CESI Energy Journal

Issue 04 - July 2014

China Has a Dream

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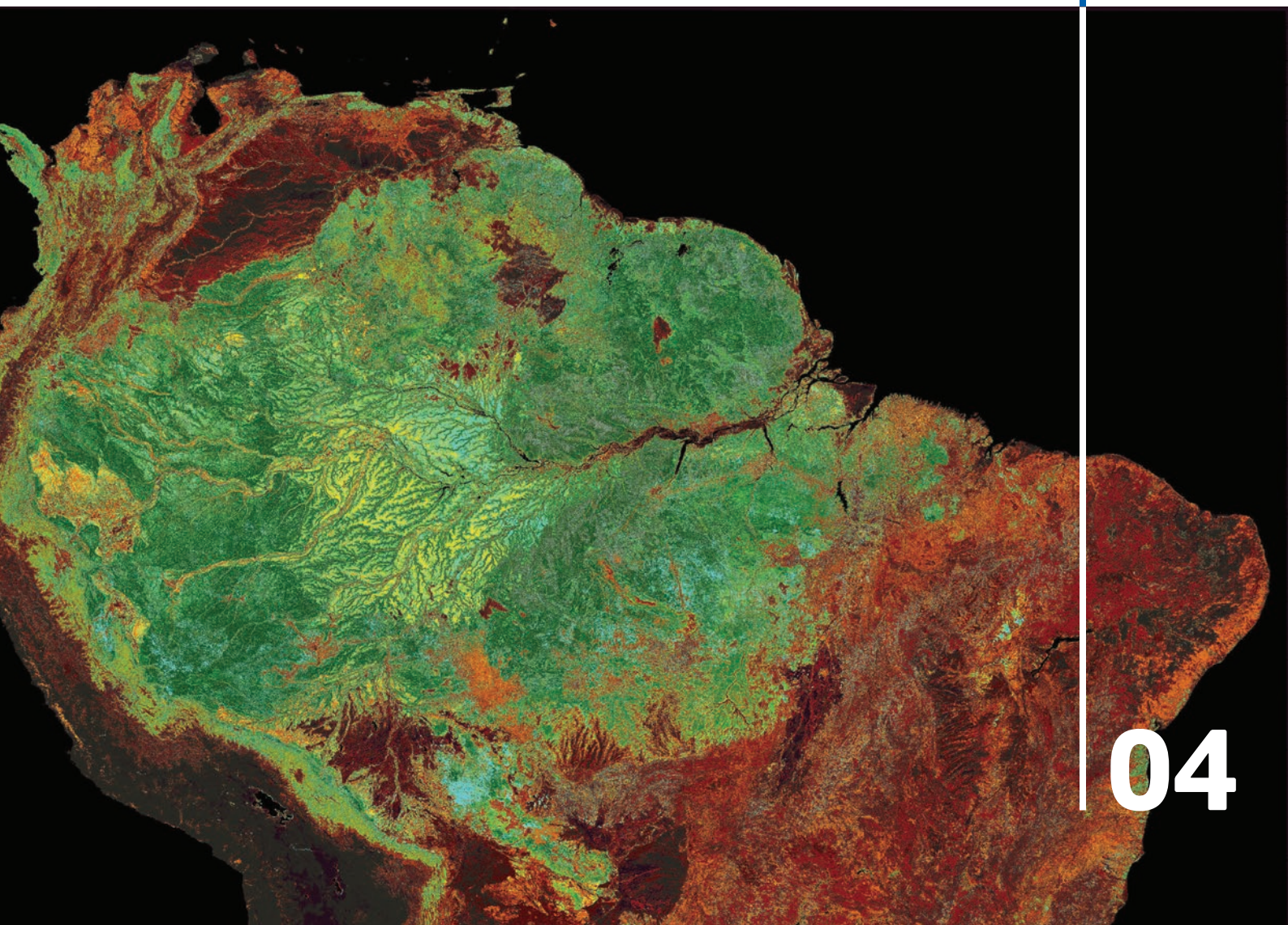

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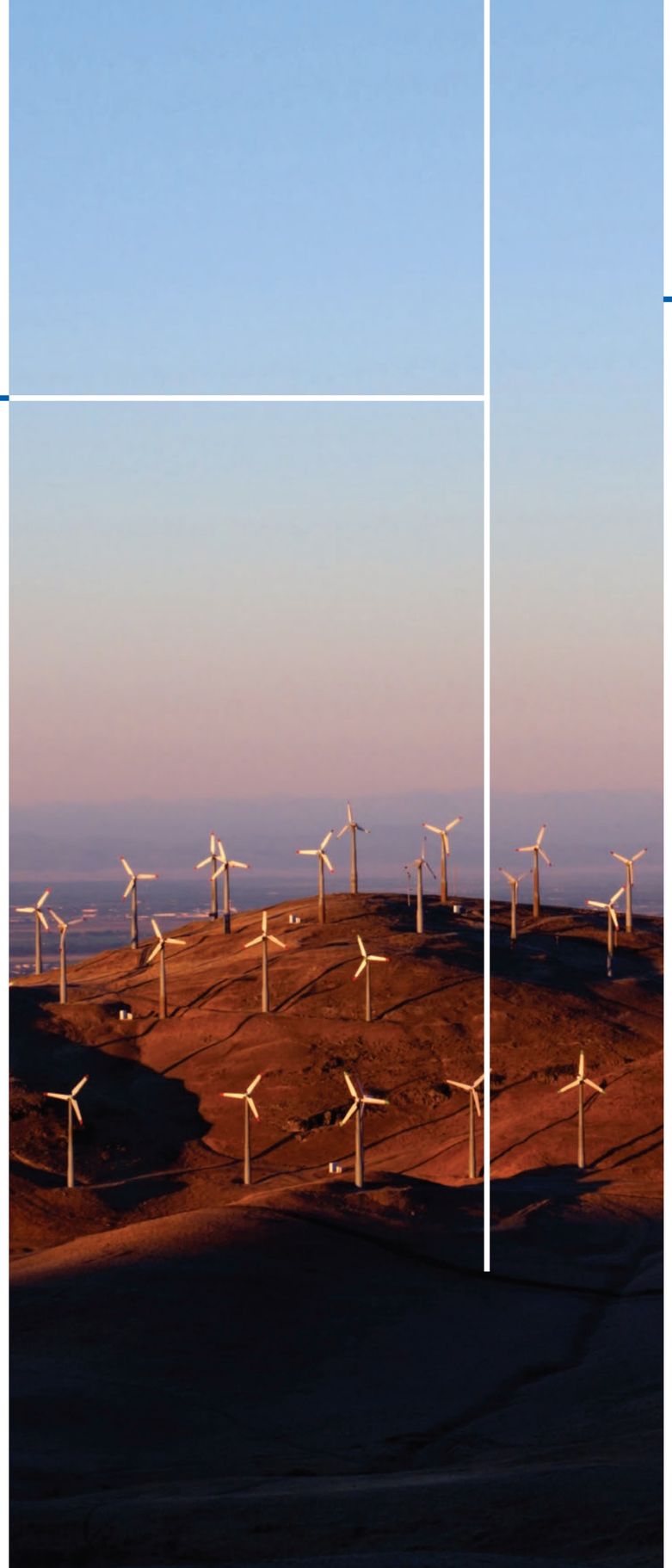

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Editorial

Salvatore Machì - Chairman, CESI
Matteo Codazzi - CEO, CESI

At the beginning of May, Ministers of Energy from the G7 gathered in Italy for the Rome Initiative. Although the talks were born of an urgent need to set down specific actions designed to deal with the delicate geopolitical landscape, they also served to address energy security in a broad manner, identifying this issue as a long-term objective on the road map for the future.
Their final statement, which we are republishing in this issue of EJ, underlines the key point: energy security is a collective responsibility. As long as they remain limited within national confines, even the most farsighted policies are destined to fail.
Security of supply can be guaranteed by a transparent, flexible and competitive marketplace; a marketplace that is diversified in sources, routes and suppliers, and within which each country can develop natural resources – renewable resources in particular – and is closely interconnected with the others through a thick layer of transmission networks.
The Ministers joint document they've produced pays particular attention to the need to implement innovative technologies for the renewable generation, transmission, distribution and storage of electricity.
In his interview also Christoph Frei talks about the G7 and describes a complex challenge we have to face.

