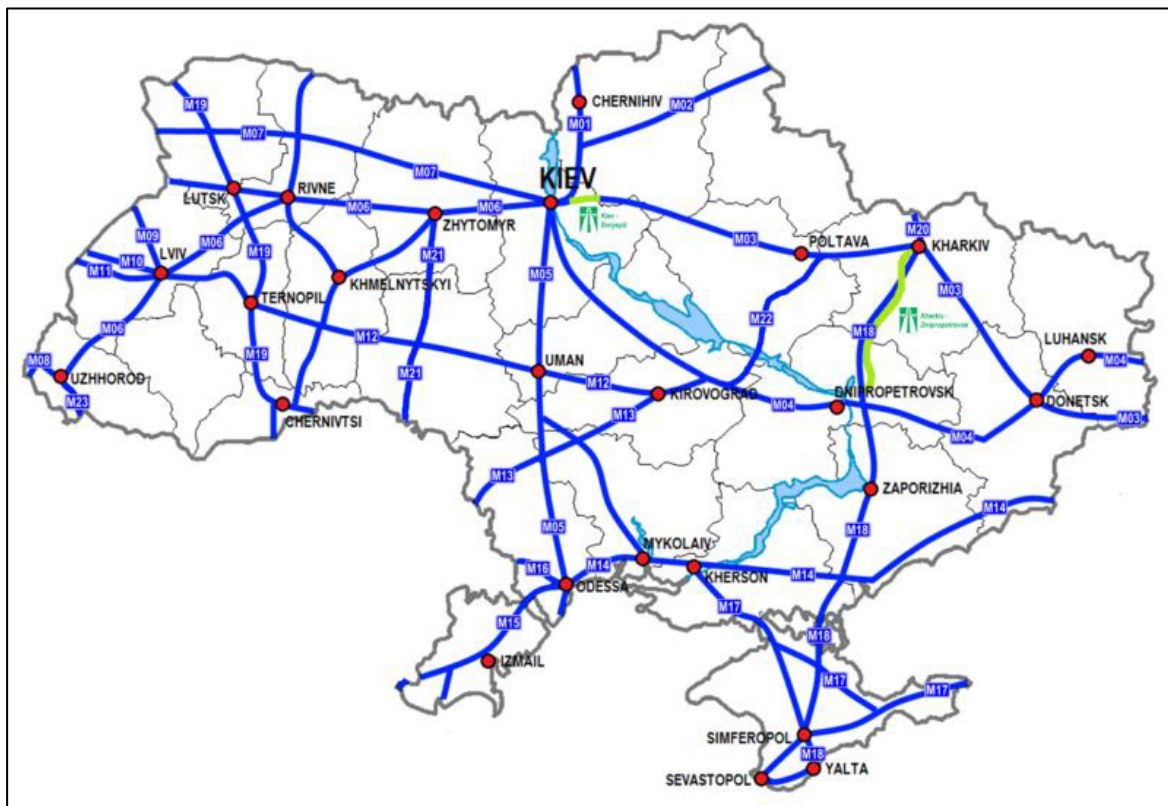


Figure 3.5: Major road networks in Ukraine

Source: wikimedia.org, 2016

Other important projects include expanding the underground network in Kiev, Kharkiv and Dnipropetrovsk. The national railway in Ukraine also has plans for considerable investments in renewing

its rail network. The country is carrying out ambitious projects such as expanding the handling capacities of its Black Sea ports, for example for grain in Odessa [35].

There are direct flights to Boryspil International Airport in Kiev from Berlin, Frankfurt and Munich. The Zhuliany International Airport in Kiev can be reached directly from Dortmund and Memmingen. Lviv can be reached directly from Munich.

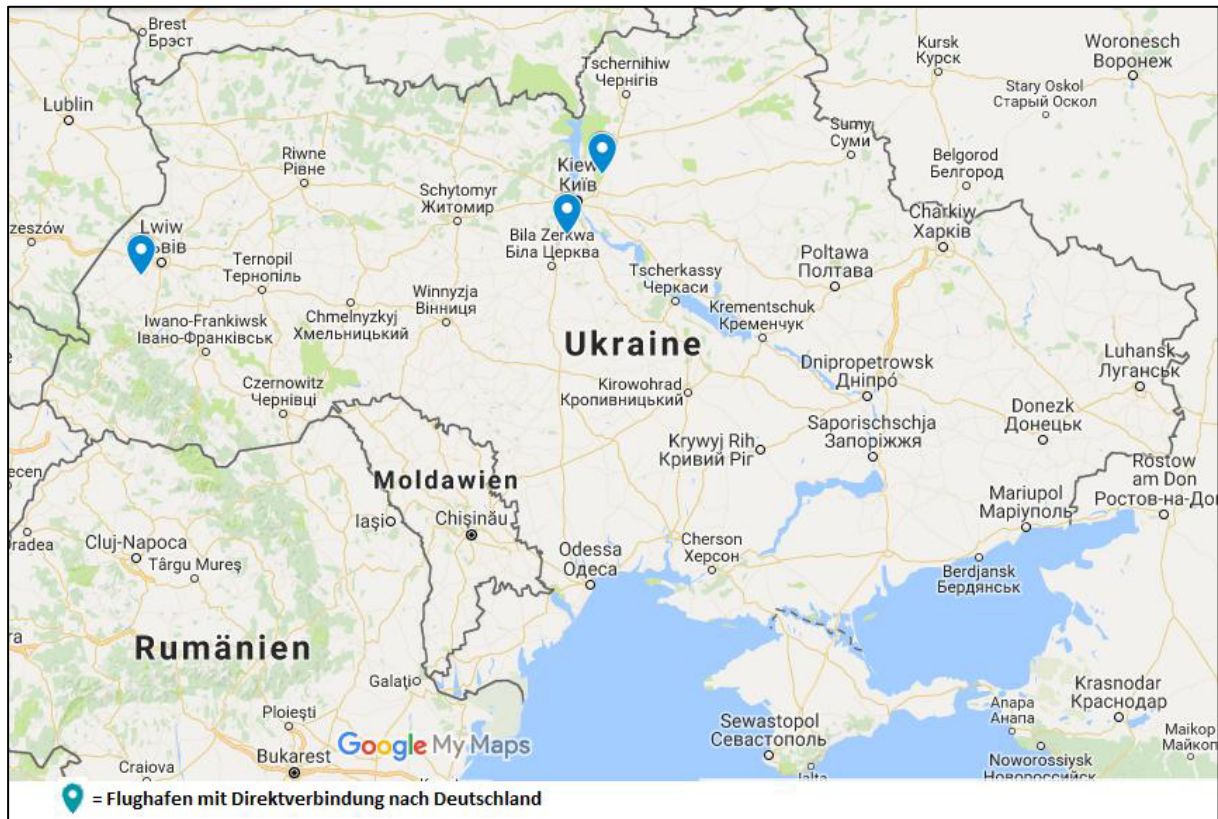


Figure 3.6: International airports with direct connections to Germany

Source: Independent research, as of 10/2016, map, Google Maps

In terms of information and communication technology, for every 100 inhabitants, there are 25 landline connections, 144 mobile phone contracts and 43 internet users:

Table 3.3: Information and communication infrastructure of selected countries (per 100 inhabitants)

	Ukraine	Poland	Hungary	Romania	Germany
<b>Landline connections</b>	<b>25</b>	<b>13</b>	<b>30</b>	<b>21</b>	<b>57</b>
<b>Mobile phone contracts</b>	<b>144</b>	<b>156</b>	<b>118</b>	<b>106</b>	<b>120</b>
<b>Internet users</b>	<b>43</b>	<b>67</b>	<b>76</b>	<b>54</b>	<b>86</b>
<b>Broadband internet connections</b>	<b>8</b>	<b>24</b>	<b>27</b>	<b>18</b>	<b>36</b>

Source: destatis, 2014 [36]

### Energy prices

Each inhabitant used 3,600 kWh on average in 2013 [37]. Electricity prices are being raised continuously. Table 3.4 shows the current electricity prices as well as the planned prices after the next tariff increase in March 2017:

Table 3.4: Electricity prices in Ukraine

Tariffs from 09/2016 Consumption in kWh/month	UAH / kWh	Eurocent / kWh
1 - 100	0.71	2.5
101 - 600	1.29	4.5
> 600	1.64	5.7
Tariffs from 03/2017 Consumption in kWh/month	UAH/kWh	Eurocent/kWh
1 - 100	0.90	3.1
> 100	1.68	5.7

Source: MinFin, 2016 [38]

Energy prices consistently rise even for commercial consumers. Depending on voltage, prices are currently at 1.57 to 1.97 UAH/kWh (5.48 to 6.86 Eurocent/kWh) [39].

The price of diesel is currently around 18 UAH/litre (63 Eurocent) and the price of premium grade petrol is 20.50 UAH/litre (71 Eurocent) [40].

### Corruption index

In the Corruption Perceptions Index from Transparency International, which measures the noticeable corruption amongst officials and politicians, Ukraine is ranked 130th out of 168 countries [41]. Cases of corruption are frequently found when privatising state property, awarding public contracts or posts, and also in the police and the judicial system.

## 3.3. ENVIRONMENTAL POLICY AND MANAGEMENT

Ukraine has entered into the following international environmental conventions, amongst others (date of ratification in brackets):

- London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1976)
- Geneva Convention on Long-Range Transboundary Air Pollution (1980)
- Bucharest Convention on the Protection of the Black Sea Against Pollution (1994)
- Basel Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1999)
- Kyoto Protocol to the United Nations Framework Convention on Climate Change, or Kyoto Protocol for short (2005)
- Stockholm Convention on Persistent Organic Pollutants, also known as the POP-Convention (2007)

Collaboration in climate, environment and nature protection as well as the quality and management of water resources and waste management was agreed upon in the Association Agreement with the

EU. Strategies for these areas must be developed. In the annex to Section 6 of the agreement, the adjustment of Ukrainian legislation to EU guidelines is agreed upon within certain time periods [42].

For recycling management, adopting the Waste Framework Directive 2008/98/EC and the Landfill Directive 1999/31/EC as national legislation is particularly significant. For water supply and wastewater management, adopting the Water Framework Directive 2000/60/EC, the Urban Waste Water Directive 91/271/EEC and the Drinking Water Directive 98/83/EC is pivotal.

At the moment there are more than 300 national laws and regulations concerning environmental protection [43].

Further information about individual laws, the degree of implementation of environmental objectives by those in charge and the important management institutions can be found in the individual sections about recycling and water management.

### 3.4. ACCESS TO THE MARKET

#### Distribution channels

It is recommended for German companies to work together with well connected local employees or representatives with industry-specific market expertise. For a fee, The German Chamber of Commerce Abroad (AHK) in Ukraine can help German companies to look for qualified partners, representatives and employees. The AHK also offers support when looking for offices or commercial properties (for contact, see section 6).

It is also recommended to bolster entry into the market with exhibitions and trade fairs. Table 3.5 gives an overview of important trade fairs for the areas of recycling management, water supply and wastewater disposal, renewable energies and environmental technology.

Table 3.5: Trade fairs for recycling management, water management, renewable energies, environmental technology

Trade fair	Main focus and when it takes place	Location	Organiser
AQUA UKRAINE	Water supply and wastewater management Annually in November	Kiev	International Exhibition Centre +38 (044) 201-1162, 201-1154 aqua@iec-expo.com.ua <a href="http://www.iec-expo.com.ua/en/aqua-ukraine-2016-en.html">http://www.iec-expo.com.ua/en/aqua-ukraine-2016-en.html</a> WASSER BERLIN/Messe Berlin wasser@messe-berlin.de
COMMUNTECH	Housing industry, municipal services, disposal of municipal waste. Part of the trade fair is also the "Waste treatment in Ukraine: legislation, economics, technologies" forum Annually in November	Kiev	International Exhibition Centre +38 (044) 201-1159, 201-1166 forum@iec-expo.com.ua <a href="http://www.iec-expo.com.ua/en/ct-2016.html">http://www.iec-expo.com.ua/en/ct-2016.html</a>
INDUSTRIAL ECOLOGY	Monitoring the environment, exhaust gas purification, disposal of industrial and hazardous waste, remediation, noise control, environmental technology Annually in November	Kiev	International Exhibition Centre +38 (044) 201-1162, 201-1154 ecology@iec-expo.com.ua <a href="http://www.iec-expo.com.ua/en/ie2016.html">http://www.iec-expo.com.ua/en/ie2016.html</a>

AQUA-THERM KIEV	Heating, ventilation and cooling technology, water supply, sanitary facilities and environmental technologies Annually at the end of May/beginning of June	Kiev	ITE Group Plc Inquiries from Germany: Cinzia Van, Senior Project Manager +49 (0)40 2 35 24-511 van@gima.de <a href="http://www.aqua-therm.kiev.ua/en-GB/">http://www.aqua-therm.kiev.ua/en-GB/</a>
ElcomUkraine	Energy generation, energy efficiency, electrical engineering and industrial automation Annually in April	Kiev	fairtrade Messe und Ausstellungs-GmbH & Co. KG +49 (0)6221 45650 info@fairtrade-messe.de <a href="http://www.elcom-ukraine.com/elcomukraine.html">http://www.elcom-ukraine.com/elcomukraine.html</a>
Alternative Energy Lviv	Heating systems, insulation, ventilation systems, photovoltaic systems, solar thermal energy, thermal insulation systems, thermal pumps, Annually in September/October	Lviv	Gal Expo +38 (0)32 2949112 exhib@galexpo.lviv.ua <a href="http://galexpo.com.ua/en.html">http://galexpo.com.ua/en.html</a>
Wood Energy Kiev	Organic energy, biomass, waste wood Annually in September	Kiev	Acco International +38 (0)44 4563804 acco@acco.kiev.ua <a href="http://www.woodenergy.kiev.ua/en">http://www.woodenergy.kiev.ua/en</a>
BioFuel Kiev	Renewable energies Annually in June during the AGRO trade fair	Kiev	Ministry of Agrarian Policy and Food of Ukraine vladylava.rutytska@minagro.gov.ua <a href="http://www.agroexpo.de/">http://www.agroexpo.de/</a>

Sources: Trade fair websites (online access 09/2016)

Exhibition and brochure material should be made available in Ukrainian and Russian. Many young professionals speak very good English, but for older customers and partners, communicating in English may be an issue. In such cases, an interpreter should be contracted.

## Tenders

Project tenders can be found on various local and international portals. A few examples:

- gtai database "Internationale Ausschreibungen" (International Tenders) (<http://www.gtai.de/GTAI/Navigation/DE/Trade/Projekte-Ausschreibungen/ausschreibungen.html>)
- EU tenders database TED (<http://ted.europa.eu/TED/main/HomePage.do>)
- EuropeAid tenders database (<http://europeaidcontracts.com>)
- dgMarket tenders database (<http://ausschreibungen.dgmarket.com/>)

Projects are also advertised on the websites of international financial institutes. It is worth, for example, visiting the websites of the European Bank for Reconstruction and Development (EBRD) on a regular basis: <http://www.ebrd.com/ukraine.html>.

### Project financing

If German companies get involved in project development, financing by foreign means can be complicated. Banks there are very cautious and only grant short-term loans for one to two years. At 12 to 15 %, interest rates are also comparatively high. As well as this, banks have little experience in financing waste, water and wastewater projects.

Even the municipalities are still limited in their financial options e.g. for sewage treatment facilities or waste sorting technologies. Municipalities are increasingly merging, however. This increases financial leeway, as these units are also preferred by the central government and they can generate higher taxes. Investments for waste, water and wastewater projects must compete with other infrastructure projects, however. As well as this, there is currently a lack of project management and tender expertise in the municipalities.

The KfW Entwicklungsbank supports the Ukrainian Social and Investment Funds (USIF), which implements small infrastructure projects with municipalities so it can bolster them. The KfW is also involved with financing water supply and wastewater disposal systems in medium-sized municipalities, for example, the city of Chernivtsi on behalf of the German government [44]. Projects are published on the aforementioned gta database "Internationale Ausschreibungen". The KfW subsidiary DEG is currently involved with financing three private sector projects in Ukraine. This predominantly concerns commitments that were already made before 2014. The options for new financial commitments are currently greatly limited due to the challenging risk profile in the Ukrainian private sector and are checked on a case-by-case basis. Especially projects with international or German participation on the side of the investor have particularly good prospects.

The ERBD provides loans for private sector projects with a project volume of €5 to 250 million. The ERBD also invests equity in the form of minority investments in industry and infrastructure projects. Further information can be found at <http://www.ebrd.com/ukraine.html>.

