The European Union's Tacis programme

Black Sea Investment Facility

Solid Household Waste Management of the Donetsk Oblast

Complementary Study for EIB

Report: Comments on Ukrainian Norm DBN B.2.4-2-2005 and EU Directive 9931

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Warning

This programme is implemented by the Consortium Thalès EC – GKW Consult - Sogreah. The views expressed in this report do not necessarily reflect the views of the European Commission.

The concept

The main environmental question of the region is: How to reduce the stream of pollution in the Black Sea?

There are 6 countries bordering the Black Sea: Bulgaria, Romania, Ukraine, Russia, Georgia, and Turkey. Three of them are candidates to the adhesion to European Union; three of them are eligible to the Tacis Programme. The candidate countries and the new member states with the help of the European Union, particularly in the framework of programmes of co-operation in the Danube's catchment, do a lot of efforts. But these efforts should stay insufficient without the same efforts in the NIS.

The European Union estimated it should be useful to push these projects and their financing and launched the BSIF Programme. The Black Sea Investment Facility provides studies in aim to facilitate the funding of projects allowing a reduction of the pollution of the Black Sea by the International Financing Institutions.

The target groups

Beneficiary Countries

The beneficiary countries of this investment facility are the three CIS countries bordering the Black Sea (Georgia, Russia and Ukraine), plus Moldova, which is also connected to the Black Sea via its river basins.

IFIs: International Financing Institutions

IFIs involved in the BSIF programme:
World Bank – International Bank for Reconstruction and Development
EBRD – European Bank for Reconstruction and Development
BSTDB – Black Sea Trade and Development Bank
EIB - European Investment Bank

Organisations of the co-operation already existing

BSC Black Sea Commission
BSEP Black Sea Environmental Programme
DABLAS (Danube & Black Sea) Task Force
JEP (Joint Environment Programme) (TACIS)
2001 Regional Environment Programme (EBRD)
Bangkok Facility (EC & EBRD)
MISP (Municipal Investment Support Programme)
GEF Strategic Partnership on the Danube/Black Sea Basin
BSERP Black Sea Ecosystem Recovery Project

Bilateral Donors

Canada, Denmark, France, Germany, Japan, Switzerland, United Kingdom, USA

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Glossary

IFI	International Financing Institution
Municipal waste	Waste in charge to the municipalities, of the same nature than household waste, but resulting of specific activities as the street cleansing, the parks and garden maintenance, the open air markets
NGO	Non-Governmental Organization
Private sector	This denomination is used to name the sub-districts made of individual houses, generally equipped with a private garden
Remediation of landfill	Treatment of hazardous landfill, generally including operations as moving of hazardous waste, waterproofing of the bottom, treatment of leachates, treatment of biogas, etc
Sanitary Landfill	Landfill designed and built in aim to protect the environment, according to international standards and regulations
SHW	Solid Household Waste
SHWM	Solid Household Waste Management

Summary and experts' comments

The design and construction of landfills in Ukraine is regulated by the Law on Waste and the norm DBN B.2.4-2-2005.

The funding by IFIs includes generally as conditions that the project fulfils the "state of art" regulations and norms. Specifically, IFIs pay attention to be sure that the project will not attempt to environment and public health.

On several points the norm DBN B.2.4-2-2005 contradicts EU regulation and the Western "state of art". It is detailed in Part 1.

Formally, DBN is only a norm and not a regulation. But the administration will refer to DBN for the permitting instruction. So this question must be debated between the Ukrainian administration and the IFIs and a solution is to be found. A solution can be that:

- the dossier is made with EU experts, developing how it applies the DBN norm and why it doesn't apply it;
- the administration names a State institute of project as expert for the instruction of the dossier.

1. Comparison

DBN refers to the Ukrainian Norm DBN B.2.4-2-2005 "Design Solid Household Waste landfills – Basic design regulation".

EU refers to the COUNCIL DIRECTIVE 1999/31/EC of 26 April 1999 on the landfill of waste.

EU Directive focuses on a **permit**. DBN norm focuses on a **design**.

1.1. General

DBN§1.2 is less acute than the EU Article 1.1. Specifically DBN says "ensure" and EU says "prevent or reduce as far as possible".

