



The new industrial revolution making it sustainable

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Forum

The new industrial revolution: making it sustainable



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

1. INTRODUCTION

The overarching theme of the fourteenth session of the General Conference, “The new industrial revolution: Making it sustainable”, highlighted the fact that inclusive and sustainable industrial development strategies are of critical importance to reconcile the three dimensions of sustainability: environmental, economic and social.

The Forum on 28 November explored some of the possible answers and solutions to the problem of sustainable industrial development, setting the scene for a policy agenda for the “new industrial revolution”. High-level national and international officials as well as entrepreneurs and academics were invited to address these questions in a panel discussion moderated by BBC World anchorwoman Zeinab Badawi.

The present document gives an overview of the Forum. It contains:

- An introduction to the Forum theme which provides the context for the statements made by the panelists;
- The written statements submitted by the panelists;
- A summary of the Forum presentations and discussions;
- Brief biographies of the moderator and the panelists.

2. BACKGROUND

I. The issues

The overarching theme of the fourteenth session of the General Conference, “The new industrial revolution: Making it sustainable”, highlights the fact that inclusive and sustainable industrial development strategies are of critical importance to reconcile the three dimensions of sustainability: environmental, economic and social.

Never has the world been more interdependent, more shaped by technological, economic and social progress, and yet more vulnerable to economic and environmental shocks and political failure. It will be increasingly difficult to meet the aspirations of the world’s growing population for prosperity and justice as an array of converging systemic risks must be addressed: the food, fuel and financial crises; changes in demographic structures and attendant pressures for migration; the growth of the illicit economy; the inadequate responses to the threat of climate change through greener patterns of economic and industrial growth; and increasing inequalities.

A further deepening of the current crises is possible over the next decade, as an increasingly crowded, diverse and interconnected world confronts threats that it is not equipped to withstand. Resource scarcity, or the limits to the sustainable consumption of highly strategic commodities such as energy, land, water, food, and space for emissions, can exacerbate existing problems. This provides fertile ground for instability and volatility, especially for fragile States, such as those emerging from conflict.

Current growth trajectories, based on traditional industrial growth patterns, are hitting their limits. It will be necessary to take decisive action and move the sustainability agenda from the “green margin” into the economic and geopolitical mainstream. This will require radical policy change and massive investment in innovation and technological advancement.

A “new industrial revolution” is therefore needed. This can only be achieved through a comprehensive rethinking of the way business is conducted and how the international community and all its stakeholders, both public as well as private, will approach these global challenges. New concepts and technologies that benefit all, including vulnerable groups, will require modes of international cooperation, networking and partnership. The “new industrial revolution” must be global in nature, simultaneously addressing the economic, environmental, social, justice and security challenges. Anything less will be insufficient.

II. Focus of the Forum

The High-level Forum explored some of the possible answers and solutions to these issues and set the scene for a policy agenda towards making the “new industrial revolution” sustainable. The debate opened new perspectives on key issues and questions, for example:

- (a) What should be the dimensions of the revolution to address the wide range of complex economic, environmental, social, justice and security challenges?
- (b) How can it be made sustainable, promoting the continued development and creation of prosperity, particularly in developing countries, while minimizing environmental risks? How can the participation of vulnerable groups be ensured?

(c) What are the potential difficulties linked to the new concepts, technologies and approaches, emerging from this revolution? How can the transformation of core economic systems, including energy systems, be advanced without causing major economic or social disruption?

(d) Can the revolution be financed given the current financial crisis? What new modes of international finance can fulfill such a purpose?

(e) What are the governance principles and modes of international collaboration? How would international cooperation, networking and partnerships need to change in order to cope with the complexity of the current situation and the required risk mitigation responses? How can the private sector be involved effectively?

(f) Are there specific regional challenges in the realization of the “new industrial revolution”? How should these challenges be addressed or approached? Are there regional solutions or best practices that can serve as role models?

3. STATEMENTS BY FORUM PARTICIPANTS

Sustainable development in Costa Rica – reorientation of public policies

María de los Ángeles Antillón Guerrero

Minister for Economy, Industry and Trade of Costa Rica

Visionary decisions make a difference. Costa Rica has a long tradition of taking such decisions and implementing them:

- The country has a tradition of democratic elections dating to 1889;
- Social security was introduced in 1942;
- The army was abolished in 1949;
- The country initiated an industry-led development strategy in 1960;
- Since the 1980s, it has pursued a development policy based on economic liberalization and globalization;
- Protected natural areas now cover one-fourth of the country;
- In recognition for efforts to promote peace in the region, president Arias received the Nobel Peace Prize in 1987.

Costa Rica's strengths

Economy

Costa Rica has successfully made the transition from primary sector to high value-added exports. While exports largely consisted of just two agricultural products – coffee and bananas – until the 1980s, non-traditional goods now constitute almost 90 per cent of the exports. Electrical and electronic goods and medical and precision equipment together, for example, account for almost 40 per cent. Costa Rica has signed a number of bilateral, regional and international free trade agreements, and exports have increased by 200 per cent since 1993. Per capita GDP has trebled over the past two decades.

Environment

Costa Rica generates 94 per cent of its energy from renewable resources. It is the first tropical country to reverse deforestation, with the help of funds accumulated through a Payment for Environmental Services scheme. The large areas of unspoiled nature have made green tourism a major contributor to GDP. Foreign exchange earnings from such tourism have increased by almost 70 per cent in the past decade.

Society

Costa Rica is among the countries with high human development in the UN's Human Development Index. The World Economic Forum's Competitiveness Index shows that Costa Rica is the leading country in Latin America with regard to the quality of education. Spending on education is to rise from 6 per cent of GDP to 8 per cent by 2015. Life expectancy is comparable with that in highly developed countries.



María de los Ángeles Antillón Guerrero at the Forum

Pillars of future development

The future development of the country will be based on three pillars:

Renewable energy

The country intends to rely completely on renewable energy by 2021. While all sources of renewable energy will be exploited, the focus will be on large hydropower projects.

Telecommunications

The strategic importance of telecommunications in the digital age is well understood. In 2011 alone, investments will amount to US\$ 570 million. Employment in the sector has increased by almost 85 per cent between 2006 and 2009. With a National Fund for Telecommunications, the digital gap will be closed.

Innovation

In addition to investing in technical education and in higher education (the number of graduates is to double in the coming five years), the country has established innovation funds for dynamic entrepreneurship and a strategy is being developed to attract more R&D.

Inclusiveness

Underlying the development strategy for the future is the key concept of *inclusiveness*. This has several aspects:

- Stimulating small and medium scale enterprises (SMEs), which constitute the vast majority of businesses, with a special focus on environmentally friendly production;
- Increasing productivity and competitiveness in the business sector in general;
- Targeting both domestic and international markets;
- Mobilizing the potential of all the country's regions;
- Using equity, sustainability and regional balance as success criteria.

