



Itaipu dam and power lines, Brazil
photo Leandro Neumann Ciuffo

While there is a lot of talk about the growth of decentralised power generation, another trend is being largely overlooked: that of regional electricity integration. Remarkably, all over the world countries are connecting up their power systems, to make the best use of their (energy) resources, while at the same time boosting economic growth and promoting international cooperation. World Energy Focus reports on an underreported trend.

Last month Bolivia struck the latest of a string of energy deals with Peru which will see Bolivia selling electricity to its neighbour. This came within a month after agreements for gas export to Peru and for joint development of an integrated energy infrastructure.

The two deals were made just eight months after the energy ministers of the

two countries met for the first time at a World Energy Council summit. Their encounter in Cartagena, Colombia generated a dialogue between the countries that did not exist before.

The example of Bolivia and Peru's energy cooperation does not stand on its own. It represents a development that is taking place throughout the world.

Policymakers are increasingly aware that interconnection allows countries to make the most of their diverse but complementary energy sources and hydrological cycles. It also generates economies of scale, reduces costs, and creates a market for energy trade and for renewable energy. Border regions could also benefit through new jobs gained.

In Latin America interconnection is growing apace. In addition to its deal with Peru, Bolivia this year made accords with Argentina, Brazil, and Paraguay, to invest more than US\$620 million into an electricity interconnection programme. This will result in the installation of 1400 km of

power lines. Bolivia will get to export electricity to its neighbours, proceeds from which could help alleviate poverty in the country.

In the South integration levels have traditionally been high, between Brazil, Argentina, Uruguay and Paraguay, owing to the large cross-border hydro projects such as Itaipu and Yacyretá. In Central America, where renewable energy projects are increasingly coming online, the final link of the Central American Electrical Interconnection System (SIEPAC) was completed late last year. This connects six countries from Guatemala to Panama via an 1800 km line.

SIEPAC has been widely considered a success, but not just for physical lines. "It allows the region to be interconnected not only with transmission infrastructure, but with a system of regional interchange, a regulator, and a regional energy authority," says José Antonio Vargas Lleras, the World Energy Council Vice-Chair for Latin America and the Caribbean.

MOVING IN BIG STEPS

In Africa, interconnection levels also vary, but the continent "is moving in big steps to get interconnected," says Professor Mosad Elmissiry, who heads up the energy programme of NEPAD, the implementation body of the African Union dedicated to promoting economic development and poverty eradication.

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The Egypt to South Africa corridor is progressing well: interconnection already exists among a number of countries but there still are missing links. Interconnectivity is being established or has been planned across Kenya-Tanzania-Zambia; Malawi-Mozambique; Ethiopia-Kenya; and the West Africa power corridors that start from Ghana up to Gambia, Guinea, Guinea-Bissau and Senegal, which also link Nigeria, Mali and Niger.

As for Latin America, the impetus for connecting Africa lies in optimising the use of under-utilised energy resources to plug the increasing gap between energy demand and supply, enhance energy security and promote socioeconomic development.

“We strongly believe that the optimal solution for the energy crisis in Africa is to go regional”

“We strongly believe that the optimal solution for the energy crisis in Africa is to go regional,” says Elmissiry, whose agency is the partner for the Africa Energy Indaba, the Council’s annual regional African event.

Greater connectivity is already having positive impacts. For example, the Ethiopia-Kenya and Kenya-Tanzania lines are creating jobs, raising standards

of living, and upping the involvement of local communities and industries.

Speedy interconnection projects are largely down to the drive and commitment of governments, Elmissiry says, citing Ethiopia as an example. Ethiopia has massive hydropower resources and aims to be a major power exporter.

By contrast, Central Africa is lagging behind in interconnection, due to capacity constraint. The strength of utility companies with sound balance sheets is seen by experts as a key factor for attracting private sector investment and the success of regional integration projects. Elmissiry notes that giving greater autonomy to utilities and setting tariffs on business grounds will help improve the investment case, citing government interference in the form of tariff mandates as a major deterrent for investment. “The more the utilities are made autonomous and given set targets to achieve, the more they will ... achieve their set targets in the most efficient way.”

