



## Sixth Annual Expert Workshop: Challenges in Electricity Decarbonisation

### MID-CENTURY DECARBONIZATION IN THE ELECTRICITY SECTOR

Thursday, 17 October 2019, 13:00 - 18:15

*(followed by a reception)*

*and*

Friday, 18 October 2019, 08:00 - 15:15

**IEA ROOM 1, FRANCE**

*9 rue de la Federation 75739 Paris*

The *Sixth Annual EPRI-IEA Challenges in Electricity Decarbonisation Expert Workshop* will focus on the growing number of mid-century electric sector emissions targets announced by governments and electric utilities throughout the world, near- and long-term strategies to achieve those targets, and potential challenges likely to be encountered along the way.

Reaching low-to-zero greenhouse gas emissions globally across the economy by mid-century, consistent with a pathway toward well below 2 °C temperature rise, requires deep and rapid decarbonisation of the electricity sector combined with widespread electrification of the buildings, transport, and industrial end-use sectors. While a number of electric utilities have announced plans to reduce emissions to close to zero (or even beyond) by 2050, how this will be achieved in different jurisdictions throughout the world is an open question. Certainly much has already been learned from countries' experiences with high shares of renewables to date; however, moving toward even higher shares will create significant challenges necessitating new infrastructure and operating paradigms.

This year's EPRI-IEA workshop will focus on potential pathways and associated challenges by which utilities may drive their emissions close to zero (or beyond) by 2050. The workshop will span 1.5 days and will consist of sessions on the following topics:

- National and sub-national actions to deeply reduce electric sector greenhouse gas emissions
- Electric utility ambitions for decarbonization
- Market, policy and technology challenges associated with high shares of renewables
- Role of long-distance transmission and cross-border energy flows in countries' decarbonization efforts
- Innovative strategies to facilitate the task of deep decarbonization

The *EPRI-IEA Challenges in Electricity Decarbonisation Expert Workshop* series brings together leading experts from government, academia, think-tanks and the private sector from around the world to share experiences relating to decarbonizing the electricity system. Participants identify barriers and opportunities for the sector and discuss lessons learned from various approaches to decarbonization in different jurisdictions. Past workshops have performed deep dives into a diverse set of topics including near-term market structure, long-term decarbonisation pathways, security of supply and resource adequacy, and end-use electrification opportunities.

The meeting will be informal in nature and held under [Chatham House Rule](#). Attendance is by invitation only. Please indicate your interest in participating on the [registration page](#).