At the level of the individual regions, concrete actions taken against this background will include:

- Establishing an improved infrastructure for SME support, with business incubators in all regions. The Brunca region will be the location for a pilot project. The governance system will be based on the involvement of all key actors: local government and other public sector bodies, the private sector, academia and civil society.
- Stimulation of the aerospace industry, health tourism and alternative energy as spearhead sectors. These are already well established: the first two, for example, jointly generate some US\$ 450 million in revenue.

For a small country like Costa Rica, strategic international alliances are essential in achieving its sustainable development objectives. The country therefore cooperates with many countries on a bilateral basis as well as with regional and international organizations.

Note: This is an informal summary of a PowerPoint presentation prepared by the Minister.

The new industrial Revolution

Rahamatoulaye Bah

Minister of Industry and Small and Medium Enterprises of Guinea

The Industrial Revolution, the historical process that characterized the transition from an agrarian and crafts-based society to one based on trade and industry has profoundly altered our world. Major changes have taken place in agriculture and spread gradually over the last 150 years to all sectors – including energy, transport, textile, metallurgy, electricity, steel and chemicals – resulting in radical a transformation of our societies, commerce, economy, politics, and the environment.

The changes and transformations over the past decades in all sectors of industrial activity are extremely deep, varied and complex, as are the solutions to the many challenges they pose to

humanity. A new industrial revolution will again fundamentally affect the way we produce, trade, in short, to live.

The global financial crisis continues with the spectra of an overall recession and a deepening social crisis in many countries. This is mainly due to bad governance, the exclusion of the majority from the decision-making processes in social and economic policy, the rapid rise in unemployment in many countries, the restrictions on migration that block the hope of many unemployed and disoriented youth for a better future in other places, the gradual reduction of foreign direct investments and official development assistance flows, currency depreciation and the volatility of exchange rates, and the progressing depletion of non-renewable resources due to increased demographic pressure. These challenges as well as climate change, which is caused by our production systems, call for the establishment of new national and international instruments, to restore peace in the world and restore confidence in the future.



Rahamatoulaye Bah, Minister of Industry and Small and Medium Enterprises of Guinea, at the Forum

Among the many questions that arise, the fundamental question is how to promote sustainable development to ensure peace and prosperity in the world:

- In my opinion, our first priority should be to improve international dialogue by strengthening the capacity of international organizations in their ability to analyze and monitor decisions, which must be taken in a participatory manner;
- It should also strengthen the competitiveness of African industries by increasing and improving their value added.

For least developed countries, particularly in Africa, resources (such as for example minerals or primary minerals that make up the main base of our resources) are exported to developed countries where value is added through manufacturing. Such manufactured goods are re-exported to Africa, indeed inflicting a double loss. We need therefore:

- Establish a policy of diversification of production, operation, management and exploitation of natural resources;
- Promote the necessary infrastructure and energy for institutional development;
- Focus on developing and sustaining human capital, innovation, science and technology;
- Develop and comply with norms;
- Establish an appropriate legal, institutional and regulatory framework;
- Mobilize resources for industrial development in the context of win-win partnerships; and
- Improve production and trade capacities of Africa.

Towards a new global Development Paradigm

Irene Giner-Reichl

Director General for Development Cooperation, Austrian Federal Ministry for European and International Affairs

The aspirations of the world's growing population for prosperity and justice will only be met if we manage to first envisage – and then implement speedily – a new development paradigm for the globe. By and large, this new development paradigm will need to be the same for the so-called "developed countries", the so-called "countries in transition", the so-called "emerging economies" and the so-called "developing countries". Even now, these categories do not capture properly the diversity of country realities.

In this context, I strongly advocate re-discovering the concept of "sustainable development" which, as we move towards the celebration of the 20th anniversary of the Rio Conference on Environment and Development, is re-incarnated (to a degree) in the concept of the green economy. I like the emphasis that "sustainable development" puts on the social dimension. Sometimes this social dimension is short-changed in green economy discussions. And yet: if we look at the unrest and protest that flare up in London and Madrid, in Israel and the US, and in so many parts of the "developing world", it is often fuelled by severe social discontent and the lack of perspectives, including for the youth, in very unequal societies. The social pillar of sustainable development may already be experiencing more pressure than the ecological, even though I do not want to downplay the serious damage that our current mode of consumption and production does to the environment.

If we want to pursue in earnest a single development paradigm for the globe, issues of distributive justice will have to move to forefront. Despite our technological prowess, resource scarcity is a reality. There are limits to the sustainable consumption of strategic commodities such as energy, land, water, food, and space for emissions. How we allocate these strategic commodities around the globe will be a key question. The current allocation is, as we all know, highly inequitable. As the poor, who are currently shortchanged on all accounts, emerge from severe poverty in significant numbers and start to adopt consumption patterns that mimic ours, the pressures on

food and energy supplies grow. We now witness once again a significant rise in food prices, way beyond the levels of the crisis year of 2008.

As an international community, we have not progressed significantly along the path of distributive justice. It is not by co-incidence that international cooperation for socio-economic development – also known as development cooperation – is voluntary and still far away from reaching the 0.7 per cent of GDP target set some 50 years ago. Why do we all agree to pay for peacekeeping on an assessed basis, but not for socio-economic development – without which there cannot be lasting peace?

We have barely begun to develop appropriate legally binding funding tools, except in very specialized areas, such as the Montreal Protocol for the protection of the ozone layer. The emergence of a truly supra-national system of transfers and burden-sharing under the Convention on Climate Change is perhaps the most promising trail for now. But we all know how painstakingly slow negotiations on such systems move, how complicated the envisaged mechanisms are and how politically sensitive.



Irene Giner-Reichl speaking at the Forum

The "new industrial revolution" will be a centre-piece of any new development paradigm. It will go hand-in-glove with a new understanding of how to allocate work. Unemployment – especially the plight of the young who are unable, despite decent education and professional training, to find employment – is perhaps one of the greatest challenges of our time. And while we allow capital to move freely, so freely that it can easily become a destabilizing factor, across continents more and

more obstacles are put in the way of economic migrants, people in search of a better economic perspective for themselves and their families.

At the heart of the "new industrial paradigm" will be a better, a more sustainable use of energy. United Nations Secretary-General Ban Ki Moon has launched a global initiative to this effect on 20 September 2011 in New York, and a High Level Group on Sustainable Energy for All under the Chairmanship of UNIDO's Director-General Kandeh Yumkella met in Vienna from 18 to 20 November 2011 for strategy discussions on this initiative.

