



# Geopolitical events and trends, as they relate to essential services and critical resources

Highlights from the Veolia Institute Foresight  
Committee's 2022 annual meeting

# The Veolia Institute

## Thinking together to illuminate the future

Conceived as a platform for discussion and collective thinking, the Veolia Institute has been exploring the future at the interface between society and the environment since its foundation in 2001. Drawing on its connections to the global intellectual ecosystem, it facilitates multi-stakeholder analysis to explore emerging trends, particularly the environmental and societal challenges for the decades ahead.

Over the years, the Veolia Institute has built up a network of intellectual and scientific experts, universities and research bodies, NGOs, international organisations around the world. The Institute pursues its mission through its high-level publications and conferences, its foresight working groups and its diversified network of experts.



*Foresight Committee meeting - October 2022*

*First row from left to right: Philippe Kourilsky, Mamphele Ramphela, Dinah Louda, Amy Luers*

*Second row from the left: Franck Galland, Sébastien Daziano, Jean-Pierre Tardieu, Pierre-Marc Johnson, Nicolas Tenzer, Nina Cambadelis, Harvey V. Fineberg, Emilie Nguon, Pierre Ribaute*

# Editorial



We are close to ending the first quarter of the 21st century; many of the identified necessities for the world consist in defining actions and seeing to preparations to provide relief to the overwhelming issues the next few generations will face and establishing means of successful outcomes in development.

Some answers must be found to the addressing the consequences of Climate change, water scarcities, demographic crisis, competition for resources, social tensions related to migration, the role of public and private actors in addressing these with new technologies, numerical instruments, and their availability all in the context of the necessary ecological transition of our economies.

It is thus important to try setting the ground to alleviate the worst that can emanate from these realities and challenges and to nurture the benefits brought about with the emergence of new means to tackle them.

Trying to assess trends demands defining the proper questions and approaches, also deploying efforts at finding a consistency in approaches to address the challenges.

The engines of change are the ever-increasing energy use, natural resources availability to feed development of mostly new technological means. Globalization, an almost seamless flow of interdependencies in goods and services production and consumption is put into question. For more than two generations it was the motor of world economic growth, economic public policies and actions as well as the modus vivendi of major economic private actors. Should it recede, it will be for socio-political reasons.

But the taste of its breath and power to bring about more goods, services across the world will remain. Addressing scarcity as we have in our meeting, leads to addressing the realities of geographic availability, careful attention to exploitation of newly essential metals, life cycle approaches, re-use, recycling.

The necessity of cooperation across sectors as well as regions of the world stand out. Interdependencies related to environmental threats like Climate Change, or to facing the demands of the deployment of new technologies are obvious because of the scarcity of essential resources such as water and the metals that feed the technological power-house Artificial Intelligence systems. Co-operation is fundamental to reach the means of controlling Climate Change trends as well as access to scarce necessary resources. The absence of co-operation among actors, stake holders and states will lead to increasing risks to peace, stability, and security.

The Foresight committee of the Institut Veolia attempts with its means to make contributions to larger intellectual endeavors in academia, public policy making, not-for-profits and the private sector. Our 2022 Foresight Committee meeting addressed some of these issues in a stimulating and productive exchange between remarkable expert contributors.

The discussions will enrich open access thinking on what are musts in concerns and perspectives about our common future.

**Pierre-Marc JOHNSON**  
*Chair of the Foresight Committee*

# The Foresight Committee

Drawing on the expertise and international reputation of its members, the Foresight Committee guides the Veolia Institute and steers its development. Each year, during its annual meeting, it invites a multidisciplinary panel of experts (academics, politicians, scientists, economists, etc) to engage in discussion on a given topic.