SEVERE POWER CUTS

For India, and indeed for the broader South Asia region, governments are also increasingly recognising the benefits of interconnection, given the uneven distribution between energy resources and load centres.

An Indian national grid already existed for years, connecting four of the country’s five regions except for the south, which suffered from severe

power cuts. That changed on New Year’s Day 2014, when the southern grid was connected synchronously.

However, this connection, through a single line, still does not have the capacity needed to fully supply the region as the construction of many other lines have been delayed due to technical reasons, planning issues for substations, and right of way issues, says Mohua Mukherjee, a senior energy specialist at the World Bank.

The government is working on additional links for the south. The capacity of the current line will go up in the next six months, and by next March four more lines will be in operation, according to Dr Vinod Garg, a retired former director of Power Grid and a former regulatory official, who now sits on the World Energy Council knowledge network for Financing Resilient Energy Infrastructure.

India needs to increase competition by inviting bids for projects, says Garg, who is also former chairman of the Power Finance Corporation. State-owned power utilities nominate many projects to a select few state-controlled companies rather than opening them up for bidding. “Competition is going to bring in efficiency and lower costs, so that will further improve the system and bring in new lines and at a faster pace,” says Garg.

Elsewhere in Asia, there have long been ambitious plans for grid connections, such as the ASEAN Power Grid

(between Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam) and the North East Asian Super Grid, which would include China and Japan. However, these projects do not seem to be making much progress at this moment.

STEP-BY-STEP

In Europe there is also discussion about a “Supergrid”, but the real progress is made through a step-by-step integration of regional power markets. This started with the French, Belgium and Dutch markets in 2006. In 2012, market coupling was achieved in Central Western Europe (CWE), covering Benelux, France and Germany/Austria. In 2014, this was extended to North-Western Europe (covering CWE, Great Britain, the Nordic countries and the Baltic countries) and South-Western Europe, coupling the Iberian Peninsula. The latest step in European market integration took place in February 2015, when Italy and Slovenia joined.

This market coupling process is about the integration of power trading markets. The EU is working simultaneously on a steady expansion of cross-border interconnections. It has a 10% “interconnection target” for 2020, meaning that EU member states must have at least 10% electricity interconnection with their neighbouring countries. This target is likely to be expanded to 15% after 2020. (<http://bit.ly/1g5jLSr>)

Most experts believe the regional integration trend has by no means finished. For Latin America, more work is needed in linking up Central and South America via a Colombia-Panama connection, and in joining countries in the north – including Peru-Ecuador, Venezuela-Colombia, and Chile-Argentina – where there is little interconnection or the lines are in disuse, notes José Antonio Vargas Lleras.

“The strength of utilities is a key factor for the success of regional integration projects”

Infrastructure aside, more efforts are needed to design simple and efficient schemes of interchange so that countries can take full advantage of the infrastructure, he says. The World Energy Council will continue to explore the issue of regional interconnection at an event in Ecuador this month.

For Africa, too, the process has only just started. “We can’t wait. We have to move in big steps,” says Elmissiry. “To get interconnected, to generate more energy where it is most economical and transport it to where it is highly needed, will accelerate economic development and create jobs. These are the only solutions to achieve peace, stability and prosperity.” ●



“Our strategy is centred around flexibility, agility”

Interview Steve Holliday,
CEO National Grid

What consumers want. That will be the great driving force of the energy business in the future, says Steve Holliday, CEO of National Grid, the British company that operates the gas and electricity transmission and distributions systems in the United Kingdom and northeastern United States. Holliday spoke with World Energy Focus about how his company copes with the “tremendous transformation” in the energy sector.

“This industry is going through a tremendous transformation. We used to have a pretty good idea of what future needs would be. We would build assets that would last decades and that would be sure to cover those needs. That world has ended. Our strategy is now centred around agility and flexibility, based on our inability

to predict or prescribe what our customers are going to want.”

