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The role of the environmental industry in Europe's ecological transition

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Summary:

Europe must embark on a path leading to a virtuous ecological transition if it is to achieve further economic growth that does not harm the environment. This transition must address issues such as resource scarcity, the increasing complexity of pollution and the challenges posed by new ways of living in our cities. Environmental serviceshave an important role to play by providing the operational solutions needed to make this transition and by creating new economic models that reward performance rather than volumes sold. Local and national governments have the ability and the duty to assist in the real-life deployment of such solutions by setting clear rules and targets, using the power of public procurement and helping to put financing in place.

"We don't inherit the earth from our ancestors; we borrow it from our children." [1] This plea to respect future generations encourages us to safeguard the planet's natural resources—air, water, soil, animals, plants and so on—which are being weakened and threatened by numerous polluting activities visited on them by humanity. If we are to lay the groundwork for our children's future, we must commit to a virtuous **ecological transition** that will provide lasting environmental protection while also sustaining European industrial growth. Wherever the transition has already got under way, it has had to tread a very perilous and narrow path between two diametrical opposites: the fear that poorly designed environmental rules will undermine business competitiveness and quickly lead to the paralysis of entire industries; and the belief that unfettered use of water, raw materials and energy resources combined with over-exploitation of nature will, little by little, lead to an end to economic growth.

Environmental services operators like Veolia know that concrete solutions to drive this transition already exist—solutions that overcome the obstacles created by having to find a balance between short- and long-term choices that may at times be contradictory. As a global business, historically French and naturally European, Veolia has chosen to focus its efforts on three **critical challenges inherent to the ecological transition** faced by public and private organizations alike. These are challenges that can only be met through innovation and the creation of **new economic models**. The quality of these solutions and of their implementation will depend on the political commitment of governments and authorities.

IMMEDIATE CHALLENGES FOR ECOLOGICAL TRANSITION

To reflect the changes in production methods, consumer behaviours and lifestyles that have swept Europe during the past few decades, we have decided to concentrate our resources on the challenges posed by **treatment of the most difficult forms of pollution**, the **increasing scarcity of natural resources** and the **management of complex urban services**.

• *Treating the most difficult forms of pollution*

Economic activities generate **waste that is polluting or hazardous**. This waste must not be dispersed or diluted in the natural environment; on the contrary, it needs to be confined and concentrated prior to disposal or recovery. Within the European Union, waste management best practices are designed to meet common regulations and inspections. However, new forms of treatment, and thus new technologies, are needed in order to meet stricter regulatory requirements, including for existing pollution.

1. *A saying attributed variously to ancient Indians, Native Americans, or French writer Antoine de Saint Exupéry*

In October 2010 in Hungary, the villages downstream of the Ajka aluminium plant, and the nearby river Danube, were suddenly inundated by 2 million cubic meters of caustic red sludge released when one of the plant's reservoir dams collapsed. The accident was a human and environmental disaster that killed nine people and injured 120 as well as causing grave harm to the region's animal and plant life. This **red sludge**, a waste product of the bauxite production process, is a major environmental challenge for the aluminium industry. In 2012, Veolia signed an exclusive agreement with a Canadian company [2] whose unique **green technologies** treat red sludge, extracting reusable materials or creating an inert dry residue. We are now able to extract the alumina, rare metals and rare earths from this highly toxic sludge. This innovative process offers an effective industrial solution to an extremely serious environmental problem: there are currently some 3 billion metric tons of untreated red sludge around the world, with each year adding another 100 million metric tons or more.

New forms of pollution are emerging such as **drug residues and endocrine disruptors**. These substances are the subject of intensive studies looking for ways to improve detection and analysis methods used to monitor wastewater and treated wastewater as well as groundwater and rivers. Another form of waste that must be processed is that which is created when **nuclear power plants are dismantled**. Some 300 nuclear reactors worldwide are earmarked for decommissioning over the coming 20 to 30 years, three-quarters of them in Europe. This is why Veolia signed an agreement in 2013 with the French Atomic Energy and Alternative Energies Commission, covering the decommissioning of nuclear installations that have reached the end of their operational lives.

• *Preventing and managing scarcity*

Europe is resource-poor. It currently imports seven times more resources than it exports, even though it was the continent where the industrial revolution and the intensive exploitation of resources first emerged two centuries ago. In 2011, the European Union issued its *Roadmap to a Resource-Efficient Europe*. In 2012, in a process driven by environment commissioner Janez Potočnik, the European Commission set up the multi-actor European Resource Efficiency Platform, which is intended to provide concrete guidance in this area. Looking beyond Europe, we all know that our planet as a whole is confronted by the **growing scarcity of natural resources**, with projected shortages of several minerals, the exhaustion of fossil fuel resources and decreasing freshwater reserves. These scarcities can only be managed if we act on three fronts to change our economy so that it emits **less carbon**, and uses fewer r**aw materials** and less **water**.

