

IEEE Summit Report: Towards Secure Green Energy

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Disclaimer:

This report was independently commissioned by IEEE for the purpose of offering an overview of the dialogue that took place during the IEEE Summit on Towards Secure Green Energy in November 2015. The report contains the views and interpretations of the author, and in this respect, does not represent an IEEE summary of the IEEE Summit.

Opening remarks



Marko Delimar

Chairman, IEEE Ad Hoc Committee on Engagement in Europe.

Opening the summit, **Marko Delimar**, who chairs the IEEE Ad Hoc Committee on Engagement in Europe, began by telling the 100-strong audience that the event was “particularly timely” as it was happening as the European Parliament was voting on its Energy Union report, and after conclusions recently adopted by EU member states on climate finance.

The EU’s climate finance pledge is in line with the \$100 billion per year pledged by developed countries for the post 2020 period, and will be important to provide some direction and ambition.

“The IEEE gathering,” Delimar said, “comes ahead of the much-awaited 21st Conference of the Parties to the UN Framework Convention on Climate Change, to be held in Paris from 30 November to 10 December.”

Energy, the subject of the summit, has become an “intrinsic” part of our lives, adding, “it powers our cell phones and the alarm clock that woke me today and the vehicles we drive. It is as common as water and air.”

“But,” he went on, “energy also comes at a price.”

He added, “In recent years, the pendulum has swung from carbon intensive supplies of energy to renewable sources. This shift is something that not only do we want but need. But energy involves cost and the transition to a carbon-neutral world is no exception.”

The Summit, he reminded participants, was the second Brussels-based high level discussion bringing scientists and policymakers together with the main aim being to make all more aware of the important issues they face.

Keynote address



Karl Falkenberg

Senior adviser for sustainable development at the European Political Strategy Centre, European Commission.

In a wide-ranging keynote address, Falkenberg first spoke of his own formative years in the 1950s when, he reminded participants, the world "looked very different."

"Back in 1950s when I grew up there were 3 billion people living on the planet. We thought the sky was the limit and we had answers to all our energy questions, that energy would always be plentiful, safe and available to everyone.

"We have learned a lot over the years and, today, we have a global population of some 7.5 billion that is fast on the way to becoming 10 billion. Such huge population growth means we will need to considerably rethink our policies on energy if we want to survive."

There are "limits" to the world's natural resources and the public is increasingly becoming aware of the limitations of the blue planet. There was a need to be more efficient in utilising natural resources, he noted, adding, "In the past some of our natural resources have not been realistically priced and much the same goes for energy. Today, for example, there is not a single form of energy that is not subsidised."

"The way we've produced energy in past was to ensure a plentiful supply but insufficient thought was given to using less energy or using it more intelligently such as is the case with carbon capture and storage."

Falkenberg, who is a veteran of the European Commission with extensive experience in trade and environmental policies, highlighted the value of the European Energy Union, which is designed to ensure that Europe has secure, affordable and climate-friendly energy.

This argues that "wiser" energy use in fighting climate change can be both a spur for new jobs and growth and act as an investment for Europe's future. Falkenberg described the EU's ongoing work on the Energy Union as a "stunning new approach" because it puts the emphasis on energy savings, with Energy Efficiency being an energy source on its own.

"Energy is an intrinsic part of our lives but it comes at a price."

Marko Delimar

He said, "What we are good at in Europe is energy efficiency and remember that less energy means less cost and more competitiveness."

But he cautioned that the notion of cheap energy is a "fantasy" that is one that draws the focus away from things that "we could be doing better."

When it comes to the transition way from traditional fossil fuel-based forms of energy the current "champion" is Sweden where an estimated 40pc of its energy mix comes from renewables.

"This," commented Falkenberg, "is remarkable when we think that as recently as the 1990s we were still hearing that no more than two or three percent of the energy mix would come from renewables. Clearly, the change is happening and is happening rapidly."

Even so, he remains "convinced" that yet more solutions can be found for energy savings, saying, "we need to be smarter in both the way we produce energy and use it."

Given that his whole career had been spent in the EU, he said it should not be surprising that he believes the Union has a role to play.

"But," he added, "This it is not just about regulation but the need to start thinking about making Europe and the world more sustainable."

While there is a need to "fundamentally change" the way we consume and produce energy, he advocates "more closely" considering the social and even cultural implications.

"Everything needs to come together."

One example he cited is with emissions in the transport sector which, he said, are responsible for "a lot of the bad we have done to the air we breathe today."