As CEO, since 2007, of a company active on two continents, and being responsible for both gas and electricity transmission and distribution, Steve Holliday finds himself smack at the centre of the whirlwind developments

in the energy sector. And since National Grid is a regulated (albeit publicly listed) company, he can speak from a reasonably independent position. Which makes it fascinating to talk to him.

“What is crucial”, says Holliday, “is what consumers will want. In the past all consumers got the same. One size fits all. Now one size will not fit all. People will want to interact with energy in many different ways.” This is why he warns against people who think they can predict the future. “Some people think they have the answer,

whatever it may be. But I believe there will be different answers for different places, rural and cities, and for different customers. That’s why flexibility and agility are key.”

TAKEN BY SURPRISE

Nevertheless certain trends that are currently taking place are unmistakable, says Holliday. “The world is clearly moving towards much more distributed electricity production and towards microgrids. The pace of that development is uncertain. That depends on political decisions, regulatory incentives, consumer preferences,

technological developments. But the direction is clear.”

For the UK National Grid works with four Future Energy Scenarios (<http://fes.nationalgrid.com>), which are available on the internet and updated every year. According to these scenarios, it is likely that by 2020 small-scale, distributed generation will represent a third of total capacity in the UK. Holliday: “This is a quadrupling in just a few years. It represents a massive increase from the old days of centrally dispatched generation.” Recent government measures in the UK to limit subsidies for renewable energy may affect the timing of this development, says Holliday, but not the trend.

He notes that the speed at which the energy system is changing has taken many people by surprise, including himself. “The amount of solar being added to the system is incredible. 1500 MW in the first three months of this year. That’s the capacity of two power stations. I made a comment to the Energy Minister four years ago that there was little probability we would have 20,000 MW of solar in the UK. Now three of our scenarios have more than 20,000 MW of solar by 2035.”

BIG SYSTEMS

That’s not to say that there will be no need for big networks in the future, Holliday adds. “We need big systems that are able to take power that is spilling over. And you are unlikely to economically balance energy needs without some centrally > see page 4

dispatched generation, whether that's offshore wind, nuclear power or gas. In this sense we see ourselves as a stable long-term business around which new business models are emerging."

What is the future of baseload generation in such a system? "That's asking the wrong question", says Holliday. "The idea of baseload power

**"These companies
are building the apps
that will transform
the energy world"**

is already outdated. I think you should look at this the other way around. From a consumer's point of view, baseload is what I am producing myself. The solar on my rooftop, my heat pump – that's the baseload. Those are the electrons that are free at the margin. The point is: this is an industry that was based on meeting demand. An extraordinary amount of capital was tied up for an unusual set of circumstances: to ensure supply at any moment. This is now turned on its head. The future will be much more driven by availability of supply: by demand side response and management which will enable the market to balance price of supply and of demand. It's how we balance these

things that will determine the future shape of our business."

So nuclear power stations will be used to meet peak demand? "If you have nuclear power in the mix, you will have to think about the size of these plants. Today they are enormous. You will need to find a way to get smaller, potentially modular nuclear power plants. I suspect they are going to be associated with fixed demand for businesses rather than household consumers in future, for demand that's locked in. For small consumers you need flexibility."

ENERGY INCUBATOR

How much of a problem is the integration of intermittent renewables in Holliday's view? "It's simplistic to only look at storage. We will have the intelligence available in the system to ensure power is consumed when it's there and not when it's not there." This is what software companies are working on at the moment, says Holliday. "We have a partnership with New York University where we support a programme for startups. Of the 30 startups we are supporting, 25 are software companies. And this is called an energy incubator!"

These companies, says Holliday, "are building the apps that will transform the energy world, aggregating data, marrying supply and demand. It is a really exciting space to be in." As an example he notes that "there will be massive amounts of data available from vehicle charging stations in the future.

Intelligence is going to decide how this will be used."