**Harvey FINEBERG**

President of the Gordon and Betty Moore Foundation

*“ In every topic, whether energy, water or rare metals, there is vital work for Veolia as a corporate entity, for us as a society and as an Institute to consider how we can contribute. ”*



**Pierre-Marc JOHNSON**

Chair of the Foresight Committee, former Prime Minister of Québec, Of Counsel Lavery attorneys Montreal

*“ The challenge is possibly to get the best definition of the issues at this time, but also how to address them and with what instruments. ”*



**Philippe KOURILSKY**

Emeritus Professor at the Collège de France, Honorary Director General of the Pasteur Institute

*“ We need to de-center our opinion and try to have some kind of dialogue, which is becoming increasingly difficult. ”*



**Mamphela RAMPHELE**

Former Managing Director of the World Bank

*“ We have yet to find a way of governing the commons in a way that will underpin the sustainability that we would like to see. ”*



**Amy LUERS**

Global Lead on Sustainability Science at Microsoft.

*“ We brought up systems thinking, and I would like to add future thinking and historical thinking as twin pieces of that study, and then the circular thinking that embeds us in values thinking as an inherent part of solving this problem. ”*



**Amartya SEN**

Economist, Nobel Prize 1998, Professor at Harvard University

Absent from this meeting.

# The invited experts

To explore the theme of geopolitical trends and events, the Foresight Committee assembled the following panel of experts, whose diverse backgrounds and experiences brought a range of perspectives to the table:



**Nicolas TENZER**

Analyst of international and security issues, and guest professor at Sciences Po Paris

*“ On natural resources, one of the key questions is whether we will be able to create new standards and rules and to impose them. ”*



**Franck GALLAND**

CEO of Environmental Emergency & Security Services

*“The World Water Forum launched an organisation with Guinea, Mauritania and Mali to share the wealth of the Senegal River. They decided to jointly finance infrastructure and share technical data. This is proof that with political willingness there is capacity for cooperation in water sharing. ”*



**Marc-Antoine EYL-MAZZEGA**

Director of Ifri's Center for Energy & Climate

*“ We are too embedded in the old world and too little advanced into the new one of clean fuels. ”*



**Guillaume PITRON**

Specialist in rare metals geopolitics

*“The energy transition is also a digital one. ”*



**Jean-François NOGRETTE**

Senior Executive Vice President Veolia France & Special Waste Europe

*“ There is energy dependency in Europe, with a natural gas reservoir in the North Sea that will shortly be gone. ”*



**Pierre Ribaute**

Executive Director of Veolia Water France

*“ Climate change is speeding up and disrupting the water cycle. Over the next 30 years, the aquifers, 70% of the water we use in France, will replenish at a rate 20-40% less than today. ”*

# Geopolitical overview and resource implications

*Presentation by Nicolas Tenzer, Sciences Po Paris*

“The real point is that countries such as Russia and the Popular Republic of China (RPC) are trying to completely disrupt the world order from an economic point of view and in terms of political and social values. Russia and China are completely different, but there is a clear attempt by Russia to create more unpredictability in the markets and in terms of rule of law. Unpredictability is certainly what we want to prevent. We witness what Russia is doing in Ukraine, preventing it from sending wheat, corn and other categories of food to the rest of the world, but it is also looting crops and destroying them. In the long run, if this regime is still in place in Russia in the coming years, it will create more unpredictability and risk for grain supplies in all categories and trade in general, not to mention the delegitimization of international and humanitarian law. It would also increase the danger of some countries in which it has a footprint becoming failed states. This destruction of states could have consequences in the regions surrounding them, with an increase in ill-development brought about by the appropriation of resources by criminal groups and large-scale corruption.

On natural resources, one of the key questions is whether we will be able to create new standards and rules and to impose them. In the last G7, a new concept has been launched, called ‘Build Back Better Worlds’. We have to create the conditions for a sustainable and balanced development. In her speech, Ursula Von der Leyen, the President of the European Commission, stated that there are two competing ideas of the world. In this competition between standards, we should ensure that the ill-practices will not win. States as well as private companies must accompany this gigantic investment and development program, the only way to ensure that virtuous development standards prevail. These go hand in hand with the empowerment of local communities and NGOs.”

## Discussion of the committee

### The importance of history

“You said that the regime matters, and I would add that history matters. The issue of the West’s history in the rest of the world matters in enabling Russia and China to establish themselves as an alternative. Europe and America have not acknowledged that history matters, which is why at the UN you can have equivocation around human rights.”