DBN §1.4 & §1.5 define the waste authorized for landfilling. EU articles 3 to 6 copiously (2.5 pages) develop the classes of landfills and the relevant authorized and forbidden waste.

DBN §1.10, 1.11 & 1.12 wish the design should be based on studies and should aim to the protection of health, safety, environment and future. All that is said within 10 lines. For EU the rules of design are described all along the Annex I that is 2.5 pages.

DBN §1.13 puts the question of land reclamation after closure. EU details the aftercare procedures in Article 13 and Annex III.

DBN §1.15 takes into account the regulation about recyclables. This point is evoked in "Whereas" (3) and (17) and in Article 5.

1.2. Location of SHW landfills

The choice of a site obeys to several categories of conditions. The site must offer proper conditions for the long-term protection of environment, this last usually meaning the water resources. The future existence of the landfill must not trouble the neighbourhood.

But some conditions are manifestly inspired by the usual state of Ukrainian landfills as a distance of 15 km from airports, meaning that the smokes of the usual burning of landfills could perturb the visibility for planes. Generally the conditions are described as if they aim to prevent future bad conditions of operation and/or as if they wouldn't be completely fulfilled.

Ukraine considers the choice of a site as a last resort use of a land:

2.2. SHW landfills should be located:

1. at non-agricultural lands which cannot be used for agricultural activities, are of an inferior quality and not occupied by green plants (especially by forests of the 1st group);

2.3. It is not allowed to locate a landfill:

- at sites containing mineral resources and areas with mine works without a prior approval of state mine supervision bodies;

These two items show clearly that economical land use has a priority on ecological land use.

EU gives a clear priority to ecology. Economical land use has an economical cost. This question must be solved by a market approach: what's the price for this site if it's the best site for a landfill?

Whereas (12) gives priority to the requirements for long-term protection of environment. In Annex I, §1. Location fixes principles of requirements (to be defined in national transposition of the Directive), meaning that the studies should *indicate that the landfill does not pose a serious environmental risk*.

DBN §2.6. speaks of the passive barrier of clay and refers to "in accordance with European standards". But it indicates only the coefficient of permeability (10^{-9} m/s) although EU Annex I gives also a minimal thickness ≥ 1 m. But there's more ambiguous. This §2.6 clarifies in fact what is said at §2.4: *SHW landfills can be located at the area of the 3rd sanitary protection zone of water intakes provided they are naturally protected (presence in lithologic section of quite powerful and mature waterproof rocks) plus installation in the basin of the landfill of a reliable anti-filtration barrier*. So §2.6 says only that anti-filtration barrier *has a coefficient of*

water filtration of not more than 10^{-9} m/s. But what's to be done out of the *3rd sanitary protection zone of water intakes*?

1.3. Design of SHW landfills

Engineering studies of the SHW landfill

3.2. At the area allocated for a SHW landfill it is necessary to implement engineering studies such as topographic and geodesic surveys, geological, hydro-geological, hydrologic, ecologic, sanitary and hygienic studies.

3.4. As a rule, the engineering research is implemented in two stages. The objective of the first stage is to justify the choice of a SHW landfill site (upon analyzing the options), the objective of the second stage is to receive initial data for development of the necessary design documentation. The content and scope of studies are defined in the Terms of Reference.

This part puts a problem in Ukraine. Existing data about geology, hydrogeology, and in a minor part geodesy, are "secret". At first stage, the justification of the choice of the site on the base of these data supposes to get an access to the regional data, meaning in a radius around the proposed site. These data are managed by the regional Geology state company. The Geology state company can deliver a report on the site, for some contract and payment. Anyway, after we have seen such reports, the data and the maps are not located, meaning they don't give geodesic markers allowing the reader to superpose the information and to make his own opinion. By the way, the Geology state company plays also the role of last resort expert and has to give its approval within the authorisation procedure. So the same people make the studies, approve the studies and are supposed to be the counter-experts in case of litigation.

In fact, the studies can be done by any organisation that has a relevant license, however, they should be agreed with the regional state geology company.