Going carbon-free means moving beyond the world of oil, gas and coal. How can we make drastic cuts in our carbon emissions while still meeting energy demands, which remain high in Europe and are increasing at the global level? The first thing to do is to make energy savings. Then, failing to abandon fossil fuels completely, we can use cogeneration, or combined heat and power, to make significant improvements in power generation efficiency. Lastly, we can replace fossil fuels with clean energies, for example use biomass instead of coal to power district heating networks. In Poland, our Dalkia subsidiary has upgraded the power plants in Lodz and Poznan and adapted its supply processes to change the types of fuel used. A significant amount of the heat distributed by both cities' district heating networks now comes from forest and farm biomass.

Using fewer raw materials in our economy so that we consume fewer natural resources requires us to **break the link between growth in GDP and the use of resources**. It is by turning waste into a resource, aiming to create a **circular economy**, that this break will become a reality. Just like every other continent, Europe started very simply, recycling paper, cardboard and scrap metal. To take this process to the next level requires technological advances to ensure that recycled products are able to meet requirements for quality, health and safety, and economic competitiveness. Such advances include the reuse of catalysts and activated carbons used in industry, after recuperating the mercury content [3] that classes them as hazardous waste. This is what Veolia subsidiary Batrec does, applying the expertise it developed for recycling batteries.

2. Orbite Aluminae

3. Mercury recovered as a 99.9% pure liquid

Wastewater sludge from municipal wastewater treatment plants was for years thought to be worthless. But it is in fact a source of energy and raw materials, providing us with another example of the circular economy. Digestion of the organic matter the sludge contains produces biogas, which can then be turned into heat and electricity. The sludge is also an invaluable source of **phosphorus**, an essential element for the modern farming industry; with reserves likely to run out by the end of the century, this is one mineral that really needs to be recycled everywhere as a matter of course.

Lastly, we need to reduce the water we use in our economy so that we can lower the amount pumped from rivers and aquifers. Water is a renewable resource, but it is very unequally distributed and is subject to problems of **increasingly acute scarcity** due to greater volumes taken, increasing urbanization and climate change. This includes in parts of Europe previously considered unaffected, such as the United Kingdom and some German *Länder*. Various solutions exist to meet this challenge, including **cutting losses from leaks in public water distribution networks, aquifer recharging** and, most critically, **recycling treated wastewater.** This is a technology that is hardly used in Europe at present, despite the fact that it opens the door to an alternative resource that is available in large quantities in exactly the place where it is needed.

• *Optimize management of complex major urban services*

Many European cities are pursuing policies designed to turn them into smart cities, and **new technologies** are going to have far-reaching effects on urban services. Powerful data acquisition and processing systems are being developed that are able to handle so-called big data—colossal data sets—about citizens, such as their energy and water consumption, transport and leisure choices, waste volumes produced, and so on. These systems will pave the way for the appearance of **new local services** that will transform, or even revolutionize, the way that people behave: alerts to signal electricity over-use, CO_2 emission calculations, and more.

In 2011, Veolia partnered with Orange in a joint venture called m2ocity. The company aims to install and run 5 million **smart meters** for water, gas or any other type of flow. These new generation meters will make it possible to optimize management of energy use in commercial buildings as well as in the home. A further advantage is that individual real-time consumption tracking makes it simpler to apply preferential social and green tariffs.

MEETING THESE CHALLENGES: INNOVATION AND THE ADOPTION OF NEW ECONOMIC MODELS

• *No ecological transition without innovation*

In the future, **there will be less demarcation between different environmental services**, something still seen all too often in many municipalities where you have energy on one side, waste on the other, water somewhere else entirely. We are already seeing more and more blurring of the lines between urban services. This convergence is at work wherever waste generates electricity, fuel or compost. Or when wastewater from a treatment plant becomes a source of organic material used for the **production of bioplastics**. This is happening right now at the North Brussels treatment plant, which serves over 1 million people and is running a unique prototype installation unlike anything else in the world. With the pilot phase successfully completed, we now have to work on the business conditions needed to move to full-scale production.

• *The need for new economic models*

In the past the "common good" required networks to be extended, thus increasing the volumes of drinking water or energy distributed to households in order to improve people's health and living conditions. Today, it requires us to cut the amount of resources that we consume. The original economic rationale is thus turned on its head while still remaining the prevalent model. Rather than trying to sell more, water and energy services must now focus on selling less, despite

the fact that they are generally financed via sales!