SECURITY OF SUPPLY CAN BE GUARANTEED BY A TRANSPARENT, FLEXIBLE AND COMPETITIVE MARKETPLACE

Integration and interconnection between countries located in the same region were also the key concepts in a speech given by Li Keqiang during the Boao Forum. The Chinese premier confirmed his country's leadership role in Asia, but also emphasized the need to develop shared strategies, making traditional, renewable and potential resources a common factor for everyone, and thereby reducing risks as well.

For these same reasons, countries in the Middle East, operating through the Arab Fund for Economic and Social Development, are elaborating strategies aimed at creating a unique energy market that will allow them to best take advantage of the local natural riches such as natural gas, but also sun and wind. Renewables are in fact becoming key pillars in this policy, designed to deeply transform the energy scenario in the Middle East.

As always, technological innovation lies behind all of this: it is indeed technology that is allowing us to transform natural resources into increasingly clean, cheap and abundant energy, with profound effects onto the landscape of current international geopolitics. As we explain in this Energy Journal, it is precisely within this sphere that CESI intends to continue making its contribution, producing innovation and providing support for institutions and companies all over the world that are grappling with increasingly challenging technical projects, making it possible for them to achieve success.
Our adventure is still being written. We invite you to step in through the following pages to learn more.

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China Has a Dream

Li Keqiang, Premier of the State Council of the People's Republic of China

IN HIS OPENING SPEECH AT THE LATEST BOAO FORUM, CHINESE PREMIER LI KEQIANG IDENTIFIES NEW GROWTH DRIVERS FOR THE AREA AND UNDERLINES THE IMPORTANCE OF SHARED ACTIONS DESIGNED TO ACHIEVE PROGRESS FOR EVERYONE. "A SINGLE THREAD CANNOT BE SPUN INTO A CORD. AND A SINGLE TREE CANNOT CREATE A FOREST" SAID LI KEQIANG, BUT CHINA'S LEADERSHIP IN THE REGION IS NOT DISPUTED.

Our world today is undergoing profound changes. The international architecture faces new adjustment. Uncertainties and destabilizing factors affecting the global and regional environment are increasing. Hotspot issues emerge from time to time. The world is moving toward multi-polarity amidst twists and turns. The global economy is in profound adjustment. Developed economies have seen new changes, while emerging economies have encountered new challenges, and many countries are on different economic trajectories. The global recovery has been a slow and difficult process, and growth remains lackluster. To achieve strong, sustainable and balanced growth remains a daunting challenge we all face.

Asia, one of the most dynamic regions in the world, is at a crucial stage of development. It boasts one third of the global GDP, over 4 billion people and an ample labor force. It enjoys distinct advantages as a latecomer and has tremendous untapped development potential. That said, most Asian countries are developing nations, with low per capita GDP and uneven regional development. Over 700 million people in Asia still live below the international poverty line. Asia is faced with the huge challenge of growing the economy and improving people's livelihoods. And Asian countries have to address problems both old and new. Ultimately, the key to solving Asia's problems lies in development. It is development that will change the world and shape the future. Development therefore remains the top priority of Asian countries. To sustain its development momentum under the new conditions, Asia needs to find a dynamic source of development to re-energize itself. Here, I wish to share with you my views as follows:

We should stick to the overarching goal of shared development and build an Asian community of shared interests. In the age of economic globalization, no Asian countries can achieve development in isolation, still less can they pursue development as a "zero-sum game". (…)

ASIA IS FACED WITH THE HUGE CHALLENGE OF GROWING THE ECONOMY AND IMPROVING PEOPLE'S LIVELIHOODS

Faced with these new developments and new problems, we countries in Asia should continue to act in the spirit of solidarity in face of difficulties, turning our strong economic complementarity into mutual support for each other's development, expanding convergence of interests and achieving mutually beneficial coexistence and win-win development. (…)

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We Asian countries need to deepen result-oriented cooperation in all fields. (…) Infrastructure connectivity is a basic condition for integrated development. Countries in the region should join hands and speed up infrastructure construction including rail, road, air and water transportation. (…) China is ready to intensify consultations with relevant parties in and outside Asia on preparations for the Asian Infrastructure Investment Bank, and hopes that the bank can be officially launched at an early date. Industrial complementarity is a key aspect of integrated development.

FACED WITH THIS COMPLEX SITUATION, WE NEED TO CALMLY ASSESS CURRENT DEVELOPMENTS, STAY FOCUSED, AND TAKE INITIATIVES AS NECESSARY

We Asian countries should take advantage of our geographical proximity to deepen cooperation across the upstream, mid-stream and downstream industrial chains, and build an industrial network and economic system that draw on our respective comparative strengths. The destiny of the Asian economy hinges on reform, innovation and structural adjustment. Asian countries need to ride the global trend of new technology revolution, enhance exchanges, and draw on each other's experience to advance scientific and technological progress and personnel training – especially of young people – as well as boost the "new economy" of green development, energy, environmental protection and the Internet so as to seize an advantageous position in future development and raise industrial and economic competitiveness. This will not only increase the internal impetus for achieving sustained development in our region, but also create new opportunities for global economic recovery.

Asia's development is important to the future of the world, and China's development is closely bound up with Asia.

To keep China's economy running within a proper range is both a basic target of China's current macro-control and its medium to long-term policy goal. We have set this year's target of economic growth at about 7.5%. (…) Statistics show that urban employment continued to increase, individual income, corporate profits and fiscal revenue registered steady growth, consumer prices remained stable, electricity consumption started to rise and there were positive dynamics in structural adjustment. In short, the Chinese economy has gotten off to a good, stable start. On the other hand, the upturn of the Chinese economy is not yet on a solid footing, downward pressure still exists, and difficulties in some fields must not be underestimated. These problems show the impact exerted on China by the complex international environment; they also reflect the prominent challenges and economic slowdown that China faces.

Preparedness ensures success. Faced with this complex situation, we need to calmly assess current developments, stay focused, and take initiatives as necessary. (…)

With all the established principles and policy options at our disposal, we can handle all possible risks and challenges. China's development is strongly resilient. (…)

There are conditions in place for the Chinese economy to achieve sustained, sound growth. China has a big economy and large foreign exchange reserves. There is steady and coordinated progress in advancing the new type of industrialization, IT application, urbanization and agricultural modernization. And the Chinese market has broad space. There is much we can do to boost China's development. In particular, there is a large urban-rural gap in development. Population in the central, western and northeastern regions accounts for over 60% of the national total. And per capita GDP has just exceeded USD $5,000. Narrowing the gap between urban and rural areas and among different regions will unleash huge growth potential. (…) Under the theme of identifying new growth drivers, we will make multi-pronged efforts in the following three areas:

First, we will create impetus by deepening reform. The market has huge vitality and the people have unlimited creativity. We will work harder to streamline administration and delegate more power to lower level governments. We will introduce a system of listing government powers, consider the adoption of a management model based on a negative list approach, accumulate useful experience through the development of the China (Shanghai) Pilot Free Trade Zone and spread it to other areas. This will enable us to expand market access, foster a better business environment, encourage fair competition, develop a law-based economy, unleash greater dividends of reform, spark social creativity, and stabilize market expectations. (…)

Second, we will create impetus by adjusting economic structure. (…) We will speed up efforts to improve the services sector, which is our weak link, extend the pilot VAT reform to postal, telecommunications and other services sectors, use tax tools to develop producer and consumer services, and use more private capital to increase the supply of old-age support, health, tourism, cultural, sports and other services. We will implement a new type of people-centered urbanization, address the bifurcation between urban and rural areas and within cities, and grant urban residency in an orderly manner to rural people who have moved to cities. The government will increase support and use market tools to rebuild more rundown areas this year. We will expand development from coastal areas to the inland regions in phases and nurture new economic support belts along the Yangtze River waterway and important land transportation trunks. We will push forward the construction of rail, road and other transport infrastructure in central and western regions to foster favorable conditions for industrial relocation. We will also promote the development of green industries, new energy, and energy conserving and environmentally friendly technologies and products to foster new growth areas, and resolutely eliminate backward production facilities in this process to ease resource and environmental constraints. We will increase the size of the national guidance fund for venture capital in emerging industries, leverage the role of innovation in spurring development, move industries up the value chain, and raise the productivity of factors of production.

