

# COALLAND

Faces of Donetsk



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ENVSEC

Окружающая среда и безопасность

## ***Coalland – Faces of Donetsk***

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# COALLAND

## Faces of Donetsk

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# Foreword

by Nickolai Denisov, ENVSEC regional desk officer for Eastern Europe, Geneva

As a doctoral student in Moscow, I did not see much of my university advisor. One of Russia's first environmental ministers and the deputy prime-minister of the Soviet Union after the 1991 coup d'état, he suddenly had to deal with a mountain of problems with the decaying union. Among the first were angry miners from Donbas banging their helmets in the centre of Moscow. As in many other places, miners were seen as the vanguard of political aspirations – and the reflection of growing desperation in the industrial badlands.

Readers interested in history may remember Alexey Stakhanov and Nikita Kruschev, who both started their careers in Donetsk. Football fans witnessed the spectacular appearance of Shakhtar Donetsk in the 2009 UEFA Cup Final. Today the coal-producing and industrial region of Donetsk is Ukraine's major centre of gravity, supplying the country with industrial output, tax revenue, pollution, and its

business and political elite. In the region itself the environment remains both a bottleneck and a solution for improving people's lives: not an unimportant concern given Donetsk's special place on Ukraine's agenda.

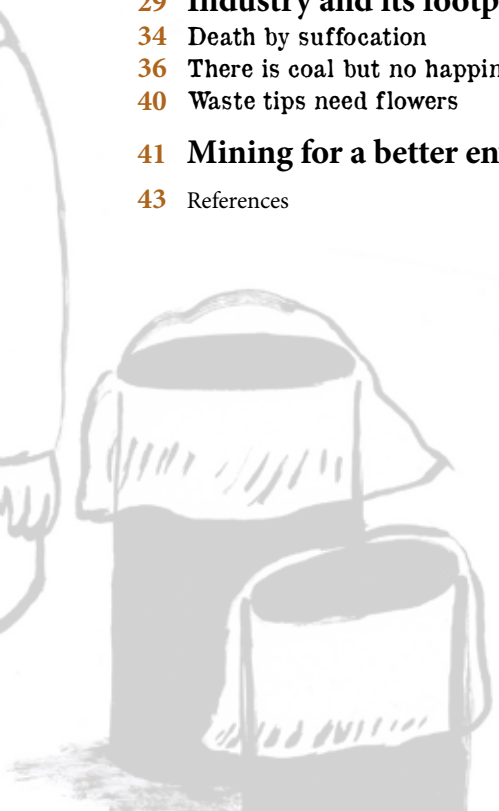
In this publication we have tried to collect data, thoughts and impressions from several years of cooperation between the Environment and Security initiative and the people and authorities of Donetsk. Through this cooperation we wanted to bring solutions, which have worked in other parts of Europe, ranging from the Mining for Closure approach to providing citizens and decision-makers with understandable and timely information. We are also determined to make this information clear and visible through maps, photographs, art and journalism.

Not least, we want to reveal Donetsk in all its diversity, with different faces, seen from the inside and the outside, beyond just coal and football.



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This report was produced within the framework of *Assessment and Capacity-Building for Managing Environment and Security Risks in Donbas and Salihorsk regions*, a UNEP-led ENVSEC project implemented in Ukraine and Belarus to address environmental risk from hazardous activities, and improve environmental management and awareness. Project activities included technical assessments, training and analysis of mining sites, but also workshops and training sessions for journalists to build up their communication skills on environmental topics relevant to their region. This publication presents the findings and results of both parts of the project. It offers an introduction to the issues facing the Donetsk region, mainly focusing on environmental challenges. The text is complemented by media stories written by journalists from Belarus and Ukraine

who participated in the media training organized by ENVSEC. The articles featured here were produced during the workshops and have been published in various media across the region.

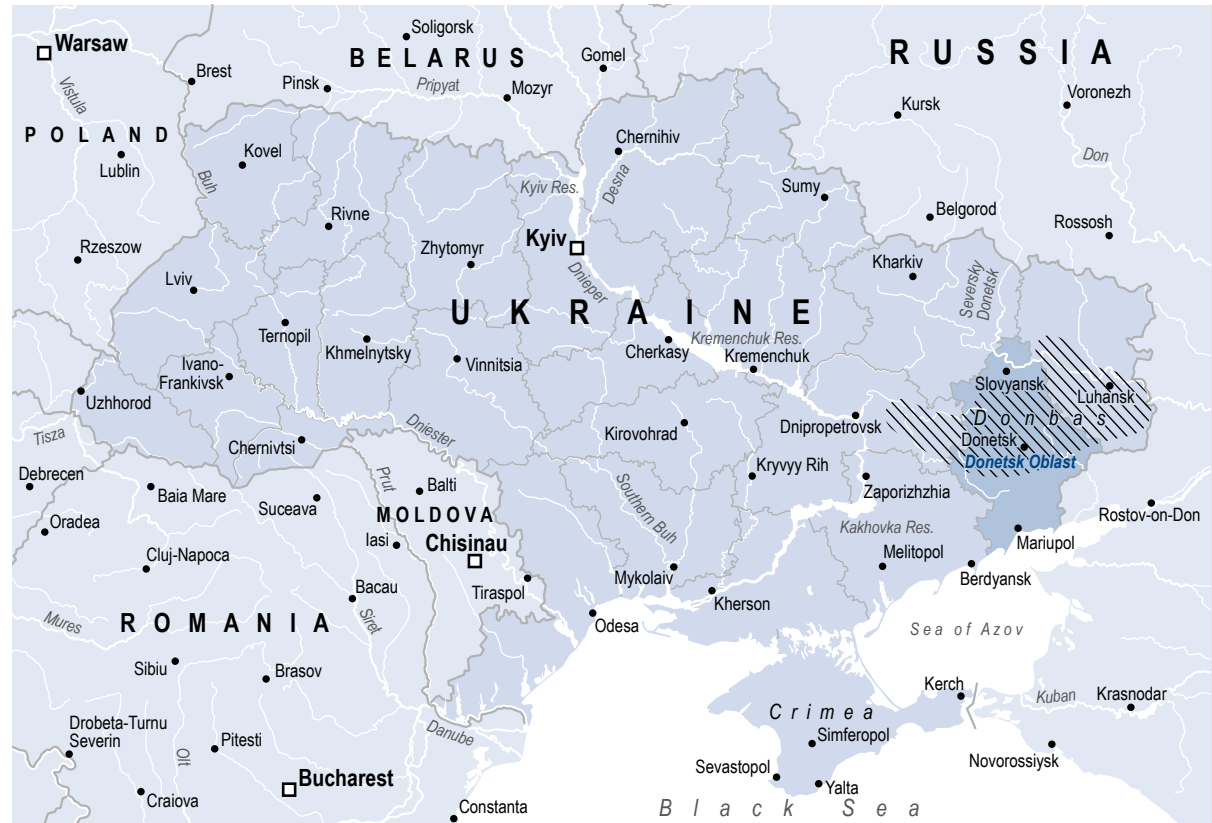
In addition, this report presents the findings of the ENVSEC risk assessment analysis, *Risk Assessment Considerations in the Donetsk Basin – Mine Closure and Spoil Dumps*, highlighting the need for solid risk assessment and the potential sources of risk associated with mining activities in Donetsk. Based on these findings, an action plan is proposed suggesting how these issues can be addressed by decision-makers and practitioners alike.

This publication uses original photographs by Alban Kakulya taken in Donetsk in May 2010.

# Donetsk at first sight

Close to the centre of Donetsk stands a huge steelworks, Donetsk Metallurgical Plant, known locally as Donetststal. In a brave attempt to make this industrial behemoth less of an outrage to the senses the plant's owners have built a small pleasure garden at the entrance, complete with a pond on which live two swans. The swans' plumage is black. The local humorists enjoy telling credulous visitors that the birds were snowy white when they arrived, but quickly changed colour as the dust and pollution of the plant enveloped them. In fact they are Australian black swans, designed that way by nature. But everyone agrees it would be a shame to spoil a good story.

The city of Donetsk has a long pedigree. It began life as a Cossack village late in the 17th century, and by 1820 small-scale coal mining had started. The city proper was originally called Yuzovka, after John Hughes, the Welshman who is credited with founding it in 1869. In time more skilled workers and technicians arrived from Britain to expand the mines and build a steel mill.



The Soviet Union later developed the steel industry enormously. In the second world war the city (then known as Stalino) suffered grievously, the

population falling from 507,000 to 175,000 as the Nazi invaders came close to destroying it entirely. Collective responsibility in those grim

years meant that for every German soldier killed 100 inhabitants were put to death, and one for every policeman killed.



The death of Stalin and the gradual move towards less totalitarian rule from Moscow saw yet another name-change, this time to Donetsk (Nikita Khrushchev was a local boy). Peace brought gradual improvements for the miners, the industrial elite of Donbas\* (the coal-mining region round Donetsk, along the Donets river). They became one of the highest-paid categories in the USSR. When the 1990s dawned they were influential actors in the social turmoil which was engulfing the dying Soviet Union, travelling to Moscow to bang their safety helmets on the pavement outside the Kremlin as a vivid way

of driving home their demands for a better life: health care, accommodation, recreation and leisure facilities, pensions – and of course more pay. The more the miners were owed in back pay, the oftener they gathered in Red Square. Nor was Moscow their only target, as Oleg Varfolomeyev wrote in 2002:\*

*“Miners’ marches on Kyiv have almost become a tradition of the Ukrainian summer. They block the main streets, sit down in front of the government building, bang their helmets and plastic bottles on the pavement, get promised their wages, and then return home. After some time, wage arrears begin to accumulate anew.”*

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\*Donets Basin, also known as Donbas or Donbass (Ukrainian: Донецький басейн, usually abbreviated to Донбас; translit. Donetskiyi basin or Donbas; Russian: Донецкий бассейн, likewise usually shortened to Донбасс; translit. Donetskiy basin or Donbas), is a historical, economic and cultural region of eastern Ukraine. It combines three oblasts (provinces) in the east of the country: the easternmost part of the Dnipropetrovsk Oblast around the city of Pavlohrad (the so-called “Western Donbas”), the northern and central parts of Donetsk Oblast (the southern part is Pryazovia) and the southern part of Luhansk Oblast (the northern part is Slobozhanshyna). The city of Donetsk is considered the unofficial capital of Donbas. Source: Wikipedia

The miners of Donbas had earned their laurels the hard way, and few harder than Alexey Stakhanov, the eponymous Stakhanovist. He worked in a coal mine in the Donbas town of Kadiyivka, and on 31 August 1935 was reported to have mined a record 102 tonnes in 5 hours and 45 minutes, 14 times

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\*Transitions Online 5 December 2002



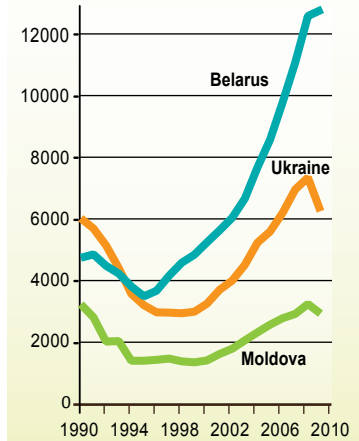
more than his assigned quota. On 19 September Stakhanov is credited with setting a new record by mining 227 tonnes in the space of one shift. He was hailed in the mass media as a model for others and was featured on the cover of Time magazine. Kadiyivka, understandably, is now called Stakhanov.