The International Finance Corporation (IFC), a subsidiary of the World Bank, supports companies in implementing and financing projects in Ukraine. Projects in the food industry, infrastructure and the financial sector are primarily supported. The area of energy efficiency is also a focus for the IFC.

Further information is available at

[http://www.ifc.org/wps/wcm/connect/region\\_\\_ext\\_content/regions/europe+middle+east+and+north+afrika/ifc+in+europe+and+central+asia/countries/ukraine+country+landing+page](http://www.ifc.org/wps/wcm/connect/region__ext_content/regions/europe+middle+east+and+north+afrika/ifc+in+europe+and+central+asia/countries/ukraine+country+landing+page).

In the past, some projects have been financed using funds from German companies.

For export business, under certain circumstances, a Hermes cover (export credit guarantee) can be requested to help protect against bad debt.

Further information can be found at the following link

<http://www.agaportal.de/pages/aga/deckungspolitik/laenderbeschluesse/ukraine.html>.

### Customs duties and other import regulations

Since 01/01/2015, the trade section of the EU Free Trade Agreement has been in effect with Ukraine. This has resulted in numerous customs duties for German importers being decreased or abolished. The assessment basis for customs is the customs or transaction value that is worked out based on the actual price paid or to be paid plus transport and insurance costs up to the Ukrainian border. As well as import duty, a customs fee of 0.2 % of the customs value, but a maximum of USD 1000, is to be paid.

The relevant tariffs can be looked up with the goods number in the EU Market Access Database (<http://madb.europa.eu>) in English.

The import-turnover tax is usually 20 % of the customs value. Some goods are exempt from the import-turnover tax. Some goods such as tobacco, vehicles and crude oil products have a mandatory excise duty.

The following documents are necessary for customs clearance:

- Delivery contract
- Invoice (importers usually have the invoice translated into Russian/Ukrainian for customs)
- Delivery note
- Accompanying documents (technical descriptions, instructions, brochures etc. in Ukrainian)

Goods such as items for exhibitions, professional equipment or measuring devices, can be imported for temporary use using the ATA Carnet.

According to the type of goods, other import authorisations may be required in Ukraine. As customs in Ukraine can be very bureaucratic, it is recommended to use an experienced forwarding agent. For problems with customs clearance, the Deutsch-Ukrainische Industrie- und Handelskammer (German-Ukrainian Chamber of Industry and Commerce) in Kiev offers troubleshooting services e.g. for incorrect customs declarations (see section 6 for contacts).

The manufacturer or importer is also responsible for compliance with technical framework guidelines, also called technical regulations. The manufacturer or importer is obligated to create and apply a declaration of conformity. Currently there are 41 technical regulations in Ukraine for personal protective equipment, measuring devices and the safety of machines amongst other things.

More information can be found on the Germany Trade & Invest website in the data sheet for commercial goods imports for Ukraine: <http://www.gtai.de/GTAI/Navigation/DE/Trade/Recht-Zoll/Zoll/merkblaetter,t=merkblatt-ueber-gewerbliche-wareneinfuehren--ukraine,did=1461886.html>.

### **Legal and tax matters**

Before conducting business in Ukraine, it is advisable to seek legal advice. The law in Ukraine is different in many ways from in Germany, which means there are a few stumbling blocks to look out, for example, with assembly or employment contracts, as well as corporate law issues. It is generally sensible for important contracts to contain detailed regulations for the collaboration and that they are drawn up in two languages. No sample contracts should be used or accepted without prior inspection by a professional. For verifying possible partners, a local lawyer can be helpful, especially as there is no disclosure from banks in Ukraine. This complicates the credit assessment, so it may be important to check the penal, insolvency and property registers, as well as possible court cases.

For tax matters, advice should be sought from an experienced consultant. The tax rate for corporate earnings is currently at 18 % and value added tax at 20 %. The income tax rate is 18 % [45].

Details of German-speaking tax advisers and lawyers can be found in section 6.

## Business protocol

Entering the market successfully is hugely dependent on personal relationships with strong local partners. You should ensure that you have enough time and patience to build up and maintain such relationships and not overload your appointments calendar during business trips to Ukraine. The effort it takes to maintain these relationships with business partners is often underestimated by German businesses. Regular calls and visits are required to build trust and to successfully develop the business. Communication via e-mail alone will not do.

Informal meetings, such as dinners, are also valuable. It is recommended to show interest in the personal environment of your business partners and to accept invitations to their homes. Important business partners should be wished a happy birthday.

In official meetings with business partners and authorities in Ukraine, it is custom to wear business attire. Women usually dress more elaborately than in Germany in public as well as in private. In the younger generation, and especially in start-ups and the ITC industry, the dress code becomes considerably more relaxed.

Women are completely recognised as business partners in Ukraine and often occupy leadership positions in Ukrainian businesses and institutions. The situation of women in the workplace is generally comparable to Germany. There are no particular rules to be aware of.

There are four types of address in Ukraine:

- Formal address using Mr or Ms plus the last name – this is common for visitors from non-English-speaking countries.
- Formal address using Mr or Ms plus the first name – particularly for translations from Ukrainian (Пане Олександрє - Mr Alexander).
- Formal address using the first name – especially when switching between English and Ukrainian or Russian.
- Formal address using first name and patronymic – especially for members of the older generation, when addressing officials or dignitaries, or domestic managers particularly in Russian-speaking areas. This is used less in West Ukraine, where the 3rd option is preferred. The patronymic is derived from the father's first name.

Changing to an informal form of address is uncommon in service-related or official relations unless there is an Anglicised company culture. A mix of formal and informal, so general formal address and the first name, is what colleagues usually use, but not when speaking to managers.

As in many Eastern European countries, greeting with a handshake is common in Ukraine amongst men. For women, you should wait to see if she offers her hand. It is only acceptable to offer your hand if she has offered her hand first. Greeting and saying goodbye with a handshake between a man and a woman in Ukraine is unusual.

Ukrainians are extremely proud of their country, history, and what they have achieved since gaining independence in 1991. It is recommended to read up on the history and politics of the country before travelling there. Being interested in the country can help German businesspeople to be seen in a good light and can help to open doors.

A CV and references should be thoroughly checked during the selection process of employees. As the legal notice period is only 14 days, it is important to hire employees that will remain at the company for the longer term. To motivate employees and to have a good working atmosphere, it is important to offer an appropriate salary and the guarantee of personal development. Business objectives should be clearly communicated. In this case, too, it is recommended to show interest in the personal lives of your employees and their families [46].



### Regulatory and other aspects

In June 2016, the National Bank of Ukraine lifted certain limitations on foreign exchange transactions, e.g. the banning of dividend payments for 2014 and 2015. However, the dividend payment must not exceed 10 % of the entire scope of the dividend or maximum \$5 million. The compulsory exchange into hryvnia for proceeds in foreign currency was lowered from 75 percent to 65 percent. Incoming foreign currency for investment purposes is not subject to this compulsory exchange. These are steps in the right direction, but nevertheless these currency regulations create stumbling blocks for foreign investors [47].

Another obstacle is the lack of legal certainty and the difficulty in enforcing the rights of foreign companies in Ukrainian courts. In June 2016, the Ukrainian parliament introduced the long-promised justice reforms in Ukraine with the law 'On the Judicial System and Status of Judges' and with several constitutional amendments. Amongst other things, the Cassation Courts, which were deemed corrupt, were abolished and an anti-corruption court was created. In the future, judges will be named by the Judicial Council and not by the president or parliament like before. The salaries of judges are to be considerably raised. As well as this, judges will be obligated to disclose their family relationships with people employed in other federal organisations. The hope is that the government will be resolute in these reforms and create trust in a transparent and independent court system [48].

The hurdles placed in the way of economic cooperation in the recycling and water management industries mean that a different approach is required in many cases compared with the situation in Germany. Because of a lack of transparency in regard to responsibilities, development and decision making processes and roles that quickly change, working with local partners can be difficult. The unreliability of certain contractors and the political situation can have a negative impact on project planning and investment risk. As well as this, prices and fees are often not set to cover costs and are not transparent. This means that long-term planning of maintenance costs and investments is more difficult. The fact that the operation and maintenance of technical facilities and training of staff have a subordinate role, often has an effect on technical functionality [49].

## 4. RECYCLING MANAGEMENT

### 4.1. WASTE GENERATION AND DISPOSAL INFRASTRUCTURE

#### Waste produced

According to the Ukrainian statistical office, in 2015 (excluding the Crimean peninsula, for which there is no data) a total of 312 million tonnes of waste was generated, of which 29 % was recycled in terms of material. Just under 1 % was treated thermally. Almost 49 % of all waste was deposited in official landfills [50]. Consequently, around 21 % of the entire volume of waste is not recorded in official statistics. This essentially relates to the disposal and recycling paths for waste from industry and agriculture that are not recorded. The relatively high material recycling quota of 29 % can be explained by the existing recycling paths and quotas for mineral waste, dredged material, manure and iron scrap, that taken together, make up 85 % of the entire amount.

In 2015, 11.5 million tonnes of solid municipal waste (domestic waste and similar) was created. Every inhabitant in Ukraine produced an average of 269 kg of municipal waste in 2015 [51]. In comparison with Western Europe, this is a relatively low quantity, but it fits within the context of other Eastern European countries.

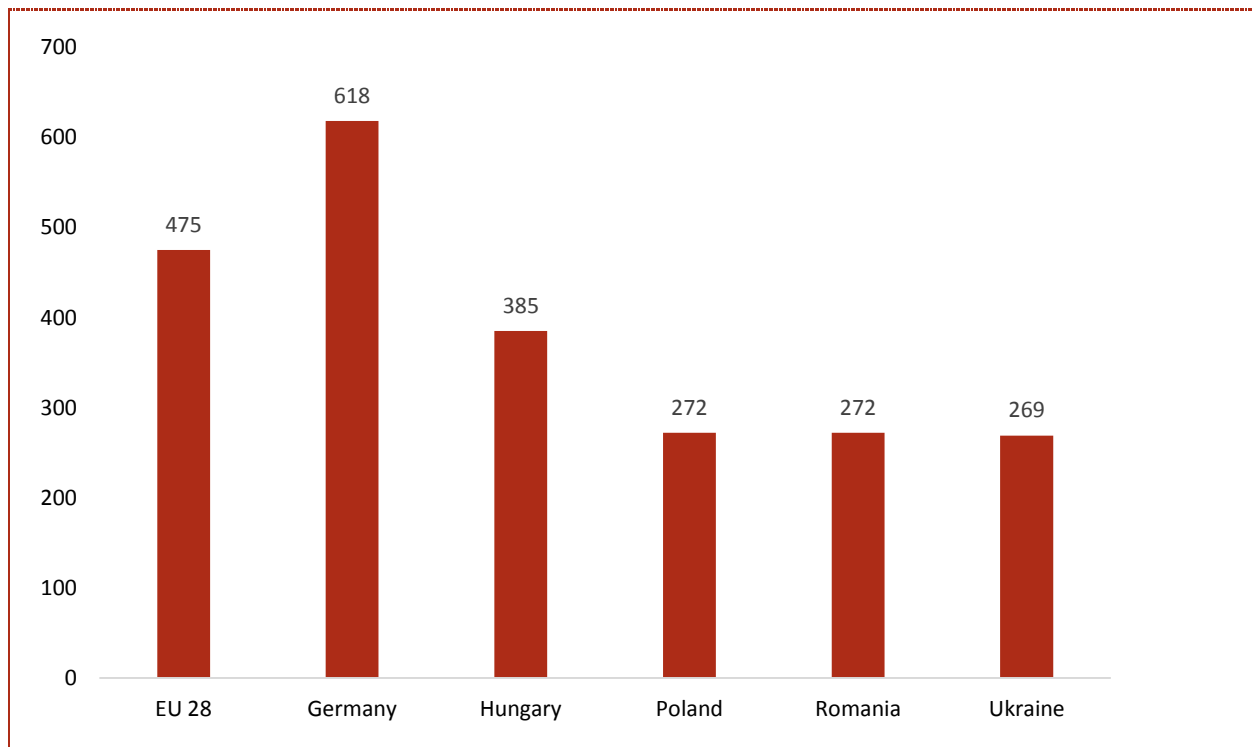


Figure 4.7: Municipal waste – amount per inhabitant in kg (Ukraine 2015, other countries 2014)

Sources: Eurostat, 2016 [52] and ukrstat, 2016 [53]

Figure 4.8 shows the amount of municipal waste in the 24 Ukrainian regions (oblasts). In 2014, in the Dnipropetrovsk oblast more than 1,206,000 tonnes of municipal waste was created, in the Kharkiv oblast it was 950,000 tonnes, 770,000 tonnes in the Kiev oblast and 720,000 tonnes in the Odessa oblast. In the city of Kiev, which is managed directly by the central government and is not counted as the oblast of Kiev, around an additional million tonnes is created every year.

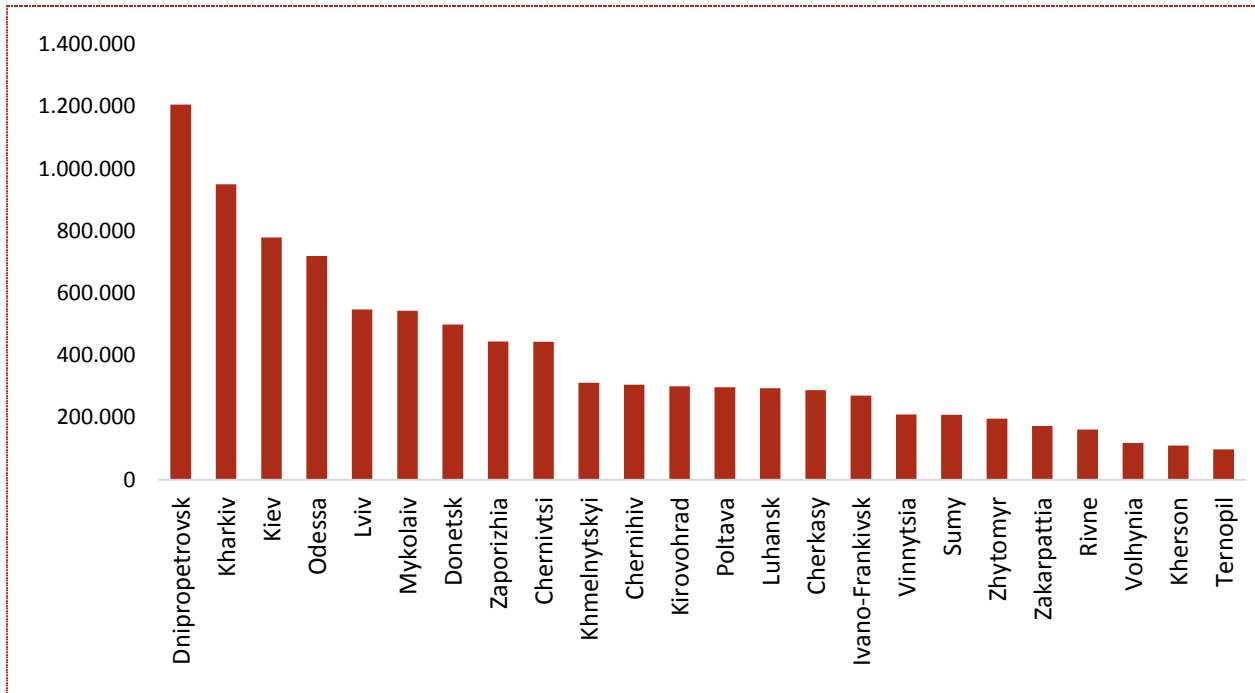


Figure 4.8: Municipal waste – amount per region in tonnes 2014

Source: ukrstat, 2014 [54]

### Disposal methods

In terms of solid municipal waste, 254,000 tonnes were treated thermally in incineration facilities. This makes up around 2 % of the waste created. Almost 98 % of all municipal waste was sent to landfill.