Third, we will create impetus by improving people's livelihoods. The purpose of development is to improve people's lives. The 1.3 billion Chinese represent the largest consumer market and source of demand in the world. And as people's lives improve, domestic demand will play a greater role in driving economic growth. We need to increase people's income as the economy grows. And employment is the source of income and crucial for people's lives. We will implement a more energetic policy for employment and entrepreneurship and give greater fiscal, tax and financial support and services to university graduates and unemployed people when they seek jobs or start their own businesses. (…)

WE WILL ALSO PROMOTE THE DEVELOPMENT OF GREEN INDUSTRIES, NEW ENERGY, ENERGY CONSERVING AND ENVIRONMENTALLY FRIENDLY TECHNOLOGIES AND PRODUCTS TO FOSTER NEW GROWTH AREAS

Having registered rapid growth over the past three decades and more, the Chinese economy has entered a new stage of improving quality and performance. We need to overcome stumbling blocks as we move forward and make steady progress toward achieving our long-term goals. We will pool the courage, vision and strength of over one billion people to write a new chapter in the "China story" and endeavor to realize the great Chinese dream of national renewal.

This article includes excerpts from Li Keqiang's speech at the Boao Forum in May 2014. The full speech is available on the Boao Forum website.

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| INTERVIEW |

Tackling the Energy Trilemma

Interview with Christoph Frei, Secretary General of the World Energy Council

THE GLOBAL ENERGY SCENARIO IS COMPLEX AND FAST-CHANGING. IN ORDER TO OVERCOME THE CHALLENGES IT PRESENTS, WE HAVE TO TACKLE DIFFERENT AND INTERDEPENDENT ISSUES INHERENT TO ENERGY SECURITY, ENERGY AFFORDABILITY AND ENVIRONMENTAL IMPACT MITIGATION. THIS IS THE TRADE-OFF OF THE ENERGY TRILEMMA.

Energy Ministers of the G7 recently signed a joint statement in Rome on energy security. The fundamental principle they subscribed to is that energy security is a common responsibility. One country's energy security relies strictly on energy security in neighboring countries. Would you agree?

First, there is much work to be done at a national level when it comes to energy security. Today, every single country needs to mobilize capital for energy infrastructure renewal, transition and expansion. Political and regulatory risk is the major factor that prevents the mobilization of the capital required. Balanced policy frameworks in terms of energy security, energy equity and environmental sustainability (WEC's Energy Trilemma) are the best guarantee to avoid sudden and dramatic policy changes – political risk – and therefore a condition for the mobilization of the required capital. This is easier said than done but the point is that energy security cannot be considered in isolation since for every single country it has to be part of a balanced policy approach that also takes into account energy affordability, energy access and environmental issues. Eventually, a good Trilemma balance is a strong basis for prosperity and competitiveness in individual countries.

Second, it is also clear that many energy challenges have their most effective solutions in collaboration that goes beyond the borders of individual countries. Opportunities for the storage of oil, gas and electricity are unevenly split as resources themselves are unevenly split. This makes international collaboration critical.

The two guiding questions that should drive international cooperation are: What creates energy insecurity that needs international fixing? And, what are fundamental energy-related objectives that can only be achieved through international cooperation?

Regarding the question of energy insecurity, according to WEC's Energy Issues Monitor the CO_2 price uncertainty (in the absence of an international climate framework) is the number one issue that keeps energy leaders awake at night, political risk high and investments below what's needed. Further critical issues include market distortions created through subsidies and trade barriers (for example for green goods and services), and failing markets as a result of outdated market design (electricity markets lacking incentives for backup capacity or storage; gas storage similarly suffers from a lack of incentives; CO_2 markets are failing to deliver a signal that mitigates emissions). Finally, objectives that can only be achieved through international cooperation include as priorities universal access to modern energy services and climate change.

ENERGY CHALLENGES HAVE THEIR MOST EFFECTIVE SOLUTIONS IN COLLABORATION THAT GOES BEYOND THE BORDERS OF INDIVIDUAL COUNTRIES

With these issues in mind, the real challenge when it comes to international collaboration is shared values and principles on our future climate framework, universal access, trade rules, subsidies, market design as well as burden sharing and coordinated RD&D in system critical components such as storage or CCS. Clearly, all of these issues need much greater international cooperation and progress than what we have observed over the past decade. In this context we must keep high ambitions for COP21 next year in Paris. Meanwhile, the UN SE4All process has generated new dynamics in the international understanding that energy access is critical for the entire development agenda – yet, the issue must now move from the heart to the feet.

It is important to highlight that the best foundation for collaboration in these areas, again, is strong and Trilemma-balanced national policies. This is specifically also true for an international climate agreement: there can be no effective international climate framework in the absence of strong and balanced national energy policy frameworks. Well-functioning and balanced national energy policy frameworks are the only viable enforcement mechanism for an effective international climate agreement.

This ideal point should be translated into a concrete strategy for improving energy security. In Rome the G7 energy ministers defined some specific areas for intervention: diversification of energy fuels, sources and routes; encouragement of indigenous sources of energy supply; enhancing energy efficiency; promoting sustainable energy technologies and infrastructure modernization. From your point of view, are these the key factors that governments should work on?

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Bismarck said that politics is the art of the possible. The mentioned objectives – diversification of energy fuels, sources and routes; encouragement of indigenous sources of energy supply; enhancing energy efficiency; promoting sustainable energy technologies and infrastructure modernization – are pragmatic steps that can support Trilemma aspirations. However, as mentioned they miss out on the more fundamental and difficult issues that we cannot afford to leave unsolved.

AN INCREASING NUMBER OF GOVERNMENTS IN BOTH DEVELOPING AND INDUSTRIALIZED COUNTRIES RECOGNIZE THE LOGIC OF THE TRILEMMA

In its reports, the WEC has stressed that today's energy policies have to address a very complex Trilemma, in other words the trade-offs between energy security, energy affordability and environmental impact mitigation. This may be the most crucial challenge we have to face. Do you think we are prepared to do so?

Balancing the Trilemma is a challenge for all countries as short-term priorities are a permanent temptation for policy reactions that take us away from long-term objectives. We currently rank 129 countries with our Trilemma Index and the reality is that half of the world's countries are far from a recognizable Trilemma balance.

Meanwhile, we see an increasing number of governments in both developing and industrialized countries as well as leaders in international organizations including the UN and the OECD who recognize the logic and necessity of the Trilemma, to balance among energy security, energy equity and environmental sustainability. But it is the same as it is with personal fitness: you can always do better and without active effort things get worse.

The WEC recently defined two different developing scenarios: a "jazz scenario" and a "symphony scenario". What are the differences between these two hypotheses? And how do they impact on the dimensions of the Trilemma?

With our exploratory scenarios approach we see two fundamentally different worlds: Jazz is all about bottom-up and market-rhymed technology choice, and consumers who want energy cheap and now. Symphony stands for government-orchestrated top-down approaches based on long-term objectives with picking the winner type of interventions.

We find that the Jazz world is much better in delivering on the equity side (energy access and affordability) while Symphony shows better results on the climate side. Yet, neither of the scenarios achieves climate objectives or universal access by 2050. We will need to choose the best of both worlds, work much harder on the Trilemma and deliver innovation in areas such as electric storage and CCS if we want sustainable energy to the greatest benefit for all. And we better start now.