"We need to look holistically at all solutions, to make sure we are better educated on energy issues. But we also need to attract more engineers and ensure that investment is sufficient. New technologies offer fantastic opportunities but only provided that they pass a proper sustainability test. Yes, we need innovative solutions to meet our energy challenges, but solutions that have also been tested as to their sustainability, both socially, economically and culturally."

Q&As

“The future can be bright and I am not at all pessimistic.”

Karl Falkenberg

In a question and answer session, Falkenberg was asked about nuclear power and why the European Commission did not offer “more robust” support for the industry.

On this, he said, “I am not for or against any one form of energy, but we do need to look at public acceptance and take into account, for example, that the largest economy in Europe (Germany) has decided to phase out nuclear energy.”

“Public acceptance in Europe for nuclear is not on the increase and we need to take note of this.”

He added, “I say let there be competition in the energy sector but let’s also think more about energy efficiency and less about volume. What it’s about is making the whole energy system more intelligent.”

With Europe facing stiff competition in the energy sector it was necessary to emphasise the things that Europe “is good at”, in particular exportation of green, energy efficient technologies.

“This,” he said, “is where we are a world leader and is what everyone from Latin America to China looks to us for. This is our strength and we should focus on that.”

Looking to the future, Falkenberg would like to see more of the EU budget ploughed into renewable energy industries, saying this would also make Europe less reliant on importing energy.

While he recognises that energy efficiency currently represents a “major challenge”, he went on, “The future can be bright and I am not at all pessimistic. A global population of 10 billion can enjoy life on this planet of ours but we have to also accept that the future will be very different and this is going to take a big transformation in energy.”

To view the full content of the opening remarks: <https://vimeo.com/147439010>

Panel 1 - When will green become the new normal?



Hans ten Berge

The energy sector has embarked on a major period of change, not least in how we produce, consume and transport energy - consumers are at the heart of this change. But there is growing awareness of future scarcity in energy sources and the renewables sector has subsequently witnessed strong growth.

Speakers agree that smart metering and other similar initiatives can only be successful if consumers are properly empowered and informed.

According to **Hans ten Berge**, secretary general of the Union of the Electricity Industry (EURELECTRIC), they must also have trust in the system.



Marie Donnelly

Whether Europe should continue supporting green energy was one of the questions posed in the opening panel, “When will green become the new norm?”

Most panellists were in agreement that the question was timely given current interest in promoting and financing renewable energy, plus the European Commission’s recently-announced energy proposals for 2030.

For ten Berge, it should not be about “picking winners and losers” in energy but, rather, creating a “framework” that enables competition between RES (renewable energy sources) technologies.



James Luger

The regulatory framework should, he argues, be developed to ensure that investment in “mature technologies” takes place based on “signals” from the relevant markets.

He adds, “At the same time, we need to ensure strong research investment. The EU wants to be Number One in renewables and this should also mean being a technology leader.”



Tomas Gomez San Roman

Improving network connections, he told the audience, is also necessary in order to ensure that greater volumes of renewables can be accommodated. Policies should also be immediately reformed to make the market “fit for RES and RES fit for market.”

From 2020, subsidies should be progressively phased out and the ETS should, he believes, become the “main driver” for mature low carbon technologies. There’s “no problem” with competitiveness in the renewables sector but, rather, the prices that consumers in some countries, such as Belgium, pay for their electricity.

“Ask a teenager the cost of their mobile calls and they will know the answer. Ask a householder about their energy bills and they probably don’t have a clue.”

Marie Donnelly

“The average annual electricity bill for a Belgian consumer is €800 and a new surcharge will add €400. It is therefore worthwhile to reflect on electricity bills.”

Marie Donnelly, director of renewables, research and innovation, energy efficiency with the European Commission’s energy directorate, opened her remarks by reminding the packed audience that, initially, the emphasis had been on developing new technologies and setting environment-friendly targets.

“With 164 countries around the world now having targets we can safely say that targets have been a very useful tool,” she said. “However, we have now entered a second phase where we need to think outside the box in order to reduce the cost of new energy technologies.”

One of the advantages of renewable energy, she said, is that it “empowers” the individual consumer to have a greater say in what source of energy he or she prefers. “It does not take a lot, for instance, for someone to have a solar panel installed on the roof of their home,” she said.

The big issue for Donnelly, though, is how the customers are able to manage the volume of energy consumed. “Ask a teenager about the cost of the calls they are making on their mobile phone and they will probably know the answer. Ask a householder about their energy bills, however, and they probably do not have a clue,” said Donnelly.