Thursday, 17 October 2019  
IEA ROOM 1, FRANCE

13:00 - 14:20	<b>Registration and lunch</b>
14:20 - 14:40	<p><b>Welcome and opening remarks</b></p> <ul style="list-style-type: none"> <li>• <b>Keisuke SADAMORI</b>, Director, Office of Energy Markets and Security, <b>IEA</b></li> <li>• <b>Anda RAY</b>, Senior Vice President, External Relations and Technical Resources, <b>EPRI</b></li> <li>• <b>David HUNTER</b>, Senior Advisor for Government and External Relations, <b>EPRI</b></li> </ul>
<b>SESSION 1 REGULATOR/ POLICY-MAKER PERSPECTIVE FROM VARIOUS REGIONS</b>	
14:40 - 16:20	<p>What targets have different national and subnational jurisdictions set for their electricity sector by 2050? How do they expect to reach them? To what extent will the solutions depend on renewable energy? Where are the challenges? This panel will hear from experts around the world as they discuss strategy and potential challenges for decarbonizing their respective electricity sectors by 2050.</p> <p><i>Followed by roundtable discussions</i></p> <p><b>Moderator: Peter FRASER</b> ♦ Head, Gas, Coal, and Power Markets, <b>IEA</b></p> <p><b>Panellists:</b></p> <ul style="list-style-type: none"> <li>• <b>EU Commission view on the 2050 roadmap</b> <b>Lukasz KOLINSKI</b> ♦ Head of Unit, Economic Analysis and Financial Instruments, <b>DG Energy</b></li> <li>• <b>California: Pathways for deep decarbonization in California</b> <b>Jeanette PABLO</b> ♦ General Counsel &amp; Senior Associate, <b>Energy Futures Initiative</b></li> <li>• <b>China's 2050 Outlook</b> <b>Kaare SANDHOLT</b> ♦ Chief Expert, <b>China National Renewable Energy Centre</b></li> <li>• <b>India perspective</b> <b>Ashwin GAMBHIR</b> ♦ Fellow, <b>Prayas Energy Group</b></li> <li>• <b>Japan perspective</b> <b>TBD</b> ♦ tbd, <b>Government of Japan</b></li> </ul>
16:20 - 16:45	<b>Coffee break</b>
<b>SESSION 2 THE MARKET, POLICY, AND TECHNOLOGICAL CHALLENGE OF HIGH PENETRATION RENEWABLES</b>	
16:45 - 18:05	<p>Various jurisdictions have significantly increased their renewable penetrations to date using a variety of market and policy mechanisms, with varying impacts on electricity prices and public acceptance. Looking forward, achieving considerably higher renewable penetrations—at the 80% level or higher—will involve not only effective market and policy structures but also a number of technological developments. This session will look at both lessons learned in applying various market and policy approaches to date, as well as technological constraints and potential solutions necessary to reach ever higher renewable targets.</p> <p><i>Followed by roundtable discussions</i></p> <p><b>Moderator: Edwin HAESSEN</b> ♦ Head of the System Integration of Renewables Unit, <b>IEA</b></p> <p><b>Panellists:</b></p> <ul style="list-style-type: none"> <li>• <b>California and German market and policy lessons in high penetration renewables</b> <b>Michael PAHLE</b> ♦ Head of Energy Strategies Europe &amp; Germany working group, <b>Potsdam Institute for Climate Impact Research</b></li> <li>• <b>UK-NY-Germany lessons learned</b> <b>Karim L. ANAYA</b>, Research Associate in Energy Policy and Economics, <b>University of Cambridge</b></li> <li>• <b>EPRI's REGEN analysis of increasing solar and wind penetrations</b> <b>Geoff BLANFORD</b> ♦ Senior Technical Executive, <b>EPRI</b></li> </ul>
18:05	<b>End of day 1: closing remarks</b>
18:15 - 19:45	<b>Reception</b>

Friday, 18 October 2019  
IEA ROOM 1, FRANCE

08:30 - 09:00 Registration, coffee and pastries

### SESSION 3

### MID-CENTURY UTILITY GOALS AND HOW TO GET THERE

09:00 - 10:30	<p>This panel will provide perspectives from utility companies from around the world on their mid-century carbon goals. Panelists will discuss their company's decarbonisation targets, near-term steps (5-10 years) and long-term strategies for reaching them, and some of the challenges that will need to be overcome.</p> <p><i>Followed by roundtable discussions</i></p> <p><b>Moderator: David MCCOLLUM</b> ♦ Principal Technical Leader, <b>EPRI</b></p> <p><b>Panellists:</b></p> <ul style="list-style-type: none"> <li>● <b>EdF's mid-century decarbonization strategy</b> <b>Bernard SALHA</b> ♦ SVP and Head of Research and Development, <b>EDF</b></li> <li>● <b>The framework conditions for decarbonisation in Germany by 2030 and EnBW's strategic response to them</b> <b>Jörg JASPER</b> ♦ Senior Manager, <b>EnBW</b></li> <li>● <b>Engie perspective</b> <b>Andreas EHRENMANN</b> ♦ Senior Chief Analyst, <b>ENGIE</b></li> <li>● <b>Ameren perspective</b> <b>Stephen KIDWELL</b> ♦ Vice President, Regulatory and Legislative Affairs, <b>Ameren</b></li> <li>● <b>"Low to no" by mid-century: Southern 's decarbonization strategy</b> <b>Charles ROSSMAN</b> ♦ Economist, <b>Southern Company</b></li> <li>● <b>Xcel's plan for 100% carbon free electricity</b> <b>Nicholas MARTIN</b> ♦ Manager, Environmental Policy, <b>Xcel Energy</b></li> </ul>
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10:30 - 11:00