For additional information and WEC publications, please visit www.worldenergy.org/publications

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| Guidi, Royal, Davey: different nationalities, one vision |

Federica Guidi,
Italian Minister for the Economic Development, Italy

"Collective energy security and the actions necessary to ensure it lies at the core of the agenda," stated Federica Guidi during the final press conference. "The first part of the debate analyzed strategies to reduce energy dependency and its related risks, as the seven ministers agreed on the need to support diversification of primary sources and of energy production and dispatching technologies, on the commitment for energy efficiency and for a wider use of sources alternative to hydrocarbons (i.e. renewable, nuclear and alternative fuels).

"Development and modernization of infrastructure," continued the Italian Minister of Economic Development, "was the theme of the second part of the discussions, highlighting the need for more powerful and integrated energy networks, capable of ensuring supplies even in the case of energy shocks. This means more interconnections between countries, development of new plants to produce, receive and dispatch Liquefied Natural Gas, widespread availability of smart grids and of efficient storage systems for electricity and gas."
"The last theme we addressed, again with a view to ensuring energy security," concluded Minister Guidi, "was how to harmonize policies and the regulatory frameworks regarding raw materials markets, the mechanisms of energy and CO_2 price formation, the defense of competition, free access to markets and infrastructures and, finally, coherent stimulus systems for renewable sources and energy efficiency."

Sources: **www.sviluppoeconomico.gov.it**

Ségolène Royal,
French Minister of Ecology, Sustainable Development and Energy

"As Minister I want to make sure that France is one of Europe's primary green powers. We have the means, the capability and the skills necessary to achieve this goal.
My aim is to make France the European leader in renewable marine energies: I believe we will be able to count on 6,000 MW of electricity production from the sea by 2020, allowing us to cover 3.5% of our electric energy demand.

The law I am putting together will accelerate an energy transition that is already taking place before our very eyes, thanks to French skills, together with the talents of our European partners. We have involved both a Portuguese company and a Spanish company in this project, giving these efforts a European dynamic.
I have just returned from a meeting of G7 energy ministers in Rome, where I noted that these are common concerns shared by everyone, and that we can all work together internationally to consolidate and reinforce France's initiative.

In Rome I insisted on the importance of the connection between energy security and energy independence on one hand, and the importance of an ecological transition and the transformation into an economy that strives to reduce consumption and CO2 emissions on the other.
During the meeting I also defended the need to consider promotion of renewable energy sources and energy efficiency as the primary factors for energy independence.
This is because, as we all know, a country's energy independence is achieved through a diversification of its mix, development of renewable energy sources and alternative fuels, as well as through ambitious efficiency measures and reducing consumption."

Sources: **www.developpement-durable.gouv.fr/**

Edward Davey,
British Secretary of State for Energy and Climate Change

"Today in Rome, the G7 has started a process of disarmament to prevent energy being used as a weapon in the future. (…)
We have agreed to do what's needed to achieve a systematic, enduring step change to improve energy security - not just for nations in the G7, but for our friends and allies. (…)
The principles that will guide our work over the months and years ahead are diversified energy supplies, more homegrown energy, better infrastructures to link our markets, reducing our energy needs through energy efficiency, and the powerful role clean energy technologies have to play (…) We are united in our determination to work collectively to protect our common energy security. (…) The shared spirit of collaboration and purpose shown today will ensure our success."

Sources: **www.gov.uk**

| INDUSTRIES & COUNTRIES |

Skyrocketing Renewables in Middle East

Floris Schulze, Managing Director of CESI Middle East

IN THE MIDDLE EAST DOMESTIC ENERGY DEMAND WILL CONTINUE TO GROW OVER UPCOMING DECADES. IN ORDER TO KEEP SUPPLYING SUFFICIENT OIL FOR EXPORT, GOVERNMENTS ARE DESIGNING COMPLEX STRATEGIES TO DIVERSIFY THEIR ENERGY SOURCES.

The economic crisis changed the Middle East. Before the crisis hit, cities were binging on huge building and engineering projects, and a spike in demand for energy drove enormous investment in electricity generation and transmission infrastructure. International companies, keen to get involved in a market with so much potential, descended on the region. But after the economy stalled in 2009, governments tempered their ambitious plans and many projects were cancelled or put on hold. Now things have picked up again, and with inflation in the UAE growing from 1% in 2010 to 2.5% in 2011, growth is healthy and not overheated. This revival has come with a steady – and more sustainable – increase in energy demand. We are seeing greater interest in renewable energy, intelligent solutions, network expansion, and maintenance and asset management.

A recent report on the Middle East's energy consumption found that energy demand will grow by 114% between 2010 and 2050, so we can expect governments to continue to look at other ways to grow and diversify their energy mix. The region's skyrocketing need for power is acute in the Gulf Cooperation Council (GCC), spurred by high per capita consumption, growing populations and energy-intensive industries. Domestic demand has led the UAE, a country with the fifth largest gas reserves in the world, to import gas from Qatar and even consider importing from North America's booming shale gas market. This is, in part, the result of a long-term contract that means 93% of its Liquefied Natural Gas (LNG) is exported to Japan. Saudi Arabia, the world's largest producer of oil, uses more petroleum than any other country in the Middle East to fuel power stations and respond to domestic demand. To conserve more of the precious product for export, the Kingdom is looking to nuclear and renewable sources, and has created the King Abdullah City for Atomic and Renewable Energy. Qatar, which meets the domestic energy needs of its small population of two million while retaining nearly 85% of its leftover LNG for export, is in a more favorable position than most countries in the region.

IN MIDDLE EASTERN COUNTRIES WE ARE SEEING GREATER INTEREST IN RENEWABLE ENERGY, INTELLIGENT SOLUTIONS AND NETWORK EXPANSION

GCC countries have adopted different approaches to renewable energy depending on wealth, need and natural suitability. Saudi Arabia made serious strides toward solar energy, with the Kingdom aiming to install

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24 gigawatts of renewable power capacity by 2020 and 54 gigawatts by 2032. The first solar power station was inaugurated in October 2011 and is one of several such projects. The plant, connected to the grid of nearby Jizan City, is located on Farasan Island and produces 864,000 kilowatt hours annually. Other completed projects include the installation of PV solar panels on the rooftops of towers in Riyadh's financial district, which produce 330,000 kWh annually and are also connected to the city's grid. Dubai and Abu Dhabi aim to produce 5% and 7% of their energy from renewables by 2030 and 2020 respectively, installing several projects across the country to develop wind, solar photovoltaic and waste-to-energy solutions.

DUBAI AND ABU DHABI AIM TO PRODUCE 5% AND 7% RESPECTIVELY OF THEIR ENERGY FROM RENEWABLES

The Dubai Electricity and Water Authority (DEWA) has launched three new smart initiatives to help achieve this sustainable development. The first of these initiatives is to encourage households and building owners to install photovoltaic solar panels for local use in buildings by connecting these panels to the grid and buying any excess generated. Other initiatives include the use of smart grids and smart applications to ensure faster responses and promote resource sustainability. There are also plans to build charging stations for electric vehicles in Dubai. DEWA recently began the second stage of its Mohammed Bin Rashid Al Maktoum solar photovoltaic power project, which entails the construction of a 100MW solar PV plant 50 kilometers south of Dubai in the Saih al Dahal area. Abu Dhabi meanwhile has plans to build three solar power stations at Shams, located 120 kilometers from the capital. The first Shams station, which uses parabolic trough technology, went online on 17 March 2013, and has a capacity of 100 MW, making it one of the biggest parabolic trough power stations in the world. In addition to renewables, the UAE began construction of the first unit of a nuclear power plant in the Barakah region with the cooperation of South Korea's Korea Electric Power Corporation. The program is large in scope, with four nuclear plants planned, the first of which will be connected to Abu Dhabi's grid in 2017. The country hopes to produce a quarter of its electricity from these plants by 2020. Saudi Arabia also has plans to build 16 nuclear power plants over the next 20 years, with a projected capacity of 17 gigawatts by 2030. According to an April 2013 timeline, construction of the first plant will begin in 2016, and the first facility will go online in 2022. Kuwait has considered civilian nuclear power generation, but reportedly abandoned such plans in 2012. With the political effort and huge amount of resources that are being put behind the development of nuclear programs throughout the region, we can expect nuclear will become an important part of the energy mix.