The Secretary-General proposes three overarching goals, all to be reached by 2030: universal access to energy, a doubling in the improvement of energy efficiency and a doubling of the share of renewables in energy end-use. The first goal is for the poorer of the developing countries; it is mainly in Sub-Saharan Africa and in South East Asia that access to energy is lacking. The second and the third goals are for all countries. "Sustainable Energy for All" is an initiative that works towards one unified development paradigm across the globe while respecting national priorities and specificities. It is also a bold move to reclaim macro-economic space for the UN.

When we speak about "Sustainable Energy for All", the political and social benefits of more sustainable energy systems should not be forgotten. There is an intimate link between the establishment of energy systems and the degree to which the structure of government is centralized – in a decentralized structure, the decisions can be taken closer to where their impact is felt. Energy has to do with *freedom*, Arnold Schwarzenegger reminded us during the Vienna Energy Forum in June 2011. It has to do with *rights*, as the former President of Ireland and High Commissioner for Human Rights, Mary Robinson advocates convincingly. And it has to do with *empowerment*, empowerment of all who are currently disenfranchised; empowerment of women in particular. Where access to modern energy services is lacking, women spend long hours collecting fuel and hauling water, hours that could otherwise be put to productive, educational or recreational use.

Equality between women and men and the inclusion of the marginalized in societal decision-making and productive efforts should be hallmarks of the new industrial revolution. Equality and inclusion will help pave the way for a more responsible use of natural resources and of the ecological space on earth.

The new industrial revolution aspires to be truly green, and in order to be green lastingly, it will need to be social. "Sustainable energy for all" will contribute to realize both aspirations.

The new industrial revolution: Making it sustainable – the Viyellatex Group

K. M. Rezaul Hasanat

Chairman and Chief Executive Officer of the Viyellatex Group

A lone effort by one organization or country cannot overcome the barriers needed to create a "new industrial revolution". Collective effort is needed from both developed and developing nations. The mindset needs to transform from "self" to "self and others". The private sector must join regional and international co-operation agencies to face challenges such as the Millennium

Development Goals. Bangladesh and South Asian countries commonly face these issues. Viyellatex understands that running a business in a developing country requires addressing challenges such as the following:

- Pollution
- Overpopulation
- Inequality
- Education
- Social stigmas
- Access to credit

Our approach

In order to be a sustainable business, the company has had to grow and evolve from the conventional profit-driven mentality to a value-driven one. The Viyellatex Group has invested heavily to establish its business in an environmentally and socially responsible manner. We want to optimize resource use to benefit our stakeholders. Initiatives taken by us include the following:

- Commitment to the United Nations Global Compact (UNGC) goals: we will be 25 per cent more energy efficient by 2015;
- Commitment to be carbon neutral by 2016 by planting seven million trees, to offset the carbon emitted by our manufacturing process;
- Establishment of seven schools for underprivileged children;
- Employment opportunities for physically challenged;
- Harvesting rain water;
- Recycling used water through an effluent treatment plant (ETP) in the sanitation system for 8,000 workers;
- Making organic fertilizer through decomposition of food leftovers;
- Employment of ethnic groups at a tea plantation in Sylhet;
- Establishment of an early childhood development programme in collaboration with Save the Children and USAID;
- Medical services, including eye care, immunization and clinical services;
- Commitment to provide free ultrasonograms and medicines to 3,500 pregnant women by 2015, and to start a school for physically challenged and underprivileged children by July 2012.

Flexible industrial policy that facilitates sustainable public-private partnerships

In order to reap future benefits from present investment there should ideally be a far-sighted and flexible industrial policy in place. The responsibility of policy makers is to address the wide range of economic, environmental, social justice and security challenges faced by the countries where businesses operate. Given the wide array of issues that surround policy implementation in the real world, the business community and the government should join forces, so as to attain the most practical harmonized system as possible. For one thing this would mean more sustainable themed activities by businesses.

Encouraging investment

Through government efforts

Responsible business practices have to be complemented by vigorous attempts by governments to create an investment friendly atmosphere which would attract not only foreign direct investment but also diversified local investment. In addition, governments can provide indirect subsidies through a wide range of schemes, for instance more comprehensive safety nets, which would result in a more motivated and hence more productive workforce for the private sector.

Through stakeholder inclusion

A new industrial revolution should entail a sense of belonging from all stakeholders. That is the route that any country has to take if it wants to achieve inclusive growth and sustainable development through industrialization.

Viyellatex believes that through corporate sustainability it can involve all stakeholders in its vision to be the most highly regarded company in Bangladesh by 2015.

Setting the trend

Driven by values, not profits

Viyellatex has been quick to move past the “Profit Oriented Theology”. Now we are environment and people oriented. We can assure the rest of the world that Viyellatex is on the right track in keeping in mind “the new industrial revolution”, and is already a trend setter in Bangladesh. We hope to move on with our commitments, vision and sustainable activities and become one of the finest performers in the new industrial revolution.

Issues to be resolved

Some of the biggest issues emerging from the “new industrial revolution” are the initial investment and the implementation of awareness programmes amongst the mass of the population.

Investment

With the advent of energy-efficient technology, some enterprises are already investing to curb resource usage. However, the adaptation of resource-saving technology needs to be shared amongst all the players in the industry. Collective efforts will benefit any manufacturing industry and help it to stay competitive. But collective efforts are not always possible as the investment required is initially relatively higher. For this reason partnerships, whether they are between the public and the private sector, or between private sector enterprises, are necessary to encourage

the adaptation of resource-saving initiatives.

Awareness

Another important issue, the implementation of awareness programmes, needs to be carefully monitored to ensure that the general population is knowledgeable about the initiatives and how they will benefit their country in the long run. This will also multiply the effect of initiatives as people will also contribute towards the purpose once they are encouraged to do so.

While the advancement of new systems will affect the economy in the short term, it is believed that there will only be minor disruptions while adaptation takes place. The long-term effects will be favourable, as the world will be a much safer place to live in.



K.M. Rezaul Hasanat speaking at the Forum

Stimuli for the revolution

Due to the global financial crisis and the worst recession since the Second World War even developed countries governments are facing a credit crunch. Most countries around the world have announced packages aimed at stimulating their economies. All the packages should clearly direct a significant portion of the stimuli towards the green technologies. Governments also need to focus on measures that are capable of triggering larger portions of private investment. Loan guarantees, green technology bonds and tax benefits for private investments which support the new industrial revolution are likely to be the most effective measures to sustain the revolution. Governments should come up with a clear long-term policy which will send the right signals to investors, offer predictable incentive schemes, address all administrative and financial hurdles and develop stronger partnerships with the private sector.

International collaboration

International collaboration is inevitable for the revolution to be successful. Partnerships and relocation of factories from the developed countries to the developing countries are some initiatives that can be used as models for others to follow. For competitive labour costs and low taxes, expansion should focus on developing countries.