There's nothing about that in the EU Directive because it's obvious that the interest of environment asks to put a maximum of expertise in the geological and hydro-geological studies and this part of the studies must afford the contestation and counter expertises.

Let's add that Ukraine has ratified the Aarhus Convention and "*guarantees the rights of access to information, public participation in decision-making, and access to justice in environmental matters*". Of course, "*a request for environmental information may be refused if (d) The confidentiality of commercial and industrial information, where such confidentiality is protected by law in order to protect a legitimate economic interest*". But this last item addresses to the secret of the enterprise that has its legitimacy concerning industrial processes, customers, tariffs, and so, within a context of economical competition. Seriously, who will steal the geological resources of Ukraine?

SHW landfill scheme

DBN §3.12 imposes 85 - 95% of the total area of the SHW landfill is used for landfilling. It doesn't take into account the surface of the peripheral protection area. DBN §2.2 defines distances between the landfill and other uses of the land: airports; city-resort, open water bodies used for household purposes, cultural and health-care facilities, National parks, places of rest of migrant birds, sea cost; city borders; residential and public buildings (sanitary zone); agricultural lands, roads and railways of the common network; forests and tree lanes. EU Annex I §1.1 says only that *the location of a landfill must take into consideration requirements relating to the distances from the boundary of the site to residential and recreation areas, waterways, water bodies and other agricultural or urban sites*. Member states can go further. A common problem is how to ensure this distance will not evolve in the future? The permit is given at a date the distances are respected according the "of the moment" uses of the land. What to do if some time after the uses changes or if new constructions appear? For instance, the French law says the applicant must own the rights (by property or by easement) of the land of the protection area. Even the Ukrainian State Order 1996-0173 about "Sanitary rules of construction in populated areas" defines also these distances but doesn't say anything about the status of this protection area. Ukrainian regulation says the landfill should not be at a distance less than … from … French law says the applicant must own the land (or the rights on) on a distance of 200 m from the border of the waste disposal rows.

DBN §3.13 recommends (?) layers of waste 2.0-2.5 m thickness. The thickness of waste layers is one of the parameters of the operation mode of the landfill. The maximum thickness depends on the efficiency of the compacting in aim to get a mechanically stable layer: with sheep-feet compactors (BOMAG, Caterpillar, etc.),

it's possible to make 6.0 m layers, that is unreachable with bulldozers. As already said, the norm focuses on the "past" practices and technologies and not on "today's" and "future" ones. Moreover, a norm of design should define objectives more than means.

DBN §3.14 and §3.15 are about the disconnection of rainwater (also developed in §3.25). It's also in EU Annex I §2. DBN says the disconnection ditch is, as a rule, 1-2 m from the fence (normally, it's said that as a rule, 1-2 m from the ditch there is a fence). It's bureaucratic: the best place for the ditch depends on the topography (crest lines and separation of water catchments).

DBN §3.15 says the spare earths must be stored within a perimetric 5-8 m lane. Only the design can say which quantities and where to store the spare earths of different categories.

Design of disposal site

DBN §3.17 is about the digging of the rows. Of course, to maintain the bottom 2 m higher than the underground waters level is good. But it ignores completely the question of the clay and it's some contradictory with the requirements of the anti-filtration barrier. EU Annex I §3.2 is rigorous: "*the landfill base and sides shall consist of a mineral layer which* …" It means that the row must be dug in the clay. If DBN speaks about the passive barrier, it doesn't say where it must be relatively to the row and its bottom.

DBN §3.19. imposes "*the bottom of the pit is designed horizontal*". It's a heresy and it's a full contradiction with the drainage of the leachates. The active barrier is the draining system. According to basic engineering considerations, a draining system is made of a "waterproof" layer (low permeability), a "draining" layer (high permeability) and a slope. The combination [clay + gravel] is efficient with a > 5-10% slope (depending the quality of the clay). The combination [geomembrane + gravel] needs only a 2% slope. The difference of minimal slope is important at the scale of a landfill: it's several tens meters difference of depth, and so millions tonnes of earth to dig and remove. (DBN says that if the slope is less than 0.5% then a cascade of gullies is designed, and the difference between than is less than 1 m).