| CESI Middle East.
An effective technological partner for managing energy transition |

Since CESI launched its first Middle East office in the UAE at the World Future Energy Summit in January 2012, it has won several major contracts that contribute to the sustainability and stability of the region's energy supply. Although CESI had been present in the region for a number of years, opening an office in the UAE enabled the group to strengthen relationships with key clients and enhance its operational effectiveness and responsiveness. In 2012 CESI won a mandate, awarded by the Arab Fund for Economic and Social Development, to develop a feasibility study for establishing a single energy market between all 20 Arab countries. The mandate was prestigious recognition, and was followed by several important engagements in the area. CESI is helping the Kingdom of Saudi Arabia develop its smart grid and smart metering strategy, and assisting the Saudi Electricity Company (SEC) in implementation of a High Voltage Direct Current (HVDC) network. Earlier this year CESI signed two major contracts: one with the GCC's Interconnection Authority to provide professional services that support power market integration and grid optimization throughout the region; another with SEC to support various projects across Saudi Arabia for enhancing efficiency and the lifetime extension of existing facilities and installations.
The most recent success for CESI's growing operations in the Middle East was the signing of an agreement with Dubai Electricity and Water Authority (DEWA) related to connecting renewable energy generators to the grid.

Today it is increasingly important to develop integrated solutions, elaborating projects that involve all the countries in a given area, pulling available resources together as a shared common factor and minimizing risks and disadvantages. This, for example, is precisely the direction indicated by a feasibility study for the creation of a single energy market between 20 Arab countries, realized in 2012 with funding from the Arab Fund for Economic and Social Development. The study – conducted by CESI – was tasked with determining the best electric energy and natural gas trade scenario for each Arab country individually and for all Arab countries combined. Such a plan could help the region get the most out of its prodigious natural resources.
In Middle Eastern countries, the gigantic push behind energy generation from renewable sources is moving forward hand in hand with an equally important commitment to network infrastructures and control and measurement systems, first and foremost smart grids, smart metering and HVDC. According to statistics quoted at the World Smart Grid Conference 2013, power and utility companies in the six states of the Gulf Co-operation Council are expected to invest USD 200 billion to upgrade metering, transmission lines and communications in order to create new smart systems by 2015.

TODAY IT IS INCREASINGLY IMPORTANT TO DEVELOP INTEGRATED SOLUTIONS, ELABORATING PROJECTS THAT INVOLVE ALL THE COUNTRIES IN A GIVEN AREA

In 2012, for example, the Kingdom of Saudi Arabia developed a smart grid and smart metering strategy, a fundamental step for the Kingdom to develop and implement newer, more advanced technologies and innovations that deliver sustainable solutions and cost-saving through energy conservation.
Another crucial theme is the grid: Saudi Arabia is currently implementing a High Voltage Direct Current (HVDC) power transportation interconnector between Riyadh and Jeddah, thus covering the country's central and western regions. This new 800km HDVC link will not only increase the power generation capacity of local distribution networks, but also provide a reliable back-up energy supply in emergency situations. HVDC is a specific, technologically advanced power link that is primarily used for reliable long-distance electricity transmission. Because HVDC systems have decreased instances of electricity loss during long-distance transmission, they are considered more reliable than the more commonly used alternative current systems, and are often less expensive as well.

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Wind Power: Predicting the Unpredictable

Cesare Pertot, Engineering & Environment ISMES Division, CESI

RENEWABLES ARE HIGHLY NON-PROGRAMMABLE AND DISCONTINUOUS SOURCES. INTEGRATING RES GENERATION INTO THE ELECTRICAL GRID CAN GENERATE IMBALANCES. THIS IS PARTICULARLY TRUE FOR WIND POWER PRODUCTION. DESIGNING NEW, SOPHISTICATED WIND FORECASTING TECHNOLOGIES AND MODELS WILL SIGNIFICANTLY DECREASE THE FUTURE LEVEL OF ERROR AND, AS A CONSEQUENCE, OF IMBALANCES IN THE GRID.

The reliability and quality of electricity supply is one of the main goals, if not the main goal, in the operation of an electricity grid.

To achieve those goals, to provide and guarantee the best disturbance-free and uninterrupted electricity supply, the balance between electricity consumption and generation must be maintained at any moment. The more production matches consumption, the better the grid performance.

SOLAR AND WIND ENERGY ARE HIGHLY NON-PROGRAMMABLE SOURCES, THEIR FLUCTUATIONS POSE A DISPATCHING CHALLENGE

Network operation is one essential function, among many others, undertaken by Transmission System Operators (TSOs), which are responsible, often under regulatory or legislative provisions, for the bulk transmission of electric power on the main high voltage electric networks.

TSOs operate the transmission system in real time, carrying out congestion management and procuring balancing or ancillary services to obtain it. The balance is achieved by scheduling the needed production in advance in order to respond to load profiles (an area's overall electricity consumption) for which high accuracy forecasts are usually available.

The daily production schedule is compiled by TSOs purchasing electricity market power generation from Independent Power Producers (IPPs) and utilities.

Consumption is then met by productions from various generation systems, from conventional thermoelectric power plants (coal, nuclear, oil, natural gas) to renewable systems.
But while conventional power generation systems and some renewables (for example hydroelectric and geothermoelectric) are easily programmable and adjustable, solar and above all wind energy are highly non-programmable, discontinuous sources.

Consequently, in a given mix of injected power generation systems in the network, the fluctuations inherent to non-programmable sources pose a challenge in dispatching.

Due to the large installed capacity, wind power production is the non-programmable resource of main interest for this topic.

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When measured wind power fails to equal scheduled power, imbalances are generated. The greater the share of wind generation injected into a power system, the greater the network's instability and consequently the challenges that must be faced in order to achieve and maintain balance.

INTEGRATING WIND GENERATION INTO ELECTRICITY GRIDS REQUIRES US TO OVERCOME ITS VARIABILITY AND MAKE THIS SOURCE LESS UNPREDICTABLE

So, integrating wind generation into electricity grids requires us to overcome its variability and make this source less unpredictable. This is particularly true when wind generation accounts for a significant share. This can be due not only to an increase in absolute values of the installed capacity, but also to a reduction of demand in an electricity market where renewables are present. In some cases, in a scenario ruled by the electricity market, the development of wind generation on one hand and consumption reduction on the other, may lead (in the event of an annual average wind power penetration of 15-20%) to instantaneous wind power production above 100% of the corresponding consumption.

Thus, two main issues enhance the need for accurate wind power forecasts:

- The proposal of quantities of energy for the following day at a given production cost for the power producers;
- The TSOs grid balancing action and the penalties related to failure to comply with its demands.

A Power producer may obtain additional benefits from the availability of accurate predictions of wind power production, mainly regarding wind farm management. For example, the integrate assessment of forecasted data SCADA control system allows for a variety of post-hoc analyses for performance verification, both for each WTG and for the wind farm as a whole. Forecasts of up to 10 days in advance also make it possible, despite a lower accuracy in the prediction's absolute value, to obtain information on the expected production of non-productive periods, useful for programming operational maintenance activities as well as health and safety issues especially, but not exclusively, for offshore wind farms. The key role weather and wind conditions play in the production of wind power plants and the management of assets led to look for reliable and cost-effective solutions in order to achieve forecasted, real-time and historic wind data.

Most of the tools developed to satisfy this need are user-friendly web interfaces, behind which a complex modeling system based on a mesoscale numerical weather prediction model, site observations, a wind-to-power converter module, statistical modeling and self-learning neural networking technology is implemented.

A mesoscale numerical weather prediction model is basically a set of equations representing the dynamic behavior of the atmosphere. The model, starting from a description of the actual state of the atmosphere, makes it possible to estimate weather evolution, providing a 3D deterministic forecast of (among other things) wind intensity and direction, air temperature, humidity and pressure precipitation for the area being modeled.