“You talk about sharing, and that the West must invest in the emergence of a Russia with social conditions for people’s emergence, but that has not happened in post-colonial Africa. China comes in and invests in infrastructure, and there is the debt trap. Part of what we need to think about in terms of creating conditions for a more stable world with shared values and goals has to include self-examination in the West’s creating the current conditions, not mentioning the oligarchs which were deliberately created by the West.”

# Inter-state tensions related to water resources

*Presentation by Franck Galland, Environmental Emergency & Security Services*

“In 1996, about 400 million people were facing water scarcity. Today, we estimate that this has risen to 1.2 billion. The figures in 2035 will be 3.7 billion.

Unfortunately, water is an issue of collective security, that it can be weaponised in new conflicts. [...] Let's take the example of Yemen. McKinsey wrote that Sanaa, its capital city, would rely on only 250 metres of renewable water per year per inhabitant by 2035. The main reason for the lack of water was poor governance and lack of investment, but mainly that 80% of it was used in agriculture, and a very specific type. 50% of this water was to produce drugs for use and export, and since 2005 a major high-intensity conflict has taken place through proxies. It was lacking in infrastructure before the war, but since then water systems have been deliberately targeted. This can explain the major cholera outbreak in 2015, affecting a million people and 500 000 people the following year. Therefore, they rely on very poor water infrastructure, and if there is a ceasefire tomorrow, the question is how the country will get back on track. This can explain major migration and major political and religious radicalism; religious groups use food and water to recruit these very poor people affected by water stress. [...]

Water is a collective security issue. It is a strategic issue for governmental bodies. Looking at the Shanghai Cooperation Organisation, created by China in 1996, where Russia, Iran, Pakistan and India are key partners, water scarcity is on the agenda. Just before the war in Ukraine, NATO was increasingly interested in discussing water scarcity issues in Central Asia and Eastern Europe, but what is new is the role played by the UN Security Council on this issue.” [...]

## Discussion of the committee

### The problem of the lack of water scarcity's knowledge and predictability

“We can predict and have a clear vision of the available surface water, but there is a knowledge gap about availability and how it works in terms of aquifers, underground water. We definitely need more knowledge of this, and it requires a lot of investment and technology, because this water can definitely be a solution to bring peace and security to a lot of African countries lacking water, and the same for elsewhere. Our knowledge of underground water definitely has to be improved.”

“Regarding surface water and projections, in France the depth of rivers will decrease at a rate of 20% in the next 20 years and the level of aquifers will decline at a rate of 20%. I am sure we can be more effective if we find more concrete solutions to face water scarcity and security issues if we have better knowledge of available underground water.”

# Inter-state tensions related to energy resources

*Presentation by Marc-Antoine Eyl-Mazzega, Director of Ifri's Center for Energy & Climate*

“We came out of five years of extraordinarily low energy prices. 2015 to 2020 was an extraordinary period, so much so that we managed to set for ourselves very ambitious decarbonisation targets. [...]”

We did not see three things. The first is how confrontational the relationships with a number of key energy players would become, some of them holding energy resources and some being key transit countries.

The second element that went missing is the extent to which oil and gas investments had been falling – there was a 50% decrease since 2014, but at the same time, demand for fossil fuels has increased. There was obviously already a big imbalance in the system, which has been tracked in oil and gas but much less so in mining and infrastructure. Clean energy investments were rising at the same time, but not enough to make up the difference. While we saw a rise in investment, we probably did not pay enough attention to that it was not happening as much in Europe as in China. Our largest energy majors in Europe were not investing in renewables, or very little. [...]

The third thing we did not pay enough attention to is that things were getting really tense and over-dependence on German gas, Russian diesel, methane supplies from Chinese value chains, etc. We came out of Covid thinking that this was behind us, greenhouse gas emissions had diminished and things were positive, and then came the demand shock, with Asian markets picking up much quicker, with strained markets, the mining industries being disrupted by Covid, etc. [...]