Ukraine became independent in 1991, and the bubble burst. Conditions rapidly deteriorated as post-Soviet industrial output fell. But the social infrastructure and the very survival of Donbas still depend on its heavy industry, handicapped by technology and attitudes inherited from the Soviet era as its traditional markets collapsed. Donetsk still lives by steel and coal, as no visitor could doubt. Once settled in your hotel, if you open the window you quickly shut it again, settling for a stuffy atmosphere and the inevitable headache rather than the stream of sour air which pours in from outside.

A giant statue of a miner holding a lump of coal greets you as you enter the city, its emblem is a miner's

### Gross National Income (GNI)

per capita  
in current US dollars



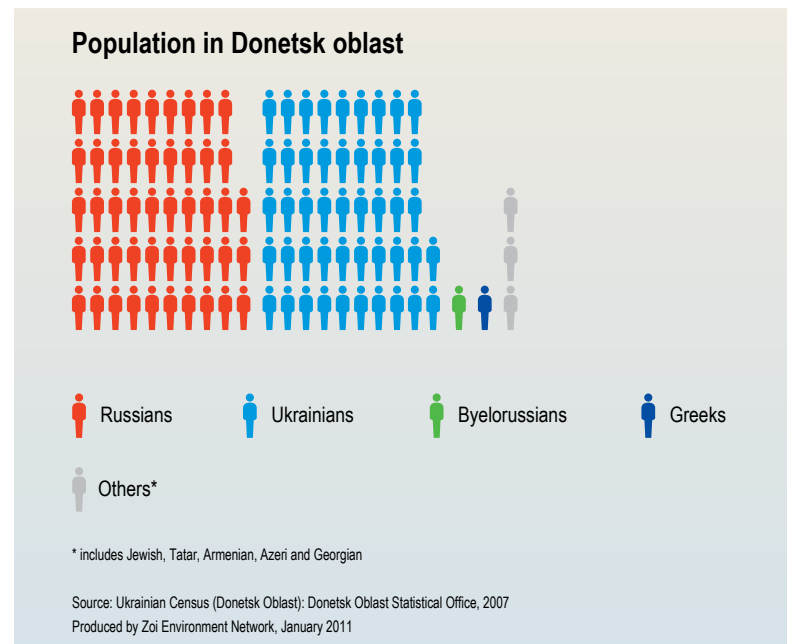
Note: Purchasing Power Parity method.  
Source: World Bank. Development Indicators database  
Produced by Zoi Environment Network, January 2011

hammer, and its beloved soccer teams are the FC Shakhtar (the Miners) Donetsk and FC Metalurh (the Metallurgists) Donetsk. Football, incidentally, is the way to many a Ukrainian heart. Donetsk, together with several other cities in Ukraine and Poland, is the host of Euro 2012 (the UEFA European Football Championship).



Regions of Ukraine	Rank by life expectancy index	Rank by level of education	Rank by Gross Regional Product Index	Overall rank by human development index
Kyiv	1	1	1	1
Lviv Oblast	4	5	13	2
Ivano-Frankivsk Oblast	5	10	20	13
⋮	⋮	⋮	⋮	⋮
Zaporizhia Oblast	20	20	5	11
Odesa Oblast	21	4	8	8
Dnipropetrovsk Oblast	22	9	3	7
<b>Donetsk Oblast</b>	<b>23</b>	<b>18</b>	<b>2</b>	<b>9</b>
Kirovohrad Oblast	24	14	22	23
Mykolaiv Oblast	25	21	11	18
Luhansk Oblast	26	24	12	20
Kherson Oblast	27	13	18	22

Source: State of the Environment Report for Donetsk Oblast, 2007  
Produced by Zoi Environment Network, May 2010



Today the Donetsk region (the name is used variously for the city itself, the oblast – the administrative region around it – and for Donbas as a whole) is the most densely-populated part of Ukraine. It accounts for a third of Ukraine’s export revenue, thanks mainly to the metalworking industry. The growth of the region’s GDP since 1999 has been mostly related to

the steel sector, though this has so far been driven by central policy and a favourable world market, not by any structural reforms.

Yet problems remain. The region is undeniably one of Ukraine’s wealthiest, responsible for the lion’s share of the country’s industrial output and GDP, but few areas of Europe have

sustained such a body blow from the world economic crisis as the industrial heartland of eastern Ukraine. Orders for steel and other metals have almost completely dried up and prices have plummeted. In the Donetsk Oblast, home to 4.6 million people, around 80 per cent of the economy is tied to the metals industry. In January 2009, when industrial

production dropped by a precipitous one-third throughout Ukraine, in the Oblast it fell by half against the previous year. Donetsk makes up 10 per cent of Ukraine’s population and provides 20 per cent of its GDP, a fact to which local politicians often draw attention, arguing that the region’s wealth should be spent there instead of feeding the rest of the country.

Most people in the Oblast (and more generally in Donbas) speak Russian, not Ukrainian. Almost 50 per cent of the people who live in the city of Donetsk are classed as ethnically Russian.

Despite the economic buffeting Ukraine has suffered recently, a number of Donbas coal mines and the Donetskstal steel mill are still hard at work. Yet where you might have expected progress, there has been very little. Two decades after independence coal mining remains a dirty and very dangerous job, and now pays far less than in Soviet times. The wife of a retired Donetskstal worker is quoted in 2008:<sup>\*</sup>

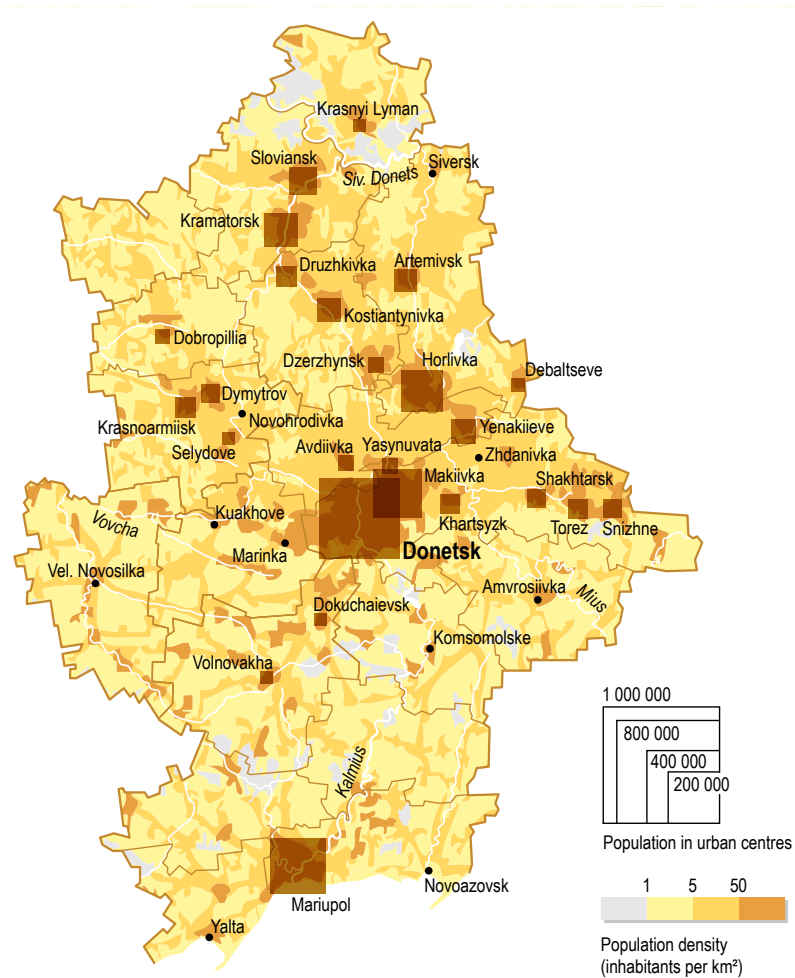
*“The temperature in the open-hearth furnaces is almost 2,000°C. But the only protection the workers have is a felt suit with thick gloves, special boots and a helmet with black goggles.”*

Even beyond the mines and the mills themselves, it is not a healthy place to live. The average life expectancy for men in Donetsk is between 53 and 55 years, five years below the national

level, low as that itself is. The leading cause of death is diseases of the circulatory system, with cancer the second. One local journalist says heavy industry’s malign footprint stretches much further even than that: “The World Health Organisation says air pollution shortens the life of every European by an average of eight months. Here in Donetsk the figure is eight years.”

Pollution from fixed points like mines and steel plants is now being augmented by growing traffic exhaust fumes as vehicle ownership and use steadily increase. Many Donetsk residents use public transport – when they can. One frustrated traveller said: “The metro, alas, remains only in the planning stage, although the money already spent is a lot. Nobody can understand why...”

But Donetsk makes valiant attempts to remind you that there is more to it than industry alone. It used to be called the City of Roses, and has now set about replanting a million rose bushes in its parks. A city of grime, pollution and ill-health, yes – but Donetsk is human enough to remember that its citizens need to dream as well.



## Population in Donetsk Oblast

Map produced for ENVSEC by ZOI Environment Network, September 2010  
 Source: LandScan Global Population Database 2007, Oak Ridge, TN, Oak Ridge National Laboratory (→ [www.ornl.gov/sci/landscan/](http://www.ornl.gov/sci/landscan/));  
 World Gazetteer 2010 (→ [www.world-gazetteer.com](http://www.world-gazetteer.com))

<sup>\*</sup>Natalia Huzeva, Selyanska pravda, Kyiv, Ukraine 12.12.2008

# Four minutes past midnight

Karen Gambaryan, Donetsk 10 October 2008

I am waiting for angels. They will definitely come today. At four minutes past midnight. Why are you smiling like that? Is something the matter with me?

Yes, I am waiting for angels. Every night before going to bed I set my alarm for 23:50 so as not to miss their arrival. But I don't need the alarm clock. I've got used to waking up a minute earlier and switch it off so as not to wake up my folks at home. The truth is that if the angels come they'll wake everybody up anyway. Even those who sleep deeply. So everybody can see how they are going to save us.