DBN §3.20 recommends a square shape of the landfill in aim to maximize the stored volume. But it says also in §1.13. "*the design project should foresee land reclamation after closure of a SHW landfill*". The EU Directive 96/61/CE IPPC considers all impacts on environment and asks for best available techniques implementation. It applies on landfills and specifically about visual impact or impact on landscape, which is considered as an impact on environment. In member states transposition of the directive, it's required to develop at the stage of the project a final state after closure aiming at the integration of the landfill in the landscape. The purpose is to get a natural relief shape instead of a pyramid in the plain.

DBN §3.22 duplicates EU Annex I §3.2 about the natural barrier of clay. But the DBN §3.23 shows that EU has not been understood. EU says that if the "geological" barrier doesn't meet the conditions, it may be completed by artificial means giving equivalent protection. The meaning is that an additional layer of very low permeability material (as Bentonite with $K<10^{-12}$ m/s) and >0.5 m thickness should provide the equivalent protection. DBN says it can be completed with an artificial barrier with $K<10^{-9}$ m/s. The meaning is to use a geomembrane but: (a) the effect to fight is the stream of leachate able to pass in the subjacent layers and it depends on permeability and thickness (1 mm at $K<10^{-9}$ m/s is no effect!); (b) geomembranes are a component of the draining system and never a waterproofing element.

The same DBN §3.23 says to protect the artificial layer with sand with granulometry <0.5 mm. Unfortunately, it contradicts the efficiency of the draining system. Two functions must be ensured: the protection of the geomembrane and the efficiency of the drainage. It's why the "state of art" associated geotextiles and several species of gravels and the design will depend on the load of the waste on the geomembrane. The EU Annex I §3.3 develops the concept of the draining system.

DBN §3.26 and §3.27 are about the use of quarries for SHW landfilling. The temptation to fill any available hole is typically Ukrainian. EU has fought and abandoned this practice. A quarry is not a particular case and such a project should obey to the common rules.

DBN §3.28 ignores that the biodegradation of 1 tonne of domestic waste will produce 250 kg water, and so, the apparition of leachate is not linked to climatic conditions.

DBN §3.28 to §3.31 are also about another abandoned practice: the trench scheme, also called burial scheme. For EU it's not a particular case and such a project should obey to the common rules.

Globally, DBN focuses on geomembrane as waterproofing system and ignores completely the engineering of the draining of the leachates.

Disposal of briquette SHW

Sorry to contradict DBN §3.32. "*Modern technologies of SHW disposal presuppose their preliminary briquetting*" and all the following developments. In EU briquetting went in fashion at the beginning of the 90's and since has been abandoned. The reason is that it's very difficult to design and operate such rows in respect of the EU directive. Briquetting is a way to solve the rate of compaction and to simplify the transportation between a transfer station and the landfill. The counterpart is that it makes much less easy to handle the waste in the landfill. The storage of several layers of briquettes help to a forklift requires to keep an horizontal surface, beginning with an horizontal bottom of the row. This last point is in contradiction with the draining of the leachates. Another drawback is that briquetting appeared as an obstacle to the efficiency of the biogas production and collection. Finally, EU designers and operators privileged the use of sheep-feet compactors offering the same final compaction rate at a better cost and making easier the respect of the regulation.

Household area and engineering infrastructure

EU directive doesn't express recommendations for that. But other texts apply and specifically the IPPC directive.

DBN §3.44: in EU there's no derogation for up to 500,000 m^3/y landfills concerning wastewater treatment facilities. About landfills, the rule is the same whatever the size.

DBN §3.46: water on a landfill is necessary for employees life conditions, washing (truck wheels disinfection as §3.49, machines, etc.) and fire fighting. For life conditions, it's drinkable water and EU regulations favour the use of network water. Fire fighting requires (IPPC) a tailor-made and multilevel strategy. Usually it includes water reservoirs as second level means and the Emergency Situations Administration imposes (at the expenses of the facility) the connection of the landfill to a high stream water network with a main fireplug Ø 100 mm providing 6 bars. So the connection to public water network is not a derogation for small landfills but an obligation for all landfills.