Addressing the crisis

Cooperation

The potential of global environmental hazard and immigration problems is high when the developing countries start suffering from recession, unemployment and even a justice and security crisis. International partnerships, networking and cooperation can take the form of financial aid, support, loans and/or even tax benefits for companies in the developing countries when they decide to take measures for sustainable industrial development. People from the least developed and developing countries will find employment at home when factories are relocated there, which will help to mitigate the immigration problem of the developed countries.

Engaging the private sector

The private sector can contribute to this new industrial development in various ways. From the business point of view, if the private sector is given proper incentives, such as tax benefits for exporters, if they take specific sustainable measures, it will be highly encouraged to get involved. They can also be motivated by international exposure for their efforts by the media: they will then be more enthusiastic about taking such measures every time they expand their business or factories.

Role of developed countries

It is easy for rich nations to ask developing countries to take expensive measures for sustainability. They should come forward with a win-win paradigm making it feasible for all the countries in the world to take such measures and thus make the world greener and cleaner.

Regional cooperation

The private sector in neighbouring countries should increase co-operation in fields such as the sharing of common resources. For example, increased trade capacity can be mutually beneficial for both Bangladesh and India on multiple grounds, as the ties between the two countries are not just in commodity trading but also in natural resource sharing. International laws have to ensure fair and equitable common resource sharing. Trans-boundary trade by regional partners can be an incentive for countries to work together as a region. Better connectivity amongst nations will make the transition smoother.

Ensuring sustainability initiatives by law

This is essential, though it should be pointed out that the private sector is already moving towards socially and environmentally friendly solutions even without the enforcement of laws. Viyellatex carries out development work, without any legal requirement from the government, to act as a role model across all industries in Bangladesh. With these and other efforts, Viyellatex is unwavering in its intention of being a pioneering force in shaping the new industrial revolution in South Asia.

On the road again – with a new roadmap

Janez Potocnik

European Commissioner for Environment, European Commission

During the 20th century, the world population grew by four times, and its economic output by 40 times. We increased our fossil fuel use by 16 times, our fishing catches by 35 times, and our water use by nine times. It was called the “great acceleration” – which fits nicely with this statement’s motoring metaphor title.

One hundred years ago, when the world population was 1.5 billion, this growth path was fine. It gave us health, well-being, and wealth. But with a population of seven billion, it is not fine. Every day, 140,000 more people are sharing a planet which will stay the same size. As we don’t have another planet, we have no choice but to use the resources on this one more efficiently.

Resource efficiency is not a choice, it is inevitable. Our choice is whether to do it now, or wait until we are forced to do it, when critical resources are exhausted and expensive. To go back to the motoring metaphor, if we want to continue to accelerate, we need to change roads or we are going to start driving straight into some walls.

So, what should the new roadmap look like? Let’s look at what made us so competitive so far, and see how that is changing.

Europe is poor in mineral resources. We get 48 per cent of our copper ore from abroad, 64 per cent of our zinc and bauxite, and 78 per cent of our nickel.

We import all of our cobalt, platinum, titanium, and vanadium. As a highly import-dependent continent, you would expect that we would manage our resources efficiently. The reason we don’t is because their prices have actually been decreasing in real terms for the last 150 years, excepting occasional wars and oil crises.

At the same time, labour costs continued to rise. To remain competitive, we had to use all our ingenuity to match these increased costs with massive increases in labour productivity – increasing it about 20 times in the same 150 years. This mutually reinforcing increase in costs and productivity fuelled the engine of our technological progress.

The mega-trend today is the end of perpetually cheaper resources. With material costs making up more than 40 per cent of total costs in manufacturing industries, compared to less than 20 per cent for labour, it is clear that we need to apply the same ingenuity and innovation to improving our resource productivity now, as we did to improving our labour productivity in the past.

In a resource-constrained world, our resource poverty means that the old cycle of extract-use-throw away, extract-use-throw away, will only lead to further dependency on external sources and vulnerability to price hikes. This is the message that leaps out at me from reading the background papers. It is the message that leaps out from the industrial policy of Japan and Korea. It is the message that leaps out from the latest Chinese five-year plan.



European Commissioner for Environment, Janez Potocnik, speaking at the Forum

Our challenge is that, after a few centuries of resource-intensive growth, we in Europe are “locked-in” to resource-inefficient infrastructures, resource-inefficient economic and financial systems, resource-inefficient business models, and resource-inefficient behaviour. These are the legacy of our growth over previous centuries. Today’s fast developing countries are less limited by such structural legacies and will be more able to quickly adapt their growth paths in response to resource constraints. If we in Europe are to remain competitive in this new paradigm, we will have to achieve a major structural transformation.

There will be no growth if it is not green growth. That is why environmentalists and industry must move away from their old polemics and work in partnership. Environment policy cannot just be about punishing polluters. We must build it into the very way we produce and consume.

If we are able to do this, we will start to see environment policy not as a constraint on competitiveness, but rather as essential to ensuring our future competitiveness. Or to look at it another way, we are not protecting the environment from business, so much as using business to protect the environment.

I remain optimistic, because one resource that we have in plentiful supply in Europe is resourcefulness itself. The power of our ideas and creativity gives us a comparative advantage for future growth. There is a huge margin for increasing the efficiency of our resource use through innovation:

- Turning coal into light is still only 3 per cent efficient;
- Only 15 per cent of the energy you put in your petrol tank is used to actually move your car down the road;
- 80 per cent of what we produce is used once and then discarded;
- 80 per cent of the world’s resources are used by 20 per cent of its population; and

- Only 1 per cent of the valuable rare earth metals that we use in products are recycled at the end of the product's life.

But innovation is not enough. As an economist, I learned that the first rule of competitiveness is the rational allocation of resources, and in our markets we use prices to do that. But how can we be expected to be rational and efficient, if the prices bear little relation to the value of those resources? Most raw materials are traded and managed pretty well, but we will never manage other valuable resources such as water or forests properly as long as there is no incentive to do so. We have to use market-based instruments to provide those incentives.

Here we reach the more difficult aspect of the relationship between resource efficiency and competitiveness. I will not hide the fact that the relative prices of some resources will need to increase. Nor will I hide the fact that our levels of consumption will need to be reduced. These messages are not easy for industry to swallow, so let me tackle them head on.

First, it may seem counter-intuitive to suggest that increasing prices of some inputs can make us more competitive, but that is because we take a short-term perspective. Not only will getting prices right mean we manage resources better, it will mean we manage them sustainably and avoid hitting those walls I mentioned earlier. We should not kid ourselves that we can go on relying on cheap resources; we need to provide the right pricing signals in a predictable way that gives industry the time to invest in ensuring that resource productivity keeps pace with resource costs.

Second, when we talk about reduced consumption, what we are actually saying is less “stuff”, but that does not mean less profit. We need to develop smarter products that do the same with fewer resources. And we need to sell the associated services. We need new business models that encourage greater value added, and more life-cycle thinking, such as chemical leasing. And we need to develop the financing tools and the skills to ensure that there are no bottlenecks to developing these approaches.