They will come in a big sparkling starship which they used to save more than one world. I saw them do that on TV. They cleaned up – cleaned up everything, the air, the water. And everything started growing again on the planet. They had beautiful white clothes too with the letter “A” on the shoulder because they were space angels. They said that on TV. But when I talk about it everybody smiles as if something was wrong with me and tells me I shouldn't believe everything they say on TV. But why shouldn't I believe

it? After all when on one occasion they said on TV that many people were dying of cancer every day, some of the neighbours came and told us Auntie Valya from next-door had died of cancer. And when on TV they warned us about the big R-E-L-E-A-S-E at our plant I wasn't allowed out onto the balcony. They wouldn't even let me open the window. I like our plant though. Especially at night when I wake up to see the angels. The sky above it has got a wonderful purple glow. And after the big R-E-L-E-A-S-E all the puddles that are usually grey and dull became wonderfully red and carrot-coloured. Why are you smiling like that? Is there something the matter with me?

Once we were taken to visit the mine where one big guy showed us the machine which can catch gas. The gas is called methane. It just happens there is a lot of it under the ground. When men drill to dig out some coal, the gas leaks away. When there is a lot, it explodes. And then people die. But the guy's machine catches this methane and mixes it with air, so it can be used to power cars. It could also be used to heat the water in radiators for almost nothing. I brightened up at that as we don't have a lot

of money and in winter the radiators are always cold at home. I asked the guy if he could heat up the radiators in my home, but he said he couldn't. I asked why. He looked at me, smiled as if something was wrong with me and said the baddie called Zozo Power would not allow it. It would not be P-R-O-F-I-T-A-B-L-E for him. I've remembered the name of the baddie so when the space angels come and clean up the planet I'll ask them to leave the dirtiest place for Zozo Power and not to heat his radiators. Why are you smiling like that? Is something the matter with me?

The other day they said on TV that a lot of methane had been released at the mine and exploded. Right away Tanya screamed behind the wall. Tanya who recently got out into the yard in a beautiful white dress. Lots of people gave her flowers and threw sweets and coins. But somehow she didn't pick them up. Neither she, nor the guy who was next to her. I was told that Tanya was getting M-A-R-R-I-E-D to this guy and taking his last name. But now Tanya can't be with her husband because he used to work at the mine which exploded. That's why he died. Tanya will no longer smile with her wonderful

**“I like our plant though. The sky above it has got a wonderful purple glow.”**

smile I love so much. But I hope that when the space angels come I will be able to persuade them to R-E-C-O-V-E-R Tanya's husband. So that she can smile again. They do R-E-C-O-V-E-R air and water, don't they? Why shouldn't they recover Tanya's husband? And Auntie Valya from next-door? And all the others? Why are you smiling like that? Is something the matter with me?

They will definitely come, just wait and see. At four minutes past midnight. When the national anthem has finished on TV. And when the sky has got a wonderful purple glow. We will hit the streets in rubber suits with hoods and gas masks, just like on the planet the space angels have already saved. And I will step forward, take off my gas mask and say as if on TV: “Our miserable planet welcomes you! We hope you can save us!” And surely they will help us! Why are you smiling like that? Is something the matter with me?

# The nature of Donbas

Donbas has a temperate continental climate with clearly-defined seasons. There are big differences between winter and summer temperatures. The average January temperature is  $-4^{\circ}\text{C}$  to  $-6^{\circ}\text{C}$ . In some parts of the Oblast it reaches  $-7^{\circ}\text{C}$ . During the coldest winters the temperature can fall to  $-36^{\circ}\text{C}$ , while the maximum in summer is  $40^{\circ}\text{C}$  to  $42^{\circ}\text{C}$ .

Observations show that climate change is already having an effect in the region, notably on the time of formation and duration of permanent snow cover and on the duration of seasons. Cold winters and persistently hot summers combined with increasing precipitation have inevitable consequences for agriculture. According to the Oblast administration the Donetsk region urgently needs to implement a regional action plan, both to reduce the region's own emissions of greenhouse gases and to adapt to the impacts of climate change.

Precipitation in Donbas is 350 to 600 mm annually. This is not enough: spring, the end of summer and autumn are arid, and the rains are intense, localized and brief. Water is a big problem for Donbas. Where industry is concentrated and population highest, daily demand is high. For example, producing one tonne of coal takes half a cubic metre of water, one tonne of steel needs  $25\text{ m}^3$ , and a tonne of sulphuric acid  $90\text{ m}^3$ . Donbas gulps down 55 per cent of Ukraine's total water consumption. Guaranteeing supplies to the area is a serious problem, so Donbas has to rely on a number of large reservoirs. Donetsk Oblast itself is one of Ukraine's most freshwater-deficient regions. The large mineral reserves in the Donetsk coal basin have resulted in rapid industrial development here – much of it needing plenty of water – and a considerable concentration of population. That means there is now an acute shortage of high-quality fresh water for households, farmers, industry, and other users.

## Sea of Azov

The Donetsk Oblast borders on the Sea of Azov, which is a shallow branch of the Black Sea, connected to it by the Kerch Strait. The large rivers that flow into the Sea of Azov are the Don and the Kuban. The Sea of Azov now lies within the borders of Ukraine and the Russian Federation.

The sea received its current name from the town founded by the Cumans (a nomadic people who inhabited a shifting area north of the Black Sea) in 1067. They called it Azak, which later became Azov. The sea covers an area of  $38,000\text{ km}^2$ , with an average depth of 8 metres, a maximum depth of 14 metres, and a water volume of  $320\text{ km}^3$ . The sea has been a major thoroughfare

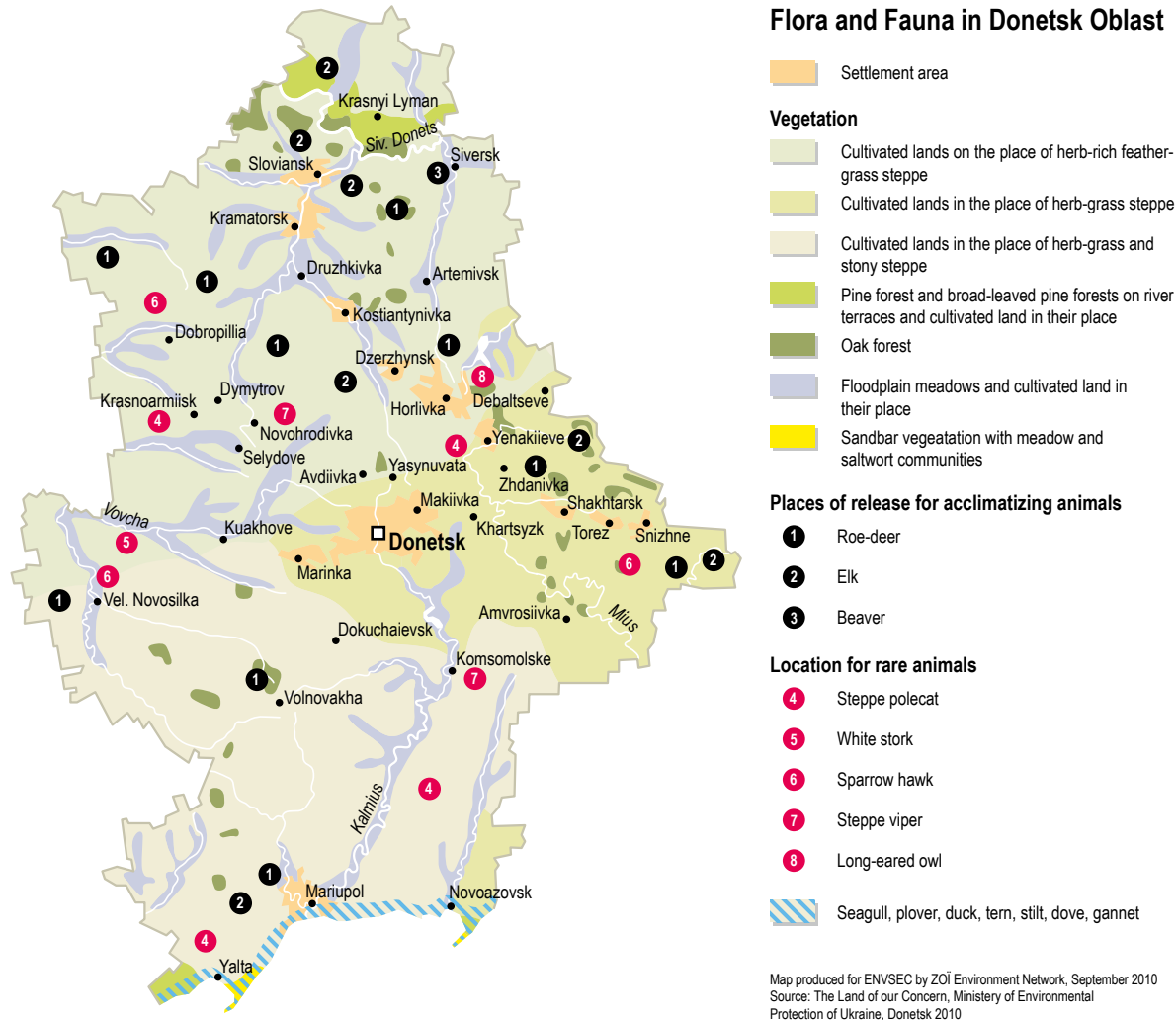
since the dawn of history. By the end of the 19th century more than 2,660 ships, with a total capacity of 362,000 tonnes, docked in its harbours every year. At the time the Russian merchant fleet on the Sea of Azov numbered 1,210 vessels. To this day it remains a major transport route.

On 11 November 2007 four vessels – the Volnogorsk, Nakhichevan, Kovel and Hadji-Izmail – sank in the Kerch Strait near the Russian port of Kavkaz in a severe storm. Six vessels broke adrift and ran aground. Two tankers – Volgoneft-139 and Volgoneft-123 – were damaged. About 1,300 tonnes of fuel oil and 6,800 tonnes of sulphur spilled into the Sea of Azov.

Source: Donetsk Oblast State of the Environment Report, 2007

Priorities for improving the quality of natural water in Donetsk Oblast:

1. Decrease surface water pollution in the region due to sulphates and sewage.
2. Improve the ecological state of the rivers Kalmius, Kazennyi Torets and Kalchyk; apply strict measures to control waste water discharge into the river system by industrial enterprises.
3. Control mine water discharge into the rivers Kazennyi Torets, Vovchia and Kalmius.
4. Reactivate hydrochemical monitoring sites closed in 1995–2000 on the region's rivers.
5. Deploy administrative measures to reduce discharge of polluted waste waters by the region's industrial enterprises.
6. Decrease municipal and agricultural run-off into water bodies.
7. Develop an automated system and network for monitoring the region's surface and ground water bodies of the region.