DBN §3.47: not only separate water collection but also EU imposes separate wastewater treatment facilities. In addition, EU considers that any water likely to be in contact with waste is supposed to be contaminated. It implies, as some waste can fall from trucks on the roads and tracks of the landfill, these roads and tracks must bordered with a ditch collecting the running water and sending it to the leachate treatment facility (see also §3.52).

DBN §3.48: fires on a landfill are not a fate. The control of fires lies on the avoidance of contact between waste and air, and on the collection of biogas. So the modern landfill operation modes aim to limit the surface of open air waste (small area of landfilling, immediate cover with earth). As all leachate must be collected and purified, it's better to avoid to moisture the waste because it should upsize the leachate treatment facility.

DBN §3.53: lighting supposes the landfill is connected to the electricity network. Lighting, premises and maintenance workshops are some tens kW power. The collection of biogas and its conversion to electricity means to put on the network hundreds or thousands kW power. It should be scheduled in the design (see §3.74).

Sanitary protection zone and system of monitoring

The monitoring is developed in the EU ANNEX III Control and Monitoring Procedures in Operation and After-Care Phases. EU adds the parameters to be measured, the minimal frequency of the operations of monitoring, linked to the reporting obligation of Article 15.

Conditions for organization of works at SHW landfill, which should be taken into account at the stage of design

DBN §3.66 lists allowed waste but forgets the waste from organisations (canteens, offices, shops, and so). It refers to Annex G for allowed industrial waste of 4^{th} class. DBN §3.67 lists forbidden waste.

EU Article 6c lists the waste allowed on non-hazardous waste landfill. More interesting, the criterion of non-hazardous is defined in Annex II by a procedure that refers to the Directive 91/689/EEC on hazardous waste. This organisation of the regulation makes much more easy to adapt to the market and to the progress. A

"new" waste is not forbidden because it is not on a 10 (or more) years old allowed list: the producer may apply the procedure of characterisation and demonstrate it's hazardous or not.

System for collection and utilization of SHW landfill biogas

DBN quotes some parameters of the biogas production (§3.75) and proposes a model of calculation of expected quantities (§3.76 and §3.77). The problem is that: (a) DBN doesn't give an exhaustive list of parameters influencing the production of biogas; (b) DBN doesn't say in which brackets of parameters values its model is reliable.

Following DBN describes one way to implement the biogas collection. But it's only one way among a lot of available technologies:

- It's not sure it's the best way for all cases;
- It's not sure some parts are not already obsolete;
- It's sure that the market's offer evolves quickly and future technologies cannot be in the norm.

EU stays on very general consideration in Annex I §4: all the biogas must be collected.

System of leachate collection and neutralisation

DBN §3.106 to §3.108: it's rather confuse and it describes a contradictory technology. Leachates must be collected all over the bottom of the row but as previously it was said this bottom must be horizontal, it means there would be a high density of draining pipes. The draining layer is made of pebbles but the protection layer of the geomembrane must be made of sand. The minimal diameter of the draining pipes is 300 mm, but in aim to resist to the weight of the waste, the thickness should be several cm. Materials used should be chemically and biologically resistant but it's not said for how many years.

Here also, one way is described without to specify its domain of performance.

EU asks only to collect all the leachates, imposing an artificial waterproof sealing and a draining layer ≥ 0.5 m. For the rest it's engineering and the applicant has to demonstrate how he will fulfil the objective.

Land reclamation after closure of SHW landfill

The plantation of trees for the reclamation 2 years after the closure (§3.116) and on a reclamation layer of minimum 70 cm (§3.131) is not realistic. In EU the plantation of trees is forbidden as long there's a production of biogas, so minimum 25 years for domestic waste. The only allowed plants are the ones whose roots cannot reach the hydro-insulation barrier in aim to avoid any damage on it.

DBN never speaks about the shape of the landfill after closure (integration in the landscape) but the §3.124 gives normative slope angle depending on the target use of the land after closure. The values are rather low (18° maximum) which is good for the landscape even if the values are inspired by agricultural uses.