Does this mean network operators are currently overinvesting? For example, do we really need to build big new power lines to transport electricity from offshore wind power farms, as some people are saying? Holliday: "It depends. If you look at Germany, they will have huge offshore capacity in the north and a lot of the consumption in the south. How else can you match that than with transmission lines? But in the UK and Northeastern US, the challenge is to ensure we are smart and limit the building more capacity and sweat our assets."

ELECTRIFYING

In the UK total electricity demand is expected to stay flat until the mid-2020s. Then it will take off again as "enormous amounts of heat and transport are likely to be electrified". He is convinced "cars will go electric". So will a major portion of heat. "As the World Energy Council's Jazz and Symphony Scenarios show, for the moment you can't square the Energy Trilemma without fossil fuels. But in the future what you really need is electricity." So could the likes of Shell, BP and Total move into electricity? "If you want to be an energy company ten years from now, it's hard not to think about that."

Interestingly, the UK and Northeastern US have very different market designs. The UK retail market is competitive and fragmented. "In the Northeastern US",

says Holliday, "95% of our customers want us to procure their power and gas and simply charge them the wholesale costs." The advantage of the US structure is that "it allows us to really focus on reducing our customers' demand without implications for our profit. In a competitive retail market as an energy supplier where volume drives profits it is difficult to incentivise using less energy." Yet in both markets, new entrants will emerge that will transform the business, says Holliday. "They will ask consumers what they will really value. 100% reliability? A low price? And they will find or design a product that is suitable." ●

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India eyes 175 GW renewables and plans Green Corridors

India is planning to increase its renewable energy generation to 175 GW by 2022 to meet growing energy needs. The majority of this capacity, 100 GW, will come from solar, marking a five-fold increase from the previous government's target.

The Indian Minister for Power and New and Renewable Energy, Piyush Goyal, announced the country's new renewables target in late August, ahead of the finalisation of the country's emissions reduction plan to the UNFCCC, the United Nations climate commission. India's "Intended Nationally Determined Contribution" (INDC) is expected to be made in the first week of September.

Renewable energy currently provides less than 6% of India's energy mix. A recent study by Deloitte and the Confederation of Indian Industry has found that not even 1% of India solar potential has been tapped.

In addition to its renewable energy plans, India is also carrying out an ambitious renewable energy transmission network programme. Power Grid Corporation of India has recently operationalised the second phase of the so-called "green corridor" programme, and has allocated a transmission project in Andhra Pradesh, while completing the tendering process for projects in Madhya Pradesh and Karnataka reports the international energy website CleanTechnica. ●



Japan has switched its first nuclear reactor back on amid massive public protests. Nuclear power is more unpopular than ever among the Japanese, but at this moment "nuclear energy is inevitable for Japan," according to Teruaki Matsumoto, Chair of the Japan Energy Association (JEA), the World Energy Council's national member committee. This does not mean there will be a Japanese "nuclear renaissance".

Kyushu Electric Power turned on its Sendai nuclear unit in the south of the country on 11 August following new safety checks by the Nuclear Regulation Authority. The utility expects this first reactor to reach full capacity on 31 August. A second reactor is due to restart in September.

The reactor was switched on amid massive public protests against nuclear power, more than four years since the triple meltdown at Fukushima Daiichi forced the country to shut down all 48 of its nuclear fleet. Recent opinion polls show that four years on, a majority (48-57%) of Japanese citizens are still opposed to or dislike restarting nuclear reactors.

Critics accuse the government of bowing to pressures from pro-nuclear industry groups. However, many local residents close to the sites are in favour of a restart due to job opportunities. Despite public opposition, Prime Minister Shinzo Abe in April approved the restart, pointing to the need to reduce Japan's oil and natural gas imports and its reliance on thermal power, which emit high levels of CO₂.

Since Japan mothballed its entire nuclear fleet, its fossil fuel bills, electricity rates, and carbon emissions all went up sharply, as a result of higher fossil fuel imports to meet the shortfall left by nuclear, which used to supply 30% of the country's power.

