

WORLD
ENERGY
COUNCIL

Performing while transforming:

The role of transmission companies in the energy transition

Innovation Insights Brief | 2020

In collaboration with PwC



FOREWORD

Transmission of electricity plays a crucial role in meeting growing demand for clean, affordable, reliable, and equitable power. The role and position of transmission companies is changing in fast and fundamental ways in this time of energy transition. The importance of electricity transmission is not in question, but the who, operating and business models involved are expected to transform in the decades to come.

Demand for renewable and net zero carbon power is expected to triple by 2050. Electricity will need to be transported across longer distances, via increasing cross-border connections and regional grids. Transmission companies are working to provide the physical and operational backbone of a new global energy system that can meet growing and shifting demand for heat and cooling, 'on demand' energy-plus services, and, short and seasonal storage needs. Meanwhile, the short and medium term 'how to' practicalities of designing, building and operating large scale, multi-directional and hybrid grid systems are characterised by ambiguity, uncertainty and new kinds of systemic and emerging risk, including global pandemics, cyber security and extreme weather events.

Transmission companies and system operators around the world also face new kinds of 'off-grid' community opposition and competition from non-traditional energy providers. They are challenged to find ways to balance the trade-off between arriving too early with the wrong technology solution (e.g. battery and/or alternative to battery storage solutions) or hindering the speed of global energy transition by waiting until the fog of societal ambiguity and new technology risk becomes clear.

This study by the World Energy Council, in collaboration with PwC, provides timely insights on the challenges ahead and solutions emerging, based in interviews with 37 transmission companies, covering all regions of the world. Three strategic implications are clear: (1) the future of the grid involves investment in people and skills, as well as in the tools and infrastructure required to anticipate and meet more mobile and dynamic demand; (2) transmission companies will need to play an increasingly active role in designing the new power ecosystem and securing their social licence to operate; and, (3) cross-border and regional connected grid systems offer multiple benefits, including enhanced resilience but these systems may incur political risks.

As the COVID-19 crisis continues to have an impact across the world, the lights have stayed on in many countries even as national economies and social mobility have come to a virtual standstill. It is too early to say when there will be a return to pre-covid business-as-usual. Based on the Council's wider global energy community surveys, expectation is growing of a slow recovery to a 'new/next' normal, rather than a return to normal. The shape of the 'new normal' varies, however, depending on the duration of global economic recession or depth of contraction, priority to climate neutrality and the ambition for transformational outcomes and societal behaviour change.



Dr Angela Wilkinson
Secretary General & CEO
of the World Energy Council



Jeroen van Hoof
PwC Global Power & Utilities
Leader



EXECUTIVE SUMMARY

Transmission companies are key players in electricity systems. With safety and reliability in the foreground, their main responsibility is to ensure that the grid remains stable at all times so as to safeguard consumers' security of supply³. Spanning all continents and a range of regulatory and national contexts, this brief reviews the common themes, the differences in how transmission companies are planning for the energy transition and the dilemmas they are facing in the process.

Despite the great diversity in terms of structure, geography, resources, GDP of the country of operation of the transmission companies that we interviewed, their CEOs and other top executives are in no doubt about the importance of transmission in the future. They see a future where **transmission companies are at the heart of change, enabling innovation in their energy systems and, in many cases, helping to lead its visionary development.** Whilst the end-goal for these organisations is clear, several trends are affecting how they prepare and re-think their operations and business models:



**RELIABILITY IN AN ERA
OF VARIABLE RENEWABLES**



**LONG-TERM PLANNING AND
WORKING WITH NEW ACTORS**



**DIGITAL DELIVERY –
MOVING BEYOND THE PHYSICAL**



**INCORPORATING NEW
(AND UNCERTAIN) TECHNOLOGIES**



**INTERCONNECTION,
INTEGRATION AND GEOPOLITICS**

³ Security of supply entails meeting the demand for transmission while keeping generation/consumption levels balanced as to avoid any fluctuations in frequency, interruptions in supply and even grid failure.

Arising from these five trends and uncertainties, we found that the overarching challenge of transmission companies is to **perform and transform simultaneously**. On the one hand, they need to **perform**: security of supply is to be ensured at all times whilst complying with fast changing regulation (e.g. integrating new technologies, working with new actors or increasing the overall flexibility of the system). On the other hand, they must **transform** to integrate, manage and influence the changes affecting them as a result of energy transitions.

Leveraging the insights from our interviewees, we developed four recommendations to accompany transmission companies in this perform and transform journey:



FOCUS ON THE FUTURE

The variability of renewables as well as the key uncertainties discussed in this brief shed new light on the critical role of both forecasting and scenarios. Building capacity in these two areas is key to deliver clean energy futures.



SHAPE THE ECOSYSTEM

The interviews which inform this brief have highlighted the opportunity for transmission companies to define themselves as drivers of the energy transition by moving beyond being physical infrastructure providers to being shapers of a community of energy system actors.