EU says only in Article 13 that the after-care procedure must be ensured by the operator as long the landfill could present hazards. For SHW landfills, the common acceptance of hazards is that the biodegradation will generate biogas and leachates for 25 years after the closure (under temperate climate). Usually, national transposition of the directive by member states specifies the land cannot be used for any purpose during this period. From time to time it's allowed to use it for recreational activities (there are famous examples of golf) but never for food crops because the biogas doesn't contain only methane but also >1200 identified gases whose some are harmful for health. Anyway, it's difficult to conceive a land would be cultivated with the presence of all a network of biogas pipes and so.

1.4. Annexes

1.4.1. Annex A

DBN Annex A gives **definitions** that are in EU Article 2.

EU defines **municipal waste** produces **by** household and other waste of similar nature. DBN defines **solid household waste** as waste produced **in** residential buildings and other, among them medical institutions; and **consumption waste** as industrial products without any further use.

Hazardous waste are defined in DBN as "considerable danger" that is very fuzzy and open to any interpretation. EU defines them within the Council Directive 91/689/EEC of 12 December 1991 on hazardous waste.

EU defines **inert waste** that are not defined by DBN even if §1.4 quotes industrial waste of the 4th class of hazard can be used at a SHW landfill as an insulating material.

DBN defines the **treatment** as all physical operations on the waste. EU defines it as the processes that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery. EU has an objective that is not in DBN.

DBN defines **Treatment, Collection, Storage, Recycling, Transportation, Utilisation, Neutralisation, Disposal** of solid household waste that EU doesn't define.

DBN defines **Specially allocated sites and facilities**, including landfills but doesn't define landfills. EU defines acutely **landfills**.

DBN defines **Biogas** as issued of anaerobic decomposition of organics. EU defines **landfill gas** as all the gases generated from the landfilled waste.

DBN defines **Leachate** as liquid phase created by the disposal of waste (meaning their biodegradation) and the excess of rainfalls. EU defines it as any liquid percolating through the deposited waste and emitted from or contained within a landfill.

EU defines key-people: the **Applicant** (who applies for a landfill permit), the **Holder** (the producer of the waste or the natural or legal person who is in possession of it), the **Operator** (the natural or legal person responsible for a landfill), the **Competent Authority**.

1.4.2. Annex D (recommended)

DBN recommends bulldozers for compaction. It's a countersense. Bulldozers are designed for pushing and not sinking in unstable soils. So there are equipped with caterpillar wheels in aim to reduce at the minimum the pressure on soil. Compaction is the contrary!

Waste compactors have been developed in aim to crush and dam the waste. They are usually equipped with sheep-feet wheels, including vibrators, and allow to get a density of 1000 kg/m^3.

1.4.3. Annex G

This annex gives the list of industrial waste of the 3rd and 4th classes of hazard that can be received by SHW landfills and within which conditions.

In "*Table 1 – List of industrial waste of the 4th class of hazard, received by SHW landfills without limitation and used as an insulating material*", we notice that are allowed waste containing sulphur (gypsum, $CaSO_3$) or chlorine. Out of the fact they should be considered as hazardous in the EU directive if they don't fulfil the procedure of acceptance, sulphur and chlorine compounds generate gases that are harmful for engines in case biogas should be used for electricity conversion. So usually national transpositions forbid the landfilling of such waste.

Additionally, some waste contain elements that are inhibitors of the biodegradation as copper.

The principle of the "*Table 2 – List of industrial waste of the 3d and 4th classes of hazard received by SHW landfills with limitations and which should be stored together (norms for 1000 m^3 of SHW)*" is usually called in EU "co-disposal". It has been developed mainly in UK and in Greece. It's now forbidden by the EU directive, but these two countries have obtained a period of grace.

It is the same for "*Table 3 – List of industrial waste of the 3d and 4th classes of hazard received by SHW landfills with limitations and which should be stored together (norms for 1000 m^3 of SHW) with consideration of special conditions*". It's also co-disposal. Let's add that a waste as activated carbon is an inhibitor of biodegradation.

2. Problem analysis

2.1. Regulation or not

The usual problem of norms is that they reflect a temporary "state of art". DBN doesn't escape to this drawback. It reflects the usual Ukrainian practices with a small progress toward the future. But if the understanding of future is the EU regulation, there lies the main problem.