Inspection team visits Daiichi 2 Fukushima

Restarting nuclear is therefore crucial for the country's energy self-sufficiency, according to the JEA. Japan's primary energy self-sufficiency was around 20% in 2010, while this dropped to 6% due to the nuclear shut-down. Its newly established energy mix for 2030 – as set out in its Basic Energy Plan last year and confirmed this July – aims to meet 25% of its energy needs from own resources.

"To attain this goal, nuclear energy is inevitable for Japan," says Teruaki Matsumoto, Chair of the JEA.

However, the restart of the first nuclear plant will not necessarily spell a nuclear renaissance for Japan given uncertainties such as the timing and number of units to follow Sendai, and whether ageing plants should be scrapped at 40 years or having their lifetime extended to 60 years.

That's even apart from the question of how feasible the building of new plants would be. Before Fukushima, Japan had ambitious plans for new nuclear build. Further restarts, let alone a revival of nuclear power, would require public opinion to be more favorable to nuclear, while nuclear power plant owners would have to try harder to create understanding and earn support from the public, notes Matsumoto. ●

NEWS IN BRIEF

MUSLIM SCHOLARS URGE FOLLOWERS TO TACKLE CLIMATE CHANGE

Islamic scholars from 20 countries have issued an "Islamic Declaration on Climate Change", calling on the world's 1.6 billion Muslims to commit to cutting greenhouse gas emissions. The document implores richer Islamic nations, many of which are oil-rich, to take the lead in reducing carbon and to financially support poorer nations to tackle climate change. The declaration posits climate action as a moral and religious duty, echoing Pope Francis' encyclical in June.

EBRD FUNDS TURKEY RENEWABLES PROJECTS

The European Bank for Reconstruction and Development (EBRD) is boosting financing for Turkey's renewable energy sector. The Bank is providing new financing of \$180 million to two national Turkish banks to fund mid-sized renewable energy projects. Since 2009 the EBRD has invested E2.2 billion in nearly 60 renewable energy projects. The new injection of finance follows the country's pledge to generate 30% of its energy from renewables by 2023.

CORRECTION

In the July issue of World Energy Focus, we wrote that China will reduce its greenhouse gas emissions between 2005 and 2020 with 60-65 percent. That is not correct. China has indicated it intends to reduce its carbon emissions per unit of GDP with at least 60 percent.

US Clean Power Plan future of nuclear and coal uncertain



The Obama Administration's Clean Power Plan, hailed as the “single most important step” the US has taken on stemming global climate change, has been regarded as good news for nuclear power and bad news for coal. But this does not mean nuclear has a bright future in the US or that coal is doomed.

The Clean Power Plan, unveiled on 3 August by the US Environmental Protection Agency (EPA), is the first time the US has put national limits on carbon emissions from the power sector. It requires overall emissions from power plants to be reduced by 32% from 2005 levels by 2030. This would keep 870 million tonnes of CO₂ out of the atmosphere, equivalent to taking 166 million cars off the road.

The plan requires each state to choose its own strategies to implement a specific reduction target. It also offers incentives, in the form of credits and allowances, for states to meet their goals early or to exceed their targets. Over the last decade the US has already reduced its emissions by about 18% as a result of switching to natural gas, the recession, and the massive gains in energy efficiency, meaning that

roughly half of the targeted reduction has already been met.

Observers agree that the new “ruling” is good news for renewable energy. The EPA expects that it will “drive more aggressive investment in clean energy technologies,” resulting in 30% more renewable energy in 2030 and continuing to lower its costs.

In the current competitive market “most power generators will pick natural gas over renewables if they can,” says Barry Worthington, Executive Director of the United States Energy Association, a national member committee of the World Energy Council. But states will almost certainly have to boost renewables to meet their targets. Worthington is confident that this is doable. Innovations in smart grid technologies will happen, mitigating the

grid complications associated with the expansion of renewables, while helping operators better predict and handle load fluctuations. “We’ve got pretty smart engineers and we’ll figure out how to do it.”