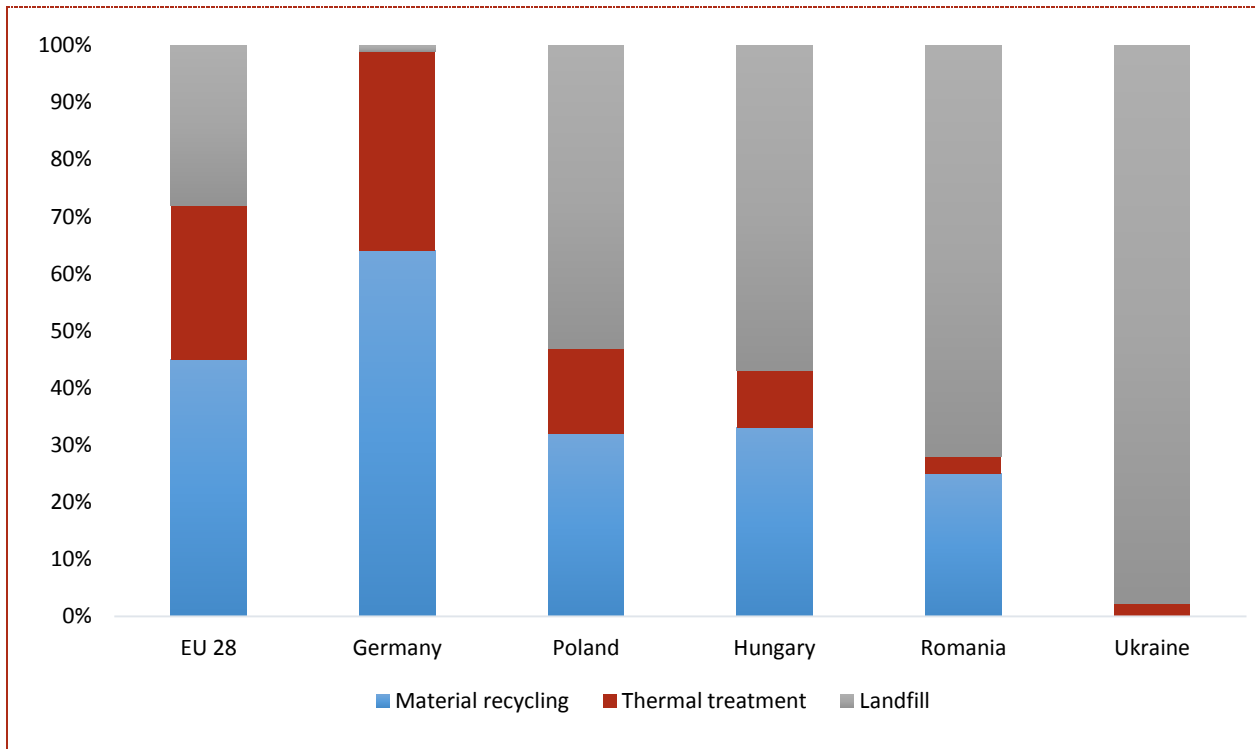


Figure 4.9: Disposal methods for municipal waste (Ukraine data 2015, other countries 2014)

Sources: Eurostat, 2015 [55] and ukrstat.org, 2015 [56]

Comparatively, on average, the other EU countries recycle 45 % of municipal waste in terms of material; 27 % is treated thermally in incineration facilities; and 28 % is sent to landfill. Germany is the

leader in material recycling with a comparative figure of 64 %. Incineration facilities are used to thermally treat 35 % of municipal waste in Germany. In Poland and Hungary, material recycling rates reach 32 and 33 % and thermal treatment rates are 15 and 10 %. Romania has a material recycling rate of 25 % and a thermal treatment rate of 3 %. In Ukraine, only a small amount of municipal waste is recycled in terms of material. In the WIF Kiev just over 2 % of municipal waste is treated thermally and the rest is sent to landfill.

These figures demonstrate the considerable potential for growth in material recycling of municipal waste in Ukraine. In other words: If Ukraine could manage to raise its material recycling rate to the current EU level of 45 %, landfill waste could be cut by more than 5 million tonnes.

**Composition of municipal waste**

The composition of municipal waste also highlights untapped recycling potential.

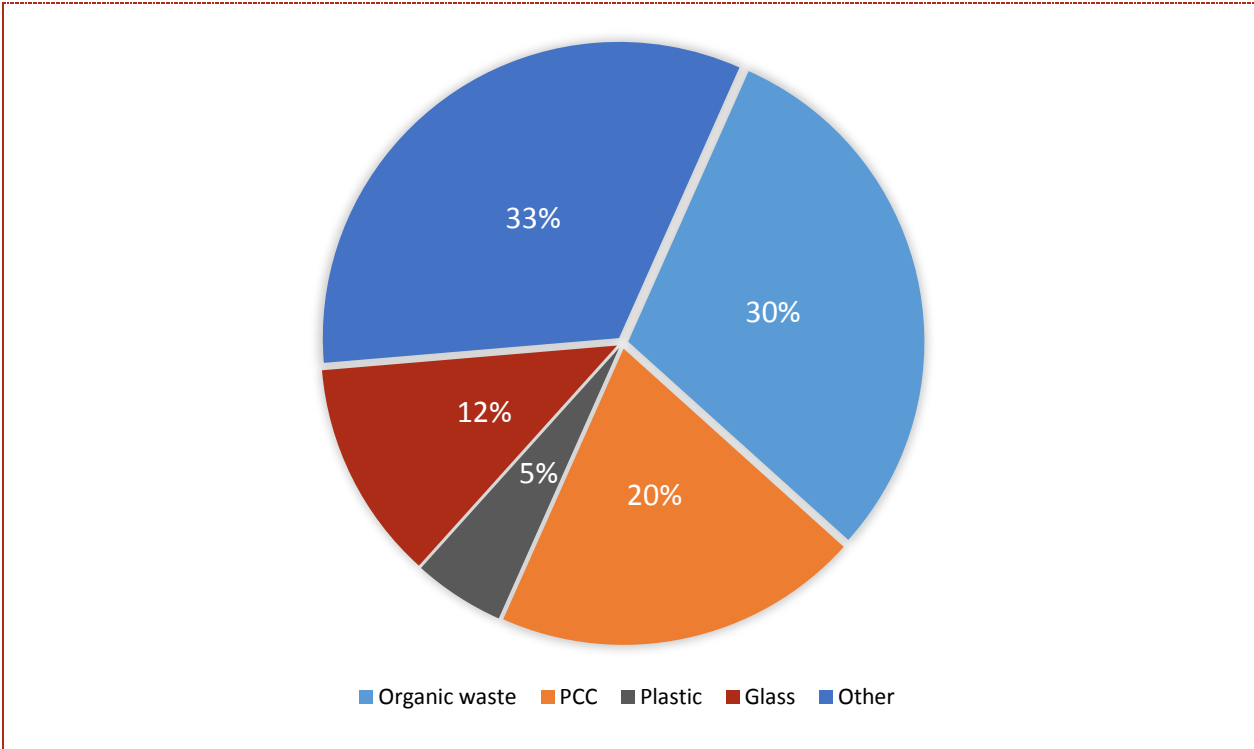


Figure 4.10: Composition of municipal waste in Ukraine 2010

Sources: IFC, 2014 [57]

The groups of paper, glass, plastic and metal together make up around 37 % of the total municipal waste, which equates to around 4.25 million tonnes. The 3.5 million tonnes of organic waste could also in part be recycled.

### Collection of waste and recyclable materials

In some cities, recyclable material from households is collected via a two-bin system with a residual waste bin and a recycling bin (usually a pallet box). This system is often described as wet-dry-separation. Paper, card and cardboard (PCC), glass and aluminium and PET are collected in the recycling bins. The dry portion of the waste is then mainly separated manually in simple sorting facilities. The quality of the recyclable material is low.

Recyclable materials are also collected from households by the informal sector. In many parts of the country, collection points are in operation in industrial parks and rear courtyards. Deliverers get a small payment for their waste. The privately organised collection points then sell the recyclable material to traders of secondary raw materials who then sell it on directly to recyclers. For the collection of recyclable material from commercial and industrial operations, supply structures have also partly been developed outside of traditional waste disposal management, so that, for example, the collection of waste paper in some places is organised directly by paper factories.

### Area coverage of waste and recyclable material collection

Only around 70 % of the population has access to public waste disposal. In some rural areas there are no waste collection and disposal structures in place. The number of municipalities which have introduced a separate recyclable material collection system has been gradually growing over the past few years. In 2004, recyclable material was collected in 5 municipalities; this number rose to 53 by 2010 [58]. By 2015 it had risen again considerably to 523 municipalities. However, in spite of this recent increase, only 2 % of the total 27,500 municipalities in the country have introduced a separate recycling collection system [59].

### Tender and disposal fees

Generally, permits are awarded by the cities and municipalities for collecting municipal waste. These permits are partly put out to tender and partly given directly to the disposal companies. The disposal companies, of which approx. 75 % are public-private partnerships and 25 % are purely private companies, are obligated to disclose their calculations so the veracity can be checked. Usually the municipalities approve the tariffs (charges) on the basis of cost prices plus a profit margin of 5 % for private households and 20 % for commercial businesses.

The collection and disposal tariffs are paid monthly directly from the household to the disposal company, although in some cases these are also billed at a municipal level. For apartment buildings, the community of owners or building management pays.

The monthly disposal tariffs are split into two elements: one tariff for the collection and another for disposal. On average, the collection tariff is 10 UAH per household per month. This is around €3.50 a year. In some areas, collection tariffs of up to €20 can be due per household per year.

The disposal tariffs tend to mirror the gate-fees for landfills, which mainly belong to the municipalities. The landfill fees, which are approved centrally by the state, can differ greatly from region to region – gate-fees are known to range from less than €0.50 to up to €5.00 per tonne. The majority of waste is taken by the disposal companies to municipal landfills.

A fundamental reason for the low rate of recycling of municipal waste in Ukraine is the lack of suitable recycling tariffs that allow the disposal companies to set up containers for the separated collection of recyclable material and residual waste and to operate sorting facilities [60].

### Recycling, treating and disposing

Waste paper is used in several paper factories in Ukraine including Obukhiv, Zydachiv, Odessa and Zhytomyr. The use of waste glass is also widespread in Ukrainian glassworks. In Novomoskovsk (Dnipropetrovsk oblast), there is a modern waste glass sorting facility.

Plastic processing companies are operating in Kiev, Lviv, Cherkasy and Obuchiv, for example. Many processed plastics are exported to China.

Currently, there are neither composting nor fermentation facilities for organic municipal waste. There are also no mechanical-biological treatment facilities (MBT) in place.

Figure 4.11 shows sorting and incineration facilities in operation for municipal waste in Ukraine.

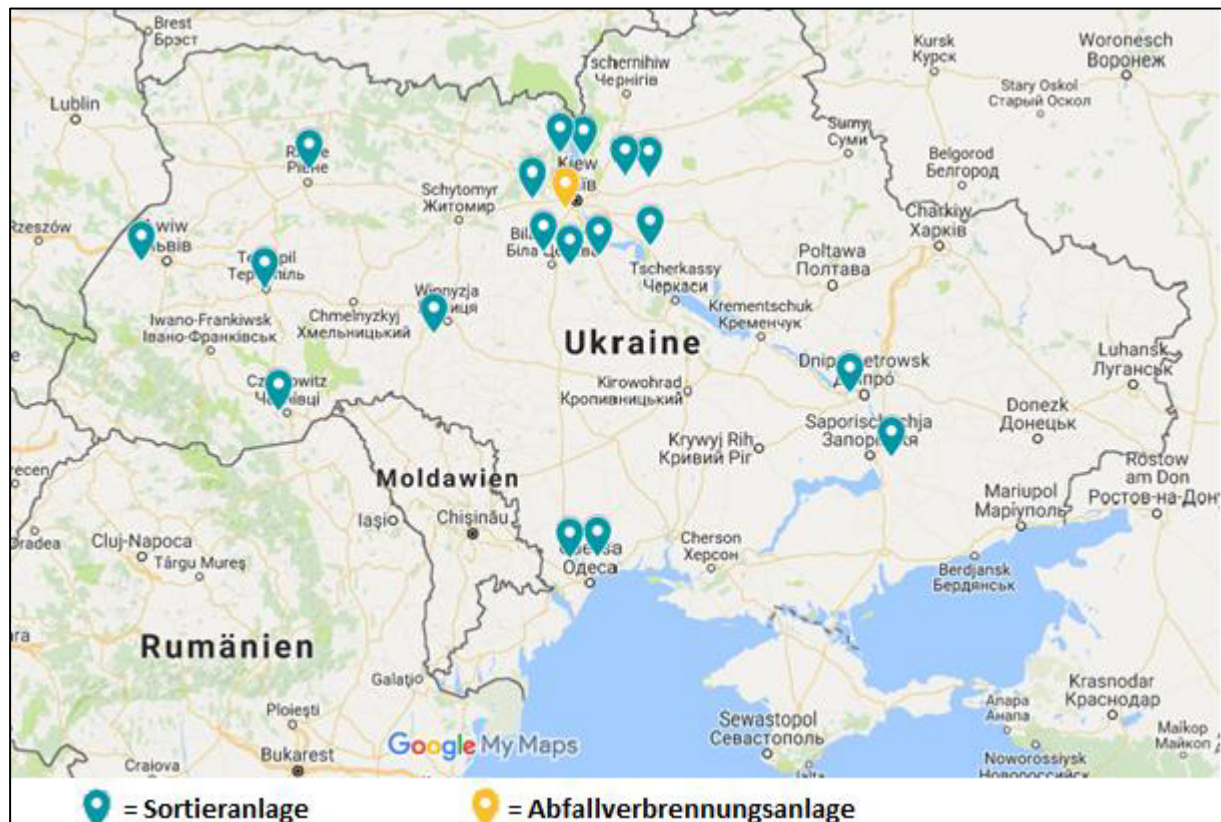


Figure 4.11: Sorting and incineration facilities

Sources: MinRegion, 2016 [61], map, Google Maps

In Vinnytsia new sorting facilities for municipal waste are currently being built with a daily processing capacity of 20 tonnes [62].



Figure 4.12: Enerhiya incineration facility in Kiev

Source: wikimapia.org, 2016

Only one of the original four incineration facilities built in the 80s and 90s is still in operation. The gate-fees in the WIF Kiev are around 130 UAH or 4.50 €/t [63]. The plant in Dnipropetrovsk was, up until recently, only used sporadically but has now been decommissioned. The facilities in Odessa and Sevastopol have also been decommissioned. Smaller incineration facilities in Kharkiv, two of them mobile, process a few thousand tonnes in total every year.

Because of the low tariffs, however, most waste, as mentioned above, is sent to landfill. A recent investigation identified 6,682 authorised and 30,483 unauthorised landfills [64]. The high number of illegal landfills can, for example, be attributed to the fact that only around 70 % of the population has access to public disposal. This creates small landfill sites near to residential areas in rural regions. Most authorised landfills operate with no sealing, leachate or landfill gas equipment.

Every fourth landfill for household waste does not meet the Ukrainian environmental standards, and every sixth is overflowing. Authorised landfills take up a surface area of approx. 9,000 hectares. The sometimes very small, unmonitored landfills take up a surface area of more than 1,000 hectares [65].

Landfill gas collection systems have now been installed on twelve landfills [66], e.g. in Vinnytsia, Kremenchuk, Yalta, Alushta, Lviv and Mariupol; here the collected gas is generally only flared [67]. In Vinnytsia, a city to the south west of Kiev with approx. 370,000 inhabitants, the landfill gas collected has been used for power since May 2015.

Looking at industrial and hazardous wastes, it is obvious that much of this waste goes into landfills completely untreated in Ukraine. Especially of note in this context are acids, alkalis and saline waste, 76 % of which is sent to landfill. Sludge and wastewater from waste treatment is all sent to landfill [68]. Many industrial companies organise the disposal of their waste themselves and use local landfills to do this. In Ukraine, there are no specialised incineration or recycling facilities for hazardous waste. The state is prepared, however, to raise special means for the disposal of hazardous waste on

a selective basis. This was the case when stockpiles of obsolete pesticides were taken to the hazardous waste incineration facilities of SARP Industries in Poland for disposal.

Finally, it can be determined that the recycling of numerous recyclable materials to save resources, better protect the environment and reduce raw materials imports still has a large potential for development.

## 4.2. MARKET PARTICIPANTS – DISPOSAL, RECYCLING AND ENVIRONMENTAL TECHNOLOGY

In this section, disposal companies, and recycling and environmental technology companies that operate in Ukraine will be briefly introduced.

### Disposal companies

In Ukraine, there are more than 1,000 companies that collect and dispose of municipal waste [69]. Around 75 % of them are joint ventures with public and private owners; 25 % are purely private companies.

Amongst the market leaders in Ukrainian disposal management is the company UMWELT, which emerged in 2015 from the management buyout of Remondis Ukraine. With 600 employees and 150 waste collection vehicles, UMWELT is operational in 7 cities – apart from Kiev, this is mostly in the south east and central regions of the country. The company disposes of the household waste of around 2.3 million inhabitants and operates sorting facilities in Kiev and Zaporizhia as well as two landfills.