# The other face of Donbas

Oleg Lystopad for Selyanska pravda, Kyiv, Ukraine 24 July 2009 (abridged translation)

Ask somebody what comes into their minds when they think about Donbas and the usual answer is: "Coal tips, mines, plants, dust, smoke, stuffiness". However, Donbas, and Donetsk Oblast in particular have another face: charming steppes, quiet rivers fringed by forests in ravines and gullies, coastal sand spits with hundreds of wonderful birds flying over them.

These green and blue spots are quite rare on the map of Donetsk and that makes them even more valuable. "Donetsk Oblast makes up just 44 per cent of the land area of Ukraine but has 10 per cent of the country's population and 23 per cent of the industrial potential concentrated in the province. We are subjected to a significant anthropogenic and technogenic load, and intensive use of natural resources which has a negative impact on the state of the environment," according to the heads of the Donetsk Oblast Council and the Oblast State Administration.

The leaders of the Oblast acknowledge that the destruction of wild nature for the sake of industrial or agricultural land development has reached a critical point in Donetsk Oblast. The area of flora and fauna habitats has declined significantly and as a result the diversity and health of many species has changed. Therefore the establishment of nature park areas is especially important for the Oblast.

Are you wondering where life could be found in areas of the Oblast covered by quarries, ground away by mine

**"Until just 150 to 200 years ago, there used to be oak trees with girths of six metres, and pine trees of four metres. Even rivers have disappeared, with nearly 20 lost in the past 350 years."**

shafts and piled up with waste rock? Well, they can be found! A national nature park has been established (the first in the east of Ukraine), and there is also a diverse network of regional landscape parks and other protected areas. Let's have a closer look at some of these natural wonders!

## Green on white

These particular colours have been chosen by nature to embroider the scenery of the Svyati Gory national nature park. The white chalk mountains on the high right bank of the Severskij Donetsk river used to be covered by pine trees. Nowadays these can only be found in a few places, most of them having been cut down. A 600-year-old oak tree which stands 30 metres high, two metres in girth, has been preserved on the remaining flood plain of the river, a monument to the previous mighty local forests. Until just 150 to 200 years ago, there used to be oak trees with girths of six metres, and pine trees of four metres. Five

hundred years ago bears also used to live here. Now this is all history. Even rivers have disappeared, with nearly 20 lost in the past 350 years.

## White on green and blue

These colours are from the Kleban Byk regional landscape park. The main area of this park is located along the banks of the reservoir on the Bychok river. This area places many conflicting demands on local natural resources. For example, the power engineers do not agree with the demands of nature conservation regarding water use. The fishery would also like to introduce its own rules for the use of water. Due to such conflicts of interest, the lack of administrative coordination and joined-up thinking and action, the water level of the reservoir has dropped significantly.

The local wonder is the petrified araucaria trees which are 200 to 250 million years old. There used to be tens of thousands of them in Kleban

**“If at least a minimum of nature is not preserved then the delicate balance of natural processes would go head over heels and we would all cry bitter tears. They seem to understand this in the Donetsk Oblast.”**

Byk but less than 200 are now left. The others have been stolen to decorate rich private houses. Fortunately no one has yet invented a way of stealing the local steppe itself, for otherwise that too would have gone!

### White on blue

Blue is definitely the colour of the sea. So what if it is shallow and barely salty! The white spits of the Azov Sea are nevertheless the favourite breeding grounds for hundreds of thousands of birds. After my visit to the Meotida regional landscape

park I was absolutely sure that this bird haven has been preserved as a result of the devoted efforts of the park specialists.

Looking through binoculars at the great black-headed gull (which is on the Red List of Threatened Species), sea gulls, terns and the clumsy giant pelican I thought that bird lovers from rich and civilized countries would pay a lot to see this spectacle. However, commerce is not the main task of such parks. Their main function is the protection of birds, sand spits and the shellfish of the coastal zone. If at least a minimum of nature is not preserved then the delicate balance of natural processes would go head over heels and we would all cry bitter tears. But it would be too late. They seem to understand this in the Donetsk Oblast.

But I have to add a small spoon of tar to this barrel of nature-conservation honey to keep local naturalists on their toes. Not all the valuable areas

of nature are protected by law. Documents making a scientific case for the establishment of nature reserves on six areas of steppe land were presented to the State Agency for Nature Protection three years ago. A public organization, the Kyiv Environmental and Cultural Centre, produced the proposals free of charge. The Oblast also has other potential opportunities for nature conservation.

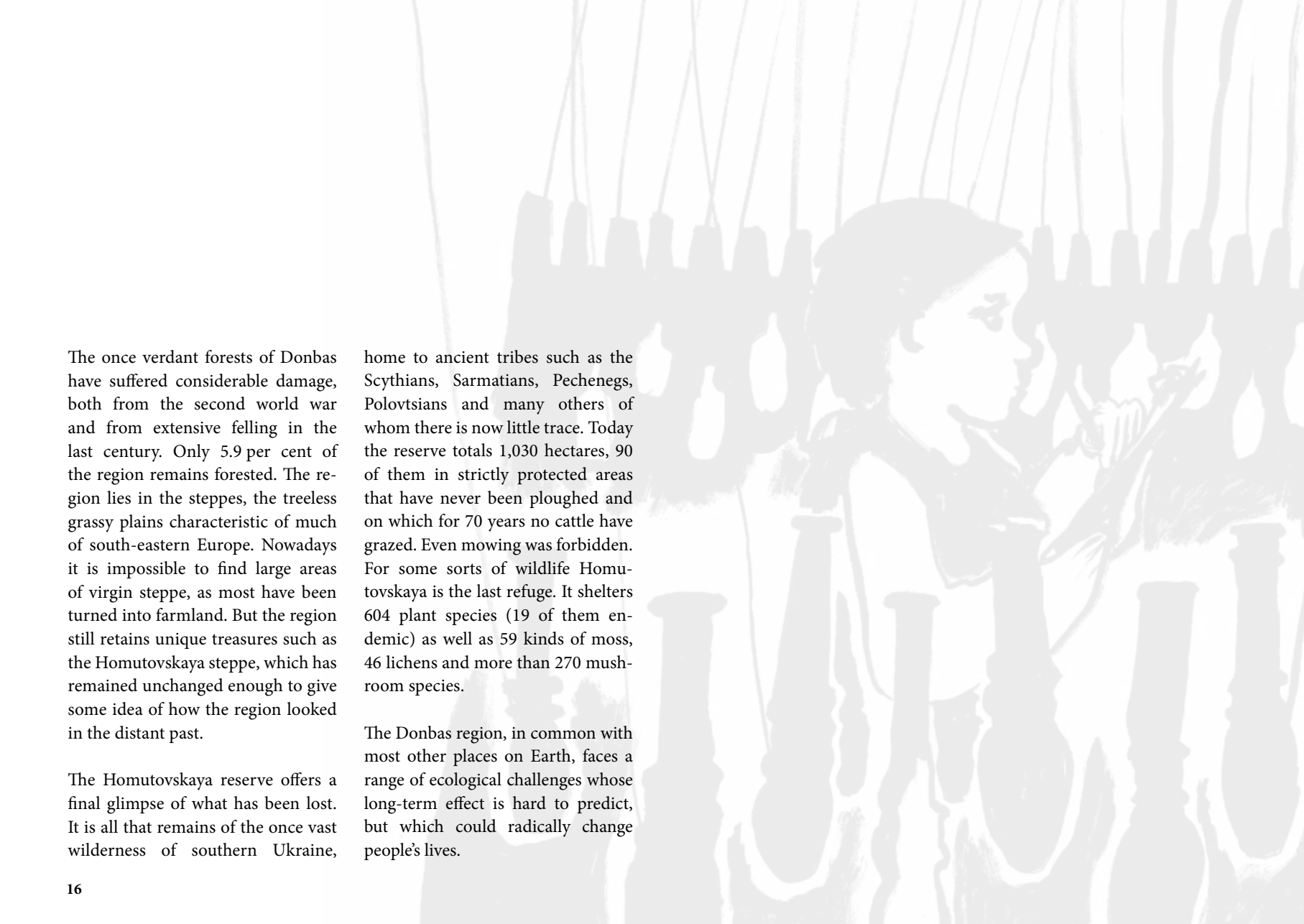
But still, I would like to finish on a positive note. At the moment, the network of protected natural areas covers more than 3 per cent of the total territory of the Oblast. Protected areas occupy four times the area they did 12 years ago. Maybe 3 per cent is not a huge area as the average indicator for Ukraine as a whole is about 5 per cent, but a spe-

**“Protected areas occupy four times the area they did 12 years ago.”**

cial state security agency watches over 85 per cent of these protected areas, a much higher proportion than the average for Ukraine.

“Time demands further actions on our behalf”, the Governor and the Head of the Donetsk Oblast Council said recently. “We need to improve the management of the territories and facilities of the nature protection fund; ensure protection of valuable natural landscapes using environmental education and economic levers and develop the infrastructure.”

It is obvious that expansion and conservation of the nature and reserve fund of the Oblast requires the joint efforts of the local executive bodies, local self-governance authorities, nature protection authorities and the general public. There is no need to persuade anybody that such joint action is necessary. At the moment the level of common responsibility for nature and hence for our future life depends on everyone.



The once verdant forests of Donbas have suffered considerable damage, both from the second world war and from extensive felling in the last century. Only 5.9 per cent of the region remains forested. The region lies in the steppes, the treeless grassy plains characteristic of much of south-eastern Europe. Nowadays it is impossible to find large areas of virgin steppe, as most have been turned into farmland. But the region still retains unique treasures such as the Homutovskaya steppe, which has remained unchanged enough to give some idea of how the region looked in the distant past.

The Homutovskaya reserve offers a final glimpse of what has been lost. It is all that remains of the once vast wilderness of southern Ukraine,

home to ancient tribes such as the Scythians, Sarmatians, Pechenegs, Polovtsians and many others of whom there is now little trace. Today the reserve totals 1,030 hectares, 90 of them in strictly protected areas that have never been ploughed and on which for 70 years no cattle have grazed. Even mowing was forbidden. For some sorts of wildlife Homutovskaya is the last refuge. It shelters 604 plant species (19 of them endemic) as well as 59 kinds of moss, 46 lichens and more than 270 mushroom species.

The Donbas region, in common with most other places on Earth, faces a range of ecological challenges whose long-term effect is hard to predict, but which could radically change people's lives.





