In late August President Obama reinforced his support for clean energy by announcing a swathe of initiatives to promote renewables, energy efficiency, and innovation in the household energy sector. This initiative received a lot less attention than the Clean Power Plan, but it is quite significant. It includes a US\$1 billion loan guarantee and new guidelines for distributed energy projects.

In the Clean Power Plan nuclear energy is treated more favourably than what many had anticipated. The Nuclear Energy Institute in the US issued a bullish statement highlighting the value that the Plan has placed on nuclear, noting the rule says that new nuclear capacity, like renewables, “can clearly replace fossil fuel-fired generation and thereby reduce CO₂ emissions.” Nevertheless, the future of nuclear power in the US is uncertain. Nuclear units are already having difficulty competing with natural gas in the power markets.

For coal, the future seems to be bleak. Even before the new rule was announced, it was estimated that in the next five years, a large number of existing plants – accounting for 75,000 to 100,000 MW – would have to retire due to various EPA regulations,

reduction in demand, and price competition with natural gas.

However, not all is lost for coal power. Many believe that by 2020 the EPA will require new gas-fired power plants to install carbon capture and storage (CCS). Coal plants will also need to have CCS, but if gas plants have the same requirement, the economics may turn to coal's favour. This is because more CO₂ can be captured from coal plants than from gas plants. “If the coal industry can survive for the next five years, there’s a good chance for coal to be more competitive,” says Worthington. ●

Honduras makes further moves in solar

Operations have begun in Honduras’ newest solar park. The 61 MW, Aura II PV plant will generate 109 million kWh per year, enough to supply 80,000 families and reduce 40,000 tonnes of CO₂ emissions per year. This follows the start of operations of a 145 MW plant at Nacaome, the largest PV park in Latin America.

The electricity generated will be delivered to the national utility Empresa Nacional de Energía Eléctrica (ENEE) through a 20-year power purchase agreement. ●

Brazil’s energy investment plan unveiled

Brazil’s President Dilma Rousseff has announced an investment plan of US\$54 billion into the country’s energy sector over the next three years in a bid to guarantee supply and cut prices. Of this amount, 62% will be for generation – with the priority on renewable energy – while the rest will be for

transmission. The announcement on 11 August came a week after heavier rainfall had eased the country’s hydropower crisis. Electricity prices in Brazil have risen by about 40% this year after the introduction of a new tariff system in response to the hydropower crisis. ●

How big is ENI’s new “supergiant” gas field?

Italian state-owned oil company ENI has discovered what it calls a “supergiant” gas field in the deep waters off the Egyptian coast. With 30 trillion cubic feet (tcf) of lean gas in place (or 5.5 billion barrels of oil equivalent), this “is the largest gas discovery ever made in Egypt and in the Mediterranean Sea and could become one of the world’s largest

natural-gas finds”, ENI says in a press release. Note that the world’s largest gas field – Qatar’s North Field/Iran’s South Pars – holds 900 tcf. Apparently, ENI is expecting additional finds on top of this. Egypt consumes about 1.68 tcf per year, so ENI’s find will be able to satisfy Egypt’s gas demand for many years, and will possibly turn the country into a major gas exporter. ●



The Polish energy transition: regional integration can help

Like many countries in the world, Poland aims to reduce its heavy reliance on coal power. To this end the Polish government has proposed an ambitious rollout of nuclear power and renewables. The Polish committee of the World Energy Council believes that further integration of the Polish energy system with that of its neighbours in the EU will be an important factor in the success of Poland's energy transition.

In August the Polish Ministry of Economy revealed a new draft Polish Energy Policy to 2050, showing that the government is determined to reduce the country's dependence on coal. It includes one 'basic' scenario and two alternative ones. All the scenarios lead to reduced use of brown and black coal and more nuclear power and renewables.

In the basic scenario, which assumes the continuation of current trends and the realisation of decisions already taken, nuclear power would contribute 45 TWh per year in 2035 as well as in 2050, in line with the government's plan to build two nuclear power plants of 3000 MW each. Renewables would grow to 61 TWh in 2035 and 73 TWh in 2050.