I want the *European Commission's Roadmap for a Resource-efficient Europe* to be seen as a partnership of old adversaries. Environmentalists and industrialists must get together to recognize that the environment and the economy must coexist and depend on each other. And environment and industry ministers must help make that happen.

Antonio Tajani, European Commission Vice President for Industry and Entrepreneurship, and I are already on the same wavelength, but achieving our ambition of decoupling Europe's growth from resource depletion requires more than we have in the European Commission's policy toolkits. We need national government action, and we need the private sector on board. Europe's industry ministers will be a central part of achieving resource efficient growth and I have already presented the Roadmap to them.

This is not just a European story. I am also convinced that on the global level industry and environment must work together. As we prepare for the UN Rio+20 Conference on Sustainable Development in June 2012, we are all developing our approaches to its debate, stimulated by UNEP, on the green economy. The transition to a green economy is contingent upon the good management of crucial resources, such as water, energy, forests, agriculture, oceans. So resource efficiency is not only the right approach for Europe, it is also fundamental for developing and emerging economies whose management of water, energy and biodiversity are so important for their growth and for poverty eradication.

So, I am highly encouraged that UNIDO is working towards the objective of decoupling economic growth from resource use and pollution through its Green Industry initiative.

The future of energy

Jeremy Rifkin

President of the Foundation on Economic Trends

This year has seen ever-higher prices at the pump, rebels seizing Libyan oilfields and a nuclear facility crippled in Japan. Yet few have realized that these disparate events are part of a larger unfolding drama. Our global energy economy, long powered by fossil and nuclear fuels, is spiraling into a dangerous and unstable endgame.



Zeinab Badawi and Jeremy Rifkin at the Forum

In the first decade of this century, the emerging nations, led by China and India, brought one-third of the human race into the declining oil era. Global output rose and because every activity in our economy requires carbon-based energies, huge demand pressure was placed on diminished fossil fuel reserves.

When the price of oil passed the \$125 per barrel mark in early 2008, the folly of constructing a civilization on exhumed carbon deposits became clearer. Looking back, we can see that we hit peak globalization, the outer limits of an economic system dependent on fossil fuels. By July 2008 oil had risen to \$147, precipitating a slowdown in the global economy. This was the economic earthquake that signalled the passing of the oil era; the financial collapse sixty days later was merely the aftershock.

This is now happening again, sped forward by Libya and Fukushima. 2010 saw a tepid recovery, mostly to replenish exhausted inventories. But as growth resumed, oil rose too – it now hovers at about \$110 – forcing up prices. Indeed, this is precisely what one would expect from an oil era entering a long, slow death throe: each time output throttles up, oil prices rebound, purchasing power drops and the economy stalls.

Of course, the oil spigot is not going to run dry tomorrow. There are still coal, tar sands, heavy oil and shale gas. But these are dirtier, more expensive and exacerbate climate change. Nor can we replace our energy infrastructure overnight. The challenge is keeping the old regime on life support long enough to lay the foundations for a new energy infrastructure, in part through energy efficiency measures taken by businesses and households trying to cut costs in response to increased prices.

What we need in the long run, however, is the equivalent of a new economic paradigm – that is, a systemic change in the way we organize economic life – to move beyond carbon and nuclear energy. And here I believe we are on the cusp of a third industrial revolution, in which Internet technologies and renewable energies merge to create a powerful, new energy infrastructure.

In the coming era we will need to create an “energy internet” to enable hundreds of millions of people to produce green renewable energy in their homes, offices and factories. They can then store this energy as hydrogen and use green electricity to power their buildings, machinery and vehicles. Surplus electricity can then be shared with others, just as we now share information online.

Buildings are already being converted into micro-power plants with the installation of solar panels, vertical wind turbines, geothermal heat pumps, biomass converters, small hydropower plants and the like. Sensors will be applied to every appliance, and software will keep owners apprised of changes in the price of electricity moment-to-moment, so that they can adjust their electricity use and sell electricity back to the grid if the price is right, making everyone an energy entrepreneur.

We can already see some of the other innovations that will be needed to move down this path. Governments around the world have recently instituted feed-in tariffs that pay businesses and homeowners a premium price for the renewable electricity they produce and send back to the grid. Green mortgages with low interest rates that allow businesses and homeowners to “pay as you save” on energy are also becoming popular.

The new system that needs to emerge also holds the promise of fundamentally restructuring our economy. Fossil fuel energy systems favoured vertical economies of scale and giant, centralized enterprises. In contrast, the era of renewable energies will empower a multitude of small and medium sized enterprises, as well as larger companies, to share their energy with each other in networks that function more like ecosystems than markets. Just as millions share music with each other online and overpower major music companies, so millions of energy producers sharing electricity can overwhelm today’s conventional power generated by centralized power and utility companies.

As the oil era draws to a close, this vision offers the hope of a sustainable post-carbon era by mid-century and the possibility that we can avert catastrophic climate change. The question is whether we will see the economic possibilities ahead, and muster the will to get there in time.

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The new industrial revolution: Making it sustainable

Dov Zerah

Chief Executive Officer of the French Development Agency

Inclusive and sustainable industrial development strategies are critical to ensure long-term development. This is particularly true for Africa because of the scope of the challenges the continent faces, particularly its high population growth: there will be close to two billion inhabitants in Africa in 2050. Providing decent jobs and food for all will be challenging.

The French Development Agency (AFD) and Proparco, its development finance institution, support private sector development in Africa through the Cape Town Initiative launched by President Sarkozy in 2008. Between 2008 and 2012, € 2.5 billion will be dedicated to that purpose.

In parallel, it is of critical importance to develop energy and transport infrastructure, which impede the competitiveness of African enterprises. In vocational training is crucially important to match curricula with the private sector's needs.



Dov Zerah at UNIDO's Forum

This industrial (r)evolution must be green and inclusive. AFD's experience in the Congo basin forest proves that the development of an industry (i.e. agroforestry) is possible while preserving the environment. Africa's hydropower potential will enable the continent to fill its energy gap without increasing its carbon emissions.

The newly created growth should be fair and wealth should be redistributed in an equitable way, reaching the most vulnerable population groups.

The "new industrial revolution" will, in short, need to address a complex of issues. This can only be achieved through a comprehensive rethinking of the way in which business is conducted.

4. SUMMARY OF THE FORUM

Presentation of the main points of panelists' statements

To set the scene, the Forum opened with a brief recapitulation by Mr. Rifkin of the main points of the keynote speech he made during the First Plenary Meeting of the conference.