The company Veolia Ukraine, belonging to the French environmental group Veolia, has been in operation in the country since 1995 and runs disposal operations in Kiev, Ternopil, Czernovitz and Yalta with over 400 employees. The 100 waste collection vehicles cover households and commercial and industrial operations. Veolia takes care of the household waste of around 850,000 inhabitants and runs a sorting facility in Kiev.

The company AVE, owned by the Czech company EP Industries, a.s. has its headquarters in Lviv and also has locations in the south west of the country in Mukachevo, Uschorod, Ivano-Frankivsk, Kolomyia and Vynohradiv. They cater for municipal, industrial and commercial waste. AVE operates sorting facilities, transfer stations and landfills.

Amongst the market leaders are also a host of Ukrainian companies that were established over the past 20 years. For example, the companies Ekovtor-Trans, Grinko and PJSC Kiespetstrans from Kiev as well as the company A-MUSSON from Sumy.

As well as traditional disposal companies that collect, prepare and dispose of municipal, commercial and industrial waste, there is a whole variety of companies active in Ukraine that work on the collection, preparation and marketing of recyclable materials. Table 4.6 shows some of the more significant companies.



Table 4.6: Secondary raw material companies

Name	Locations	Activities	Number of employees
DrogobyschVtorRessursy	Drogobysch	Preparation of PPC, glass, PET, film, aluminium	10
Ekoton	Cherkasy	Preparation of waste	
Ekowtorswit	Cherkasy	Preparation of PPC, glass, PET, film, aluminium	14
KiewGorWtorRessursy	Kiev	Preparation of waste, document destruction	377
Collective enterprise: "Wtorma-Mukatschewo"	Mukachevo	Preparation of PPC, glass, PET, aluminium	17
Korsim	Kiev, Bortnichi	Preparation of PPC, PET, aluminium, document destruction	> 120
Konstanta	Kiev Lviv, Ivano-Frankivsk	Preparation of waste	90
Kramar Recycling	Kiev	Preparation of PPC, PE, PET, glass, cans, waste wood	
SchimomirWtorRessursy	Zhytomyr	Preparation of PPC, glass, PET, film, aluminium	40
Secondary Resources Company No. 3	Kiev	Preparation of waste, document destruction	> 30
UkrPromRessurs	Kiev, Vinnytsia, Khmelnytskyi, Zhytomyr	Preparation of PPC, glass, PET, film, aluminium	> 100
Wisa-Wtorma	Ivano-Frankivsk	Preparation of waste, disposal of municipal and building waste	
Wtores	Kiev	Preparation of PPC, glass, PET, film, aluminium	80
Wtorma	Kiev, Brovary, Odessa, Lviv, Uman, Rivne, Kharkiv, Donetsk, Chernihiv, Luzk, Pavlograd	Preparation of waste, document destruction	

Source: Independent research, as of 10/2016

The companies Eko Most, Jupiter Eko, Rekulivazija, Sowremennyj Zentr Utilisazii, Tarkom Ekoservis and UkrWtorUtilisazion are active in the field of hazardous waste disposal. UkrWtorUtilisazion has its headquarters in Dnipro, and the other companies are based in Kiev.

### Recycling businesses

Waste paper is used in several paper factories in Ukraine. Kiev Cardboard and Paper Mill, the largest paper factory in the country, processes 850 tonnes of waste paper per day in Obukhiv, south of Kiev. Other important paper factories that process waste paper are Zydachiv Pulp and Paper Mill (Lviv

oblast), Ismail Pulp and Paper Mill (Odessa oblast) and Zhytomyr Cardboard Factory (Zhytomyr oblast).

Utility in Novomoskovsk (Dnipropetrovsk oblast) is a leading glass recycling company in Ukraine. At the company, 15 tonnes of waste glass is sorted every hour using optical detection. The shards of glass go to Ukrainian glassworks as well as neighbouring countries abroad.

In Table 4.7 companies are listed that deal with recycling plastic waste amongst other things.

Table 4.7: Plastic recycling companies

Name	Locations	Activities	Number of employees
VtorServis	Lviv	Plastic recycling	11
Cherkasy WtorRessursy	Cherkasy	Plastic recycling, document destruction	> 100
ObuchowGorWtorRessursy	Obukhiv, Kiev	Plastics recycling, document destruction, waste wood recycling, municipal waste disposal, manufacturing of containers and systems	120

Source: Independent research, as of 10/2016

As well this, the company wastecon AG from Oststeinbek has been working in Ukraine for two years and founded the company Wastecon-Deutsch-Ukrainische Umweltservice GmbH i.G. (WADUUS) with a Ukrainian partner in Kiev. The partner operates, amongst other things, a recycled plastic processing system with a sorting and cleaning system and an integrated grinding system for creating granules as well as a sorting facility. Another area of operation for WADUUS is the machine trade and consulting for all questions pertaining to waste management and secondary raw material trade.

The following companies have specialised in recycling old electric and electronic devices, for example:

Table 4.8: Electronic scrap recycling companies

Name	Locations	Activities	Number of employees
Ekologitscheskije Investizii	Kiev	Recycling of electronic scrap, batteries and accumulators. Processing of waste from the food industry	
Jupiter Eko	Kiev	Recycling of hazardous waste, electronic scrap, luminescent lamps, accumulators; food waste recycling	> 100
Rekultivazija	Kiev	Disposal of industrial waste, battery recycling, processing lights and devices containing mercury	50
Sowremennyj Zentr Utilisaziii	Kiev	Disposal of industrial waste, battery recycling, processing lights and devices containing mercury	> 300
UkrWtorUtilisazion	Dnipro, Kiev, Cherkasy	Disposal and recycling of abrasives, lights, accumulators, batteries, types of slag, sludge, electronic scrap	

Source: Independent research, as of 10/2016

### Environmental technology companies

Some German companies successfully offer their services, machines and components in Ukraine.

For over 15 years, the company BN Umwelt GmbH from Kremperheide in Schleswig-Holstein has been drawing up systems and developing waste disposal concepts for customers in Ukraine. Waste disposal and recycling concepts have been created for some cities, for example. As well as this, BN Umwelt has carried out planning for sorting and refuse-derived fuel facilities.

The company Alternative Energiesysteme und Umwelttechnik GmbH in Vinnytsia, a joint venture of Heers & Brockstedt Umwelttechnik GmbH from Neumünster and Mr Jörg Meissner, has been planning and implementing landfill gas projects in Ukraine for several years. Gas collection systems were installed in the landfills in Vinnytsia and Kremenchuk. Other landfill and biogas projects e.g. with waste from the food industry are in the planning phase.

### 4.3. LEGAL AND INSTITUTIONAL FRAMEWORK CONDITIONS

#### Overarching objectives

The waste policy in Ukraine is shaped by several overarching objectives: reducing quantities stored in landfills, securing existing landfills and the accelerated expansion of recycling recyclable material. Instruments for achieving these objectives are specifications, recycling rates, taxes and the introduction of a polluter pays principle. Recently, some tasks have been delegated to the municipalities in the context of efforts to decentralise. Currently, efforts to match the environmental standards of the EU with the Association Agreement from September 2014 are also important.

#### Basic regulations

The framework law – “Law on Waste” 187/98 from 05/03/1998 with several additions from later years – defines the legal, administrative and economic basis for reducing, collecting, preparing, recycling and landfilling waste.

Ministerial Regulation 915 from 26/06/2001 on the ‘Introduction of a System for Collection, Preservation and Utilization of Waste as Secondary Raw Material’ introduced a recycling rate of 35 % for packaging waste from 2011.

Regulation 1070 from 12/10/2008 on the ‘Procedure for Municipal Waste Transportation Rate-Setting’ made it mandatory for municipalities as well as households to organise the separate collection of recyclable materials and waste. From 2013, households can incur fines from not adhering to this order.

In a cabinet order from 2013, the primary aims for waste disposal were determined: the introduction of technologies and the implementation of measures for reducing waste production and improving waste collection, preparation, recycling and disposal to prevent damage to the environment and health. UAH 4,656 billion (€466 million) was made available for financing these measures. In the initial phase (2013 – 2015), the most environmentally harmful landfill was to be eliminated, as well as ensuring that waste generation was reduced and that illegal disposing was prevented. As well as this, modern landfills were to be built as pilot projects. In the second phase (2016 – 2020), a modern infrastructure for the collection and recycling of waste is to be introduced (Ukrainian Cabinet of Ministers’ Regulation No. 22-r of March 1, 2013).

As well as this, a landfill tax for financing follow-up measures is provided (Number 2755-17 of the general tax code from 8/11/2014, chapter VIII).

Moreover, so-called “green tariffs” for electricity from renewable energies have been introduced, including biogas and landfill gas. The feed-in tariff is remunerated as per the following depending on the time of commissioning [70]:

- 2016 – 2019 0.1239 €/kWh
- 2020 – 2024 0.1115 €/kWh
- 2025 – 2029 0.0991 €/kWh

For facilities with a local content of at least 30 %, the above-mentioned remuneration rates will be raised by 5 % in each case, and for 50 % even by 10 %.

In the Association Agreement with the EU, which came into power on 01/01/2016, collaboration on environmental issues was agreed. In terms of waste and recycling management, the following agreements were reached:

- Implementation of the Waste Framework Directive 2008/98/EC in national law within 3 years and creation of waste management plans under consideration of a five-step waste treatment hierarchy (prevention, processing, recycling, energetic recovery, disposal). Within 5 years, a

polluter pays principle must be introduced, according to which the costs of the waste management will be assumed by the generator or owner of the waste. An authorisation system for operators of waste treatment and waste disposal facilities is also to be introduced within five years.

- Implementation of Directive 1999/31/EC regarding waste landfills including the creation of a national strategy for reducing biodegradable waste that is sent to landfill. Within 6 years, approval procedures, acceptance criteria, monitoring and follow-up regulations for landfills must be determined.

### **Implementation in practice**

A great number of laws have been passed for the realisation of goals for waste policy in the country; these have only been implemented reluctantly in the past, however. There are difficulties with monitoring on site effectively because of a lack of specialists and financial resources in the relevant authorities. As well as this, there are frequently overlaps in responsibilities between different authorities. Even the individual laws and regulations are not always coordinated with each other. Low tariffs available for collecting and disposing of municipal waste also make keeping to the legal framework difficult.

Some market participants interviewed hope that the Association Agreement with the EU will help modernise waste management, especially in the development of recycling concepts and recycling measures that are essential to reduce the dependency on outdated landfills.

### Authorities and their responsibilities

Table 4.9 shows the important institutions that are responsible for waste and recycling management in Ukraine.

Table 4.9: State stakeholders and their tasks in recycling management

Authority	Key tasks
Ministry of Ecology and Natural Resources (MENR)	Leading ministry for the development of waste legislation, monitoring of compliance with laws, supervision of authorities that operate licensing for recycling services and monitor the technical, health-related and environmentally relevant aspects of facilities, monitoring the waste and facilities register made by municipalities, authorising cross-border transfer of waste
Ministry of Regional Development, Construction, Housing and Municipal Services (MinRegion)	Supervising the implementation of waste policies on a municipal level, passing of guidelines, provisions and standards for the implementation of municipal waste disposal
State Ecological Inspectorate (SEI)	Lower authority of MENR traders are obligated to declare the packaging they have put into circulation to the SEI
Environmental departments in the regions (oblasts), often called Department of Ecology and Natural Resources	Responsible for emissions protection and waste disposal authorisations, managing statistics for the waste generation of companies
Municipalities	Responsible for collecting, recycling and safe disposal of municipal waste within their area, authorising charges for the collection of municipal waste, contracting private third parties for waste disposal, managing a waste registry (generation, recycling and treatment), managing of a facility registry with entries regarding disposal facilities and landfills

Source: Al-Naber et al., 2016 [71]

There are around 210 employees in the Ministry of Ecology and Natural Resources. There are 22 employees working in the department responsible for disposal tasks. In the SEI regional offices, there are almost 2,500 employees. The Ministry of Regional Development, Construction, Housing and Municipal Services has more than 380 employees. In the Division of Household Solid Waste Management, there are 5 employees [72].

#### 4.4. BUSINESS PROSPECTS FOR GERMAN COMPANIES

The need for services, facilities and equipment in Ukrainian waste management – especially in municipal waste – is enormous and persistent across the entire value chain from the collection, sorting, preparation and recycling, to disposal of the waste. In many regions, outdated fleets and container systems for waste collection are still being used. The fact that only around 70 % of the population has access to public disposal highlights the potential for suppliers of collection systems. The efforts to introduce the separate collection of recyclable material and residual waste in other municipalities is also proof of the business opportunities presented for suppliers of the relevant technology.

There is still accumulated demand in the sorting field, where requirements in the form of a sorting tariff must still be created. A packaging tax or fee is currently being discussed in the relevant ministries, with the involvement of the disposal management industry, which should help to finance the separate collection and sorting of recyclable waste. The private disposal management industry favours a participation fee for packaging brought into circulation which will be managed by an association or a foundation. The relevant organisation will then organise and put out to tender the collection and sorting.

Also, MBTs that process recyclable material from dry waste bins are a conceivable solution in Ukraine. In order to work economically, MBTs can be constructed in landfill areas.

Larger cities could profit from thermal treatment facilities. The WIF in Kiev from 1987 is still operational. The facility in Dnipropetrovsk was recently decommissioned, and the facilities in Odessa and Sevastopol have been dormant for a long time. If there are no grants from international benefactors, building new thermal treatment facilities will likely not be possible in the next few years due to high investment costs and low disposal fees.

In the waste disposal industry, business opportunities present themselves in the remediation and reinforcing of existing landfills, in gas collection and conversion into energy, and in building new landfill sites with suitable sealing as well as gas and leachate collection systems. The demand for cost-effective and useful solutions is huge, as landfills are overflowing, outdated and in need of decontamination. There are hardly any gas collection systems, meaning that the greenhouse gases caused by the anaerobic decomposition of organic components are largely set free. It is estimated that approx. 100 existing landfill sites are suitable for the installation of gas collection and gas utilisation facilities [73]. It is expected that this market segment will be boosted by feed-in rates for energy from renewable energy sources: the so-called “green tariffs”.

The World Bank subsidiary International Finance Corporation (IFC) published two scenarios in 2014 for the development of the waste and recycling management industry up to 2025 in Ukraine. The first, “business as usual” scenario envisages a modernisation of the collection infrastructure, the strengthening of existing landfills and investments in new landfills. The investments come to a total of €13.8 billion. The second “innovative” scenario also envisages modernisation of the collection systems and the strengthening of existing landfills, but aims to heavily curb the construction of new landfills, by using investments in the sorting and recycling infrastructure. Table 4.10 gives an overview of both IFC scenarios and the investments needed for each.

Table 4.10: Scenarios for modernising waste management up until 2025

Measures	Business as usual € in billions	Innovative scenario € in billions
Modernisation of collection infrastructure and reinforcing existing landfills	5.9	5.1
Building of new sorting and recycling facilities	0.5	4.3
Building of new landfill sites	7.4	5.1
TOTAL	13.8	14.4
Recycling rate in %%	8	41
Costs in € per inhabitant	35.4	30.1

Source: IFC, 2014 [74]

In order to implement “innovative scenarios” like those laid out by the IFC, and to turn waste management in Ukraine from a mere collection and disposal system to a true recycling management system, the existing regulations must also be consistently applied in practise. This includes, for example, the previously mentioned separated collection of waste from households, the recycling rates for packaging, as well as the levying of a landfill tax. The Landfill Directive 1999/31/EC should be implemented in national law as quickly as possible. Further sources of finance and incentives are required, and the focus here should be on the most cost-effective procedures. It must also be considered that all citizens must have as uncomplicated a waste separating system as possible, e.g. the two-bin system already in place in some cities with a recyclable goods bin (paper, cardboard, glass, cans and PET bottles). The non-recyclable component of household waste and similar waste goes in the residual waste bin. For such a separating system, a sorting tariff and determined PR measures are required to increase the sorting quality of household recycling.

If existing regulations are consistently implemented and if enough financial resources are secured, there could be interesting business prospects for German companies in the Ukraine waste market.

German companies are regarded highly in Ukrainian waste management. This is also true for planning and engineering companies, service providers in the waste management industry and suppliers of containers, vehicles and preparation or sorting facilities, as well as companies from the fields of landfill remediation and exploitation of landfill gases. German companies can apply their successes and experience with building the German recycling management system and the developing disposal management systems of other Eastern European countries in the last 25 years to Ukraine. Also, the value of the experience in supplying industrial companies with important secondary raw materials and refuse derived fuel cannot be underestimated in a country that has a large interest in developing its independence from the import of raw materials and energy.