Even the most advanced mesoscale numerical weather prediction model is a numerical approximation of a physical description of the atmosphere, and as a consequence its forecasts always contain some degree of uncertainty.

A variety of factors introduce elements of uncertainty into the forecast. Some are intrinsic limits of the model, due to simplification of the phenomena; others depend on the complexity of the site where the wind farm is located, and on orographic complexity in particular.

The results presented by the European project Anemos, an exercise that compared a number of advanced prediction systems, show that on average, terrain complexity can double error. The performance, evaluated in terms of Normalized Mean Absolute Error, range from 10% of installed capacity in flat terrain or offshore sites, to approximately 13% in complex terrain sites and up to 22% in highly complex sites.

Although significant improvement has been achieved, the tools for wind power prediction have not yet reached the highest degree of scientific maturity.

DEVELOPMENT EFFORTS FOR BETTER DETERMINISTIC WIND POWER FORECASTING ARE STILL ONGOING, AND WILL SIGNIFICANTLY DECREASE THE FUTURE LEVEL OF PREDICTION ERROR

Development efforts for better deterministic wind power forecasting are still ongoing, and will significantly decrease the future level of prediction error. However some uncertainty will always remain, and probabilistic forecasts may help support wind power management and trading accounting for prediction uncertainty.

One path for development aims to couple the probabilistic modeling system with a model of the electricity market in order to increase wind farm income by reducing prediction uncertainty.

Several questions remain unanswered, providing a glimpse of multiple future developments.

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| FACE TO FACE |

Latin America Grows Green

Interview with Umberto Magrini, Head of Engineering, Enel Green Power and Domenico Andreis, Head of Engineering and Environment, ISMES Division, CESI

SOUTH AMERICA IS EXPERIENCING STRONG GROWTH. BUT THE AREA IS ALSO A VITAL GREEN LUNG FOR THE ENTIRE PLANET. FOR THIS REASON, LOCAL DEVELOPMENT NEEDS TO PUT ENVIRONMENTAL SUSTAINABILITY AND ECOSYSTEM SAFEGUARDING AS ITS FOREMOST PRIORITIES. WORKING IN SOUTH AMERICA MEANS PROVIDING THE BEST MANAGERIAL AND TECHNICAL SKILLS IN ORDER TO ELABORATE INNOVATIVE STRATEGIES FOR SUSTAINABILITY.

Umberto Magrini

Domenico Andreis

Latin America is experiencing an important growth phase. Consumer demand is on the rise, and now the area needs to develop infrastructures of all kinds, from energy networks to roadways, as well as power plants, production facilities and industrial complexes. These undoubtedly represent investment opportunities for international companies. What are your development strategies for this part of the world?

Umberto Magrini
Renewables have a great future where there is economic and population growth. Latin American populations are increasing rapidly, businesses are developing and quality of life is improving. Energy and electricity are part of a path which, in a number of different ways, will affect the entire subcontinent.
Enel Green Power is managing the construction of different types of facilities across the whole continent. This is reflected in Enel Green Power's continuing growth in 2013 – an 11.3% increase in net installed capacity and 17.5% rise in electricity generation compared to the previous year. In Brazil, the most recent construction site EGP has opened is the Apiacás hydroelectric facility. The plant will have a total installed capacity of 102 MW and will respond to Brazil's increasing energy demand, which is estimated to grow at an average annual rate of 4% through 2020.
For Enel Green Power, Brazil is also the land of wind and solar power. Many facilities have already been completed, while others are currently being built in Bahia and Pernambuco. Enel Green Power is also developing, building and operating several wind, solar and hydro plants in Chile, Mexico, Costa Rica, Guatemala and other Latin American countries.

RENEWABLES HAVE A GREAT FUTURE WHERE THERE IS ECONOMIC AND POPULATION GROWTH

Domenico Andreis
Over recent years Latin America has experienced strong development. Brazil has been the main actor of this fast growth, with a GDP that has grown an average of 3.5% annually. Europe,

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and Italy in particular, can be an important partner for the development of structures and infrastructures. Energy is a highly strategic, fundamental theme for defining the economic relationships and international relations between Europe and Latin America. If properly set up, it represents the most important driver for environmental protection and economic and social development. Thanks to the experience we've gained through decades of hard work, based on a deep scientific knowledge constantly updated, CESI can play an important role in tracing a sustainable direction for industry and business development of this part of the world.

ENERGY IS A HIGHLY STRATEGIC THEME FOR DEFINING THE ECONOMIC RELATIONSHIPS AND INTERNATIONAL RELATIONS BETWEEN EUROPE AND LATIN AMERICA

Today development has to be sustainable; it must improve quality of life for individuals and the community, while at the same time respecting the environment. This is all the more so in an area that is clearly so important for the ecological balance of our planet. Over the course of their long histories, CESI and Enel Green Power have matured specific expertise and sensibilities for managing these critical issues. How will these advantages be made available to the territory and help support its sustainable growth?

U. Magrini
As you know, for Enel Green Power sustainability means not only building something with support from others, but also creating value for us and for others. Renewable energy sources are an important tool for promoting competitiveness in the production chain in various countries while also supporting environmental protection.
In 2013 alone, thanks to energy generation from water, sun, wind and the Earth's heat, Enel Green Power saved over 16 million tons of CO_2; more than 16% from 2012 levels.
But Enel Green Power's approach to sustainability is not limited to "green" aspects; it also promotes a strategy that integrates sustainability into business processes and the entire value chain.

D. Andreis
According to the data provided by OECD (Organization for Economic Cooperation and Development) and ECLAC (Economy Commission for Latin America and the Caribbean), in 2012 Italy doubled its investments in renewable energy, increasing from 1.9 GW to 3.8 GW. 17% of these investments were realized in South America.
The skills and competences CESI has developed in Italy over the course of its history can be considered precious resources also for Latin American companies, supporting their business growth in the in harmony with the surrounding territory. These skills allow to support stakeholders in integrating environmental issues in all the project life cycle, assisting them with authorizations and helping them in managing their plants according to sustainable criteria.
A close collaboration between CESI and ENEL can be the driving force to spread know-how and to contribute to the definition of new cooperation targets between these two areas, in line with the strategies set up by the inter-regional alliance between European Union and ECLAC.

How can technology help heal the environment?

U. Magrini
Hydro resources, the ability to develop sustainable design and prevent environmental impact during construction and operation of the plant all represent key factors.
Today there are many tools and techniques that have to be adopted to develop sustainable projects. These include territorial diagnostics, mitigation of environmental impact, monitoring natural hazards such as landslides and floods, and preparing emergency plans to be implemented in case of disaster.
During the operation phase of hydroelectric plants, a structural monitoring system for the dam allows the operator of a given facility to get all useful information he or she needs to asses and control the state and the evolution of the structure.

D. Andreis
The last data issued by ECLAC show that the energy mix in South America produces the lowest emissions in the world, roughly 200g of CO_2 per kWh produced. This is because approximately 70% of South America's energy output is made up of renewable energies (58% from hydroelectric). A constant growth of alternative sources has been identified as the future scenario with an average increase of about 3.7% per year.
In this framework Brazil has supported some of the most innovative private initiatives in the sector thanks to public funding, making it possible to realize projects that could bring an increase of about 25,000 MW in hydroelectric energy supply in the Country.
Compared to the past, today there's an enormous amount of information available about the project area. A deep knowledge of the territory is fundamental for the development of a project in harmony with its geographic location. The choice of the best location, the evaluation of the best alternative in the energy source, the indications of the best project choice in order to avoid undesired interactions are some of the activities that could potentially benefit from the tools made available by modern technology.

ENEL GREEN POWER'S APPROACH TO SUSTAINABILITY PROMOTES A STRATEGY THAT INTEGRATES SUSTAINABILITY INTO BUSINESS PROCESSES

Another delicate issue has to do with managing government procedures. From this point of view, international observers note the need to proceed with systemic reforms in this part of the world, to bring international best practices into play. Can collaboration with companies like CESI and Enel Green Power prove useful from this point of view as well?