- The five pillars of the Third Industrial Revolution are:
 - Shifting to renewable energy;
 - Turning all buildings into micro power plants;
 - Storing the energy in the form of hydrogen;
 - Using Internet technology to create energy-sharing grids;
 - Replacing the internal combustion engine by electric and hydrogen fuel cells in the transport sector.
- The energy revolution will be based on collaborative structures.
- In the developed world, the EU is setting an example with its goals of 20 per cent renewable energy by 2020; the conversion will create millions of job.
- The young generation is the key to achieving sustainable development for all.
- The role of the existing (international) institutions is to provide young people with the right structures and models.

The other panelists then highlighted important points of their statements:

María de los Ángeles Antillón Guerrero

- The success of the Third Industrial Revolution will depend on:
 - The solidity of a country's earlier development achievements;
 - An equitable society: education which not only transfers environmental knowledge but also practical skills that can be used to build up 'green' industries; a strong small and medium enterprise sector; democracy;
 - A strong innovation system with a focus on renewable energy sources and other environmentally friendly technologies;
 - Policies for the above which are adapted to domestic needs and are integrated with each other;
 - The number of countries joining the Revolution;
 - Different values: the focus must be on sustainable development, not growth.
- Governance becomes more complex (involvement of all stakeholders, higher expectations of people).
- Costa Rica will set an example: 'everything is possible...if you have the right values'.

Rahamatoulaye Bah

- Environmentally sustainable development is essential for peace and prosperity.
- Solutions to present crisis must not only address climate change and resource depletion, but also the whole development context, from bad governance, a lack of grassroots participation and a fairer distribution of gains to unemployment and deficient educational and physical infrastructure.

- In least developed countries, in particular in Africa, the Revolution cannot succeed if these countries do not also move away from raw material exports and towards higher value added industries.
- Organizations like UNIDO are of key importance in intensifying South-South and North-South cooperation. New international governance instruments are needed to address the present challenges and ensure that development aid is based on a dialogue among equals.



Forum panel

Irene Giner-Reichl

- The crisis facing the human species requires the development of a biosphere consciousness. It has made distinctions such as developed/developing/transition countries obsolete – all countries face the challenge of sustainability.
- The world's strategic resources must be distributed in more equitable way.
- Sustainable development has a strong social dimension: employment opportunities for and the empowerment of all.
- Actors at all levels must cooperate to address the challenges:
- At the national level, more unified action by ministries – in Austria, for example, platforms have been created for integrated approaches to development, environmental sustainability and security issues.
- The international community needs to develop better mechanisms for sharing the burdens of climate change.
- Civil society and non-governmental organizations must be involved.

Janez Potocnik

- Not only climate change is accelerating, but also the depletion of raw materials and water resources and ecosystem destruction.

- Against this background it can be stated that 'there will be green growth or there will be no growth.' This means decoupling economic growth from resource (ab)use.
- While price mechanisms are important drivers of environmentally friendly innovations, prices do not always reflect resource scarcities; therefore government intervention ('green investment' climate, financial support) is needed
- The greatest efforts will have to be made by the developed countries, the greatest consumers of natural resources.
- Countries and industrialists who spearhead the Third Industrial Revolution will reap the benefits. Politicians who continue to ignore the urgency of the issue condemn their countries to be among the losers.

Dov Zerah

- Sub-Saharan Africa faces a great sustainable development challenge: by 2050, the population is expected to increase by 1 billion. Food security, urban growth and resource depletion will be the main issues. Its problems are exacerbated by unfavourable terms of trade.
- From an industrial point of view, the link between agriculture and agro-processing on the one hand and environmental sustainability on the other will be the main challenge – but it can also be seen as a major opportunity in terms of employment effects.
- The French development agency is committed to supporting Africa in meeting the challenges, for example in the areas of vocational training, renewable energy and environmentally friendly industrial operations.
- At a more general level, France implements projects to mitigate climate change with a range of developed and developing countries.

Rezaul Hasanat

- Environmental thinking in his firm started with the need to reduce costs, and his basic approach remains that environmental gains must also be economic gains.
- There are also intangible gains, such as good publicity for a 'green' company, which can boost tangible gains.
- Look for environmentally friendly solutions where circumstances force you: in a location where local power infrastructure was inadequate the firm built a new plant which saved 40 per cent on energy costs.
- 'Green' enterprise has become a matter of enlightened self-interest.
- Turning a firm from a profit-driven into a value-driven firm requires awareness building among shareholders and Boards of Directors.
- While entrepreneurs should not wait for external support, government policies and regional/international cooperation which stimulate 'green' growth are of key importance.

Questions, remarks & answers

On this basis, a dialogue between the panelists and the audience took place. Of the following questions and remarks, only the first question was addressed specifically by panelists; the panelists responded to remaining questions and remarks in the context of their closing statements.

Morsy Amin, Financial Business Counsellor, Iraq: *What was the role of the Government of Bangla Desh in supporting Mr. Hasanat's initiative? More generally: is a shift towards sustainable industrial development possible without such support, given the investment costs and the long pay-back periods of such investments?*

Rezaul Hasanat: Sustainable manufacturing can be profitable: his company is more profitable than those of his competitors. He receives no Government support; however, incentives can of course help to motivate business to 'go green'.

María de los Ángeles Antillón Guerrero: Incentives are important, but as tax-related incentives are less and less possible, other types of incentives should be developed to promote private sector activities that are both profitable and sustainable. The economic policy framework must also meet sustainability criteria – but sustainability is not just the responsibility of the Ministry of Economics. And governments must work hand in hand with the private sector.

Jeremy Rifkin: The Third Industrial Revolution requires public-private partnerships to create the energy infrastructure. These partnerships must be created at all levels, from the local to the continental. The market will not bring about the revolution on its own. The European Union is setting examples at the continental level through the right policies and incentives. The large utility companies, for example, must now allow anyone who generates a surplus of 'green' energy to feed this back into the energy supply system. Local energy nodes, involving the public sector, business and civil society are being created – not only in the European Union but also in the United States. To ensure that local initiatives do not remain isolated, and create a fully interconnected EU-wide infrastructure, the European Union has established the *Connecting Europe* investment facility.

Robert Sichinga, Minister of Commerce, Trade and Industry, Zambia: *The Third Industrial Revolution faces a major obstacle in the developing countries, and in particular in the African countries: they cannot compete with the developed countries, who still control most of the investment resources and show few signs of wanting to give up their privileged positions, as the slow progress in removing trade barriers through the Doha Round shows.*

Chief Executive Officer of an energy company: *We must be skeptical about a leading role of the private sector in bringing about the paradigm shift which is at the basis of the Third Industrial Revolution, and little can be expected in this respect from the COP 17 Climate Conference in Durban. So: who will lead the paradigm shift?*

Dinesh Bhattarai, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of Nepal, Geneva: *LDCs continue to face trade barriers and distortions. World trade can be said to have two sets of rules: one for developed, one for developing countries. These must be removed if sustainable development is to have any meaning.*

Jean Mader, Doyen Délégué permanent, Institut Supérieur de Gestion: Could a next meeting of UNIDO not invite young managers from all over the world, who are making important contributions to new development visions, to share their experiences with senior public and private sector decision makers?