## 5. WATER MANAGEMENT

### 5.1. WATER SUPPLY AND WASTEWATER DISPOSAL

#### Water resources

The availability of water in Ukraine varies greatly on a regional level due to the changing climate in the country. While the humid north west of Ukraine experiences a yearly average of 600 mm of rainfall with a maximum of 1600 mm, the arid south east of the country only experiences a yearly average of 360 mm [75]. During long dry periods in summer and simultaneous water withdrawal, the south easterly regions regularly experience a shortage of water [76]; [77].

There are seven PAs in Ukraine that, with the exception of the Western Bug in the western-most part of the country, all flow into the Black Sea. The most important river in terms of water management is the Dnieper, the PA of which covers 65 % of Ukraine's land area. The next largest PAs are the Dniester (12 %), the Donau (7 %), the Donetsk (4 %) and the Southern Bug (3 %). The groundwater resources in Ukraine are estimated at 20 billion m<sup>3</sup>/year. Artesian sources are located in the north of the country at depths of 100-150 m and in the south at depths of 500-600 m [75].

Generally, the water quality in Ukraine is disproportionately poor. The main causes of water pollution are caused by the direct drainage of or insufficiently treated municipal and industrial wastewater into surface water. The most frequently occurring pollutants are nitrogen and phosphorous compounds, organic substances, pesticides, oil products, heavy metals and phenols. With 894 million m<sup>3</sup>, industry drains the most wastewater into the wastewater system and into bodies of water, followed by households and municipalities with around 538 million m<sup>3</sup> and agriculture with almost 71 million m<sup>3</sup>. The most severe cases of pollution are recorded in the industrial regions Donetsk, Dnipropetrovsk, Luhansk and Odessa in the east and south of the country. In all, around 75 % of the wastewater produced flows into bodies of water here [78].

#### Water requirements

The total water consumption in Ukraine is around 15 billion m<sup>3</sup>/year, of which almost half is attributed to the industrial sector (cf. Figure 5.13). The highest quantities consumed by far are a strong 3 billion m<sup>3</sup> in the energy sector, agriculture (almost 3 billion m<sup>3</sup>), households and public suppliers (almost 2 billion m<sup>3</sup>) and the metallurgical industry (1.5 billion m<sup>3</sup>) [75].

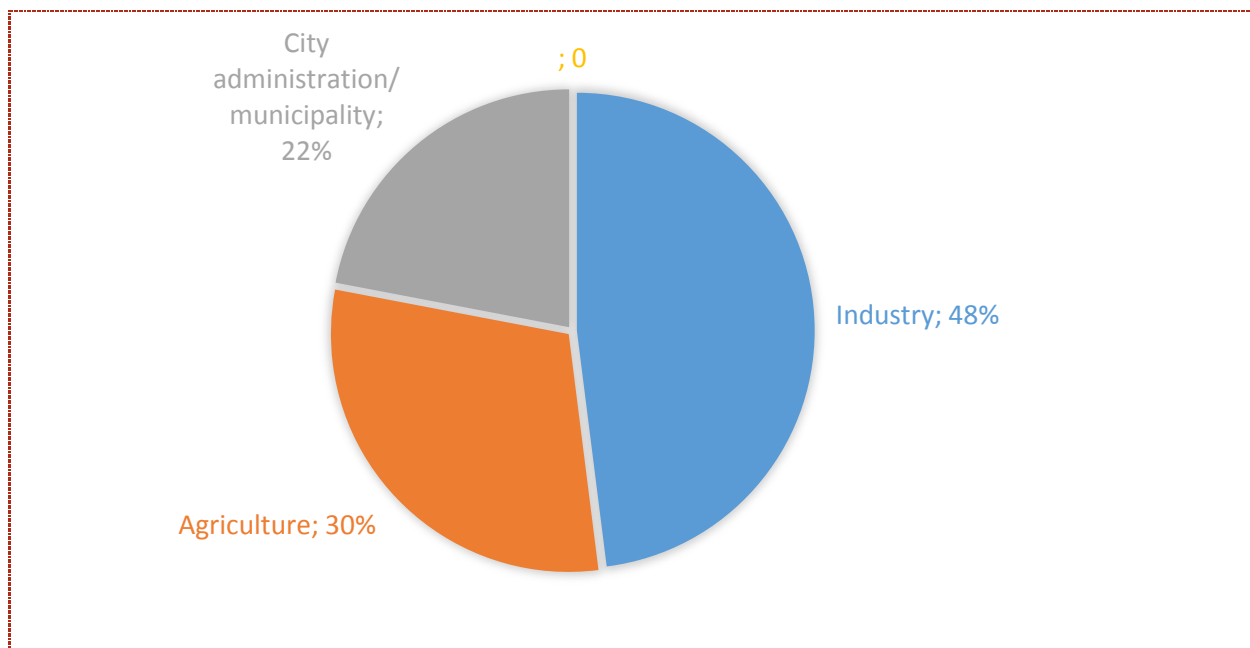


Figure 5.13: Water usage per sector (in %)

Source: FAO, 2016 [75]

80 % of the water requirements in Ukraine are covered by surface water and only 20 % by groundwater [75]. Around 75 % of the population in Ukraine is dependent on water resources from the drainage basin of the Dnieper, from which 9.2 billion m<sup>3</sup> of water is taken every year [76]; [79]. Table 5.11 demonstrates the regional water usage. The regions mentioned together make up around 71 % of the entire water requirement for Ukraine.

Table 5.11: Water usage per region (in millions per m<sup>3</sup>)

Region	Water usage
Donetsk	2,093
Dnipropetrovsk	1,684
Autonomous Republic of Crimea	1,625
Kherson	1,392
Odessa	1,236
Zaporizhia	1,211
Kiev oblast	1,170

Source: Larive International, 2014 [79]

### Drinking water management

The access rate to drinking water in Ukraine is considerably higher than the access to wastewater systems. In 2014, around 66.9 % of the population had access to a central drinking water supply. The supply level in cities was around 82.3 %. The drinking water supply level in rural areas varies greatly (cf. Figure 5.14) and averages 31.8 % [80]. Especially in cities and during the night hours, there are occasional interruptions to the drinking water supply [81].

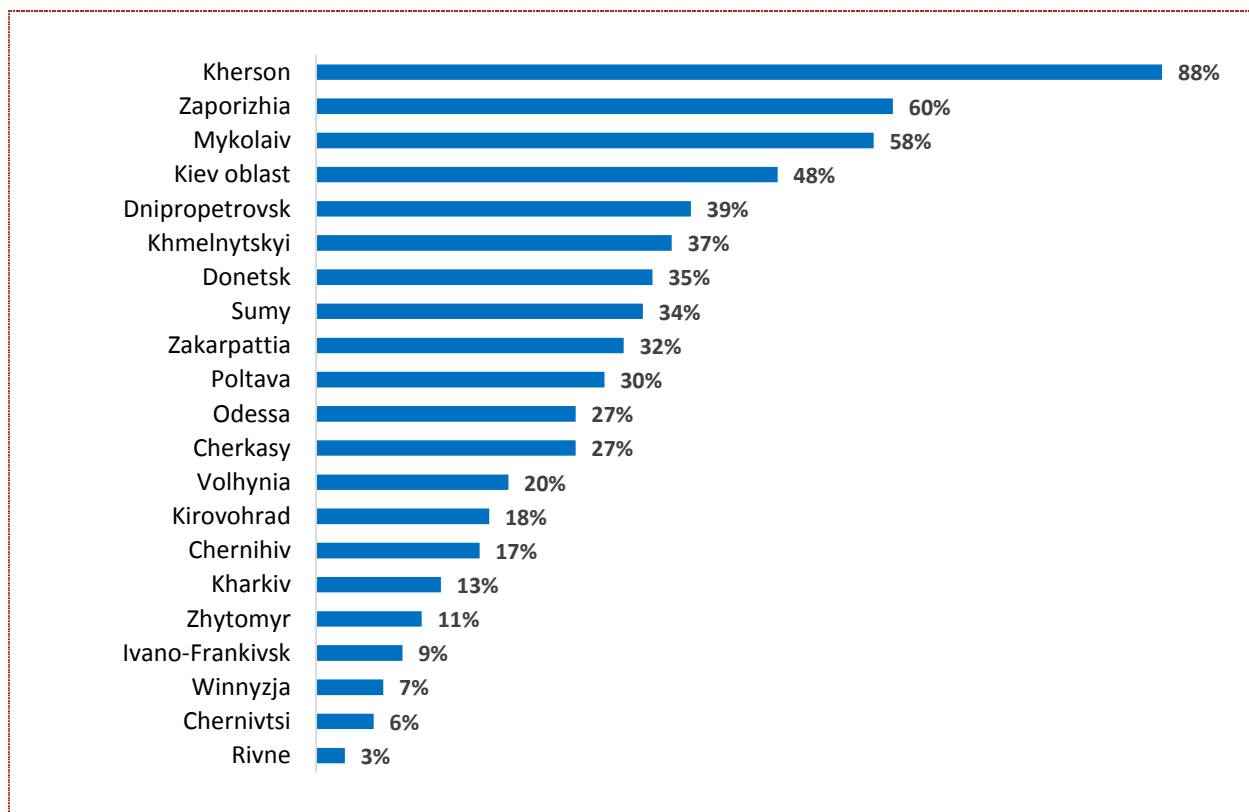


Figure 5.14: Rural water supply according to region (in %)

Source: MinRegion, 2012 [82]

Around 23 % of the population in large cities drinks untreated water. In small cities and rural areas this figure rises to 46 % and 63 %. To obtain drinking water, private wells and smaller bodies of surface water are often used. Around a fifth of Ukrainian households use water preparation methods like filtration using textiles, boiling off water, water filters and the sedimentation of suspended matter as well as bleaches and chorines [83].

The entire amount of water supplied to meet drinking water requirements was almost 3 billion m<sup>3</sup> in 2013. Of this, around 2.2 billion m<sup>3</sup> was treated and 1.8 billion m<sup>3</sup> actually consumed [79]. The average consumption per head of 260 l/day is considerably above the European average (100-200 l/day) because of huge water losses [82]. The increasing installation of water meters should help to decrease water usage.

The water loss rate in the drinking water supply is 38 % in Ukraine, a relatively high proportion. This equates to drinking water consumption of around 100 l/day. The losses are very different depending on the region (cf. Figure 5.15) [82]. Half of all water losses (51 %) are caused in the municipal sector of Eastern Ukraine [79]. High losses of water can be attributed in particular to out-dated facilities and a run-down pipeline network. The average age of pumps is estimated at around 30 years. Of these, 80-85 % are models from the Soviet period [79]. In 2013, in the supply of drinking water, it was estimated that, of the entire stock, 16,000 pumps (29 %) needed to be replaced. Of the total of approx. 133,000 km of the pipeline system, around 48,000 km (38 %) were in need of repair [82].

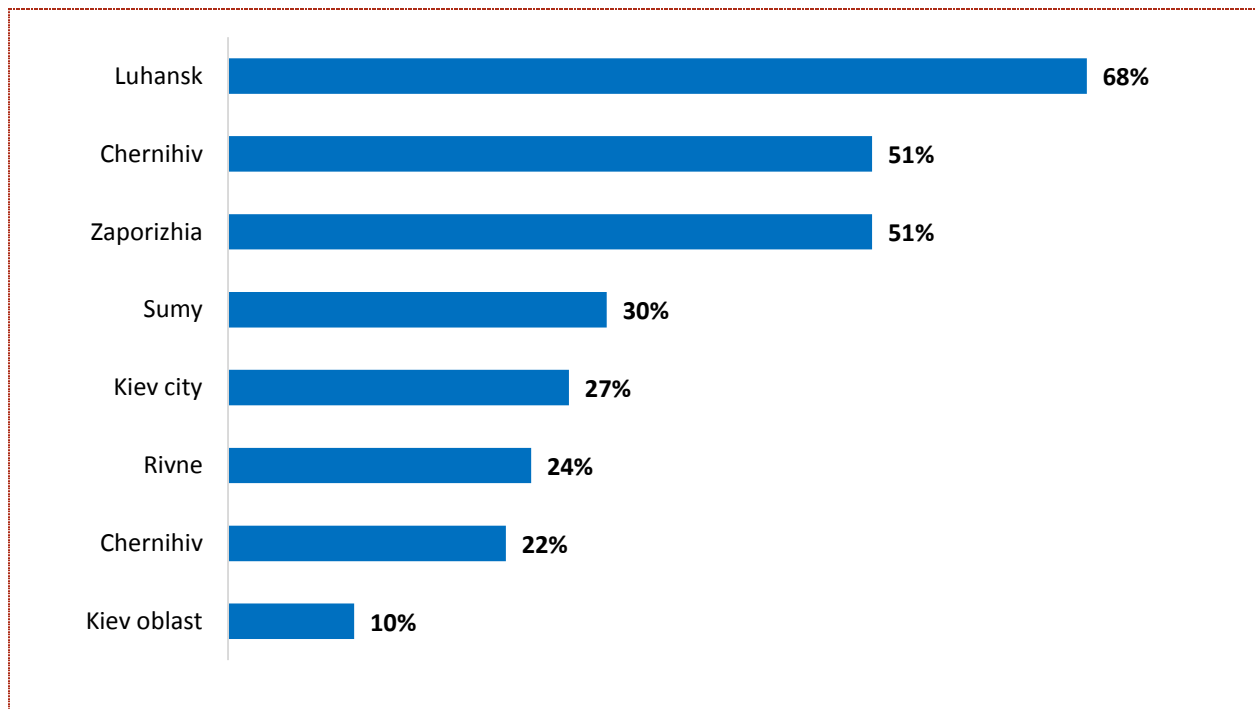


Figure 5.15: Water losses and technical own requirements in 2013 for selected regions (in %)

Source: MinRegion, 2012 [82]

Drinking water is mostly treated in mechanical water treatment systems through sedimentation or sand filtration and subsequent chlorination, which only leads to an improvement in water quality to a small extent. Run-down pipelines also allow outside water to penetrate the pipes so that there are regionally high cloudiness values and dips in quality on a regular basis [76], [84]. Because of non-existent or insufficient drinking water treatment and the poor state of facilities and pipeline systems, the quality of drinking water in Ukraine often does not meet WHO hygiene requirements [84]; [85]. The monitoring of direct and indirect discharge of wastewater is also insufficient due to lacking technological means and lack of political motivation [84]; [86].

### Wastewater management

The access rate to a central wastewater disposal system in Ukraine was around 56 % on average in 2012. In cities the average access was 75 %. The wastewater access rate in rural areas is very low at 8 % on average and demonstrates large regional differences (Figure 5.16) [80]. As well as the central wastewater disposal, a large percentage of the population use cesspits. In 2012, this proportion was 2.4 % in big cities and 21.1 % in small cities and 57.9 % in rural areas [83].