The only response is to save energy, [...] and it takes social discipline. [...] For the first time everybody understands that there is a huge crisis, so something has to be done about it. [...] Energy resources and behaviour change are getting more traction.”

## Discussion of the committee

### Public opinion and wellbeing

“ We need to quantify the potential well-being. It is less pollution, less congestion, less time in traffic jams and better quality of life. We have to redesign that. It goes with the way we work and travel, for example teleworking, which in some companies is part of the package and in others is unheard of. I am surprised that in opinion polls climate change and degradation are among the top concerns, though not in the US, but the US is big, and if you talk to someone in Florida whose home was decimated, they might see it differently. If you ask people what they are ready to do for it, it is maybe EUR 20 per month, not more.

Therefore, it really requires elites who have a consensual view of where we want to go. I was positively surprised during the German electoral campaign that there was a growing consensus on that, even on the Conservative side. Unfortunately, we are not there yet in France or in Italy, and there are still reservations and it is highly polarised, but this consensus has to be built. ”

# The Rare Metals War

*Presentation by Guillaume Pitron, Specialist in rare metals geopolitics*

“Recent news has confirmed that not only the US but also China want to move towards a low-carbon world, but every energy transition needs resources, and the first one of these took place in the 19th century (started end of the 18th century), when the transition to the steam engine required coal.

The second energy transition, the Second Industrial Revolution, also needed other energy resources to make cars work, not to mention oil.

We want to move toward a third generation of technologies which are called green and are even more complex than past ones, and to make this possible, certain metals are needed. These include rare earth elements (REE) such as cobalt, nickel, indium and gallium, not because they are really rare but because they dilute the earth’s crust more than base metals.

Dysprosium and neodymium are rare earths, the latter responsible for 90% of cars and hybrid vehicles, and in most cases to make a magnet for an EV you need neodymium, an iron-boron magnet. You do not make an EV without lithium, cobalt, nickel, manganese and sometimes iron for the battery, but also other resources such as copper. [...]

European production has been going down for the last 150 years. There used to be a time when Europe extracted most of the metals and minerals for the rest of the world and itself, but now it is responsible for 3%. The peak for US production was in the 1950s, and since then it has been going down, and the same goes for Russia.

Regarding the energy transition and where these metals are being produced, we see that the main producer of lithium is Australia. We see DRC for cobalt, South Africa for platinumoids, Russia for palladium, and China, which has become the main producer of antimony at 74%, which is becoming an issue in the US, because antimony is necessary for the defence industries. Therefore, we need to bring strategic and also critical minerals into the debate, a term which has been devised by the US, Canada and Europe. [...]

Circular economy will become very important, because we need to recycle, and develop a circular economy, smart and responsible mining, eco-design, changing economic models, sharing economies, making phone life cycles longer, etc.

The energy transition is also a digital one. There are more sources of energy input into the grid, along with many more plugs for a diverse range of electricity uses. Clean energy is intermittent when there is no sun or wind, and the grids are very complex, so digital technologies are needed to pilot these networks.”

## Discussion of the committee

### Enhancing rare metals’ alternatives through research an Artificial Intelligence (AI)

“Is there active research to find alternatives to these chemicals? A lot of research must be going on, but what is promising or otherwise?”

*Substitutes are heavily researched, and the French are very willing to find substitutes in the lab but mostly unable to transform the discovery into a sustainable business. This is where investors from the UK and US come to get the French knowledge and turn it into a business. This is how we can turn a discovery into innovation. Artificial Intelligence has been used by a university, perhaps Johns Hopkins, for chasing the 25-cent coin. These coins were made of nickel, and the price of nickel was getting so high that the cost of the coin was higher than the face value. I spoke with the researchers. They used the technologies to find the best ingredients in 18 months so they could come up with a substitute for nickel and a coin with the same chemical properties and weight, so that machines could recognise it, and with much less re-course to nickel. Digital technologies and AI accelerated this process. The researchers could not tell me how much time they had gained, but it was obviously very important. Digital technologies can be very helpful in this way.”*