Santiago Pasto Polo, Intern, Spanish Ministry of Industry, Tourism and Trade: It is doubtful whether the energy (and therefore the sustainable development) problems of this world can be solved by the transition to renewable energy sources. Neither will the present mass movements of young people make much difference: they are no more than 'ecstatic gestures', rebellions. Those who live in developed countries should be prepared to live with less.



Voices from the audience during questions & answers sessions

Jeremy Rifkin: Is the paradigm shift really so disruptive? Renewable energy technologies are developing very fast, and their costs are going down rapidly with mass production, as happened with the computer and the cell phone. Utility companies have lost their monopolies in many countries and have joined the efforts for decentralized, 'democratic' energy generation and supply. In the process the power companies are turning into energy services providers who only manage energy flows, and new business models are emerging based on 'shared savings' in the energy sector. Solar power is free everywhere, and energy will become as cheap as information. In short, from the energy perspective the basic conditions for the Revolution are already emerging.

María de los Ángeles Antillón Guerrero: Can trade be fair? In an open market there is competition among businesses, and the strongest win. But international agreements should ensure that serious imbalances in access to natural (and human) resources are prevented. Another important factor in ensuring more balanced, sustainable development is information: the consumer is now in position to choose products that reflect responsible business practices, and does so increasingly. The market will therefore force companies (as well as countries and the international community) to act in an environmentally and socially responsible way. It is not only profitable: it is the only way to sustain our presence on this planet.

Rahamatoulaye Bah: Africa must use its comparative advantages to bring about a transition from raw material exports to a modern economy led by a green industrial sector. But this will require large investments in, for example, education and in rural areas. Environmentally sustainable business practices must be mainstreamed progressively in existing economic activity. Development assistance will be needed to achieve all this. UNIDO is best placed to create a framework for green industrial growth in Africa.

Irene Giner-Reichl: We can no longer play off social, environmental and economic interests against each other or election gains against mid-term development goals. We must integrate efforts. The Third Industrial Revolution offers a blueprint for a sustainable future. But it should be

realized that technological solutions are not enough – we must also ensure social cohesion. Perhaps it should be made legally binding for the winners of the Revolution to compensate the losers.

Rezaul Hasanat: ‘Pressure from outside will kill the life in an egg, pressure from inside the egg creates new life’ (Bangladeshi saying). The Revolution must, in other words, come from within business: it must take the initiative and not wait for the right framework of policies and incentives. Regional and global cooperation are important.



UNIDO Director-General Kandeh Yumkella at the questions & answers session of the Forum

Janez Potocnik: A realistic perspective on the global power of the European Union is needed – many resources it needs, such as oil, are beyond its control. The subsidies of the European Commission to agriculture and forestry (which are criticized for creating an unfair advantage in markets) are in many ways justified: one-third of that budget, for example, is to promote nature management by farmers and foresters, and therefore is an investment in the environment. The European Union will keep to its climate targets, whatever the outcome of the Durban climate change conference will be. It sees the Rio + 20 conference as an opportunity for progress towards sustainability. The European Union wants to help create a more equitable, responsible and sustainable global society.

Dov Zerah: It is doubtful that the private sector in most countries in Sub-Saharan Africa is in a position to make the investments needed for the Third Industrial Revolution. There is, however, progress elsewhere, and that progress can spread. After the 2008 earthquake in the Chinese province of Szechuan, for example, one of the reconstruction projects of the French Development Agency was the building of 100,000 biodigesters for human waste. These not only improved

sanitation, but also supply natural gas and fertilizer. France now works with China to introduce these biodigesters in other countries. Global cooperation is essential, and there is progress towards world government – slowly but surely.

Kandeh Yumkella: The main challenges are integration and cooperation. In Africa, for example, decentralized power production can be linked to rural industrialization. Of course tariff and incentive structures need to be modified so that developing countries are no longer penalized in trade in manufactured goods. The New Twelfth Five-year plan of China, with innovative ideas about and funds for green growth, is a good example of what emerging nations can contribute to the realization of a sustainable future. The world must be open to these transformative ideas, and look for solutions anywhere in an open dialogue.

5. FORUM PARTICIPANTS

Moderator

Zeinab Badawi

BBC News

Ms. Zeinab Badawi is a Sudanese-British television and radio journalist. She was the first presenter of the ITV Morning News (now known as ITV News at 5:30), and co-presented Channel 4 News with Jon Snow (1989–1998), before joining BBC News. Ms. Badawi is currently the presenter of World News Today broadcast on both BBC Four and BBC World News.

After studying in Oxford University, Badawi was a researcher and broadcast journalist for Yorkshire TV from 1982 to 1986. In 1988 she joined Channel 4 News co-presenting Channel 4 News from 1989 until 1998 when she joined the BBC.

At the BBC Badawi worked as presenter and reporter for Westminster live political programmes for five years. She also worked on BBC radio as a regular presenter of The World Tonight on Radio 4 and BBC World Service's Newshour.

In 2005, Badawi became the new presenter of The World on BBC Four, the UK's first daily news bulletin devoted principally to international news. She is a regular presenter of the BBC interview programme HARDtalk.

In November 2009, Badawi was named International TV Personality of the Year in the Annual Media Awards, the international media excellence awards organized by the Association for International Broadcasting. Since 2010, in addition to her presenting role on BBC World News, Badawi has presented on the BBC News Channel and the BBC News at Five.

Badawi was awarded an Honorary Doctorate of Letters by the School of Oriental and African Studies (SOAS) in recognition of her achievements in journalism on 21 July 2011.

Panelists

María de los Ángeles Antillón Guerrero

Minister for Economy, Industry and Trade of Costa Rica

María de los Angeles Antillón Guerrero is a political scientist at the University of Costa Rica. Currently she is Minister of Economy, Trade and Industry for the term 2010-2014. She is also the president of the Governing Board of the Development Bank.

María de los Angeles Antillón Guerrero was Minister of Communication and Liaison under the administration of Mr. Arias Sánchez during January 2009 – May 2010. Before that she was deputy in the Legislative Assembly from 2006-2009 and head of the Fraction of the National Liberation Party in the period of 2006-2008.

She chaired the Commission on Foreign Affairs and Trade during the term of 2008 and the Special Committee that reviewed and created the Law on the Banking System for Development. As deputy, María de los Angeles Antillón Guerrero promoted the law on 'Banking System Development', the draft law on 'Improvement of Socioeconomic Conditions of the Workers', and the 'Constitutional Reform Project' which incorporated solidarity with labour organizations.