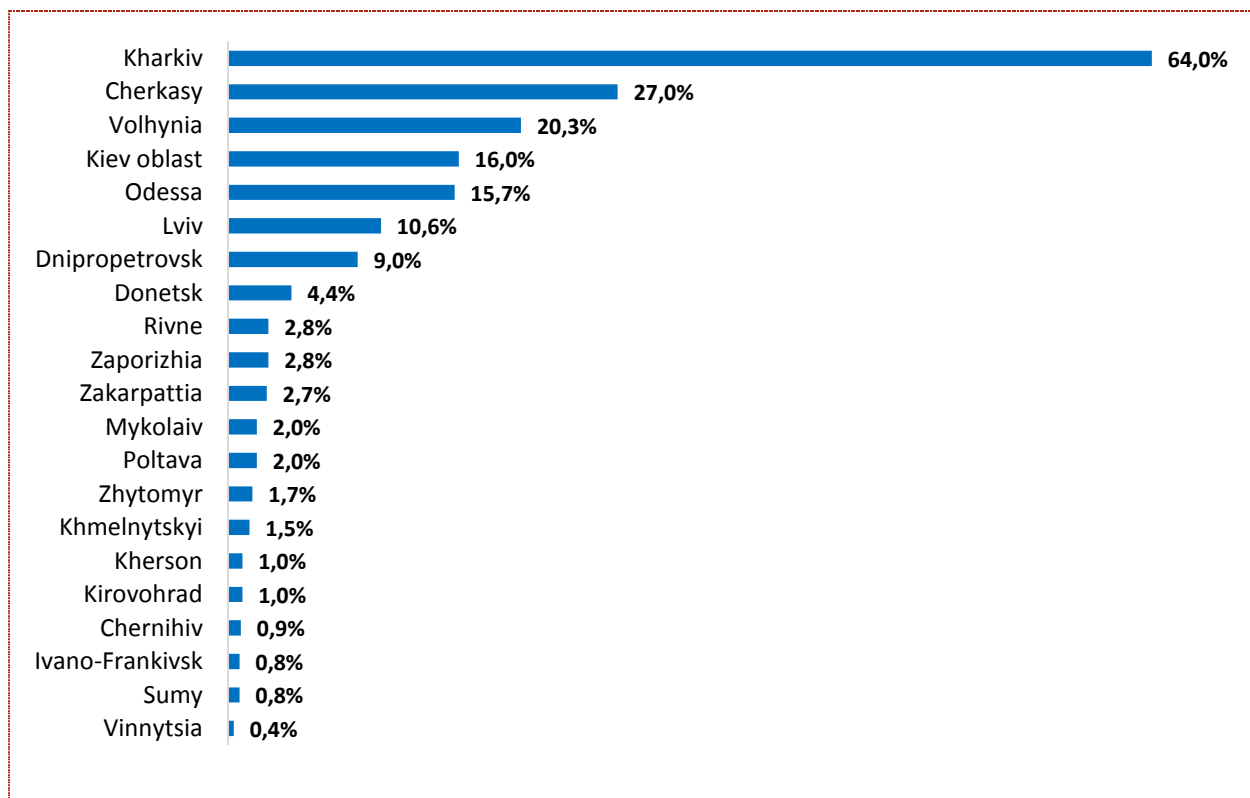


Figure 5.16: Rural wastewater disposal levels according to region (in %)

Source: MinRegion, 2012 [82]

In large cities, around 90 % of wastewater is mechanically-biologically treated. In smaller cities this method is only carried out in 45 % of facilities. In rural regions wastewater treatment is often limited to mechanical primary treatment [87]; [79].

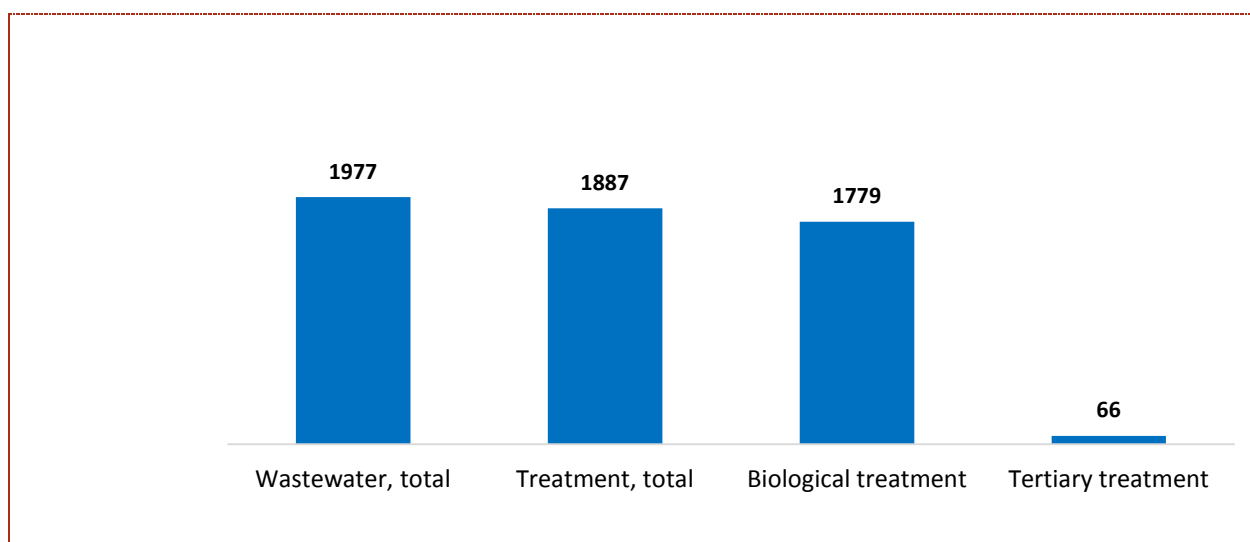


Figure 5.17: Operating figures for wastewater treatment in Ukraine in million m<sup>3</sup>

Source: Dreberis, 2015 [89]

The central wastewater disposal system is known to be only minimally automated, have a large number of employees, and have defective or inefficient technology. Following considerable drops in consumption, its facilities are oversized, there is a lack of treatment capacity in wastewater treatment facilities and a lack of possibilities in terms of sewage sludge disposal [88].

The following deficits can be observed in wastewater treatment:

- Coarse materials are often only removed manually,
- Rakes or sand traps are often missing or no longer work,
- The biological wastewater treatment is often carried out using activated sludge processes and without eliminating nitrogen and phosphorous separately,
- The ventilation systems often run inefficiently,
- The sewage facility is mostly operated without online measurement and control technology.

The treatment capacity in sewage facilities is therefore heavily dependent on both the experience and commitment of employees [86].

The resulting sewage sludge can often not be chemically-biologically stabilised sufficiently. Because of excess volumes and a lack of capacities, the sludge is often not stored and disposed of properly and therefore the potential for biogas production (anaerobic sludge disposal) cannot be exploited [84]; [86].

The sewage facilities in Ukraine were mainly set up in the 60s and 70s. Many of them were fitted in accordance with modern treatment standards for that time, but no longer fit with the current state of the art and so are in need of renovation. The regional percentages of sewage facilities that are in need of renovation are shown in Figure 5.18 [82].

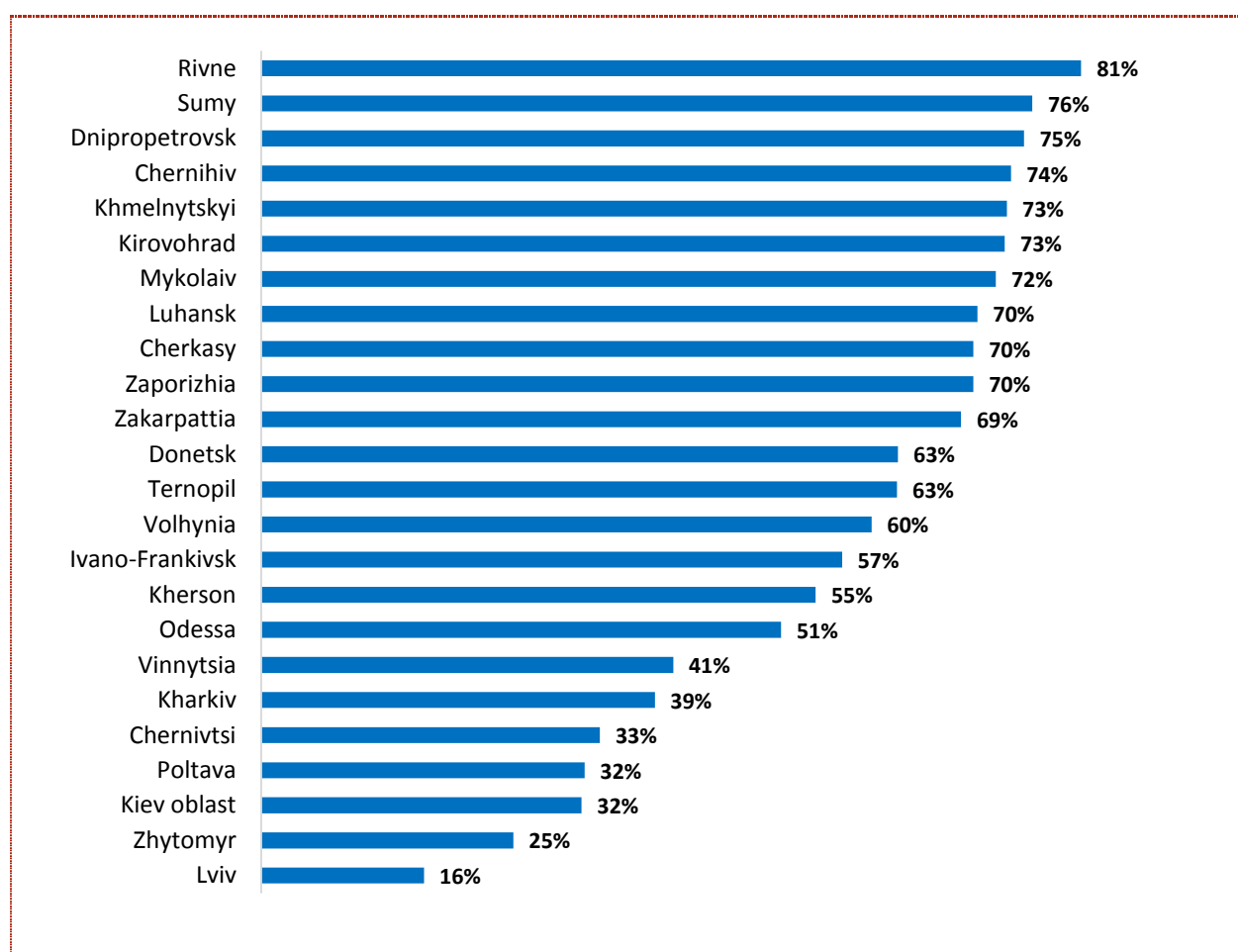


Figure 5.18: Percentage of sewage facilities that are in need of renovation in 2013 (in %)

Source: MinRegion, 2012 [82]

Because of the run-down condition of the entire sewage system, (42,800 km in length), the need for renovation in 2013 was estimated at around 16,000 km (38 %) of the sewage pipelines. As well as this, around 7,650 sewer pumps (33 %) from the pump stock were in need of renovation [82].

The usage of outdated technology also leads to a very high energy requirement in the drinking water management and wastewater disposal sectors. In Luhansk, the region with highest water loss rates at 67 %, energy usage is 1.54 kWh per m<sup>3</sup> of treated water [79]. In the Khmelnytskyi area, for example, over 900 kWh per m<sup>3</sup> of treated wastewater is used [82].

## 5.2. MARKET PARTICIPANTS IN WATER MANAGEMENT

The market for water collection and treatment in Ukraine is very competitive. A range of local and foreign companies from different areas of the water sector already boast a long history of business in Ukraine.

It is estimated that 60-75 % of the water technology is imported into Ukraine. Because of the product diversity in the water sector and the lack of publicly accessible information, estimating the total volume of the water market is very difficult. According to experts, the market volume is between €1.2 and 1.5 billion (2013) [79].

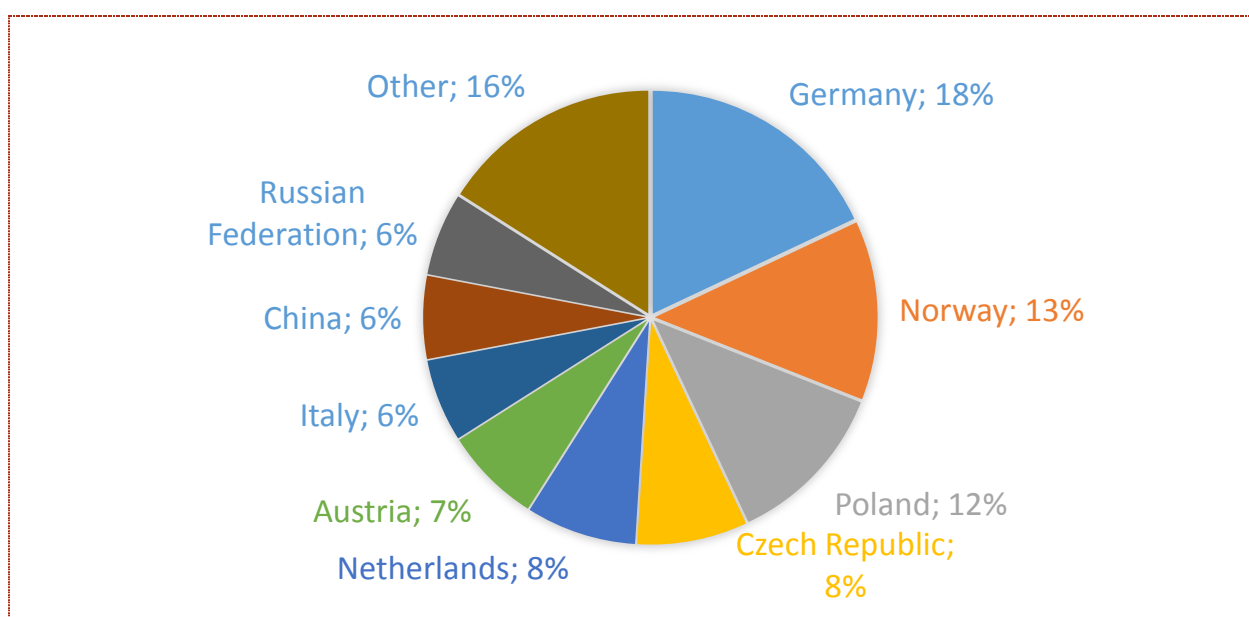


Figure 5.19: Import distribution of filter and water processing technologies 2015 (in %)

Source: UN Comtrade, 2016 [90]

The largest import volumes in the field of filter technology and water treatment were reached by the following countries in 2015: Germany (18 %), Norway (13 %), Poland (12 %), Czech Republic (8 %), The Netherlands (8 %), Austria (7 %), Italy (6 %), China (6 %) and the Russian Federation (6 %) (cf. Figure 5.19). Italy is top of the list for electric pump imports (57 %), followed by Poland (13 %), China (8 %) and Germany (4 %) [90].

Primarily, companies from the USA, Russia and Scandinavian countries are amongst the international market leaders for drinking water supply and wastewater disposal. In 2014, market leaders for waste filtration and purification were Danfoss (Denmark), Aquaphor Marketing (Russia), Hager + Elsasser (Germany) and Mettem Technologies (Russia). The largest sales revenues for pumps were achieved by Grundfos (Denmark), WILO (Germany), Pedrollo (Italy), Danfoss and Gardena (Germany). The market leaders for plastic pipes and tubes are CELL-FAST (Poland), PROFIL Wytworknia (Poland), Vailant (Germany), Viessmann Werke (Germany) and REHAU (Germany). The biggest importers of fittings and valves are Danfoss, Viessmann Werke, Grundfos, Agregat (Russia) and GE Transportation Parts (USA) [80].

Local companies from the water sector are listed in the following.

Table 5.12: Ukrainian market participants in the drinking water sector

Company	Website
Aqua-Lux Ltd.	aqualux.com.ua
Aquaton	www.aquaton.org
Hydroecologia Ltd.	hydroeco.com.ua
Ingar	ingar.kiev.ua
Kyiv Best Service	kbest.com.ua
SPA Ecosoft	www.ecosoft.ua
SPF Ecovod	www.ecovod.com.ua
Ukrainian Water Technologies Ltd.	www.uwt.kiev.ua

Source: Updated according to Larive International 2014 [79], last updated October 2016

Table 5.13: Ukrainian market participants in the wastewater sector

Company	Website
Aquaphor Center Ltd.	aquaphor.ua
Aquatec Ukraine Ltd.	aquatec.in.ua
Arista, Commerce and Industrial Union Ltd.	www.arista.com.ua
Asio Ukraine Ltd.	www.asio.com.ua
Biohim-Service Ltd.	biohim.com.ua
BVT Ukraine Ltd.	www.bwt.ua
Danfoss Ltd.	www.danfoss.com
Dzherelo	www.ecology.com.ua
Ekoton	en.ekoton.com
Energoresurs – Invest Corporation	ru.energoresurs.com
Eurowater Ltd.	www.eurowater.ua
Honeywell Ukraine	www.honeywell.com
Kharkiv Electric Industrial Company Ltd.	www.helco.com.ua
PC Potential-4	potential4-privat.com.ua
PJSC Santechcomplect	santech.ub.ua
PJSC Ukrainian technology company	www.ukrtechcom.com
Promtehvod Ltd.	promtehvod.com.ua
SPE Polimer Mehanika	polimer-meh.com.ua
SPR-Group Ltd.	www.sprgroup.com.ua
UniLOS-Ukraine Ltd.	www.unilos.com.ua
Vulver	www.vulver.com.ua
Wilo Ukraine Ltd.	www.wilo.ua



Source: Updated according to Larive International 2014 [79], last updated October 2016

Table 5.14: Ukrainian consulting and engineering service providers in the water sector

Company	Website
CJSC SU Group	<a href="http://www.sugroup.com.ua">www.sugroup.com.ua</a>
Engineering company Skandtehimport Ltd.	<a href="http://www.pump.biz.ua">www.pump.biz.ua</a>
Hydrotech Engineering	<a href="http://www.hydrotech-engineering.com">www.hydrotech-engineering.com</a>
Jurby WaterTech International	<a href="http://www.jurby.com">www.jurby.com</a> <a href="http://www.vodasystem.net">www.vodasystem.net</a>
Potential-4 Ltd. Scientific Engineering Centre	<a href="http://www.potential4.com.ua">www.potential4.com.ua</a>
SE UkrRTC Energostal	<a href="http://www.energostal.kharkov.ua">www.energostal.kharkov.ua</a>
SPE Vodtehservice	<a href="http://ochistka-vody.com.ua">ochistka-vody.com.ua</a>

Source: Updated according to Larive International 2014 [79], last updated October 2016

Approximately one quarter of the population of Ukraine consumes bottled water from different bottlers. The market leader in terms of drinking water treatment and bottling is “Ukrainsky Vodni Tekhnologiyi LCC” (AVT). The company operates several water treatment and bottling facilities that are fitted with modern technologies from abroad [79].

