



THE ROLE OF NEW TECHNOLOGY FOR A MORE COMPETITIVE AND PRODUCTIVE WORLD ENERGY MIX

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The future of the world energy mix is moving towards increased energy efficiency, electrification and powered by renewable technologies.

The combination of economies of scale and innovative financing mechanisms are plummeting the cost of renewable technologies around the world. But there are a plethora of technologies required to support the systemic change required to integrate these sources of generation into the world energy mix.

The energy transition will be powered by renewable energy, primarily wind and solar energy, which will be connected on the distribution network in addition to the transmission network. However, the variable nature of such technologies will demand new network technologies, especially for the provision of grid flexibility and stability, under higher renewable power penetration scenarios. Such network technologies include smart grids, block chain, inverter technologies, storage technologies, ultra-high voltage power transmission technologies, local and regional electricity markets, cybersecurity technologies, enhanced demand-side management possibilities, and others. While the cost of solar and wind power generation has drastically decreased, it is really the network which shall define the maximum penetration of such technologies into the system.

While the network improvement costs globally shall be initially substantial and may even increase the average cost of electricity generation, transmission and distribution in the short term, in the long term this cost shall decline and favor the consumers.

These systemic changes need innovation across a wide spectrum, from the power electronics to the regulatory frameworks for enabling interconnections. The concept of

smart grids supported by smart metering is one fundamental technology area which needs development to enable this new energy mix to succeed. Several disruptive technologies are being developed and tested by key utilities across the world. Special startup funds and accelerator programs have been created within major utilities and have smart grids as an overarching theme.

In the UAE we have the *Innovation Centre* in the Dubai Electricity and Water Authority which includes four focus areas: Producing electricity using solar power; Integration of Smart Grids; Energy Efficiency and Water.

The Dubai Future Accelerator (DFA) was launched in 2016 by His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and the Chairman of Dubai Future Foundation. DFA is a nine-week program that's "not an incubator" but a platform that lets you use the city as a testbed for your solutions. One of the previous challenges included the Future of Energy, focusing on accelerating digital transformation through disruptive technologies and advancing inclusive access to secure, affordable, and sustainable energy services.

New emerging technologies have always been part of the world energy landscape; geopolitical elements have contributed to the flow of funds towards certain themes. Today the issues of climate change also feature in the story of energy transition; this is supported by the co-benefits of choosing clean and efficient technologies. Distributed clean energy deployment is gaining ground in several developing nations which are currently energy poor. The SDGs 2030 includes the access to secure, affordable and sustainable energy services as per Goal 7.

In the UAE we have achieved near 100 per cent access to secure and affordable energy services. Energy has been the backbone of the breakneck speed of development that the UAE has witnessed. Natural gas has been the major source of energy and is one of the cleanest fossil fuels available. Therefore, the grid emission factor is one of the lowest in the world and we are continuing the transition to a cleaner electricity mix.

The challenge to the policymakers is to balance energy security, affordability, and sustainability. When discussing with the various stakeholders during the development of the *UAE Energy Strategy 2050*, the weight of these objectives is not equal. Energy security and affordability are areas of high priority, along with the long term targets of having a high presence of clean energy in the mix, serving our sustainability aspect. ■

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