This forces operators to seek new economic models: for example, **remuneration based on performance rather than volume**. In this model, operators are incentivized to increase their income by meeting targets set by local authorities rather than by trying to sell more kilowatt hours or cubic meters. In some cases, it is possible to switch from a volume model to a non-volume one, where **remuneration is based on the volumes not consumed**. Another approach is to **cut the ties between volumes sold and volumes taken from nature**, achieved by the recycling of materials or wastewater.

• *The need for a renewed territorial approach*

Environmental services provide local governments with invaluable assets they can use to their advantage to meet the ongoing challenge of urban competition: more precisely, these assets **enhance the attractiveness of Europe's cities and regions**. The overall quality of life in an area depends to a large extent on the quality of its basic services, which embody everything that help make life easier for residents and businesses, helping to secure the wellbeing of the local economy. In Val d'Europe, close to Disneyland Paris, we are recovering the byproduct heat from a bank's data center—heat previously lost—and feeding it into a district heating network serving 600,000 square meters of office, hotel and accommodation space, all without emitting any CO_2. We have recently opened the first integrated energy efficiency management platform in Paris's La Défense business district. It handles all energy management functions at 1,100 separate installations, using closely integrated human and digital networks across the entire area to make energy savings.

THE KEY ROLE PLAYED BY PUBLIC AUTHORITIES IN PAVING THE WAY FOR THE ECOLOGICAL TRANSITION

EU institutions, member states and local public authorities have a variety of mechanisms at their disposal to promote an economy that is greener, cleaner and more efficient. Most of these levers center on their roles in strategic decision-making, regulation and public procurement, as well as backing for long-term financing operations.

• *Setting ambitious strategic targets*

The overriding duty of any public authority is to **set out a clear and credible course of action**. This is what the EU has done with the three key objectives of its Energy Climate Package (the 20-20-20), seeking to cut greenhouse gas emissions, raise the share of renewable energies and improve energy efficiency. The package has already made a positive impact in the way that we manage our environment. But the course of action needs also to include specific provisions for certain types of energy that are highly advantageous in terms of their cost-efficiency ratio: one of these is heat, which is all too often overshadowed in EU legislation in favor of electricity, even though buildings, the number one users of energy, consume twice as much heat as electricity.

The recent EU directive on energy efficiency [4] requires member states to adopt a long-term strategy for renovating private and public buildings, and imposes an obligation to renovate 3 percent of the floor area occupied by central government each year. Meeting these obligations will certainly require **public authorities to make a major push in favor of energy performance contracting**, a mechanism encouraged in the directive. These contracts feature measureable performance commitments that the private partners must guarantee. Contracts of this type can generate significant, achievable energy savings over time, with investments amortized over 10 years at most. In France, the city of Montluçon has signed a 10-year energy performance contract with our Dalkia subsidiary that will see a raft of energy reduction strategies put in place in approximately a hundred public buildings. The actions taken include rationalizing building heating systems, switching to renewable sources and the fitting of building management systems. In the first three years, our teams have achieved a cut in energy consumption of 21.5 percent in comparison with the position at the start of the contract term. Similar contractual arrangements, based on energy savings, are in place elsewhere in Europe, for example in Slovakia and Horby, Sweden.

More generally, the **EU**, where heating accounts for 46 percent of energy consumption, **needs a roadmap for heat**. There are no specific targets for district heating networks, despite these being far more efficient than individual installations. There is real scope in Europe

4. Directive 2012/27/EU, October 27, 2012

for growing this method as well as for updating existing networks.

Regarding **renewable energies**, it is important to make sure that the growth in intermittent sources (wind and solar) is matched by an increase in flexibly sourced generation, which is deemed to be more cost-effective for the public purse: **biomass**, which also creates local jobs, **geothermal**, and **energy recovery from waste** are all under-exploited techniques. [5]

Lastly, any worthwhile objective must **improve business competitiveness**. When realistic and properly targeted, it can encourage an industrial sector to become more organized and developed, helping to boost the attractiveness of the regions involved and contributintg to Europe's ability to develop the know-how and infrastructure that will be one of the motors for tomorrow's growth. As far as the waste management sector is concerned, there remains a pressing need for EU legislation to set targets for recycling and reusing **priority waste sectors and streams**, such as electronic waste and electric vehicle batteries.

• *Adopting rules and standards to hasten the energy transition*

New regulations will be needed to accompany this transformation in the nature of environmental services. Although regulations can sometimes result in excessive or useless restrictions being placed on businesses, they are also a way to **stimulate innovation**, helping to **make Europe the benchmark** for its international competitors in certain sectors. Regulation is also the key to providing stakeholders with the guarantees needed to monitor new practices that may carry with them risks to health or the environment.