She was a member of the Committee on Economic Affairs in the period of 2006-2008. In the private sector, she served for over twelve years as Vice President of the Chamber of Industries of Costa Rica, where she strengthened the domestic production sector, *inter alia* through the law on 'Strengthening Small and Medium Enterprises', and the law on the 'National Quality System'.

She promoted the Programme and Business Excellence Award, the Cleaner Production Centre, the ACT program for workforce development in the private sector, and the Kedesh Programme Don Bosco. She has been Executive Director of the Costa Rican Union of Chambers and Director of Institutional Development of the Federation of Private Entities of Central America and Panama (FEDEPRICAP).

Rahamatoulaye Bah

Minister of Industry & Small and Medium Enterprises of Guinea

Rahamatoulaye Bah is a senior international official with 33 years of experience in the field of economic and social development. She worked for the U.S. Federal Government, where she managed funding and technical assistance programs for large development projects in Africa in key sectors of the economy such as agriculture, livestock, health, fishing and manufacturing industries and processing.

Mrs. Bah has very successfully managed strategic partnerships for economic and social development programmes with several African governments including Cape Verde, Senegal, Mali, Mauritania, Niger, Benin, Central Africa, Cameroon, Swaziland, Rwanda, Burkina Faso, Cote d'Ivoire and Mozambique. These programmes focused on promoting the private sector, especially SMEs/SMIs.

Ms. Bah holds degrees from the prestigious Georgetown University and the American University of the United States in Sociolinguistics, a Masters in Business Management and Public Administration and a Master's degree in Interdisciplinary Studies.

Irene Giner-Reichl

Director General for Development Cooperation, Austrian Federal Ministry for European and International Affairs

Irene Giner-Reichl has been a member of the Austrian Diplomatic Service since 1982. Over the last few years, she has mainly worked in the area of economic and social development, environment, energy, and development cooperation. She has held numerous international bureau functions. From 1995 to 1998 she was the director of the international department of the Austrian Ministry for the Environment. From 1998 to 2001 she was Austria's Permanent Representative to the UN in Vienna. From 2001 to 2004 she headed the UNIDO Office in New York in the rank of an Assistant Director General. Since 1 January 2005 she is in charge of Austria's development

cooperation as Director General in the Ministry for European and International Affairs. Irene Giner-Reichl founded the Global Forum on Sustainable Energy (GFSE) in 1999 and acted as Convenor for the GFSE's seven global meetings. She has published various articles on global issues in Austrian and international scholarly and mainstream publications.

K. M. Rezaul Hasanat

Chairman and Chief Executive Officer of the Viyellatex Group

Mr. Hasanat began his entrepreneurial activities in 1996 when he joined Youngones Fashion Ltd, a small garment factory, as chief executive officer. Later Mr. Hasanat acquired the majority stake and under his leadership the company has grown over the last decade to become one of the largest readymade garments manufacturers in Bangladesh. A workforce of 13,000 people is now producing for globally known brands and the Group exports to 45 countries worldwide. Due to his enthusiasm for technologies, the Viyellatex Group is equipped with state of the art, modern machines, and the Group is committed to a social and environmental charter. The Viyellatex Group built the first carbon-neutral factory in Bangladesh and has pledged to the UN to become carbon neutral by 2016.

Janez Potocnik

European Commissioner for Environment

Janez Potočnik is a Slovenian politician currently serving as European Commissioner for Environment. He was formerly Slovenia's Minister for European Affairs.

He served as Assistant Director (1984–1987) and Director (1993–2001) at the Institute of Macroeconomic Analysis and Development in Ljubljana. In 1993, he got his PhD in Economics at the University of Ljubljana. Between 1988 and 1993, he was Senior Researcher at the Institute for Economic Research in Ljubljana. He was Minister Councillor at the Slovenian Prime Minister's Cabinet 2001–2002 and Minister for European Affairs 2002–2004. He headed the negotiating team for the Accession of Slovenia to the EU between 1998 and 2004. From 2004 to 2010 he was European Commissioner for Science and Research.

Jeremy Rifkin

President of the Foundation on Economic Trends

Jeremy Rifkin is an American economist, writer, public speaker, political advisor and activist. He is the founder and president of the Foundation on Economic Trends. Rifkin's work explores the potential impact of scientific and technological changes on the economy, the workforce, society, and the environment. Rifkin is the principal architect of the Third Industrial Revolution long-term economic sustainability plan to address the triple challenge of the global economic crisis, energy security, and climate change.

Rifkin is the founder and chairperson of the Third Industrial Revolution Global CEO Business Roundtable, comprising more than 100 of the world's leading renewable energy companies, construction companies, architectural firms, real estate companies, IT companies, power and utility companies, and transport and logistics companies. Rifkin's global economic development

team is working with cities, regions, and national governments to develop master plans to transition their economies into post- carbon Third Industrial Revolution infrastructures. In 2009, Rifkin and his team developed Third Industrial Revolution master plans for the cities of San Antonio, Texas and Rome, Italy, to transition their economies into the first post carbon urban areas in the world.

Rifkin has advised both the European Commission and the European Parliament. He has also advised Prime Minister José Luis Rodríguez Zapatero of Spain during its presidency of the European Union. Furthermore, he served as an adviser to Chancellor Angela Merkel of Germany, Prime Minister Jose Socrates of Portugal, President Nicolas Sarkozy of France, and Prime Minister Janez Janša of Slovenia, during their respective European Council Presidencies, on issues related to the economy, climate change, and energy security. Rifkin is currently working with European officials to help shape a Third Industrial Revolution long-term economic development plan for the European Union.

Dov Zerah

Chief Executive Officer of the French Development Agency

Since June 2010, Dov Michel Zerah is the General Director of the French Development Agency (Agence Française de Développement, AFD).

He graduated from the Institute of Political Sciences of Paris and holds a Masters in Economy from the Panthéon-Sorbonne University. Mr. Dov Zerah is a former student from the École Nationale d'Administration.

Mr. Zerah began his career at the French Treasury where he spent thirteen years. He then became the permanent secretary of Michel Roussin, the Minister of Cooperation, in 1993. From July 1993 to November 1995, he was Deputy General Director of the Caisse Française de Développement (CFD), which would later become AFD. Mr. Zerah became Corinne Lepage's permanent secretary within the Ministry of the Environment, where he stayed from 1995 to 1997. He then headed the cabinet of Edith Cresson, the European Commissioner, from 1997 to 1999. From 1999 to 2002, he was the Chief Executive Officer of DAGRIS (Développement des agro-industries du Sud), the former French Company for the Development of Textile Fibers, as well as of the Compagnie Cotonnière (COPACO). Mr. Zerah then became the Director of the Département des Monnaies, Médailles et Antiques de la Bibliothèque Nationale de France, between 2002 and 2007, before holding the post of senior counsellor at the French Court of Financial Auditors until his nomination as the General Director of AFD.