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U. Magrini
As far as Brazil is concerned, there are three fundamental phases in a power plant licensing process. First of all the "preliminary license," which consists in an environmental license for the preliminary planning phase of the project to approve location, design, environmental sustainability and establish the basic requirements to be met in the next phases of project development.
Second the "installation license," which authorizes installation of the plant in accordance with predefined and approved project and technical specifications. During this second phase it is very important to define and follow all environmental measures in compliance with different local laws and regulations.
Third is the "operating license," which defines the environmental control measures and conditions necessary for the power plant to operate.
I believe that CESI could leverage the important experience it has accumulated in Italy, Europe and other countries in such a way as to support not only local operators as they struggle to comply with all the necessary regulations, but also governments, as they work to establish a better regulatory framework.

AS A PRODUCT OF EUROPEAN LEGAL CULTURE, CESI HAS IDENTIFIED BEST PRACTICES THAT MAKE IT AN IDEAL THIRD PARTY IN THE RELATIONSHIP BETWEEN CLIENTS, AUTHORITIES AND STAKEHOLDERS

D. Andreis
The American experience first, and then the European one can help in containing the time requested to implement reforms of the government administrative procedures.
The European Union has recently become an increasingly important point of reference for environmental legislation. Coming from this legal culture CESI has settled the best practices that make it an ideal third party in the relationship among client, authorities and stakeholders, thanks to the know-how matured in the areas in which it operates.

What projects do you have in common in Latin America? What do you each expect of one another from this collaboration?

U. Magrini
Currently we are working together in Guatemala and Brazil. In Guatemala we are working for the Palo Viejo hydro plant, an 84 MW plant with five diversion dams, three water intakes, five canals for a total length of 21 km, two siphons, a reservoir, a low pressure penstock and a tunnel. We already relied on CESI during the construction phase for geotechnical design review and technical support to improve safety conditions during construction. Today the plant is operational and our new project with CESI concerns slope monitoring; collecting data to improve slope stabilization and the development of an innovative system to control possible landslides and water erosion phenomena.
In Brazil we relied on CESI to help Enel Green Power set up the Dam Safety Program in compliance with a new regulatory framework. CESI helped us assess dams and define the retrofit design.

D. Andreis
CESI and Enel Green Power have a sound and long-standing collaboration especially in civil engineering.
The dams field is one the most important: CESI has initiated Dam Safety Assessment activities on 21 dams around Brazil. These activities include verifying a dam's compliance with local regulations; verifying structural design and indicating eventual adjustments that need to be made; analyzing dam safety, including health and safety of the local workers; and evaluating structural vulnerability in case of emergency (flooding). For some of these dams has also been done hydrological, hydraulic and structural tests, as well as analyses of flooding downstream in the dam break scenario and drafting of EAP (Emergency Action Plan).
Another important project followed by CESI was located in Guatemala, on the Palo Viejo hydro power plant, where CESI supported Enel Green Power during construction and operation for geotechnical design and risk assessment.

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| IDEAS & VISION |

The New Frontier for Grids

Uberto Vercellotti, Testing & Certification Division, CESI

ELECTRIC ENERGY TRAVELS FROM ONE END OF A NATION TO ANOTHER AND BETWEEN INTERCONNECTED NATIONS. NETWORKS NEED TO RESPOND TO INCREASINGLY HIGH EFFICIENCY STANDARDS, AND SUSTAIN TRANSMISSION OF INCREASINGLY HEAVY POWER. GERMANY IS LEADING THE WAY IN EUROPE, BUT CHINA AND INDIA ARE THE TRUE FRONT-RUNNERS

Forecasts generally call for worldwide electricity demand to grow to nearly 32,000 TWh by 2035. The trend is to deliver bulk quantities of electric energy from renewables power generation plants that are typically far away from consumption centers and therefore need networks that can carry power across long distances.

In Asia, where four to six GW needs to be transmitted for over 3,000 km, the common choice is to increase ratings and achieve a voltage level greater than 1,000 kV (UHV AC and DC in China and India). In Europe, on the other hand, distances are shorter and/or there is less power to be delivered, so the preference is to maintain far lower voltage levels (HV and EHV: 400 kV AC and 5-600 kV DC).

A large amount of new T&D lines and substations will have to be installed over the next decade, while existing capacity will be upgraded, with utilities pushing component manufacturers to fulfill demand quickly. But speed cannot come at the expense of safety and reliability.
Major outages demand implementation of more stringent regulations in many countries, and these situations push utilities to rely on proof from testing as a way to demonstrate their due diligence in choosing equipment and technologies.

Transmission System Operators (TSOs) search for innovative solutions in developing the transmission grid and, as a result, it is likely that the application of extra and ultra high voltage AC and DC transmission systems will increase considerably over the coming years. But for now UHV projects per year are limited in numbers (3-5) compared to both terrestrial and submarine HV and EHV projects (40-80).
This creates a very different market situation, with a niche market for 800 to 1,200 kV tests on equipment, while the most important market is in the HV - EHV sector (220-600 kV) for both AC and DC.
Recently a higher number of XLPE cable systems have also been introduced into HV networks, and more are planned for the future.

Improvements in T&D
The benefits of being able to transmit huge amounts of energy through overhead lines or cables cannot be overlooked. Bulck power generation centers are typically far away from consumption centers and there is an increasing need to carry power across long distances.

In Europe, Germany's energiewende, or energy switch, provides a perfect example of this new energy scenario. The biggest problems are going to be for the electricity network, which was designed to carry nuclear electricity from south to north and not renewable electricity from the coast.

Germany's nuclear power plants were built near its industrial centers, and electricity flowed locally or regionally. German network providers forecast that replacing them with offshore wind parks will require hundreds of km of overhead transmission lines to be built – 3,800 km by 2022; plus an additional 1,600 km of lines that have been mapped out but not yet built – for a cost up to 20€ billion over the next decade.

TRANSMISSION SYSTEM OPERATORS (TSOs) SEARCH FOR INNOVATIVE SOLUTIONS IN DEVELOPING THE TRANSMISSION GRID

While Germany is undoubtedly the most advanced country in this sense within the European panorama, the most avant-garde projects are being realized elsewhere in the world. Today China and India are the ones betting most heavily on these technologies, thanks to their strong economic growth and constant increases in energy consumption.
In August 2006 China's National Development & Reform Commission approved the realization of a 1,100 kV AC line with a transformational capacity of 6,000 MVA. Voltage is merely one of the records this line is setting: it is 650 km long, and several stretches of the infrastructure cross the Yellow and Hanjiang Rivers. In January 2009, just three years after it was approved the relevant UHC AC stations became operational.

Today India is aiming even higher, realizing various sections of 1,200 kV line. Once again, the need to realize a UHV line derives from a strong increase in energy consumption due to Indian economic growth, as well as distances between consumption centers and energy production facilities.
Realizing a project like this one will also allow India to achieve interconnection with neighboring countries as Nepal and Bhutan, both countries rich in hydroelectric resources. Therefore it comes as no surprise that powerful political and industrial interests have converged around the project.

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| CESI's European testing platform for HVDC |

CESI has three testing platforms distributed across Europe (CESI Milano, Italy, FGH E&T Mannheim and IPH Berlin, Germany), and can boast almost 60 years of experience in developing the Italian Network system from 220 kV to a prototype 1000 kV experimental line in Suvereto, making it one of the main players in the testing market.

Overhead lines, components, cables and accessories can be tested in either FGH E&T or CESI.

In 2012 a UHVAC testing station of up to 1,200 kV was inaugurated.
This BINA project is the first interesting example in India of possible collaboration between public and private sectors in this sphere: the project will in fact involve several of the most important businesses in the sector on a national level.

The first section of 1,200 kV line may be the section between Wardha and Aurangabad in the Maharashtra, which are currently interconnected at 400 kV level. Forecasts call for initial operability in two to three years, as long as the tests conducted at the BINA center provide positive results.