SAFEGUARD THE LICENCE TO OPERATE

Transmission companies find themselves increasingly needing to have a social conversation, not just with stakeholders but also the wider public, on the choices that are available. Maintaining and building their social licence to operate with their community is key.



TRANSFORM THE ORGANISATION

The many challenges of energy transition are shifting the skillset and mindset the transmission companies need inside their organisations. To become more integrated energy ecosystems, there will be stronger emphasis on softer, collaborative aptitudes as well as digital skills.

OFFICERS OF THE WORLD ENERGY COUNCIL

JEAN-MARIE DAUGER
Chair – France

DR. ELHAM MAHMOUD IBRAHIM
Vice Chair, Africa – Egypt

SHIGERU MURAKI
Vice Chair, Asia Pacific & South Asia – Japan

ALEXANDRE PERRA
Vice Chair, Europe – France

CLAUDIA CRONENBOLD
Vice Chair, Latin America & Caribbean – Bolivia

DR. MICHAEL HOWARD
Vice Chair, Special Responsibility for Innovation – USA

KLAUS-DIETER BARBKNECHT
Chair, Finance – Germany

IBRAHIM AL-MUHANNA
Vice Chair, Special Responsibility, Gulf States & Middle East – Saudi Arabia

JOSÉ DA COSTA CARVALHO NETO
Chair, Programme Committee – Brazil

LEONHARD BIRNBAUM
Chair, Studies Committee – Germany

JOSÉ ANTONIO VARGAS LLERAS
Chair, Communications & Strategy Committee – Colombia

OLEG BUDARGIN
Chair, 2022 Congress Org. Committee – Russian Federation

DR ANGELA WILKINSON
Secretary General – London Office

WORLD ENERGY COUNCIL PARTNERS

Accenture Strategy
California ISO
Emirates Nuclear Energy Corporation
ENGIE
EY
MUBABALA
PwC
PJSC Rosseti

Abu Dhabi National Oil Company
Dubai Electricity and Water Authority
Electricité de France
Emirates National Oil Company
Marsh & McLennan Companies
Oliver Wyman
Rosatom
Siemens AG

WORLD ENERGY COUNCIL

<u>Algeria</u>	<u>Hong Kong, China</u>	<u>Panama</u>
<u>Argentina</u>	<u>Hungary</u>	<u>Paraguay</u>
<u>Armenia</u>	<u>Iceland</u>	<u>Poland</u>
<u>Austria</u>	<u>India</u>	<u>Portugal</u>
<u>Bahrain</u>	<u>Indonesia</u>	<u>Romania</u>
<u>Belgium</u>	<u>Iran (Islamic Rep.)</u>	<u>Russian Federation</u>
<u>Bolivia</u>	<u>Ireland</u>	<u>Saudi Arabia</u>
<u>Bosnia & Herzegovina</u>	<u>Italy</u>	<u>Senegal</u>
<u>Botswana</u>	<u>Japan</u>	<u>Serbia</u>
<u>Bulgaria</u>	<u>Jordan</u>	<u>Singapore</u>
<u>Cameroon</u>	<u>Kazakhstan</u>	<u>Slovakia</u>
<u>Chad</u>	<u>Kenya</u>	<u>Slovenia</u>
<u>Chile</u>	<u>Korea (Rep.)</u>	<u>South Africa</u>
<u>China</u>	<u>Latvia</u>	<u>Spain</u>
<u>Colombia</u>	<u>Lebanon</u>	<u>Sri Lanka</u>
<u>Congo (Dem. Rep.)</u>	<u>Libya</u>	<u>Sweden</u>
<u>Côte d'Ivoire</u>	<u>Lithuania</u>	<u>Switzerland</u>
<u>Croatia</u>	<u>Malta</u>	<u>Syria (Arab Rep.)</u>
<u>Cyprus</u>	<u>Mexico</u>	<u>Tanzania</u>
<u>Dominican Republic</u>	<u>Monaco</u>	<u>Thailand</u>
<u>Ecuador</u>	<u>Mongolia</u>	<u>Trinidad & Tobago</u>
<u>Egypt (Arab Rep.)</u>	<u>Morocco</u>	<u>Tunisia</u>
<u>Estonia</u>	<u>Namibia</u>	<u>Turkey</u>
<u>Eswatini (Kingdom of)</u>	<u>Nepal</u>	<u>Ukraine</u>
<u>Ethiopia</u>	<u>Netherlands</u>	<u>United Arab Emirates</u>
<u>Finland</u>	<u>New Zealand</u>	<u>Uruguay</u>
<u>France</u>	<u>Niger</u>	
<u>Germany</u>	<u>Nigeria</u>	
<u>Greece</u>	<u>Pakistan</u>	

62–64 Cornhill
 London EC3V 3NH
 United Kingdom
 T (+44) 20 7734 5996
 F (+44) 20 7734 5926
 E info@worldenergy.org

www.worldenergy.org | [@WECouncil](https://twitter.com/WECouncil)