EU regulation has been established in 1999 but the draft was already circulating in 1992. It's based on what was feasible by this time but also, and it is the most important, on what was feasible and already done for a number of years in member states and North America. It's specifically true for the geomembranes. In 1992 USA and Canada had already a 15 years experience of geomembranes. So what EU asks for landfills is feasible by EU industry (including waste industry). But it's not so easy even in EU. A majority of people have not yet understood that geomembrane is a component of the draining system and not a waterproofing equipment!

Philosophically, EU imposes results and not means. Means are the domain of the technology and the market and both progress everyday. So a regulation imposing means risks to be quickly out of date by the progress.

DBN is a norm and not a regulation.

In Ukraine, such a norm is quite a regulation. There's a procedure equivalent to permitting that is the approval of project by >20 administrations. If there's a norm, these administrations refer to the norm and verify that the dossier respects all the elements of the norm. So the norm is not a regulation but the project will never be approved if it doesn't apply the norm. Theoretically it's like that.

2.2. Normalisation

There's a key difference between the former Soviet Union's approach and the international approach about norms and standards.

Historically, the notion of norm appeared in aim to favour a fair competition: how to compare products if they are not made with the same rules of art? So the norm is a consensus between the competitors agreeing that a product must be designed and manufactured according several criteria which are determining for the purpose of the product. So it became easy to for a manufacturer to advertise that his product was made according to the norm XXXX, and by the way comparable to the other competing products. This work of normalization has been entrusted to (and often refereed by!) public organisations, first national, then international. In parallel, anyone claiming he works according to a norm must be controlled by an independent organisation in aim to maintain the trust of the public toward the norms and the normalization.

Today, the normalisation organisation proposes to the market to establish norms for a subject. Then a committee of experts is named to prepare the project of norm. This project is submitted to the critics of anyone, improved, and at least approved by the committee. Often, the norm is published as experimental norm during 1 or 2 years before to be officially adopted.

In Ukraine, there's this committee of experts but we have not heard anything about open consultation neither experimental period. In Ukraine the draft norm is placed on the web-site and is distributed between all administrative units, then the comments and proposals are collected which are taken into account at the stage of approval.

The knowledge evolves, the products evolve, the rules of art evolve, so the norms evolve. Some norms are periodically revised. New norms appear everyday. A key-point is the notion of rules of art. It's close to another concept largely developed in environment protection: the BAT = Best Available Techniques. The progress of the industry is constant but the innovation, although at the beginning, is often very expensive and the prices decrease when begins a mass production. It's so the Directive 1996-61-IPPC says in article 11: *Member States shall ensure that the competent authority follows or is informed of developments in best available techniques*. The rules of art are what a good professional should reasonably do. A good professional must be a master in his domain. He must know all techniques in his domain and must be able to use it with a good level of quality and efficiency. The rules of art are a not-said consensus between good professionals. This notion appeared in the mid-age with the companions unions, if not as they claimed, with Master Hiram who is supposed to have built the Solomon's Temple. During centuries (if not millenniums) the rules of art have been very stable but the last two centuries have seen a faster and faster development of the

science and the technology. So the rules of art must follow this faster evolution. It's a common drawback of the norms to be accused to fossilize the technique, and by the way, the market.

The norm is a consensus for the market. It's really the key-point in the Western economy. If I buy something, I can ask for products made according to the norm XXXX. The providers are free to propose or not products or services applying the norm. If they want to sell to me, they must prove they respect the norm. The customer decides what he includes in his specifications and the provider is free to agree with them.

There's a specificity for laboratory's analyses and tests, and generally for the domain of the measure. Norms aim to define how to make a measure (or test or analyse) with a particular equipment for a particular purpose. The objective is to ensure that any measure made in the same conditions can be comparable and reproducible.