# Industry and its footprint

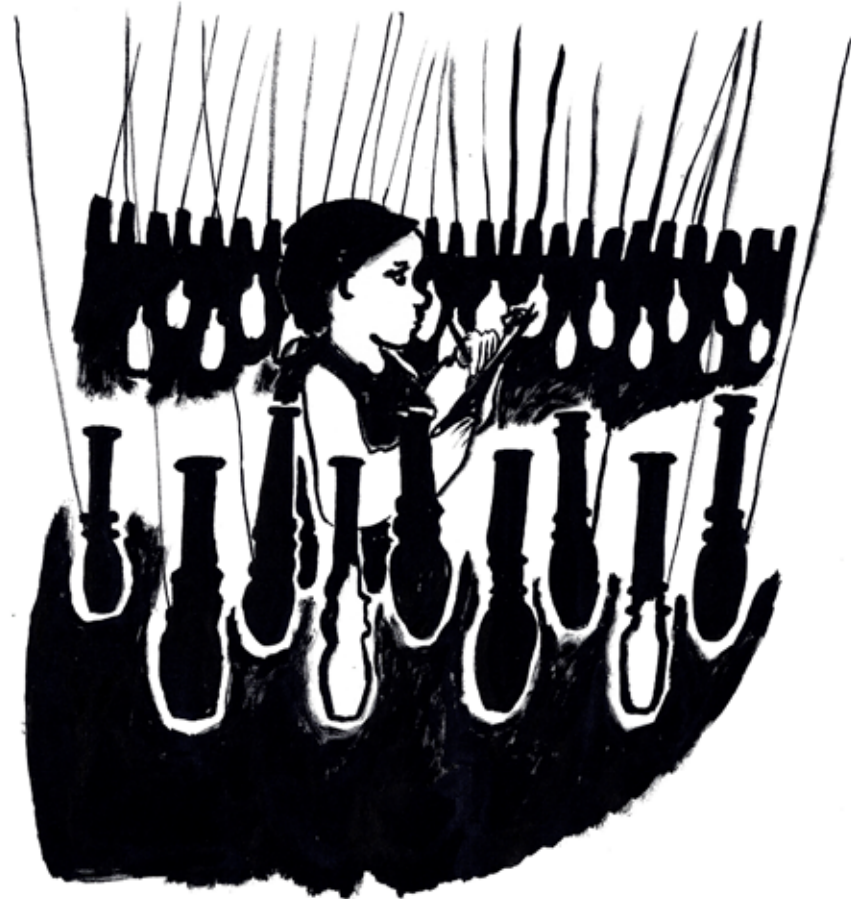
The appallingly heavy destruction inflicted on Ukraine during the second world war was followed by post-war modernization and the expansion of industry, which resulted in substantial and sustained economic growth. Coal-mining dominated Donetsk and the Donbas in those days, but it has now declined and the industrial landscape is more varied. The centre of the iron and steel industry is the Donetsk Metallurgical Plant. Coke by-products form the basis of a chemical industry producing plastics, and there are several heavy engineering works, while light industries, for example food, are also important. Manufactures include clothing, cotton cloth, footwear, furniture, and refrigerators.

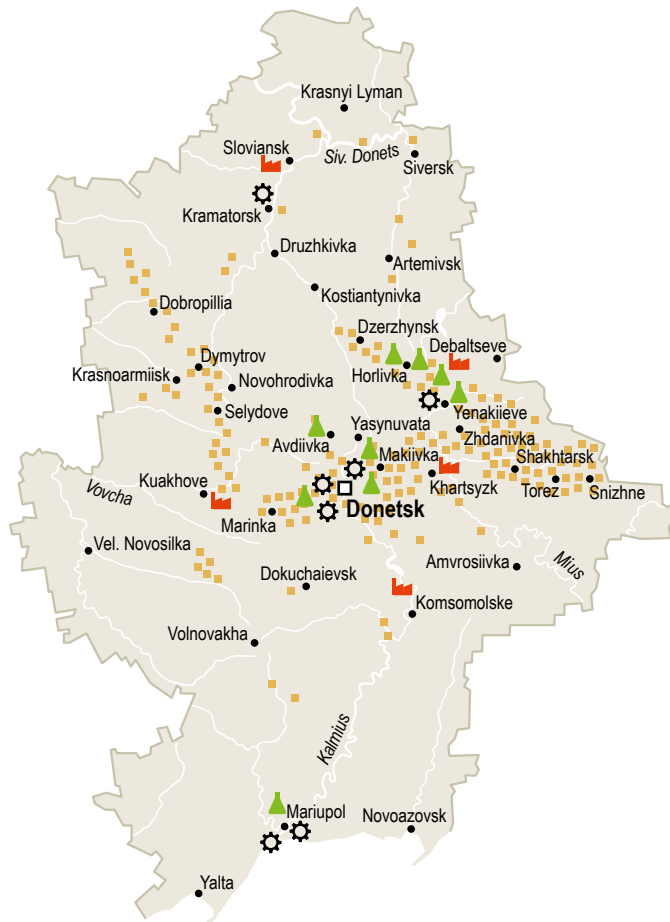
To any economist, coal's decline was inevitable. Towards the end of the Soviet era Donbas coal became fairly unprofitable as the remaining deposits were relatively thin and poor in content. Very difficult geological

conditions in many of the underground mines, including thin, steeply sloping coal seams, large depths and high concentrations of methane, are amongst the reasons why Ukraine's mines rank among the least productive in the world.

After independence, though, the situation changed significantly, breathing new life into mining. Coal was Ukraine's main domestically available fossil fuel and it has become even more vital for many users with the recent rehabilitation of coal on world energy markets and Ukraine's recent attempts to diversify its energy supply, in particular after severe disputes over gas shook Europe in 2006–9.

So industry earns Donbas a living. Within the boundaries of the Donbas region today there are altogether about 900 large industrial plants, including 140 collieries, 40 metallurgical plants, seven thermal power stations and 177 chemically dangerous





## Industry in Donetsk Oblast

- Thermal power plants
- ▲ Coking and chemical enterprises
- ⚙ Metallurgical works
- Mines, mining enterprises and open pits

Map produced for ENVSEC by ZOI Environment Network, September 2010  
 Source: The Land of our Concern, Ministry of Environmental Protection of Ukraine, Donetsk 2010

operations. Three hundred mineral deposits are being mined, there are 1,230 km of oil, gas and ammonia pipelines, and 113 other operations using radioactive materials.

But that living comes at a fearful price. What stands out starkly is the most harmful industry in Donbas: mining. If once the mines were in a workable state, today all too many are death-traps. Of 284 mines, 100 were commissioned around 45 years ago and 52 have been working for about a century. Over 25 per cent of the stationary equipment has exceeded its recommended service life, and about half the surface systems have been operating for 40 years without being upgraded at all. Production facilities have deteriorated significantly.

As a result coal production has fallen, as has productivity, while the cost of production has risen. Mine output has more than halved, from 165 million tonnes in 1990 to less than 80 million in 2007. Technologically and economically, coal mining in Donbas appears to be very inefficient. Average monthly productivity is 21.7 tonnes per miner, substantially lower than in leading coal-producing countries, and barely a fifth of what

Alexey Stakhanov is reputed to have produced in a single shift.

Despite hundreds of millions of dollars in government subsidies, many mines are still not profitable for technical as well as market reasons. In 2002, average coal mining productivity in Ukraine was approximately 320 tonnes per miner per year – less than half the figure for Poland and a tenth of the UK equivalent. The World Bank has advised Ukraine to close half its mines, but only a small fraction have in fact shut. At present 85 mines are operating in the Donetsk Oblast. Production is about 70 to 80 million tonnes annually, down from the 1970s high point of about 210 million tonnes a year.

Ukraine's mines, however rundown they may be, still mean livelihoods for individuals, life for communities and earnings for the national exchequer. But these gains come at a mounting price. Ukraine's mines are not only largely unprofitable. They have one of the highest accident rates in the world, because of poor maintenance and neglect of safety regulations. Mine officials believe unsafe conditions and irregular payment of wages have prompted many workers to leave the industry, reducing the

workforce's skills base. An estimated three-quarters of the country's 209 mines are considered to be highly prone to methane blasts. Death rates began to rise sharply when, after independence, the government slashed subsidies to the industry. About 5,000 miners have died since then, and the country's mines today are considered among the world's most dangerous as hundreds of miners die in industrial accidents every year. Very bad discipline is usually blamed. Safety regulations are continually flouted because the pit owners aim to maintain production levels at any cost, while the miners do not take proper care of themselves as they seek to increase personal output. Management in privatized mines is reportedly poor, with incentives to maximize production at the cost of mine safety (anecdotally, this is said to have meant reducing roof support intervals well below minimum standards). But the picture painted by official statistics suggests that safety performance is improving.

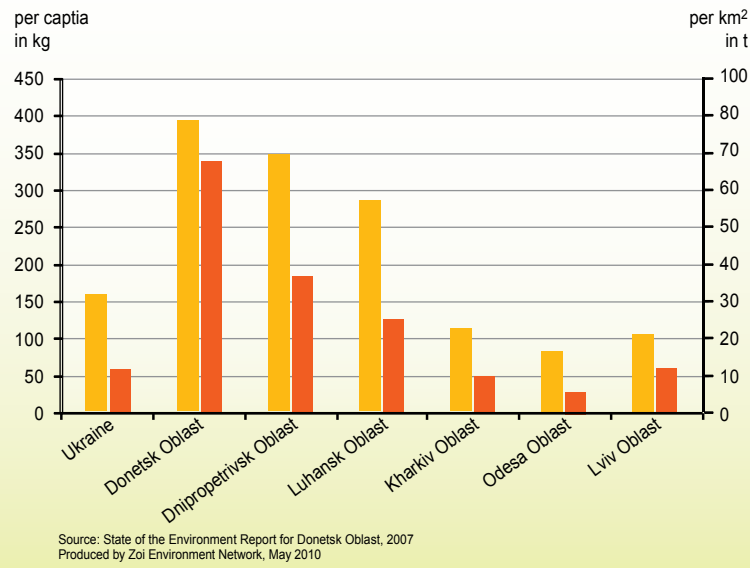
Donbas makes enormous and sometimes lethal demands on its miners. But it has another distinction too, one which few regions would envy: it blights the lives of many who never go near a mine. You do not hew coal

or make steel without producing large quantities of pollution. And however careful you may be in controlling it, some of the filth will still find its way into living creatures, including people.