THE CHOICE OF AC AND DC DEPENDS ON SPECIFIC PROJECT CONDITIONS, BUT NOWADAYS THE TREND IS TO COMBINE "AC AND DC" PECULIARITIES

AC - DC: alternative or complementary technology?
While the choice of AC and DC will depend on specific project conditions, nowadays the trend is to combine AC and DC peculiarities, like more collective expertise with equipment, possibly in order to connect loads at different intermediate points for AC systems compared to DC ones mainly point to point. HVDC system have for overhead line less environmental impact, and subsea cables links enjoy distinct technical advantages through DC solutions, not to mention the HVDC peculiarity that allows the interconnection of asynchronous AC systems (operating at different frequencies). Targeted planning may make it possible to create a DC transmission system in Europe, overlaying the existing 400 kV AC one, that can best take advantage of both technologies while guaranteeing consumers a level of service that is undoubtedly superior in terms of quality, safety and efficiency.

| First steps |

In the 1970s many countries were thinking far ahead, imagining the realization of UHVAC lines.

The first countries to initiate concrete projects were Russia and Japan.
In 1985, the Soviet Union brought an initial 500 km section of the line between Ekibastuz and Kokchetav to 1,100 kV.

In the meantime the project Enel1000 kV was worked out in Italy, with the development and testing, in CESI, of the various components, finalized in a 400/1,000 kV GIS sub station and an innovative 1,000 kV line, successfully operated for many years by ENEL

In Japan, research activities conducted by the Central Research Institute of Electric Power Industry (CRIEP) focused on this technology.
In 1993 the Tokyo Electric Power Company increased the carrying capacity of a 190 km section of line that connects the nuclear power plant on the Sea of Japan with the urban area to 1,100 kV.

Other lines were realized in 1999. Despite achieving a high level of technology, most of these networks continue to function at 550 kV.

Demand remains lower than expected, and the time has not yet come to take full advantage of those networks that have already been built.

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| REVIEW |

Energy Myths and Realities

Vaclav Smil
Distinguished professor in the Faculty of Environment at the University of Manitoba

There are many misconceptions about the future of global energy often presented as fact by the media, politicians, business leaders, activists, and even scientists wasting time and money and hampering the development of progressive energy policies.

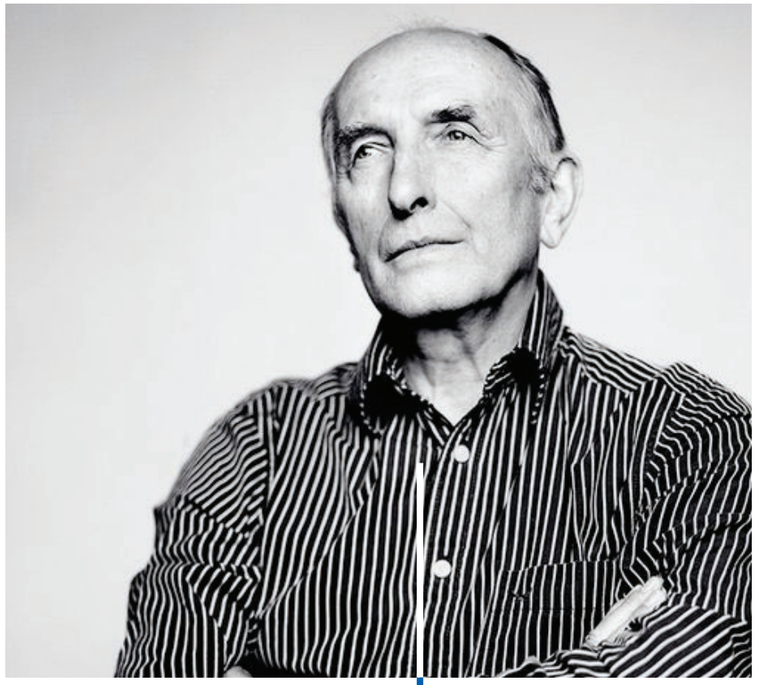
Energy Myths and Realities: Bringing Science to the Energy Policy Debate debunks the most common fallacies to make way for a constructive, scientific approach to the global energy challenge.

When will the world run out of oil? Should nuclear energy be adopted on a larger scale? Are ethanol and wind power viable sources of energy for the future?

Vaclav Smil advises the public to be wary of exaggerated claims and impossible promises. The global energy transition will be prolonged and expensive and hinges on the development of an extensive new infrastructure.

Established technologies and traditional energy sources are persistent and adaptable enough to see the world through that transition. Energy Myths and Realities brings a scientific perspective to an issue often dominated by groundless assertions, unfounded claims, and uncritical thinking. Before we can create sound energy policies for the future, we must renounce the popular myths that cloud our judgment and impede true progress.

For more information on Vaclav Smil's work and publications, please visit www.vaclavsmil.com



Biography

Vaclav Smil is currently a Distinguished Professor in the Faculty of Environment at the University of Manitoba in Winnipeg, Canada.

His interdisciplinary research interests encompass a broad area of energy, environmental, food, population, economic, historical and public policy studies, and he had also applied these approaches to energy, food and environmental affairs of China.

He is a Fellow of the Royal Society of Canada (Science Academy) and the first non-American to receive the American Association for the Advancement of Science Award for Public Understanding of Science and Technology.

He has lectured at many universities in North America, Europe and East Asia and has worked as a consultant for many US, EU and international institutions.

"I recommend this book to everyone who spends time working on energy issues – not to cheer them up but to help them have a stronger framework for evaluating energy promises.
Smil is able to prove that even if we do our best and innovation is amazing, real change will still take at least 20 years. To me, the long lead times and uncertainties involved in bringing new sources of energy online underscore the importance of pursuing many different paths.
I don't view Energy Myths and Realities as a doom and gloom book. It is sobering about the mistakes that have been made but Smil ends by listing a number of lessons that come out of the mistaken predictions of the past, all of which I agree with.
I think this book will contribute to better energy policies, which is critically important."

Bill Gates

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CIGRÉ SESSION 45

Date > 25th – 29th of August 2014
Venue > Paris, France
http://www.cigre.org/News/CIGRE-Session-45

From the 25th to the 29th of August, the CIGRE Session will gather more than 3,000 senior executives and experts from the power industry from all over the world.

CESI will participate with a dedicated booth (Stand 217 - Floor 2) and will be presenting several technical papers:

- Specific challenges of the development of submarine cable systems for Mediterranean interconnectors with depths up to 2,500 meters;
- Optimizing the electrical design of the Colombia-Panamá interconnection;
- The restoration strategies from neighbor countries: simulation studies and actual tests experience;
- Market integration and storage resources optimization to mitigate the risks of "over generation" from not programmable RES: the Italian perspective.

IV International Symposium on Sediment Management

Date > 17th -19th of September 2014
Venue > Ferrara, Italy
http://i2sm.remtechexpo.com/

The 4th International Symposium on Sediment Management (I2SM) will be held in Ferrara, Italy, during the RemTech Expo. The aim of 12SM is to bring together academics, professional figures and public agencies involved in sediment issues to discuss the state-of-the-art in this sector.
CESI will present a speech on "The problem of sedimentation in the reservoirs of Italian large dams."

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Shaping a Better Energy Future

CESI is a leading global technical consulting and engineering company with over 50 years experience in several areas including: Transmission and Interconnections, Smart Grids, Power Distribution, Renewables, Testing, Certification and Quality Assurance. CESI also develops and manufactures advanced multi junction photovoltaic solar cells for both space and terrestrial (HCPV) applications.

With an annual turnover of more than €120 million, CESI operates in more than 40 countries around the world, with a total network of 1,000 professionals. The company's key clients include Governmental Institutions, Regulatory Authorities, major Utilities, Transmission System Operators (TSOs), Distribution System Operators (DSOs), Power Generation companies, Manufacturers, Financial institutions and International electromechanical and electronic manufacturers. CESI is a fully independent joint-stock company with main premises located in Milan, Berlin, Mannheim, Dubai and Rio de Janeiro.

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