Total electricity demand in 2014 was around 159 TWh, but this is expected to grow to 221 TWh by 2035 and to 223 TWh by 2050. Lignite and coal, which provided around 135 TWh of power in 2014, would drop by 27% in 2035 and 35% in 2050.

LAGGARD

This is an ambitious transition for a country that has a reputation as being obstructionist with regard to EU climate policy. The EU has committed to reducing CO₂ emissions by 40% in 2030, although this has yet to be translated into national targets. But Poland's reputation as climate laggard is not really substantiated by the facts. Poland has lower per capita CO₂

Świnoujście LNG Terminal

emissions than most West European countries. Moreover, it grew its GDP by 12 times while CO₂ efficiency increased by 62% since 1990. Poland also reduced its dependence on coal from over 95% to over 80%, according to figures from Eurostat, the EU statistical agency.

All this while Poland is faced with unique challenges: it wants to avoid becoming increasingly dependent on Russia for energy supply, so it uses quite little gas. It also has one of the highest economic growth figures in the EU.

The new government proposals confirm that Poland is determined to contribute its fair share to reducing greenhouse gas emissions. The question is, can it succeed? And at what price? The World Energy Council Polish Committee believes that speeding up the integration of the Polish energy system with those of its neighbouring countries in the EU could make an important contribution to the national plan.

In electricity, Poland's interconnections with Germany are causing the country more problems than joys. Surges in power flows coming over the border due to excessive German export of wind and solar energy frequently destabilise the Polish grid. These unscheduled flows are forcing Poland's grid operator, PSE, to re-dispatch power around its network to avoid blackouts caused by overloads.

They are also restricting the available capacity for commercial trading at the Polish borders (both in import and export). According to the Polish World Energy Council committee, in 2011 Poland had net exports of 4.5 TWh of electricity. Last year, this had turned into net imports of 2.3TWh.

FLOW-BASED

However, rather than restricting interconnection, the problem should be addressed by better regulation of cross-border flows, says the Council's Polish Member Committee. This can be done through a system called 'flow-based allocation'.

Flow-based allocation allows the coordination of cross-border capacity in an entire synchronous grid, so that uncoordinated flows are limited. Much of Western, Northern and Southern Europe – an area from the Nordic countries to the Iberian peninsula, including Italy and Slovenia – is already integrated into a single electricity market which operates with flow-based allocation.

PSE concurs: it is investing in expanding both domestic and cross-border transmission capacity. A 500-megawatt (MW) interconnection with Lithuania called LitPol is being brought online end of this year. Interconnection capacity with Germany is also being expanded.

The greater market will make it possible for Poland to import renewable energy from Germany in a more controlled way – as well as export its own reliable

baseload power to its neighbours when they need it.

QATARI GAS

Poland is also planning to build three new gas-fired power plants totaling 1.5 GW in capacity, due online by 2019. These plants will help cut CO₂ emissions, but they will also make it necessary for Poland to import more gas. Development of domestic shale gas has so far failed to materialise in Poland.

Here too market integration provides a solution. New pipeline interconnections with Germany and the Czech Republic have already helped to increase import options, but Poland is looking further afield. A liquefied natural gas (LNG) receiving terminal, built by Polskie LNG, is soon expected to come onstream at the Baltic Sea port of Świnoujście in north-western Poland. A contract for cargoes of Qatari gas will meet around 10% of national demand.

As in the case of electricity, gas market integration not only helps to increase energy security and reduce emissions, it also provides new commercial opportunities. Gaz-System, the owner of Polskie LNG, hopes to use the 5 bcm per year terminal as a regional hub through which German, Czech and Slovak importers can access the global LNG market. Thus, Poland's energy transition, combined with further regional integration could lead to a win-win-win on all parts of the energy trilemma: in energy security, the environment and the Polish economy. ●

EVENTS

Executive Assembly

**United Nations Conference Centre
Addis Ababa, Ethiopia
26–30 October 2015**

The World Energy Council's annual meeting, welcoming the Council's community and representatives from the African and global energy sectors, will discuss sustainable energy systems on national, regional and global levels. Together with more than 20 Energy ministers that have already confirmed their attendance, leaders from business, finance and academia will share best practice and identify solutions to the energy trilemma during dedicated sessions including the **Trilemma Summit, Future Energy Leaders' Summit**, and the private invitation-only **World Energy Leaders' Summit**. The event is hosted by the Prime Minister of Ethiopia.