According to the State Statistics Committee, Donetsk Oblast accounted for 33.9 per cent of total emissions of harmful substances from stationary sources in Ukraine in 2008. This is about 391 kg of pollution emitted for every single inhabitant. The total amount of 1,533,400 tonnes is produced by more than 1,170 enterprises in various industrial sectors. From the second half of 2008 a tendency towards a reduction in gross emissions of harmful substances in the region was observed, related to the onset of the global financial crisis. However, the level of air pollution in cities such as Donetsk, Dzerzhynsk, Yenakieve, Makiivka, Horlivka and Mariupol remains high. The main atmospheric air pollutants of Donetsk Oblast, producing 91 per cent of gross emissions of harmful substances, are seven coke-chemical enterprises, five thermal power stations, six metallurgical plants, and 120 mines and mining enterprises.

Despite the serious decline in annual coal production, Donbas mines are still

### Pollutant emissions



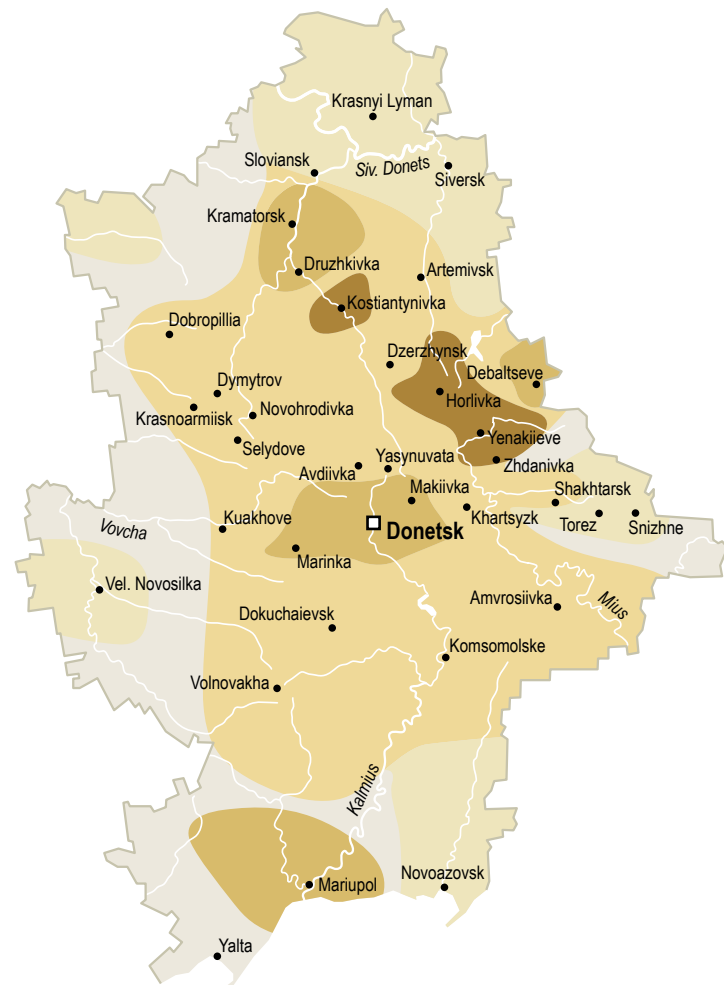
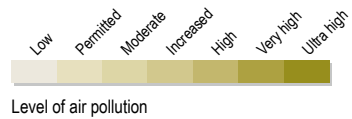
releasing 1.5 to 2.2 billion m<sup>3</sup> of methane into the atmosphere every year. It is one of the most powerful greenhouse gases and these emissions are equivalent to about 10–15 million tonnes of CO<sub>2</sub>. Methane also continues to be emitted by mines which have closed. Although the gas is a promising energy vector, only 5 to 8 per cent of its total volume is used in industry. The Donetsk basin has estimated methane reserves of 11.5 trillion m<sup>3</sup>. The A.F. Zasyadko mine is an example of how en-

vironmentally friendly energy-saving technologies can be implemented thanks to financial instruments under the Kyoto Protocol. Under the terms of the future contract with Austrian and Japanese government bodies a methane-utilization facility was installed and a cogeneration power plant was started. Some 41 million m<sup>3</sup> of methane has been processed, with 194.24 million kW of electrical energy and 168,320 Gcal of thermal energy produced at the mine.



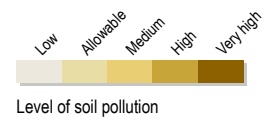
### Air pollution in Donetsk Oblast

Map produced for ENVSEC by ZOİ Environment Network, September 2010  
 Source: The Land of our Concern, Ministry of Environmental Protection of Ukraine, Donetsk 2010



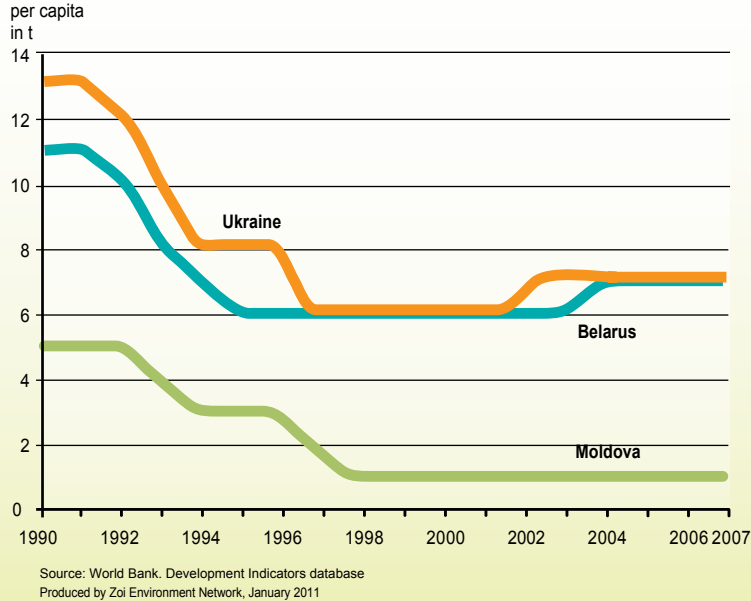
### Soil pollution in Donetsk Oblast

Map produced for ENVSEC by ZOİ Environment Network, September 2010  
 Source: The Land of our Concern, Ministry of Environmental Protection of Ukraine, Donetsk 2010





## CO2 Emissions



As one of the most hazardous regions of Ukraine for environmental pollution, Donbas raises considerable concern not only about air pollution but also about the all-too-common dumps, also called terricones in the region, piles of discarded material left behind by the mines and coal plants. Some of them burn ceaselessly due to their high concentration of coal.

Both open fires and slow underground smouldering can produce harmful gases such as carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>) and sulphur dioxide (SO<sub>2</sub>), as well as “tarry” emission products (including poly-aromatic hydrocarbons) from the incomplete combustion of coal. Mining experts say the numerous mining waste piles scattered



# There is coal but no happiness

Alesya Chumakova for Belaruskyy chas, Minsk, Belarus No 43 (1174) 24-30 October 2008 (abridged translation)

No matter how much we complain about the ecology of Belarus, there are regions in the post-Soviet countries that have got plenty of negative factors, apart from Chernobyl.

## Steamshop of the Soviets

Nowadays Donbass is considered to be one of the most polluted areas in Europe. From the very first minute of being in Donetsk you can tell that even in polluted Minsk it is easier to breathe!

## Mum or stepmother?

I asked a middle aged woman if she liked breathing in the waste products of the Donetskstal plant and adjacent mines. Her reply was: "What are you talking about? The plant has got modern equipment. Don't bother me with that!". This is the typical position for the majority of local residents whose income depends on Donetskstal. The industrial giant employs 12,000 people and is the place where Donetsk residents spend not only their working days, but their leisure hours as well.

The Country of Smiles is a recreation park located on the territory of the plant and the place where hundreds of families spend their free time. The plant spends its own mon-

ey to train youth educators, takes care of the health of its workers in its own resort and provides milk to help people combat some of the adverse health impacts.

It is not surprising that a blind eye is turned to many things. According to the head of the environmental protection department at Donetskstal, the level of dust at the plant does not exceed the established minimum levels. However, for some reason the white helmet that I got at the entrance became grey during the excursion so that it was possible to draw on it with a finger as if on dirty windows.

The situation with labour safety is not much better. The workers were dressed up in dirty overalls and none of them wore safety goggles or used earplugs despite obviously high noise levels. Probably I was talking to the wrong man, but when I, perhaps provocatively, asked the head

**"From the very first minute of being in Donetsk you can tell that even in polluted Minsk it is easier to breathe!"**

of the environmental protection department what the typical illnesses of their workers were, he replied "Acute respiratory disease, radicular pain, like everyone else". There was absolutely no chance of looking through the medical charts to check what the ecologist said.

In addition, the plant does not conduct any research to identify the impact of emissions on the environment.

Meanwhile, according to data from the Ministry of Health of Ukraine, one in two ill people in Donetsk have cancer. According to the Donetsk regional council, only 23 per cent of babies are born healthy and the death rate exceeds the birth rate. On one wall of the plant was a poster: "We will build the clean future together".

Possibly, the situation will change in 2010 when electric furnaces are to be put into operation and all open hearth furnaces are shut down, but at present pollutant emissions from the steel industry in Donetsk region amount to 494,500 tonnes a year, or 30 per cent of the total emissions in the region.

Production of gas, electricity and water is responsible for a similar

**"The level of dust at the Donetskstal plant does not exceed the established minimum levels. However, for some reason the white helmet that I got at the entrance became grey during the excursion."**

amount of pollution, and extractive industries produce another 532,000 tonnes of it.

## Breathing may damage your health

In any city the most expensive apartments are located in the centre. In Donetsk this prestigious housing is literally adjacent to the walls of the enterprise.

I stopped to talk to a woman who seemed to be living nearby:

"Aren't you scared to be living so close to the steel plant?"

"Yes, I know that it is harmful for health, but at the moment I don't have an opportunity to move out. Last year my Dad died of cancer and I think that the environment had its negative effect".

The whole of Mendeleev's periodic table of elements is dissolved in the air of Donetsk with methane accounting for half of the emissions. However, due to the fact that this gas is non-toxic it is often not taken into consideration when calculating the level of pollution. Apart from methane, the highest levels of emissions are due to dust, sulphur compounds, nitrogen and carbon oxides. Other harmful substances make up no more than 2 per cent of the total emissions, although they are even more toxic than those mentioned above and include ammonia, phenol, formaldehyde and heavy metals (lead, chromium, manganese, zinc) as well as carcinogenic benzopyrene.

The result is that your lungs would not notice much difference between a walk down the street and working at the blast furnace or coke oven. According to data from the World

**“The polluted air of a typical industrial European city reduces the life of its residents by eight months. In Donetsk the figure is eight years.”**

Health Organization, the polluted air of a typical industrial European city reduces the life of its residents by eight months. In Donetsk the figure is eight years.