For Donnelly, the debate should therefore be consumer-led, adding, “We need to focus less on how our energy is sourced - via coal, gas or renewables - and more on how that energy is actually delivered.”

She believes better and speedier information on energy consumption is needed, adding, “Why, for example, do we in Belgium only get a heating bill once a year, and then after the winter? By then, it is too late to manage consumption levels.”

One solution, she believes, is the smart meter, an electronic device that records consumption of electric energy in intervals of an hour or less and communicates that information to the utility for monitoring and billing. But even here there is need for action, with a much faster roll out of smart metering systems than is currently the case.

Her comments are partly endorsed by a third panellist, **James Luger**, a senior manager with the UK-based Office of Gas and Electricity Markets (Ofgem),

who emphasised the importance of consumer engagement and “flexibility.

“It is important,” he told the summit, “when it comes to the energy transition that consumers themselves are included in the ‘wheel’. The cost of moving from fossil fuel-led energy sources to renewables will not be insignificant so the public must be willing participants and they must also be able to understand how it all works.”

One of the aims of the European Commission’s climate package is not only to reach a 20% share of renewable energy generation in EU energy consumption by 2020, (rising to 27 percent by 2030) but to do so in a “cost-effective and economically efficient manner.”

Luger, who is also co-chair of the Council of European Energy Regulators (CEER) Sustainable Development task force, highlighted findings of two recent CEER studies relating to this.

One shows that the proportion of gross electricity produced receiving RES support currently differs widely from one European country to another ranging from 0.1% in Norway to 55.9% in Denmark, with an average across EU member states of 12.6%.

“Levels of subsidies for RES support are one of the things that stood out from both studies,” he said. “There is clearly wide variation.”

Like ten Berge, Luger agrees that it is not so much about picking winners adding that “everything” has a role to play to support the emergence of decentralised energy. “It isn’t about looking 50 or 60 years from now but, rather, how we get to a point where energy is both renewable and affordable.”

A fourth speaker, **Tomas Gomez San Roman**, of Comillas University in Spain, reinforced the message about “flexibility” but also insisted that the debate should not stray too far from the over-arching issue of achieving significant reductions in CO2 emissions.

The academic said, “It should all be about decarbonisation - this is the biggest challenge we face. We have seen the growth of a very big renewables industry, but things like carbon capture and storage and pricing are going to be crucial.”

He believes these issues, along with public engagement in the energy transition, will be the “next big challenges.”

“It should all be about decarbonisation - this is the biggest challenge we face.”

Tomas Gomez San Roman

To view the full content of this panel: <https://vimeo.com/148281412>

Panel 2 - How reliable is reliable enough?



Samuele Furfari

The security of energy supplies is currently a huge issue in Europe, not least because of its continued dependency on foreign primary energy sources from countries like Russia.

But if Europe's energy mix is to embrace a greater share of renewables, will this have repercussions for reliability of supply?

In the past electricity supply has generally been guaranteed, but can the same be said of energy sourced from renewables, whose weather-dependent production is by its very nature variable and unpredictable?



Goran Strbac

The debate is timely as it comes in the wake of a report, recently adopted by the European Parliament, on what the future Energy Union should look like.

The report supports a renewables rich system but also says energy should be properly managed and cost-effective. It should not result in increased energy costs, energy poverty or de-industrialisation.

It also underlined that part of the EU's energy strategy should fully tap all available Europe's energy resources which contribute to the ultimate goal of a low-carbon economy.



Frauke Thies

But the question remains: can a renewables-based system have the same reliability levels as one sourced by conventional fuels?

Samuele Furfari, a policy coordinator in the energy directorate at the European Commission, sought to address the reliability issue by suggesting that renewable sources of energy can never be regarded as totally reliable.

"Reliability is not a problem, of course, when it comes to fossil fuels and other traditional sources of energy," he remarked. "But the big problem is that we need electricity today and I have to seriously question whether things like solar and wind can be relied upon to produce the same levels of dependability as conventional sources of energy?"



Jean Verseille

The question, he argued, is particularly relevant with the EU emission-reduction targets looming on the horizon.

"What happens if the wind does not blow for ten days? If it does not blow in, say, Belgium, it is not likely to blow in neighbouring Netherlands.

“What happens if the wind does not blow for ten days?”

Samuele Furfari

When it comes to energy production, that is a problem and it is one that we are not going to solve overnight.”