*Coffee break*

### SESSION 4

### THE ROLE OF LONG-DISTANCE TRANSMISSION AND CROSS-BORDER ENERGY FLOWS IN MID-CENTURY DECARBONIZATION

11:00 - 12:30	<p>This panel will focus on the role of the grid in deep decarbonisation. Can we accommodate high shares of renewables without long-distance transmission and effective cross-border trading? What role will the collaboration between distribution and transmission have for the future of decarbonisation?</p> <p><i>Followed by roundtable discussions</i></p> <p><b>Moderator: Alejandro HERNANDEZ</b> ♦ Senior Electricity Analyst, <b>IEA</b></p> <p><b>Panellists:</b></p> <ul style="list-style-type: none"> <li>● <b>Danish national transmission system operator perspective</b> <b>Peter MARKUSSEN</b> ♦ Head of Department Flexibility and Ancillary Services, <b>Energinet Electricity System Operator</b></li> <li>● <b>The benefits of collaboration in the western US</b> <b>Stacey CROWLEY</b> ♦ Vice President of External &amp; Customer Affairs, <b>California ISO</b></li> <li>● <b>Thai transmission planning perspective</b> <b>Tawatchai SUMRANWANICH</b> ♦ Director, Generation and Transmission System Planning Division, <b>Electricity Generating Authority of Thailand</b></li> <li>● <b>Planning for the renewable energy future with grid investment</b> <b>Asami MIKETA</b> ♦ Senior Programme Officer, <b>IRENA Innovation and Technology Centre</b></li> <li>● <b>The potential of Hydrogen</b> <b>Uwe REMME</b> ♦ Energy Modeller, Energy Technology Policy Division, <b>IEA</b></li> </ul>
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12:30 - 13:45

*Lunch*

SESSION 5	NEW PARADIGMS AND TECHNOLOGY DEVELOPMENT: NEXT STEPS TO GET TO ZERO EMISSIONS
13:45 - 15:15	<p>In order to get to deep decarbonisation new technologies and methodologies most likely will need to develop. This panel will focus on forward looking technologies and ideas that are not currently mature in the energy sector.</p> <p><i>Followed by roundtable discussions</i></p> <p><b>Moderator: Markus WOLF</b> ♦ Regional Manager for International Stakeholder Engagement, <b>EPRI</b></p> <ul style="list-style-type: none"> <li>● <b>Negative emissions technologies</b> <b>K. John HOLMES</b> ♦ Director/scholar, Board on Energy and Environmental Systems, <b>US National Academy of Sciences</b></li> <li>● <b>Grid-interactive efficient buildings</b> <b>Alex FITZSIMMONS</b> ♦ Acting Deputy Assistant Secretary for Energy Efficiency, <b>US Department of Energy</b></li> <li>● <b>Advanced Energy Communities</b> <b>Ram NARAYANAMURTHY</b> ♦ Senior Program Manager, <b>EPRI</b></li> <li>● <b>Google's strategy for 100% renewables</b> <b>Ainhua ANDA</b> ♦ Senior Lead, Energy Strategy, <b>Google</b></li> <li>● <b>Steel production through electrolysis: impacts for electricity consumption</b> <b>Adam RAUWERDINK</b> ♦ VP Business Development, <b>Boston Metal</b></li> </ul>
15:15 - 15:30	<p><b>Closing remarks</b></p> <ul style="list-style-type: none"> <li>● <b>Mark MCGRANAGHAN</b> ♦ Vice President for Distribution and Energy Utilization, <b>EPRI</b></li> <li>● <b>Peter FRASER</b> ♦ Head, Gas, Coal, and Power Markets, <b>IEA</b></li> </ul>