### **Gas may be getting more expensive, but they still burn it**

Only one of more than 10 mines operating in the area recovers waste gas, rather than just burning it. One such facility was built a couple of years ago and uses methane for the needs of the mine, recovering heat and electricity. It has cut annual emissions by 3.8 million tonnes of CO<sub>2</sub> equivalent. The plant has the technical capacity to sell energy to the city but this system is not yet operational.

Local residents will often assure you that they are fine, the city is growing and bad air is just a result of many cars on the streets. Maybe the environmentalists are wrong? But how can we then explain what was said by one of the plant workers: “The whole of my salary is spent on health treatment for my children, with no money left for myself”.



# Death by suffocation

Oleg Lystopad for Novaya gazeta, Kyiv, Ukraine 10 December 2008 (abridged translation)

MPC defines the maximum permissible concentration of a contaminant. This is the level of pollutant concentration in the environment – the air for example – which in excessive quantities can easily damage people's health. Very often these levels exceed the norms several times over in Donetsk Oblast.

Some people might say: "Hey, that's not the issue!" During the economic crisis we should care about the work of the enterprises, and later on we'll take care of the environment. However, there is no "later". We need to think about that all the time, as the crisis will be over but health is fragile and life is short (and terribly short to be honest, as the average life expectancy for men in Donetsk is 53 years). Significant improvements in environmental protection would take years, if not decades. So the sooner we start – the sooner we will get there.

Donetsk is the administrative centre of the Donetsk Oblast, the big industrial, scientific and technical centre of Ukraine. It is located on the river Kalmius in the steppe zone in the south-eastern part of the country. At the beginning of the 1990s the population was 1.1 million people. Now the city is on the verge of losing

its million-residents status. Furthermore migration into the cities jeopardises the rural economy making survival even more difficult.

## Hand out the gas masks!

Had paganism survived in Ukraine, then Donetsk residents would mostly respect Stribog, the god of wind. Strong, predominantly eastern or south-eastern winds are one of the factors that save industrial Donetsk from smog. According to data from the Ministry of the Environment of Ukraine, Donetsk is really in danger of suffocation: over the last 20 years there has been a steady increase in the MPC for dust, nitrogen oxide, formaldehyde and benzopyrene. According to the calculations of Vladimir Berezin, a member of the Bakhmat Environmental and Cultural Centre the level of harmful emissions exceeds 1 kg per resident every day.

## The barrows are asleep but not the coal tips

Residents of Donetsk joke sadly: "Considering the environmental conditions here, we all live like coal miners. But how can we describe the conditions for coal miners then?"

The product of the coal miner's work is not just coal, but coal tips too,

heaps of waste rock. On the territory of Donetsk there are more than 100 coal tips, and over 60,000 in the Oblast. There are small, medium-sized and huge coal tips. In all they occupy 5,000 hectares, or 0.2 per cent of the Oblast's total land surface.

The oldest tips, dating from the days when Donetsk was called Yuzovka, are covered by trees and bushes. The second group were extinguished recently and now adorn the scenery with their gray humps. And finally, the last group of the monsters are the most harmful ones. They are burning and polluting the environment all day long with poisonous gases.

When a coal tip has cooled down (and this will happen in 20 to 30 years' time if we are lucky), it will still pollute, covering everything with dust. Smart Alecs will immediately say: "Plant it with trees and the problem will be solved". Yes, but there is a small problem: the tip is cone-shaped as that was more convenient. So now we have to find something that will grow on such a steep slope, and more particularly on such poor soil!

## A small green spot

However, the scientists of the

Donetsk Botanical Garden did manage to identify such plants. Indeed this institution is well known in Ukraine, and abroad, for its collections of steppe plants, exotic species, etc., and the work of its scientists, which concentrates on plant survival in industrial zones. However, over the last few years miserable budgeting has left no opportunity for doing this work effectively.

The Garden, part of the National Academy of Science of Ukraine, was established in 1964. In 2001 its Steppes of Ukraine collection was designated part of the national heritage of Ukraine. The Garden's collections include 97 species on the IUCN Red List. More than 30,000 people visit it annually.

However, all that was virtually ignored when on 1 July 2002 Ukraine's Cabinet decided to withdraw 147 hectares of land from its ownership. After an intense, protracted battle in the courts, the general public managed to return this area of land to the Garden, which promptly lost a further 59 hectares of the reserve's land (by law the Garden belongs to the State Nature Reserve Fund), this time to a private investor.

**“According to calculations the level of harmful emissions exceeds 1 kg per resident every day.”**

## Compress the gas!

Over the last few years air pollution in Donetsk has deteriorated because of increasing motor transport. Provincial traffic jams can easily compete with those in the capital. With the crisis the economic situation in Donetsk changed, but until then, the steel plants were very, very profitable. And people related to this business (not ordinary workers of course) liked to spend their money on cool new cars.

The residents of Donetsk go to work by public transport. The underground is still just a plan (although a lot of money has been spent on its construction, but somehow nobody knows what exactly it was spent on) and the trolleybuses cannot cover the territory of the huge city. Donetsk is one of the biggest cities in Ukraine, stretching 55 km from east to west and 28 km north to south. So the buses and minibuses snort around, adding to the emissions of the cars and lorries.

The level of pollution could have been reduced if transport had been converted to run on gas. And it does not matter much that Russian gas is getting more expensive. Donbass has got plenty of its own resources: I mean the coal mine methane that

is currently flared off. Zasyadko coal mine invested nearly 700 million Ukrainian hryvnas [US\$100 to 150m] in a special scheme which has enabled it to implement a degasification programme and has provided the mine with electricity as the methane is supplied to a small power station. The mine generates so much electricity that there are plans to sell it, unfortunately delayed by a recent accident. The payback period of such a programme is only three years; but other mines are in no hurry to adopt this novelty. The mine owners are not ready to foot the bill, nor do they trust the government despite talk of a special law that would stimulate the use of mine methane. Obviously the whole business is so unprofitable for gas traders that for many decades we have continued to buy gas from Russia despite having huge deposits under our feet.

Talking about transport, the whole transport fleet of the Zasyadko mine is powered by condensed gas produced at its own compressor facility. Positive improvements are there, but it is often too hard to see them.

I was very surprised that the cost of property in Donetsk is comparable with property in the capital. Strange

as it may seem, factory chimneys – literally located in the city centre – have hardly any influence on prices.

Hardly anything is deducted from those super profits for environmental protection. Donetskstal is probably the only exception. According to reports, more than 100 million hryvnas [US\$20 to 30m] have been invested there in environmental improvements over the last four years. I do not know how much the owners of the plant cared about the health of Donetsk residents whilst doing that, but it helped them to obtain ISO 9001 and ISO 14001 certification for environmental management. In turn that makes the plant's output more competitive on the international market.

There is also a plan to replace six open-hearth furnaces with electric ones. Open-hearth furnaces are not just environmentally damaging, their technology is completely outdated.

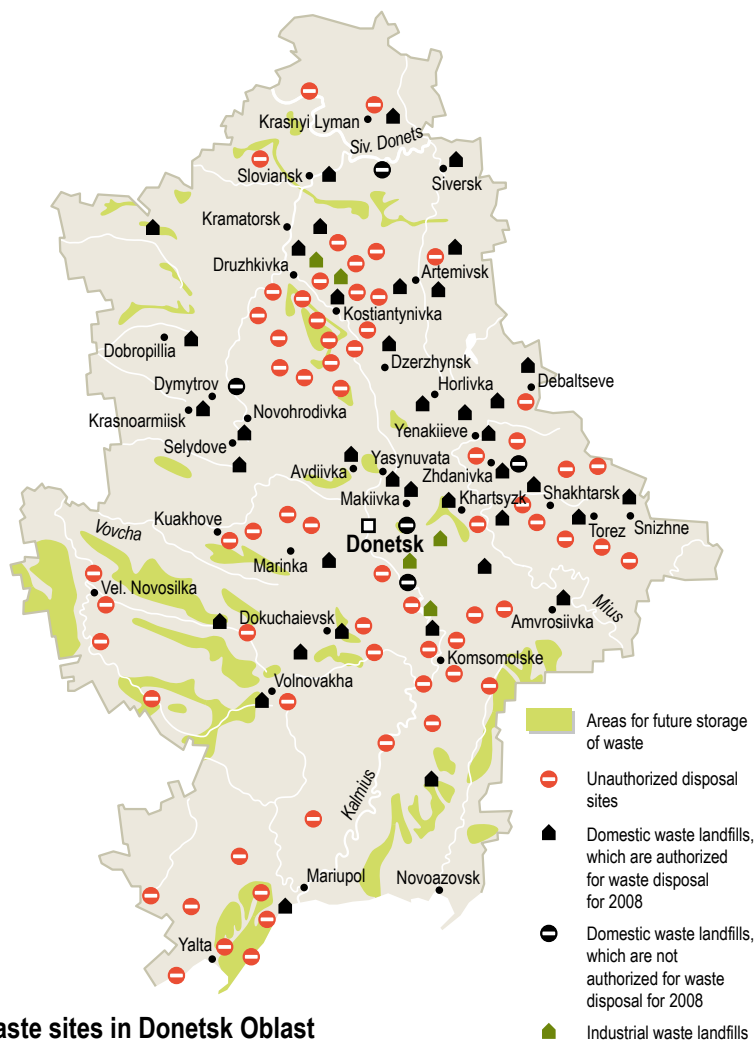
It is very difficult to breathe in the open-hearth furnace shop. No matter how bright the head of environmental protection may sound when talking about ISO certificates, it does not make breathing any better or easier. And further contemplation

of the church, little zoo and pond with the swans does not change the situation either.

The worst thing is that nobody except Donetskstal plans to replace their open-hearth furnaces, such as those in Mariupol and other Ukrainian cities. Neither India, Russia nor China could afford such an energy-hungry production method.

And finally a few words about the water basin of Donetsk. The river Kalmius remains the only blue line on the map. Twenty or 30 years ago it was still possible to go swimming there. Now only a suicide could take such a risk, as the Kalmius carries the wastewater of the city including discharge from mines and chemical enterprises. The wastewater has only undergone mechanical treatment, and the chemicals dissolved in the water remain. Some people joke that local investors are developing a project to use the Kalmius to transfer electricity. Well, why not? The concentrations of anions and cations which ensure high conductivity are much higher than maximum permissible concentrations.

The very MPCs by which the city lives, or dies...?



## Waste sites in Donetsk Oblast

Map produced for ENVSEC by ZOĬ Environment Network, September 2010  
 Source: The Land of our Concern, Ministry of Environmental Protection of Ukraine, Donetsk 2010

across Donbas annually release some 500,000 tonnes of these emissions in Ukraine, and about 120,000 tonnes in the Donetsk Oblast alone.