To keep the lights on in today’s power systems, flexible generation is imperative, he believes. Agile capacity is needed, for example, to shave peaks in electricity demand and to fill gaps of wind and solar output.

One possible solution, suggests Furfari, could be smart power plants. Smart power generation power plants are suitable for various tasks and provide back up the intermittent output of wind and solar energy. “We need to introduce more reliability in the system. We have the technologies which are helping but this still won’t solve the problem of wind or solar.”

“No-one should imagine that policymaking can solve everything”, he suggests, adding, “We must give people the freedom to act and accompany that with strong technologies. The role of the EU should not be to intervene but set a framework. We cannot decide when a baker cooks his bread but help can him to reduce his consumption where and when necessary.”

Another panellist, **Goran Strbac**, of Imperial College, London, advocated a “pro-European” rather than “EU member state-centric” approach to the question of energy security and reliability.

He said, “The reliability question is linked to economics and, for me, it is all about costs and we need to develop a more competitive market.”

Like several other speakers, he is a big believer in smart grids, the system which includes a variety of operational and energy measures including smart metering and smart appliances.

Microgrids - electricity distribution systems containing loads and distributed energy resources that can be operated in a controlled, coordinated way - could be another solution in promoting reliability.

“There is big scope in the area of smart grids to enhance security of supply. Europe has an edge here over the rest of the world and can be a game changer. Micro grids also have massive potential but we need much more money to do the work. We in Europe are leading in these areas but I have to say that there is still a massive way to go.”

Another keynote speaker, **Frauke Thies**, executive director of the Smart Energy Demand Coalition (SEDC), argued that consumer choice and empowerment were just as important as reliability.

She said, “Of course, we need full reliability because in this day and age no

one should be cut off involuntarily. But some consumers want full control over their energy sources and consumption, whereas others do not really bother that much.”

“For me, it is all about costs.”

Goran Strbac

“I believe what we are looking at is a world where consumers, either actively or passively, will steer their consumption and this is where technology will play an important role.”

In some ways Thies believes technology has already overtaken regulation, adding, “A lot is already technically possible - the picture is astonishing.”

Calling for strategies to educate the public on managing consumption, she believes, one relatively simple thing is more user-friendly billing. “If people only see their energy bills once a year, and then at the end of winter, where is the incentive for them to change their behaviour?”

While she questions whether wide public appetite exists for additional billing information, she points out that it is technically possible to help consumers adapt their energy consumption.

“The idea, though, is to make it easier for people to change their behaviour when it comes to consumption.”

“Ensuring that network capacity is sufficient to meet demand is crucial.”

Jean Verseille

Ensuring that network capacity is sufficiently reliable to meet demand is “absolutely crucial” for **Jean Verseille**, deputy CEO of Réseau de Transport d’Electricité in France.

He cited an example from one area of France last year where, during a period of excessive demand, consumers were sent text messages asking them to reduce consumption. “On this occasion, it actually worked,” he said, adding, “but that was only possible with the support of local media and politicians.”

To illustrate his argument he presented a graphic showing how an electricity grid sourced entirely from renewable energy might look by the year 2050, pointing out that the cost of creating a 100 percent “green” system would amount to between €245bn to €345bn.

Another example of how citizens are increasingly managing consumption came during a question and answer session when one participant from the floor referenced a case study in Belgium in which 50,000 Flemings had signed up to an energy cooperative, which provides them with a more transparent tariff structure.

To view the full content of this panel: <https://vimeo.com/148275171>

Panel 3 - Green, yes! Reliable, yes! But who pays?



Mukund Bhagwat

It's known as the energy "trilemma" - balancing sustainability with security of supply and competitiveness, the three key elements of a successful transition to a low carbon economy

The question is how to square the apparently competing demands of the different legs.

The European Commission estimates that the transition to a low carbon economy will require an annual global investment of up to €200bn in networks and energy efficiency.

There is a consensus that when it comes to moving to a greener economy there is probably no technological challenge that Europe cannot meet.

It is also agreed that Europe can make energy supplies reliable but the debate, as with so many, often returns to one thing: cost.

Opening the final session, **Mukund Bhagwat**, representing the International Federation of Industrial Energy Consumers (IFIIEC), considered that there is an imbalance in the "trilemma", with Europe's industrial competitiveness the one dimension that is losing out.

"Currently," he said, "there is too much focus on sustainability and reliability and it is important that the industrial competitiveness and cost elements are not forgotten."