This applies, for example, to **shale gas and coal gas**. Europe has its share of recoverable volumes and their possible exploration and exploitation is a subject of impassioned debate between member states. Commissioner Janez Potočnik has already stated [6] that the techniques and best practices to prevent, reduce and manage the risks already exist, that best practices must be followed scrupulously and that the regulatory framework has to ensure real and effective protection of health and the environment. A further example of an area where there is a need for the clear and predictable rules that are vital for new practices is **recycling treated wastewater**, a promising practice from the environmental standpoint, but one that will only gain acceptance when backed by an EU directive with common standards to be applied throughout Europe. In its *Blueprint to Safeguard Europe's Water Resources*, [7] the Commission proposes setting standards in this area. Any future standards should concentrate on setting quality thresholds that depend on the use made of the recycled wastewater, starting with irrigation for agriculture, Europe's largest water user.

• *Encouraging social excellence in public procurement contracts*

It must be made easier and less troublesome for all public procurers in Europe to favor bids that offer the **best environmental value**. Every project for an environmental service should entail wide-ranging assessments, looking at the economic and social realities of existing activities as well as the implementation costs and expected gains in public health and environmental protection. This in turn presupposes that public procurers benefit from **legal, economic and political** safeguards—something that is currently lacking. Legal safeguards mean that a public procurer should not see its choices systematically challenged, even cancelled, if the lowest bid is not preferred. In terms of economic safeguards, methods such as life cycle analysis must take environmental factors into account when identifying the most cost-effective bid. And to ensure political safeguards, public procurers must be capable of proving to users that the best value bid provides the best service at the lowest cost.

Public procurement plays a significant role in Europe, accounting for 17 percent of GDP. This underlines how important it is for public-sector buyers to **look to the long term**, to avoid the low-cost mindset. The lowest bid will not always offer users and consumers protection over the long term, because people's health and the environment have a cost. Over time this low-cost mindset will undermine many businesses, because innovations prosper best in markets willing to fund risks, and to reward companies prepared to take them.

• *Long-term financing*

We cannot ask everybody to bear the entire cost of the ecological transition. With over 150 million Europeans affected by **fuel poverty**, [8] the question of funding for basic public services is vital as a means to strengthen social cohesion. In many regions of the EU,

5. For France, refer to the Court of Auditor's report on renewable energy policies, July 25, 2013

6. Speech to the European Economic Congress, Katowice, Poland, May 14, 2013: Shale gas in Europe—being consistent with a low carbon economy, managing health and environmental risks

7. Communication 2012/673, November 14, 2012

8. Any household spending over 10 percent of its annual income on energy costs, according to the International Energy Agency (June 2011).

users are no longer able to afford the full cost of public environmental services: households in some cities in central Europe have cut their connection to the district heating network and begun using individual heaters, which pollute and are inefficient, as their low incomes mean that they can no longer afford to pay for collective heating.
Against such a background, there is a role for public financing of those general interest investments that Europe needs if it is to meet its energy and climate change targets and to ensure that all its citizens enjoy access to good quality basic services. It should be easier for public authorities that are committed to backing this type of investments to use the available EU funding for the period 2014-2020. In this respect some environmental projects should be more easily eligible for a combination of **structural funds and public-private partnerships**.

CONCLUSION

The urgent need to accelerate the speed of the ecological transition is evidenced by the series of major environmental challenges we have to meet, a list headed by the combat against resource scarcity, treating the most difficult forms of pollution and the development of complex urban services. These are issues that are already being faced by a growing number of European companies, households and local authorities.

Businesses sometimes start out thinking of these challenges as constraints that will have a negative impact on their competitiveness; however, they are also opportunities for developing new markets and creating value, and are increasingly seen as such. Local authorities across Europe are seeking answers to these challenges on a case-by-case basis, while at the same time retaining their powers to roll out ambitious environmental policies across the territories they administer, whether in terms of targets, management models or tariffs.

In such a context, environmental services have to offer exemplary operational solutions to every single participant in the economy, helping to drive the move to an economy that is cleaner, greener and more efficient. This can only come about through technology innovations and the creation of new business models. Public authorities have the capacity and the duty to help these new models to emerge, using the powerful levers they control in a balanced manner, all the way from local environmental policies to public procurement and funding.

We are witnessing a new page in the story of Europe as we experience this unsettling yet fascinating period of change at first hand: all across our continent, states, cities and companies are attempting to reinvent themselves for the era of sustainability. In truth, we are living though the very earliest days of the ecological transition, a process that surely has a bright future all across Europe. Our mission is to make it a reality.

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