A grand transformation is under way. Distributed power technologies are on the rise across the globe. Annual distributed power capacity additions grew from 47 gigawatts (GW) per year in 2000 to 142 GW per year in 2012. At GE, we expect this growth trend to continue. By 2020, GE estimates that global distributed power capacity additions will reach 200 GW per year, up from 21 percent in 2000. Further, through the end of the decade distributed power capacity additions will grow 40 percent faster than global electricity consumption.

As discussed in GE’s recent white paper, The Rise of Distributed Power, distributed power is being driven by several forces at the global level. In addition to these factors, the Middle East has a unique set of conditions that are making distributed power technologies particularly attractive in the region. Altogether, we believe there are at least eight forces that are driving the rise of distributed power in the Middle East.

1. Technology Progress

A wave of decentralization is sweeping across the world. Technology innovation is the driving force behind this megatrend. Technology is improving equipment and making it smaller, bridging the space between connected people, places and things. First and foremost, the rise of distributed power is being driven by the same force that is propelling the broader decentralization movement across industries today: technology progress. Distributed power technologies are more widely available, smaller, more efficient and less costly today than they were just a decade ago.

GE’s continuous distributed power technology innovations have created cost efficiencies that have compounded over time. Today, 6,000 cubic meters of methane per hour. With the assistance of an onsite gas piping and collection systems, this is enough methane to power a 1 MW distributed power generation system. There is enough methane to support expansion of this project to 12 MW. This is one example of the possibilities. GE believes that the market potential for these solutions in the Middle East is vast.

Conclusion

In this era of technological transformation, GE’s broad portfolio of innovative and diverse distributed power solutions gives businesses and communities around the world the ability to generate reliable and efficient power anywhere, whether on or off the grid. GE has unparalleled global experience implementing distributed power projects across a range of fuels and applications. At GE, we are proud to play a role in realizing the potential of distributed power in the Middle East, and we are excited by the opportunity to help usher in a new energy era. The distributed power transformation has just begun, and the best is yet to come.

Endnotes

2 UN Population Division, Department of Social and Economic Affairs. Medium Fertility Forecast
34 million people by 2020. That represents a rate of growth that is 65 percent faster than the global rate of population growth over the same period.1,2

Electricity demand is growing quickly in the Middle East as a result of population growth, a rapidly expanding industrial sector led by the development of petrochemical sites, and high demand for air conditioning during summer months. GE believes that electricity demand in the region will grow from 892 terawatt-hours (TWh) in 2012 to 1,262 TWh in 2020. This represents a 4.4 percent average annual growth rate. That's about 35 percent faster than the global rate of electricity demand growth over the same period.

3. T&D and Reliability Challenges

With more people requiring more energy, distributed power provides a ready-made solution. This is particularly true in light of the region’s infrastructure challenges. In addition to the lack of transmission and distribution (T&D) lines required to transmit power in some countries, many of the grids that do exist in the region can be unreliable.

For example, over the last decade Iraq has struggled to meet its power needs. According to the United States Energy Information Administration (EIA), daily outages lasting 16 hours per day have not been uncommon. In addition, enhancements to the T&D networks are required to bring additional power to customers. In Kuwait, rapid demand growth is causing rolling blackouts at times of peak energy demand. Kuwait is perpetually in a state of electricity supply shortage and experiences frequent blackouts and brownouts each summer.2 Distributed power technologies provide the critical link required to keep the lights on in the face of challenged transmission systems.

4. Fast Power Needs

Given the challenges associated with reliable T&D infrastructure in the region, distributed power technologies are an attractive alternative to building new T&D lines. Indeed, distributed power technologies provide a host of benefits that flow from their small size.

- Distributed power technologies can be installed quickly, often in a matter of days or weeks compared to years for central power stations. Rapid deployment is extremely useful in cases where there is unmet energy demand and supply must ramp up quickly. Faster build time is also useful when restoring power in the wake of natural disasters or within the context of chronically unreliable power systems.
- Due to their scalability, distributed power technologies require less money to buy, build and operate.
- Because of their small size, distributed power technologies enable energy providers to match the level of demand with the level of supply and to increase supplies incrementally as needed.
- Faster power accelerates the positive economic impact associated with electricity production and use. This can have a compounding effect on a region’s economic growth. The longer construction lead-times associated with larger power projects delay this economic benefit.

5. Increasing Electricity Access

Some areas in the Middle East are becoming electrified for the first time, and distributed power provides a solution for critical power needs among remote populations without extending the transmission network. In some countries such as Yemen, 14 million people do not have access to electricity. According to the International Energy Agency (IEA), Yemen has an electrification rate of 39.6 percent.

In total, there are 213 million people in the region without access to electricity. The expansion of distributed power is one of the keys to increasing electrification rates in these areas and providing basic services to these populations.

6. Industrial Captive Power Opportunities

The rise of industrial activities throughout the Middle East is providing an opportunity for industrial captive power solutions that are well-suited to distributed power technologies. Opportunities for industrial captive power are growing in the cement, ceramics, fertilizer, petrochemicals, steel and aluminum industries.

Consider the case of Iraq. Iraq’s Gross Domestic Product (GDP) growth rate was 9 percent in 2013, which was the second fastest growth rate in the world. Industry is the fastest growing segment in the Iraqi economy, and it is expected to grow at a rate of 6 percent over the next decade. Due to power shortages, 70 percent of manufacturing facilities are working at levels of 30 percent or lower. Industrial captive power can provide a solution to these reliability challenges. The growth of Iraqi industry, combined with reliability challenges, creates the opportunity for significant distributed power investment over the next decade.

7. Distributed Power in Oil and Gas Operations

Abundant oil and gas production in the Middle East creates a golden opportunity for distributed power technologies in offshore oil and gas platforms and as a solution to onshore gas flaring. Declining onshore reserves, high oil prices and technology advances are all driving offshore oil and gas production growth. More than $100 billion is currently invested annually in upstream operations to address increased oil and gas demand. Distributed power technologies have a critical role to play in providing power to drilling rigs and wellhead platforms as well as power and compression for offshore processing facilities.

Gas flaring is widespread in the Middle East. This occurs in operations where associated gas is produced within oil production operations. Flaring is the preferred solution when pipeline infrastructure is not available to transport the associated gas, electricity prices are low, and gas requires pre-treatment. In these cases, distributed power technologies can be deployed to consume the associated gas and provide power and compression for oil and gas production operations. Pilot projects are being launched throughout the region to explore this promising distributed power opportunity.

8. Waste-to-Energy Projects

Waste-to-Energy projects are providing another driver to growing demand for distributed power solutions throughout the region. Both landfill gas and sewage treatment plants using biogas are the most promising opportunities for distributed power technologies. The greatest opportunities for the utilization of distributed power in waste-to-energy projects exist in Saudi Arabia, Kuwait, Dubai and Abu Dhabi.

One example of this type of distributed power application is the Al Qurais 1 megawatt (MW) landfill gas pilot project in Dubai. This project is a partnership of the Dubai Municipality and Green Energy Sustainable Solutions. This facility receives 5,000 tons of waste per day, which translates to...