What Europe needs, he argues, is not so much a new policy on renewable energy but, rather, a more effective industrial policy.

"We have to be very careful with our policy objectives," said Bhagwat. "Of course, renewables policy is all well and good, but there is at present an uneven playing field and that is a big problem."

But Bhagwat says that for Europe to maintain its global industrial competitiveness, it must make RES support schemes cost efficient and all costs more transparent.

Further contribution came from **Giles Dickson**, CEO of the European Wind Energy Association, who in his opening intervention pointed out that wind currently represents 10% of EU power and should, therefore, now be considered as part of the energy mainstream rather than a "green add-on."



Giles Dickson



Sylvain Lhote



**Dirk Van
Evercooren**

The jobs and growth benefits of wind should not be overlooked either with the wind industry responsible for supporting some 262,000 jobs in the EU and €35bn worth of exports.

The EU wind industry has 40 percent of the non-EU market share and, he told the panel, every €1 spent on wind in the EU generates €12 cents for both the steel and cement industries.

“Of course, it all costs,” he conceded, pointing out that in 2012 onshore wind received €19bn subsidies in Europe in 2012. This, though, is the same as coal while gas and nuclear were both subsidised to the tune of €7bn.

But he insists that investment in wind and renewables does pay off, and industry is recognising that and sourcing power from wind sources with one example being BMW. Some 20 percent of the German car maker’s plant at Leipzig is generated from wind while other major companies, ranging from Renault and Nissan to Heineken and IKEA, are increasingly turning to wind to power their energy sources.



**Nikos
Hatziargyriou**

Dickson argues that the debate is not just about reducing demand but making the whole system “more efficient”, or balancing supply and demand.

The discussion focused partly on which element of the energy trilemma is the most important and whether Europe was over-prioritising any of them.

According to Dickson, each of the three “legs” of the trilemma are equally important - and onshore wind delivers on all three - but the problem is that Europe “in practice” does not prioritise any of them enough.

“Delivering on the energy trilemma means above all mobilising investments. And the key to that is clear long-term policy and regulatory signals to investors. Investors can choose where to invest and respond directly to positive and negative signals.”

Bad policy, he says, increases financing costs, with one example being the cost of wind investment in Spain, which is twice as high as Germany.

So, what are the hard choices governments have to make on balancing the trilemma?

“Delivering on the energy trilemma means above all mobilising investments.”

Giles Dickson

Dickson believes that governments actually have more tools at their disposal to reduce costs and deliver on CO2 and energy security than they realise, adding, “Better design of the electricity markets is an obvious one.”

Another speaker, **Sylvain Lhote**, Alcoa’s Vice President of Government Affairs, said, “Let me be clear, I don’t dispute that we need more green energy, but let’s not put the cart before the horse by failing to fully utilise today’s solutions. Industry can also deploy solutions but to do so we need the right rules for the game.”

He adds, “One problem in Europe is that we have too many energy-related targets and are trapped into talking about what we want to achieve by 2020. All these targets tend to compete against each other and it can all end up being a vicious circle.”

For **Dirk Van Evercooren**, president of the Association of Issuing Bodies, a third pillar is missing from EU renewable policy: the consumer.

“After all,” he noted, “not everyone can become a ‘prosumer’ (or professional consumer). Every European electricity customer – corporate and household – should be able to make a positive choice for green electricity, to push the market towards more investment in renewables.”

From a customer perspective, the focus on green is unjustified, he said, adding, “It’s like being in a grocery store that has five apples on sale, four red, one green. Should all attention be focused on the green apple? After all, all apples get sold.”

He told the summit that Guarantee of Origin (GO), the tracking system for electricity from renewables (RES), is now “very mature and trustworthy” but that the tracking of non-green electricity had not followed suit.

“Moreover, the RES producers carry the burden of the green tracking system whereas the non-RES producers/suppliers do not, which is not a level playing field.”

Van Evercooren said that what is needed is to empower customers and make them accountable for their choices, with a key element being carbon.

If customers are informed transparently about the carbon footprint associated with their choice of electricity supplier and contract, they will act upon this, he believes.

“Much of what we have talked about,” he said, “boils down to correcting market failures (externalities, incorrect price signals...). So next to instruments like flexibility and better market design, we also need the right price on carbon.

“If the EU wishes to reach its climate and energy ambitions, smart grid solutions are a prerequisite.”

Nikos Hatziargyriou

“We have too many targets and are trapped in talking about what we want to achieve by 2020.”