# Veolia's experience and challenges related to resources scarcity

*Presentation by Jean-François Nogrette, Senior Executive Vice President Veolia France & Special Waste Europe and Pierre Ribaute, Executive Director of Veolia Water France*

*“There is energy dependency in Europe, with a natural gas reservoir in the North Sea that will shortly be gone. Reducing industrialisation in France means importing CO2 from elsewhere, so we are still increasing emissions. Currently, our target in France is to become self-sufficient in energy in France in the next five years by de-risking essential services. Currently we produce two-thirds of our energy, comparing production and consumption, and we already produce gas, electricity and fuel, so fuel means cooking oil, gas from sludge and all kinds of organic waste, and electricity from incineration of domestic waste, so it is a mix between organic waste, with some fossil fuels, and renewable carbon.”*

## Discussion of the committee

### European regulations and mind shifting to promote sustainable water production

*“ Can we use the European regulations in the desalination field?*

*It is part of the cocktail of solutions that we need to meet the challenges of tomorrow, because we need every kind of resource. However, we need to start with usage patterns, because we need people to be responsible, for instance we need to know how much water you use. It is not that easy today – we have smart meters, but they are not being systematically deployed by local authorities. We have four million smart meters in France, but we can do much more.*

*For instance, for apartment buildings there is one smart meter, but not for each flat, so nobody knows. They are useful for us to monitor the system, but not useful for everybody to do what they are doing with energy consumption. Giving citizens the ability to control and own consumption is an important resource. There is also the hydraulic performance of the network, which you can reduce by 10% without withdrawing. Then there is water reuse inside the plants, because some kinds of wastewater is not systematically reused, so efficiency is 80-90%, but it could be close to 100% with a small change in regulations.*

*Then there is water use. We recycle 0.2% in France; in Spain it is 14%, in Italy 8%, in Israel 80%. The climate of France will be Spain's in 20 or 30 years, so we need to come from 0.2% to 20%, including desalination. Desalination is part of the solution and can be deployed in France, as we have the capabilities. It is part of the local consensus, and it is applicable when you have seawater.”*

# Main takeaways

## The complex world needs dialogues in order to promote solutions toward international cooperation.

### A complex world going through resources' scarcity and conflicts

“The Western world on the one hand and Russia and China on the other present confronting views of how we see the future, act together and we can build, or not build, confidence.

Secondly, there are trends in the case of water which seem to confirm that scarcity could lead to drought-like conditions in certain areas of the world, and possibly even in France.

Thirdly, trends show that as we use numerical instruments to build the new economy and use them to tackle many of the radical changes we will go through, there could be a lack of elements to produce these instruments. Looking at their life cycle, it might not be easy to face, even through recycling, to complement that scarcity.”

### The rise of tension in international affairs

“I would highlight two tensions. One is the recognition that we are in a world of rivalry, sometimes also hostility, about the dominance of the future in terms of ideas, ideals, systems, etc. The tension is that, as a globalist and internationalist, the world has to solve some of these ideas by working together rather than by competitive winning. We can only deal with these problems in a world that establishes a model of collaboration. How do we reconcile the world of rivalry and hostility with that consisting of problems that demand concerted and collaborative solutions? This is one of the great challenges we face.

Secondly, another implicit contradiction we feel in terms of international relations is that on the one hand we say we demand respect for the protection of universal human rights, everywhere by everyone. We also say that we accept the necessity of respecting cultural differences and cultural values. Therefore, this tension between universal rights and cultural difference is the second underlying tension.”

### Shedding light on solutions-based approaches

“There was a lot of discussion about the gravity of the situation, and there was a lot of bad news, yet a lot of solutions were touched on. We could, if we put our minds to it, find examples of the cooperation that is still ongoing in certain areas, and perhaps we could out those together and bring them out the next time.

Having heard all this, we could go a little further in exploring these. The problems are enormous, maybe worse than we thought, but there are still solutions even in the diplomatic back-channels and even the different forms of governance that are complicated and maybe not up to the standards but are there, concerning certain river basins and certain UN high commissions working on them.”

**The Veolia Institute:**  
A platform for environmental  
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