The “International Water Research Alliance Saxony” is one of the important research associations that German water management companies were involved in. IWAS, together with the Stadtentwässerung Dresden, the TU Dresden and the Helmholtz Centre for Environmental Research - UFZ as well as DREBERIS GmbH, investigated indirect dischargers and water contamination through sewage facilities in Ukraine from 2008 and 2013. In this period, almost all the large and medium-sized sewage facilities in Ukraine were investigated with a specially developed mobile laboratory.

Currently, the joint project “ZAK – Zeiteffiziente Analyse von Kläranlagen in der Ukraine” (time-efficient analyses of sewage facilities in Ukraine), hopes to contribute to an increase in the energy efficiency of sewage facilities. Alongside DREBERIS, the companies and organisations involved in this project are the TU Dresden, the Stadtentwässerung Dresden and, on the Ukrainian side, the Vodokanal companies of the cities of Lviv, Ivano-Frankivsk and Chervonohrad.

### 5.3. LEGAL AND INSTITUTIONAL FRAMEWORK CONDITIONS

#### Strategies and programmes

The 2020 national environmental strategy, passed by the Ukrainian parliament in 2010, is amongst the most important strategies in the water sector. It describes the biggest challenges in the environmental sector in Ukraine and places priority on natural resources.

The strategy has the following goals:

A reform towards rationalising water usage by implementing integrated water resource management

The reconstruction of existing and building of new municipal wastewater disposal systems with the goal of a 15 % reduction in water pollution and a 20 % decrease in insufficiently treated wastewater by 2020

Reducing the level of pollution in stagnant water and in the Black Sea and Sea of Azov [78]

The 2011-2020 state programme for drinking water in Ukraine is one of the most important programmes for water management in the country. It has the goal of ensuring the rights of the Ukrainian population to an appropriate standard of life via the provision of drinking water to a standardised quantity and quality, based on EU standards. The programme is to be financed by the state, local authorities, businesses and international organisations, although the division of costs has not yet been specified [79].

The most important programmes concerning the wastewater industry include the national programme for water management development and the state programme for reform and development of the municipal housing industry. Both programmes have the aim of de-monopolising the municipal companies in the sector by way of reforming the tariff system as well as structural and economic reforms [81].

#### Basic regulations

Two important laws regulate the water supply and wastewater disposal sector in Ukraine. The Ukraine Water Code (Water Code No. 213/95-VR) from 1995 regulates the water resource management (monitoring, usage, protection and improvement of water resources) and was most recently amended in January 2015. It defines the ownership rights of the water user and regulates the monitoring of water usage, protection of bodies of water from pollution and over usage and improvement of the ecological state of bodies of water. As well as this, the law determines the obligations and responsibilities in terms of management of water resources which are assigned to the Ministry of Ecology and Natural Resources in Ukraine. As well as the management of water resources, it is responsible for the development of the legal basis for determining water prices and wastewater fees [78]; [81].

The 2002 law governing drinking water and drinking water supply (Law No. 2918-III on potable water and potable water supply) determines the legal, economic and institutional basis for the provision of drinking water as well as responsibilities on several different administrative levels, in order to safeguard the drinking water supply for the population [91]. Currently, the Ministry of Regional Development, Construction, Housing and Communal Services is the primary responsible body for determining water and wastewater tariffs and the legally regulated cost coverage for water supply and wastewater disposal. The law additionally stipulates that the municipal administrators are responsible for determining the tariffs for water and wastewater on a local level, and that the tariffs must cover the costs for water collection and treatment, including the maintenance of pipeline and sewer systems [81].

Currently, however, there are frequent discrepancies between the legal requirements and practical implementation because of ambiguities regarding responsibilities within the responsible bodies, inef-

efficient organisation of the collaboration between municipalities and the responsible companies for drinking water supply and wastewater disposal, as well as lacking expertise amongst municipal authorities [86].

As well as those listed above, there are also other laws dealing with different aspects of water resource management. The relevant laws in the water and wastewater sector in Ukraine are summarised in Table 5.15.

Table 5.15: The most important laws for the water and wastewater sector in Ukraine

Legislation	Year of enactment
Ukraine Constitution	1996
Water Code of Ukraine	1995
Law on Local Self-Government in Ukraine	1997
Law on Housing and Municipal Services	2005
Law on Drinking Water and Drinking Water Supply	2002
Law on the Antimonopoly Committee of Ukraine	1993
Law on Natural Monopolies	2003
Law on Prices and Price Maintenance	2000
Law on Public Tenders	2015
Budget Code of Ukraine	2001

Source: own presentation according to UBA, 2013 [87] and Al-Naber et al., 2016 [78]

In recent years, there has also been a great deal of state programmes and strategies created to meet the urgent challenges in the water sector. In many cases, however, these were implemented insufficiently or not at all due to a lack of financial means [76]. The current and expected legislative changes in the water sector in Ukraine are as follows:

- The Ukraine water sector has been undergoing a politically supported process of decentralisation since 1997, when the law on local self-government was passed. In accordance with this, the responsibility of water management companies should be increased and transferred to cities, municipalities and townships, whereby water management can be more tailored to demand and the decision-making processes can be made more transparent [75]; [81].
- For the period of 2016-2020 the 2020 national environmental strategy is aiming to introduce European environmental regulations and standards. Economical mechanisms should also lead to structural changes so that development towards an ecologically efficient collaboration of the state, companies and the public can be furthered [78].
- In 2015 the law regarding public tenders was passed and supports the implementation of the Association Agreement between the EU and Ukraine for developing a transparent tender process, based online. This represents a huge step forward for fighting corruption in Ukraine.
- The implementation of green tariffs in 2013, for the feed-in of power from hydropower and biomass (including wastewater treatment products) amongst other things, has so far been very positive for the water sector [79]. The change to the tariff system in 2015 currently involves a noticeable rise in tariffs for both forms of renewable energy.

- Signing the economic section of the Association Agreement between the EU and Ukraine in 2014, which contains regulations for a free trade agreement, opens up further developments such as matching technical standards to those of the EU, introducing standardised certifications, the simplification of customs procedures, and cooperation in the field of water management and quality.

### Authorities and their responsibilities

The management of water resources is increasingly based on the principle of drainage basin management. Currently, however, local and regional authorities also have an influence on water resource management in the country. The legal implementation of drainage basin management has been a political debate for years. A regulation for collaboration between the administrative bodies of river basin areas and state institutions has so far, however, been neglected [75].

The management, the use, the protection and the renaturation of water resources of Ukraine are regulated by local village and municipal councils and their executive powers, regional and district administrative bodies, regional state authorities as well as national and local executives. The major national stakeholders are listed in Table 5.16.

Table 5.16: State stakeholders and their tasks in Ukrainian water management

Authority	Basic responsibilities in the water sector
Ministry of Ecology and Natural Resources, MENRU	Protection and renaturation of water resources, issuing of bans and punishment for water pollution and illegal water usage
Ministry of Regional Development, Construction, Housing and Communal Services	Management and development of the water and wastewater sector, expert advice and monitoring of operators, formulation of tariff policies, creation of national reports about drinking water quality, consultation for investment planning for infrastructure projects
Ministry of Healthcare	Passing of quality standards for drinking water
State Agency of Water Resources	Implementation of political programmes and strategies, authorisation for water engineering plans and issuing of water usage rights
State Service of Geology and Mineral Resources	Authorisation for building and operating underground water management facilities, identification of inactive wells and their removal and remediation, upkeep of monitoring databases for surface and ground water
State Committee for Water Management	Implementation of political programmes and strategies, management and the use of surface water, operation and maintenance of state irrigation and land drainage systems
National Commission for State Regulation of Energy and Public Utilities	Licensing central water supply and wastewater management sectors, passing of water and wastewater tariffs
Basin administrations	Water resource management on a basin level, development of political principles and strategies for using water in the PAs, solutions for conflicts between water consumers
State Environmental Inspection	Implementation of national programmes and strategies for water pollution control, water usage, renaturation and conservation
State Hydrometeorological Service	Weather analyses and predictions, agrometeorological analyses and preparation and distribution of hydrometeorological information

Source: own presentation according to Larive International, 2014 [79] and FAO, 2016 [75]

Other state institutions that are responsible for affairs in the water sector are the Ministry of Energy and Coal Industry, the Ministry of Infrastructure, the State Agency of Fisheries, the Ministry of Economic Development and Trade and the Ministry of Agrarian Policy and Food.

The law on self-government introduced decentralisation into the water sector and was supposed to shift the responsibility for drinking water supply and wastewater disposal to a local authority level (cities, municipalities, villages). In some cases, however, the responsibility was merged on a higher level, mostly on a regional (oblast) level. In Ukraine, the so called Vodokanal companies are responsible for the central drinking water supply and wastewater disposal. In 2015, the 250 Vodokanal companies had around 75,000 employees. Usually these companies are owned by municipalities, and so are managed by municipal authorities. Partial privatisation of Vodokanal companies is also possible, but because of insufficient financial and technical capacities and an unclear legal basis regarding authorisations for privatisation of operating investments, this is an exception [81]. The influence of the Vodokanal companies is very strong in many cases. Very ambitious companies can be found amongst them with whom open and reliable cooperation is possible [84].

Although the Ukrainian government has got laws and strategies to implement its water management goals off the ground, these have only been hesitantly implemented. This is particularly attributable to a lack of monitoring mechanisms as well as insufficient staffing and financial capacities on the side of the authorities. Another difficulty in implementing laws stems from the fact that the responsibilities of the authorities often overlap and the unclear assignment of responsibilities in laws and programmes.

**Water and wastewater tariffs**

The tariffs for water and wastewater have been decided by the National Commission for State Regulation of Energy and Public Utilities since 2014. The rate of basic tariffs is suggested by the Vodokanal companies. They are based on the planned operating costs and the rate of tax and compulsory payments for the following, the expenditure in the current financial year and state accounts. The basic tariffs are calculated in m<sup>3</sup> of water. If the company is state-owned, the tariff suggestions are forwarded, along with the revenue data, consumption figures and prices for raw materials, resources, services etc. to the local state administrative bodies. Municipal companies submit the calculated tariffs and relevant documents to the local councils. The responsible bodies can either accept or reject suggested basic tariffs. Determined basic tariffs can be adjusted in the event of a change in tax and fee rates, energy prices and other obligatory payments [86].

Since 2000 the decrease in subsidies for electricity, gas and district heating has led to a continuous increase in water prices (Figure 5.20). It was not until May 2016 that there was a serious rise in the heating and cold water tariffs because of the abolition of subsidies. In the future, economically weak households, however, will be financially supported by a targeted subsidy system and will only pay 10 % of the market price [92].

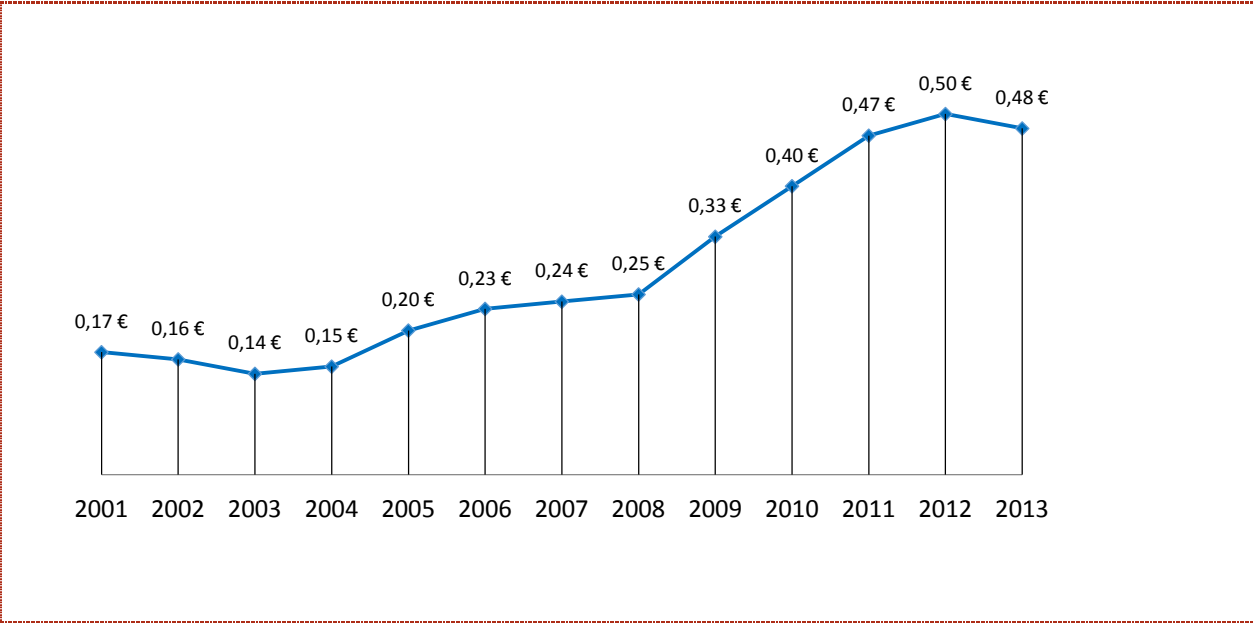


Figure 5.20: Tariff development for water and wastewater in Ukraine (in €/m<sup>3</sup>)

Source: Salvetti, 2015 [93]

#### 5.4. BUSINESS PROSPECTS FOR GERMAN COMPANIES

Ukraine represents a huge market potential for German companies in water supply and wastewater management industries. The particular strengths of German water management mean there are numerous comparative business advantages against the market competition. In Ukraine, the German water sector enjoys a very positive reputation and is known for its high level of specialisation and its quality in building facilities, service and monitoring as well as laboratory analysis. It has a high level of supply reliability in all areas of the industry, but also comparably high prices. Amongst the strengths of the German water management industry are well-founded and long-standing experience in the water sector, the high level of drinking water quality, the nationwide access rates to the central drinking water supply and wastewater disposal, the dense supply and disposal network, and the high wastewater disposal capacity according to EU standards. German companies are also popular business partners because of their sustainable use of water resources, high level of customer satisfaction and their economic efficiency. The water management industry is also known for its strong association structures, the development and regular updating of standards and standardisation as well as the active promotion and networking of SMEs with research institutes by federal institutions. There are also comparative advantages from experience with political and structural times of change from East Germany (demographic shift, change in use to industrial and agricultural sectors, changing demand for drinking water, wastewater).

On the other hand there are comparative disadvantages of the German water management industry, predicated on a language barrier and a lack of knowledge about Ukrainian processes in administrative bodies, institutions and between business partners. As well as this, the inadequate level of cooperation between specialised companies and the branches of many SMEs means that comprehensive business components are seldom offered. Often, national guidelines and reports from the sectors are only available in German. The lack of reports in foreign languages means that the information does not transfer into international markets.

The demand for investment in the water sector in Ukraine is estimated at €6.2 billion or €15/head and year. This is mainly due to failed renovation and a low level of investment since the 1990s. Moreover, the current systems for water supply and wastewater management are very energy intensive and too large because of low energy prices and irrational usage during the Soviet era [93].