Sylvain Lhote

Carbon is clearly the driver for the green electricity market, especially for corporate consumers, so let's close the circle and use the GO as an information carrier for carbon to put the customer in the driver' seat.”

In recent years, the need to tackle climate change and ensure security of supply has been “important” drivers of energy policy, said another panel speaker, **Nikos Hatzigiorgiou**, CEO of the Hellenic Distribution Network Operator.

“This has resulted in policies to encourage renewable energy, but also unconventional fossil fuels such as shale gas and these changes will bring about changes to costs,” he declared.

In particular, he believes network regulation should be revised to “incentivise” Distribution System Operators (DSOs) to make the long-term investments necessary to ensure a “secure, sustainable and reliable” electricity supply.

“Electricity network costs, along with taxes and levies make up more of the household energy bill than the energy itself. If the EU wishes to reach its climate and energy ambitions, smart grid solutions are a prerequisite and this means urgent and considerable investment.”

Hatzigiorgiou told the session that market capacity is “critical” for solving the energy trilemma, adding, “That means delivering green and reliable electricity at the lowest possible cost.”



Q&A



In a comment and question session, Dickson was probed on how the European wind industry is faring against the Chinese.

He reported that it was “holding its own” but could only continue to do so if the home market was “strong and vibrant”, adding that this is crucial in achieving further technological progress and cost reductions.

He also cautioned that Europe was now “falling behind in ambition” on low carbon compared to others, noting that China, India, Brazil and Turkey all had ambitious post-2020 RES targets, as well as many poorer developing countries such as Bangladesh, Morocco, Tunisia, Ghana and Mongolia.

It was striking, he said, that only five of the 28 EU member states had post-2020 RES targets.

“That,” said Dickson, “will not give us the vibrant home market we need to capture the expanding emerging/developing economy markets.”

On a similar theme, Lhote, whose company is a global leader in lightweight metals technology, noted that Europe’s aluminium industry was in decline largely due to Chinese imports.

He concluded by appealing for further investment to ensure that the new technologies are deployed in Europe, not overseas.



To view the full content of this panel: <https://vimeo.com/147439001>

Final Conclusions



Closing the Summit, **Pierluigi Mancarella**, chair of the IEEE European Public Policy Initiative Working Group on Energy, summarised the key points of the day.

Energy, he pointed out, has to be reliable, cost effective and sustainable, but reconciling each of these objectives is not as easy as it sounds.

He said, “The role of this Summit has been to highlight this difficulty and the likely need for a trade-off between one or more of these policy pillars.”

With all eyes on COP21 and the upcoming climate negotiations in Paris, the Summit, it was agreed, could not have been timelier in terms of considering the policies and priorities for transition to a low carbon economy.

There was also consensus among the leading representatives from engineering, government and academia who attended on the need for flexibility, more transparency, consumer empowerment, and what was repeatedly referred to as “level playing fields.”

Despite obstacles still having to be overcome, there was a quiet confidence among attendees that Europe can reach its carbon-reduction targets in the coming years. This includes ensuring that by 2030 renewables has a 27 percent share in energy consumption.

Europe, participants heard, should also be recognised as being a “world leader” when it comes to moving to a more green economy.

The Summit attendees were reminded that the European Commission, which has promised to make Europe the ‘world number one’ on renewable energy, has renewed the commitment to a binding 30% target for energy efficiency in the EU by 2030. This, everyone said, is clearly welcome.

But summitters believe that one of the most effective ways forward in the transition towards a low-carbon economy is through a clear, predictable carbon price signal that will allow industry to invest in an efficient and sustainable manner.

The Commission, it was said, must therefore take the necessary measures to ensure that EU member states meet the “at least 27%” renewable energy target by 2030. Over the next 15 years, all Member States must also do their fair share if the EU is to maintain its global leadership in renewables.

In summary, Mancarella, of the School of Electrical and Electronic Engineering at The University of Manchester in the UK, said, “We need to understand how we can reform the energy markets in order to find reliable and flexible sources of energy. We’ve got to manage the energy trilemma.

“The whole purpose of this Summit,” he concluded,” has been to demonstrate that all three elements of that triangle are important, not just one.”

It is a thorny issue - how to fundamentally transform energy systems while also ensuring that EU consumers, both citizens and enterprises - have access to secure, competitive and affordable energy.

The solution? Empower consumers, put our faith in new technologies and create flexibility. That, according to the IEEE Summit, should be the new green mantra.

To view the full content of the conclusions: <https://vimeo.com/147317059>



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