All these developments aim to say that the soviet approach of the norms was disconnected of the international movement of normalisation. The norm was the rule decided by the bureaucracy. Everything had to be done according to the norm until somebody decided to change the norm. The New Independent States have inherited of the former soviet organisation of the norms and almost all of them have not yet adhered to the international organisations. Globally, it can be also said that since the break of the Soviet Union, a lot of other priorities appeared and since 1991 nobody really took care to concretise in the national norms the catching up of the technical progress of the Western sphere. As comment, it was also necessary to protect the domestic market against the competition of foreign products and the norms were also a way to get that. In the context when everybody wants to adhere to the World Trade Organisation and/or to the European Union, and/or to the NATO, and/or to the OECD, the adhesion to the international organisations of normalisation will be a key-point. The most difficult will be to launch a "cultural revolution" as the norms are an expression of the free market and not a bureaucratic decision.

National norms can be proposed to be international norms. There's 2 main organisations: CEN (European Committee of Normalisation) and ISO (International Standards Organisation). There are other international organisation specialized in particular domains (telecommunications, electricity, …). When a norm is adopted at the international level, it's applicable in all countries belonging to this organisation.

2.3. Landfills norms

The design and the construction of landfills can lean on a lot of international norms. In October 2005 we inventoried 458 norms (312 of them making 3893 pages!) applying to:

- geological studies;
- hydrogeological studies;
- geotechnique;
- geomembranes and geosynthetics;
- HDPE pipes.

In EU no norm should be an obligation. But the applicant has to demonstrate to the administration all his affirmations, either in his permitting dossier, either in his self-control reports to the Inspection. So the application of the norms is the best way to argue that the "state of art" rules have been applied and that the samples can be counter-analysed and the results counter-expertised. The Western system has 3 levels:

- analyse (self-done or at the initiative of the applicant);
- counter-analyse (at the initiative of the administration);
- referee analyse (by a national organisation as INERIS[1] in France).

In Ukraine, the situation and the practice are quite different.

For the permitting procedure, the instruction is purely formal. Regulations say what must be the content of the dossier. So administrations check the presence of the obligatory content. It's culturally inherited form SU. By this time, the content was made by State project institutes, so nobody (and there was no *ad hoc* structure) could counter-expertise or contest the content.

[1] Institut National de l'Environnement et des Risques Industriels – National Institute of Environment and Industrial Risks

For the control of the facilities, the sampling and the analyses are made by the Inspection. Analyses are done according to Ukrainian norms and the laboratories of the Inspection are accredited by the National Accreditation Agency[2]. The results cannot be contested and the counter-analyses are not allowed. There also, it's the culture as the State cannot be wrong.

2.4. Strategy for the Donetsk Project

The aim of Tacis is to help to a progress of Ukrainian practices toward EU practices.

The regulation of Ukraine must be applied.

The IFIs cannot lend Western money for projects that could provoke some day harmful effects on environment and health, if not disasters.

It cannot be denied that the Western package of regulation and norms is more:

- up to date according to the "state of art" of the scientific knowledge, to the "best available technologies", to the capacities of the market;
- sophisticated by the large scope of available norms;
- flexible by the obligation of results but by the free choice to apply the norms or to demonstrate a better way.

Reasonably, the Donetsk Project should be considered by Ukraine as a pilot project. It means that a component would be to experiment solutions that could improve the Ukrainian regulation and norms.

Nevertheless, the administrative culture of projects and permits should evolve. The role of the State is to give an authorisation, and for that to assess a proposal. It cannot be to write the proposals itself throughout its State institutes.

Projects must be developed by the applicants help to independent consultants, experts, design offices, engineering offices, and so. All information in the dossier must be provable.

State institutes must play the role of advisors and counter-experts for the administration.

Ideally, there should be created an arbitrage procedure, and for that a referee structure.

As it is, a sanitary landfill fulfilling the EU regulation cannot be designed and built according to the full DBN B.2.4-2-2005. Formally, DBN is only a norm and not a regulation. But the administration will refer to DBN for the permitting instruction. So this question must be debated between the Ukrainian administration and the IFIs and a solution is to be found. A solution can be that:

- the dossier is made with EU experts, developing how it applies the DBN norm and why it doesn't apply it;
- the administration names a State institute of project as expert for the instruction of the dossier.

[2] Audit of Donetsk Inspection laboratories in July 2003