There is good reason to treat the dumps with extreme caution. One local expert described how they sometimes look. “At night you can see a beautiful blue glow over the heaps. But do not be tempted to admire this romantic sight. The glow is created by radiation from rare-earth metals at high temperatures inside the dumps.”

There are about 600 waste heaps in Donetsk Oblast left over from coal mining, mostly located in towns. Other mining waste, such as tailings, is also a source of concern, constituting a major source of heavy-metal pollution when acid drains from poorly managed or abandoned sites. The high acidity of mine waters means heavy metals such as copper, zinc, cadmium, arsenic and lead can leach from the rock, severely contaminating surface and ground water, soil and vegetation. They can then enter and build up in the natural and human food chains, posing a serious risk to human health. In addition, mining and other industrial waste heaps generate about 10 million tonnes of dust in Ukrainian

cities and towns, again a significant health risk.

The coal industry is not the sole source of abandoned and potentially harmful material. By 2002 about 10 bn tonnes of industrial waste had accumulated in Donbas, a total weight of 320,000 tonnes per sq km. The waste comes from the mining, power and metallurgical industries. In some industrial centres (Donetsk, Makeyevka, Gorlovka) the load reaches 3 m tonnes per sq km. The Coal Ministry is now closing 121 mining enterprises and liquidating their assets. It says they contain 341 spoil dumps, of which at least 105 are burning. All the dumps need work to extinguish, re-shape, and/or replant them.

Over and above the dumps’ environmental impact growing industrial hazards fuel social tension, including pressure on workers to keep productivity as high as they can whatever the risks, to themselves and to society. Despite the drop in production and the steps to improve safety, the number of mine accidents is not falling.

Increasingly the obvious answer is to close a mine or other installation. But even that is not without risk. Con-

tributing to the complexity of mine closure and its effects are difficulties in overall economic and market organization, and the largely unsuccessful privatization process. Privatizing Ukraine's coal industry has given rise

to various challenges, including financial instability, bankruptcy proceedings, and a chronic shortage (or reallocation) of funds for addressing the social and environmental problems associated with mine closures.

### Trends in the impact of mining on the region' environment

- The owners of mining and metallurgical enterprises do not pay sufficient attention to solving environmental problems.
- Expenditure connected with fixed capital assets intended for nature protection purposes amounts to only 0.3 to 0.4 per cent of the volume of fixed capital investments.
- Over the last five years current expenditure on the main environmental measures doubled, whereas the financial efficiency of industry increased by a factor of 4.5.
- In the metallurgical industry the share of energy-intensive and environmentally-harmful open hearth steelmaking practices remains high (about 50 per cent) and practically unchanged for many years.
- In ferrous metallurgy, sintering plants, coke-oven batteries, open-hearth and blast furnaces accounted for 60 per cent of total emissions of harmful substances, and this share is not decreasing.
- Use of fresh water and discharge of wastewater into surface water bodies are increasing in metallurgy, but on the decline in the coal industry.
- Losses of fresh water during transport are increasing, whereas reuse and recycling of water in industry remain at a constant level.
- Further adverse factors linked to the environmental impact of mine closures have come to light in the last 10 years.

These processes are still in the development stage and many adverse consequences will become apparent in the near future.



# Waste tips need flowers

Julia Maklyuk for "24", Kyiv, Ukraine 17 October 2008

Toxic vapour emissions, runoff, self-ignition and landslips are just some of the hazards posed by the waste tips which are a prominent part of the Donetsk landscape.

They could be turned into green parks yet no one is doing anything about it.

A quick survey of public opinion on the streets of Donetsk demonstrates that people consider waste tips dangerous for the environment and health. "The remains of coal burn and there is a lot of smoke. We do not know what chemicals there are in this smoke. But we are forced to breathe it", they complain.

**"Toxic vapour emissions, runoff, self-ignition and landslips are just some of the hazards posed by the waste tips which are a prominent part of the Donetsk landscape."**

**"Waste tips could be turned into green parks yet no one is doing anything about it."**

Alex Kirby, a BBC journalist from the UK, warns that waste rock dumps should be treated with great caution. "We still can't forget the tragedy in Aberfan, Wales in 1966. There, a huge waste dump slid down and hit the school building: 144 people died, including 116 children," he recalls. When a dump burns it becomes very fragile and the risk of landslides increases.

Foreign specialists note how this danger is menacing the residents of Donbass. "It is true that the waste tips of Ukraine are in a dangerous and unstable state", says Philip Peck, professor of the International Institute of Industrial Environmental Economics (Sweden). "An integrated programme for waste dump rehabilitation, like the ones used in developed countries, should be implemented."

The recipe for turning waste tips into green parks is as follows: the dump is levelled as much as possible, then covered with a layer of clay and soil, making sure there is a proper water-runoff system. Then trees which can grow under the particular conditions found on waste tips are planted, including acacia, wild rose and staff trees. In 10 years the toxic coal tip will turn into a green area that can become a park or even a reserve area.

However, Peck reminds us that it is not possible to plant the trees directly on top of a coal dump, especially if it is burning. "First of all, you need to study the composition of the waste rock, the microclimate and precipitation", he points out. Systematic information on these issues is not yet available.

The authorities are trying to make business leaders responsible for regeneration of the tips. For example the Anthracite company which recovers coal from the tips spends some of its profits on soil regeneration: this is part of its contract with

**"Officials dream of turning the tips into blooming gardens just as much as the residents of Donetsk."**

local authorities. However, the company regenerates only the quarry but not the tips themselves. One quarry has already been filled in with waste rock and covered with a layer of soil. The director of the company has promised to plant a forest on this territory in the future

Officials dream of turning the tips into blooming gardens just as much as, perhaps even more, than the residents of Donetsk. "More trees – more oxygen, less dust. And for our region it is extremely important", says Sergei Tretyakov, the head of the State Agency of Environment Protection in Donetsk Oblast. "However, state funding is not sufficient: only 18 million Ukrainian hryvnas [about US\$3 to 4m] have been allocated for waste tip rehabilitation over the past 12 years".



# Mining for a better environment

Coal mining in Ukraine has many effects on society and the environment. The spoil dumps that disfigure the landscape are one, and an important one, because of the physical damage they cause. Decision-makers and practitioners need help to develop their ability to reduce the environmental and social risks linked to mine closures.

There is ample experience from other countries, many of them in Europe, whose coal industries have contracted sharply in recent decades, and who have had to learn to cope with shattered communities and poisoned environments. UNEP has published 'Mining for Closure: Policies, Practices and Guidelines for Sustainable Mining and Closure of Mines', to help ensure mines are closed sustainably. Existing regulations also need to be periodically revised and constantly enforced if mining is to benefit society rather than threaten it.

## The Mining for Closure approach

- defines the end result for mining land and sets forth concrete objectives for implementation;
  - ensures that the mine closure plan is an integral part of the project life cycle;
  - prepares the mine closure plan early in the process of mine development and in consultation with the regulating authority and local communities;
  - explicitly includes environmental, social and economic aspects in planning for mining operations;
  - allows for review and evolution stretching from the pre-mine planning phase, through construction, mining and mine closure to post-mine stewardship.
- As more specific items, such processes should incorporate:
- the concerns and participation of other stakeholders in reclamation objectives;
  - plans for action if ownership reverts to the state despite all efforts to ensure otherwise;
  - the preservation of mine management and geological records;
  - early delineation of project creditors' claims on the site;
  - legal considerations for ownership, both now and in the past;
  - maintenance of control over tenure if leases expire and another party wants to obtain rights to the surface or sub-surface;
  - adequate capacity among regulatory personnel;
  - ongoing research and testing of remediation strategies and technologies and integration of results in mining for closure review processes;
  - surveillance of the views and desires for involvement of local communities (in particular where such parties wish to check the quality of information they are receiving – demanding a role in site-monitoring and access to information to ensure accountability of the operator and governments, for example);
  - the maintenance of communication between private and public bodies to improve closure policy and regulations;
  - ongoing searches for financing measures for clean-up; disaster response; spills management and so forth, particularly for orphaned sites, i.e. sites where legal owners cannot be identified or do not exist (anymore)

As part of the ENVSEC initiative, UNEP has analysed the risks and needs in the region to improve the environmental situation around coal mines and waste sites. The Risk Assessment Considerations in the Donetsk Basin – Mine Closure and Spoil Dumps report details the various findings and offers practical approaches to address the problems facing both practition-

ers and decision-makers in Donetsk and nationwide.


Analysis focuses on the needs and process of risk assessment as a basis for risk amelioration. To improve risk assessment for mines due to close, established mine risk management techniques will often need to be modified to suit the local context. Extensive work has already been

done to identify techniques to help reduce the impacts of mine closure. The full use of risk assessment tools can also make comparisons easier between issues at a single site, as well as between different mines. Six different categories of risk are relevant to mining and mine closure. The items addressed include:

- environmental risks
- health and safety risks

- community and social risks
- final land use risks
- legal and financial risks; and
- technical risks.

The following table outlines the main findings of the project and offers an Action Plan for the region in dealing with mining waste-related risks in the Donetsk region.

Findings of the ENVSEC risk assessment study	Solutions	Proposed approach	Proposed activities 
Ukrainian practice and legal frameworks do not support best practice	Adapt and apply best practices for the Ukraine	Involve external parties with extensive experience of such practices abroad together with Ukrainian actors to improve mining and mine closure practice	Analyse national regulations in the light of practices elsewhere and identify items which are addressed, or not.
Lack of adequate legislative structures for the sale of mine land, mine spoil dumps, etc. is a significant barrier to progress regarding the rehabilitation of mine land	Resolve liability and ownership issues	Analyse legislation surrounding transfer of site ownership and liability for initial examination	Draft proposals for improving policy measures.
Uncensored and informal mining activities. Uncensored and informal coal recovery operations.	Increase site security and establish safe coal-related activities	Regulate informal activities so they can join the formal economy and meet acceptable environmental health and safety requirements	Develop guidelines or regulations for site access and licensing, safety and environmental factors, taxation or royalties, and requirements for some forms of site restitution.
Considerable data on mine waste does exist – however, it is widely dispersed and only limited quantities are available in digital form.	Comprehensive information management on mining objects	Collect and centralize related mining site data, then prioritize risks	Develop and deploy GIS to manage environmental data.
Existing planning and goals for environmental site rehabilitation and risk reduction are inadequate	Revegetation and dump rehabilitation	Identify areas where current practices can be strengthened by tried and proven techniques from elsewhere	Activities: - landform management, dump reshaping - dump fire prevention techniques - management of acidic and saline wastes - topsoil management and soil remediation - water management - revegetation techniques and final land use considerations.

Source: ENVSEC. (2008). Risk Assessment Considerations in the Donetsk Basin Mine Closure and Spoil Dumps.



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