The need for action for German companies in the water sector in Ukraine is based on current challenges in Ukrainian water supply and wastewater management:

- High water usage (120 l/head) because of inefficient water management and huge losses in water (38 %)
- Low access rate to central drinking water supply (67 %)
- High level of water pollution (surface and groundwater), mainly caused by the non-existent or insufficient treatment of wastewater from industry and municipalities. This often leads to a regional shortage of water in eastern and southern industrial regions
- High energy usage because systems and supply networks are being used that are in great need of renovation
- Ambiguities in legal framework conditions and responsibilities of regulatory bodies and inefficient cooperation between regional and local authorities and municipal water management companies
- The lack of a cost-covering tariff system to ensure efficiency of the water sector sustainably
- Operational inefficiency due to inadequate education of municipal water supply and wastewater disposal management staff

Potential business areas in Ukraine's water sector are offered, in particular, by international cooperation in river basin management of the cross-border bodies of water in the country and the implementation of the European Water Framework Directive. International collaboration on a municipal level also represents huge business opportunities for German companies. This includes, for example, the capacity development of staff, support for planning, construction management and operating procedures for water and wastewater systems, the recording of the existing supply and sewage networks and their state, implementing web-based technology for measurements, analyses as well as monitoring and procedural processes and the introduction of a cost-covering tariff system. Finally, there is huge demand for decentralised systems for water supply and wastewater management.

The biggest need for action in the area of water supply concerns, above all, the renovation of the supply network and the related water losses. The extreme increase in the previously heavily subsidised water tariffs leads to a considerable need for investment in energy-efficient solutions [94]. There is also a large demand for the installation of modern filtration technology for drinking water treatment (membrane technology and ultra filtration) as well as quality control for drinking water [87].

Considerable business opportunities in the wastewater disposal field can be identified in the renovation and new development of sewage facilities, in the technical and structural increase of efficiency for processes in sewage facilities and in the building of sludge treatment plants. There is also a large demand for the renovation of pumping stations, the use of web-based measuring and control technology for use in plants, and the modernisation of measuring devices. Because of a sustained upward trend in energy prices, there is an increased demand for energy-efficient solutions in all operating processes. Business potential can also be found in the introduction of mechanisms for monitoring, prosecution and treatment of people who are guilty of discharging within industry and the introduction of wastewater charges [87].



## 6. USEFUL CONTACTS

### For the promotion and support of foreign trade

Organisation:	AHK - Deutsch-Ukrainische Industrie- und Handelskammer (German-Ukrainian Chamber of Industry and Commerce)
Address:	wul. Puschkinska 34, UA - 01004 Kiev
Contact:	Alexander Markus / Chairman of the Management Board
Phone:	+380 44 234 5595
E-mail:	alexander.markus@ukraine.ahk.de
Website:	<a href="http://www.ukraine.ahk.de/">http://www.ukraine.ahk.de/</a>

Organisation:	GTAI - Germany Trade and Invest - Gesellschaft für Außenwirtschaft und Standortmarketing mbH
Address:	Villemombler Straße 76, D - 53123 Bonn
Contact:	Verena Saurenbach
Phone:	+49 228 24993 – 321
E-mail:	Verena.Saurenbach@gtai.de
Website:	<a href="http://www.gtai.de/GTAI/Navigation/DE/Trade/Weltkarte/Europa/ukraine.html">http://www.gtai.de/GTAI/Navigation/DE/Trade/Weltkarte/Europa/ukraine.html</a>

### Banks

Organisation:	Commerzbank AG, Kiev branch
Address:	28, Institutska Street, UA - 01021 Kiev
Contact:	Peter Koslinski / Representative
Phone:	+380 44 303 95 30
Website:	<a href="https://www.worldwide.commerzbank.com/de/home/inhalte/niederlassungsseite_5530.jsp">https://www.worldwide.commerzbank.com/de/home/inhalte/niederlassungsseite_5530.jsp</a>

Organisation:	Deutsche Bank AG Ukraine
Address:	20 Lavrska Street, UA - 01015 Kiev
Contact:	n.a.
Phone:	+380 44 495-92 00
Website:	<a href="https://www.db.com/ukraine/">https://www.db.com/ukraine/</a>

Organisation:	EBRD - European Bank for Reconstruction and Development
Address:	Dynasty-Office-Centre, 46-46A Antonovycha Street, UA - 03150 Kiev
Contact:	Sevki Acuner / Country Director
Phone:	+380 44 277-11-00
E-mail:	kiev@kev.ebrd.com
Website:	<a href="http://www.ebrd.com/pages/country/ukraine.shtml">www.ebrd.com/pages/country/ukraine.shtml</a>

Organisation:	IFC - International Finance Corporation
Address:	1 Dniprovsky Uzviz, 3rd floor, UA - 01010 Kiev
Contact:	Olena Harmash / Corporate Relations
Phone:	+380 44 490 6400
E-mail:	OHarmash@ifc.org
Website:	<a href="http://www.ifc.org/wps/wcm/connect/region__ext_content/regions/europe+middle+east+and+north+afrika/ifc+in+europe+and+central+asia/countries/ukraine+country+landing+page">http://www.ifc.org/wps/wcm/connect/region__ext_content/regions/europe+middle+east+and+north+afrika/ifc+in+europe+and+central+asia/countries/ukraine+country+landing+page</a>

### Networks and associations

Organisation:	EBA - European Business Association
Address:	1st floor, 1A Andriyivsky Uzviz, UA - 04070 Kiev
Contact:	Anna Derevyanko / Executive Director
Phone:	+380 44 496 06 01
E-mail:	Anna.Derevyanko@eba.com.ua
Website:	<a href="http://www.eba.com.ua/en">http://www.eba.com.ua/en</a>

Organisation:	Ecology Alliance of Ukraine
Address:	1 Kotsyubinsky Street, Suite 506 UA - 01030 Kiev
Contact:	Oleg Kosciuszko / General Director
Phone:	+380 44 338 30 53
E-mail:	info@ukrecoaliance.com.ua
Website:	<a href="http://www.ukrecoaliance.com.ua/">http://www.ukrecoaliance.com.ua/</a>

Organisation:	GWP - German Water Partnership
Address:	Reinhardtstraße 32, D - 10117 Berlin
Contact:	Dr Michael Prange / Managing Director
Phone:	+49 30 3001991220
E-mail:	info@germanwaterpartnership.de
Website:	<a href="http://www.germanwaterpartnership.de">www.germanwaterpartnership.de</a>

Organisation:	German Committee on Eastern European Economic Relations
Address:	Breite Straße 29, D - 10178 Berlin
Contact:	Dr Martin Hoffmann / Regional Director Eastern Europe
Phone:	+49 30 206167-126
E-mail:	m.hoffmann@bdi.eu
Website:	<a href="http://www.ostausschuss.de">www.ostausschuss.de</a>

Organisation:	RETech - German Recycling Technologies and Waste Management Partnership e.V.
Address:	Kalckreuthstraße 4, D - 10777 Berlin
Contact:	Karin Opphard / Managing Director
Phone:	+49 30 707 60 198
E-mail:	karin.opphard@retech-germany.net
Website:	<a href="http://www.retech-germany.net">www.retech-germany.net</a>

### German-speaking law firms

The German embassy in Ukraine has published a list of law firms.

[http://www.kiew.diplo.de/contentblob/947128/Daten/6540061/pdf\\_rechtsanwaltskanzleien.pdf](http://www.kiew.diplo.de/contentblob/947128/Daten/6540061/pdf_rechtsanwaltskanzleien.pdf)

### German-speaking tax consultants

Organisation:	Otten Consulting GmbH
Address:	wul. Turgenewska 38, UA - 01054 Kiev
Contact:	Thomas Otten
Phone:	+380 44 353-01-95
E-mail:	info@otten-consulting.de
Website:	www.otten-consulting.de

Organisation:	Rödl & Partner
Address:	Mykoly Pymonenka Street 13, Building 1B, Office 31, UA – 04050 Kiev
Contact:	Klaus Kessler
Phone:	+380 44 586 23 03
E-mail:	kiew@roedl.pro
Website:	www.roedl.de

Organisation:	Ukraine Consulting
Address:	vul. Shovkovychna 42-44, UA - 01061 Kiev
Contact:	Sven Henniger
Phone:	+380 44 490 55 28
E-mail:	hennigers@ukraine-consulting.eu
Website:	www.ukraine-consulting.eu

Organisation:	IB Interbilanz
Address:	Yaroslavskaya Street 6, UA - 04071 Kiev
Contact:	Wilfried Serles
Phone:	+380 44 586 42 95
E-mail:	office@ibgroup.co.ua
Website:	www.ibgroup.at

### Ministries and important authorities

Organisation:	MENR – Ministry of Ecology and Natural Resources
Address:	Mytropolyyta Vasylia Lypkivskoho Street 35, UA - 03035 Kiev
Website:	www.menr.gov.ua

Organisation:	KMU - The Cabinet of Ministers of Ukraine
Address:	Hrushevskoho Street 12/2, UA - 01008 Kiev
Website:	www.kmu.gov.ua

Organisation:	MinRegion - Ministry of Regional Development, Construction, Housing and Municipal Services
Address:	Velyka Zhytomyrska Street 9 / Dimitrova 24, UA - 01601 Kiev
Website:	www.minregion.gov.ua

Organisation:	MNS - Ministry of Emergency Situations of Ukraine
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Address:	O. Honchara Str. 55a, UA - 01601 Kiev
Website:	<a href="http://www.mns.gov.ua">www.mns.gov.ua</a>

Organisation:	SEIA - State Environmental Investment Agency of Ukraine
Address:	Mytropolyta V. Lypkivskogo Street 35, UA - 03035 Kiev
Phone:	+380 44 594-91-11
E-mail:	<a href="mailto:info.neia@gmail.com">info.neia@gmail.com</a>
Website:	<a href="http://www.seia.gov.ua">www.seia.gov.ua</a>

Organisation:	GEO - State Service of Geology and Mineral Resources of Ukraine
Address:	Ezhena Potie Street 16, UA – 03680 Kiev
Website:	<a href="http://www.geo.gov.ua">www.geo.gov.ua</a>

Organisation:	SCWM – The State Committee for Water Management of Ukraine
Address:	Chervonoarmijska Street 8, UA - 01601 Kiev
Website:	<a href="http://www.scwm.gov.ua">www.scwm.gov.ua</a>
Organisation:	ukrstat – State Statistics Service of Ukraine
Address:	Shota Rustaveli Street 3, UA – 01601 Kiev
Phone:	+380 44 287-24-33
Website:	<a href="http://www.ukrstat.gov.ua">www.ukrstat.gov.ua</a>

## NGOs

Organisation:	All-Ukrainian Ecological League
Address:	Saksaganskogo Street 30-B, Office 3, UA - 01033 Kiev
Phone:	+380 44 251 13 32
E-mail:	<a href="mailto:vel@ecoleague.net">vel@ecoleague.net</a>
Website:	<a href="http://www.ecoleague.net">www.ecoleague.net</a>

Organisation:	Centre Ekologiya Nauka Technika
Address:	Post Office Box 149, UA - 01001 Kiev
Phone:	+380 44 28733 12
Website:	<a href="http://www.eko.org.ua">www.eko.org.ua</a>

Organisation:	MAMA-86 Ukrainian National Environmental NGO
Address:	22, Mykhaylivska Street, UA - 01001 Kiev
Phone:	+380 44 234-69-29
E-mail:	<a href="mailto:info@mama-86.org.ua">info@mama-86.org.ua</a>
Website:	<a href="http://www.mama-86.org.ua">www.mama-86.org.ua</a>

**Scientific institutions**

Organisation:	National University of Water Management and Nature Resources
Address:	Soborna Street 11, UA - 33028 Rivne
Website:	<a href="http://www.nuwm.rv.ua">www.nuwm.rv.ua</a>

Organisation:	Ukrainian Scientific Research Institute of Ecological Problems
Address:	Bakulina Street 6, UA - 61166 Kharkiv
Website:	<a href="http://www.niiep.kharkov.ua">www.niiep.kharkov.ua</a>

Organisation:	Ukrainian Hydrometeorological Institute of National Academy of Sciences Of Ukraine
Address:	Nauky Avenue 37, UA - 3028 Kiev
Website:	<a href="http://www.uhmi.org.ua">www.uhmi.org.ua</a>

Organisation:	State Institute of Management and Water Resources Economics
Address:	Solomenska Street 1, UA - 03035 Kiev
Website:	<a href="http://www.diuevr.kiev.ua">www.diuevr.kiev.ua</a>

Organisation:	V. N. Karazin Kharkiv National University, School of Ecology
Address:	4 Svobody Square, UA - 61022 Kharkiv
Website:	<a href="http://www.ecology.univer.kharkov.ua">www.ecology.univer.kharkov.ua</a>

Organisation:	National University of Life and Environmental Sciences of Ukraine Nature Resources
Address:	Heroyiv Oborony Street 15, UA - 03041 Kiev
Website:	<a href="http://nubip.edu.ua/en/">http://nubip.edu.ua/en/</a>

Organisation:	National Academy of Sciences of Ukraine
Address:	Volodymyrska 54, UA - 01030 Kiev
Website:	<a href="http://www.nas.gov.ua/EN">http://www.nas.gov.ua/EN</a>

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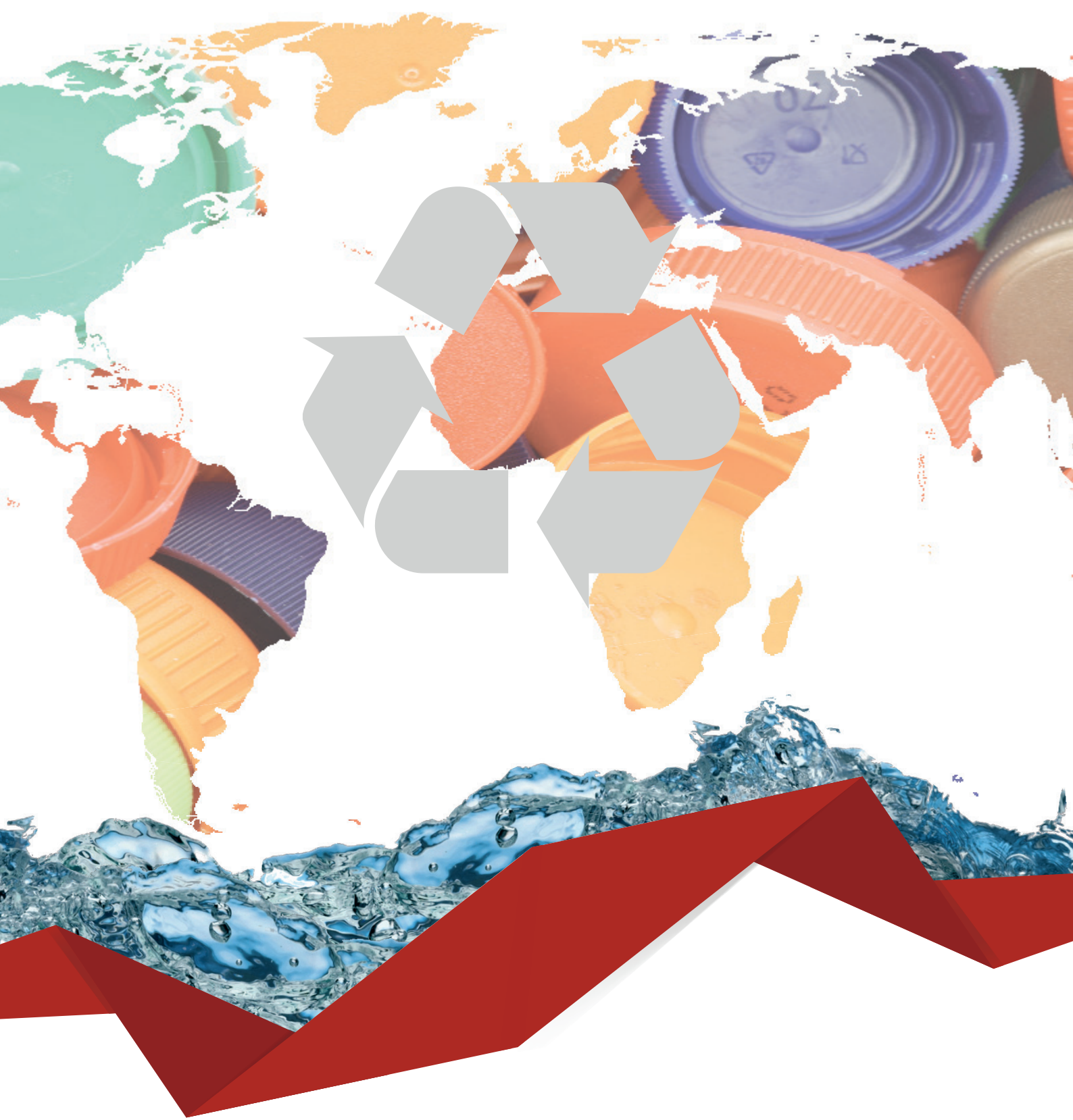
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