<http://bit.ly/1SopMvr>

REGIONAL EVENT

**South American Energy Forum
10–11 September
Quito, Ecuador**

The World Energy Council will be hosting its 2015 Latin American regional meeting in Quito, Ecuador on 10 and 11 September. The meeting will be held at the headquarters of the Union of South American Nations (UNASUR) who will co-host the event. It will include top-level participants from both the public and private sector. It is expected that UNASUR ministers will approve the principles of the relaunched Latin American energy strategy during the meeting which will be opened by the President of Ecuador. The event will include discussions on energy scenarios and the role of regional integration.

Contact: *Cristina Morales*
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MEMBER COMMITTEE EVENTS

International Beirut Energy Forum

**Beirut, Lebanon
9–11 September 2015**

With continuous oil price fluctuations, how is the world's sustainable energy sector being affected? What are the dynamics of fuel-based economy and sustainable energy development? Energy ministers and leaders from around the world will look at these and other issues at this platform for discussion of topics related to renewable energy sources, energy efficiency, and green buildings in the Middle East and North Africa (MENA) region.

Catch up on last year's event at:
<http://bit.ly/15InlgB>
Contact: *Pierre El Khoury*
pierre.khoury@lcecp.org.lb

International Energy Symposium

Seoul, Korea - 18 September

In the context of rising interest on Eurasian energy integration initiatives and in line with the policies proposed in respective countries of the Eurasian region such as China's 'One Belt One Road', Korea's 'Eurasian Initiative' and Russia's 'New Eastern Policy', the symposium aims to define what the prospects and goals of the initiatives are and how to work harmoniously to achieve the goals under the theme of "Development of Cooperation for Establishment of Eurasian Energy Network".

Website: <http://bit.ly/1les7Bs>
Contact: *Suji Kang (강수지)*
Email: program@weckorea.org

Energy Demand & Climate Change: a Mediterranean nexus

Milan, Italy - 15 October 2015

Ahead of COP21 representatives from institutions, academia and policy discuss the opportunities and challenges for sustainable development related to climate change and global warming.

Contact: *Agata Carone*
Website: <http://goo.gl/Hbjtia>
E-mail: agata.carone@wec-italia.org

SEE MORE COUNCIL EVENTS AT
www.worldenergy.org/events/future

ABOUT THE COUNCIL

The World Energy Council has been at the forefront of the energy debate for nearly a century, guiding thinking and driving action around the world to achieve sustainable and affordable energy for all. It is the UN-accredited energy body and principal impartial network, representing more than 3,000 organisations – public and private – in almost 100 countries.

Independent and inclusive, the Council's work covers all nations and the complete energy spectrum – from fossil fuels to renewable energy sources.

JOIN OUR NETWORK

Join the debate and help influence the energy agenda to promote affordable, stable and environmentally sensitive energy for all. As the world's most influential energy network, the World Energy Council offers you and your organisation the opportunity to participate in the global energy leaders' dialogue.

Find out how you can:

- join a Member Committee;
 - become a Project Partner, Patron or Global Partner;
 - take part in annual industry surveys, study groups and knowledge networks;
- by visiting our website and contacting our team on: <http://www.worldenergy.org/wec-network>

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2016 World Energy Congress

**Istanbul, Turkey
9–13 October 2016**

Under the theme "Embracing New Frontiers", the 23rd World Energy Congress is expected to bring together up to ten thousand participants, including 100 energy Ministers.

You can register at the official congress website
<http://www.wec2016istanbul.org.tr>
Follow the Congress on Twitter:
<https://twitter.com/WECongress>

