Discourse Media

The Middle East and North Africa Access to Energy Brief

460-425 Carrall St.
Vancouver, BC
V6B 6E3

discoursemedia.org
+1 604 688 0639
@Discourse_Media

Discourse Media is an independent company producing in-depth, collaborative, impact-focused journalism projects about complex social issues.

Current Energy Profile

The Middle East and North Africa (MENA) region is a huge and diverse geographical region, with some of the greatest energy wealth on the planet. The region is one of the world's largest producers of fossil fuel energy resources, with 57 per cent of proven oil reserves and 41 per cent of proven natural gas reserves.[1] The MENA region is also home to some of the globe's best solar resources. However, huge discrepancies exist between resource-rich and resource-poor countries in their ability to meet the energy needs of their citizens. As one of the world's great energy-producing regions, MENA is often overlooked in access to energy literature. It is true that most countries have almost 100 per cent access to electricity, but this high-level data obscures vast variances between countries, between income groups, and between urban and rural areas.[2][3] Today, an estimated 28 million people in the region still lack electricity, and eight million people rely on traditional biomass for all of their energy needs.[4]

Energy infrastructure in most parts of the MENA is a fairly recent intervention, such as the massive public investments made by oil-rich states in the Arabian peninsula during the 1950s and 60s. Other countries in the region were not so fortunately endowed, with Morocco, for example, reporting rural electrification rates of less than one-fifth up until the mid-1990s.[5] Rural areas in particular, where 38 per cent of the MENA region's population now live, have been historically neglected when it comes to energy investment.[6] The energy

1 World Bank. "Energy in MENA." Middle East and North Africa, September 2010. http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/MENAEXT/0,,contentMDK:22307440~pagePK:146736~piPK:226340~theSitePK:256299,00.html.

2 World Bank, 2010.

3 El-Katiri, Laura. "The Energy Poverty Nexus in the Middle East and North Africa." OPEC Energy Review 38, no. 3 (2014): 296–322.

4 World Bank, 2010.

5 El-Katiri, 2014.

6 Ibid.

Discourse Media

460-425 Carrall St.
Vancouver, BC
V6B 6E3

discoursemedia.org
+1 604 688 0639
@Discourse_Media

Discourse Media is an independent company producing in-depth, collaborative, impact-focused journalism projects about complex social issues.

profile of rural areas in the lower-income countries including Morocco, Syria, Jordan, Tunisia, Egypt, and Yemen closely resemble that of many sub-Saharan African and South Asian countries, where most access to energy literature is focused. For example, many rural households still collect and burn charcoal, firewood, and animal dung, often mixed with crop residue or kerosene when it is available, for both heating and cooking needs. Practices such as these, although harmful to both health (from smoke inhalation) and the environment (through deforestation), can be difficult to change even as incomes increase, because they are embedded and deeply entwined with the traditional cultures of the region.[7] The fact that some of the worst cases of energy poverty exist in some of the largest net exporters of oil and gas, such as Egypt and Yemen, further demonstrates that energy poverty is primarily an issue of domestic distribution rather than an issue of supply.[8] Nevertheless, the most recent available data suggests a dramatic improvement in access to energy in all but a few countries in the region over the last two decades.

The Causes and Effects of Energy Poverty

Energy poverty in the MENA region is multifaceted, with long-term and structural factors such as poverty, geography and the impacts of tradition and custom often compounded by short-term factors such as political conflict. Poverty is pinpointed as one of the main factors blocking access to energy, but the relationship is more dynamic than simple cause and effect. Rising income levels are frequently associated with better access to electricity and higher quality fuels, but access to modern energy resources is also a precondition for socio-eco-

7 Bruce, Nigel. "The Health Burden of Indoor Air Pollution: Overview of the Global Evidence." In Indoor Air Pollution and Child Health in Pakistan: Report of a Seminar Held at the Aga Khan University, edited by Tauseef Ahmad Khan and Anita K.M Zaidi. Geneva: World health organization (WHO), 2006.

8 El-Katiri, 2014.

Discourse Media

460-425 Carrall St.
Vancouver, BC
V6B 6E3

discoursemedia.org
+1 604 688 0639
@Discourse_Media

Discourse Media is an independent company producing in-depth, collaborative, impact-focused journalism projects about complex social issues.

nomic development and income growth.[9] Societies in the MENA region are defined by income inequality – both across countries in the region, and across societies within individual countries.[10] Most of the region's wealth is concentrated in the sparsely populated but oil-rich Gulf states. In much of North Africa and the Levant, a small portion of the population controls the majority of the wealth. For example, data from Jordan, Morocco, and Egypt show that the top 10 per cent earners hold around 30 per cent of their countries' wealth, while the bottom 10 per cent hold only two to three per cent of the wealth.[11] However, it is the way this inequality manifests – for example, in uneven distribution of land, employment, and education – that impacts access to energy. Uneven distribution of resources creates an environment where household incomes are extremely volatile, uncertain, and risk-prone. The resulting lack of a secure and stable source of income means that even in parts of the MENA region with a local market for modern fuels and electricity, many families lack the capital necessary to make the initial investment in a new stove, an electricity connection, or the equipment required for other liquid fuels.[12]

Conventional development theory explains the transition from traditional to modern cooking fuels with an "energy ladder" model, whereby families transition from lower to higher quality fuels with increasing affluence.[13] However, a growing body of evidence from across the developing world suggests that this is rarely the case; instead, a "multiple-fuel" model is more accurate, in which even relatively wealthy households continue to rely on traditional biomass, alongside

9 El-Katiri, 2014

10 Ibid.

11 Ibid.

12 Ibid.

13 Masera, Omar R., Barbara D. Saatkamp, and Daniel M. Kammen. "From Linear Fuel Switching to Multiple Cooking Strategies: A Critique and Alternative to the Energy Ladder Model." World Development 28, no. 12 (2000): 2083–2103.

Discourse Media

460-425 Carrall St.
Vancouver, BC
V6B 6E3

discoursemedia.org
+1 604 688 0639
@Discourse_Media

Discourse Media is an independent company producing in-depth, collaborative, impact-focused journalism projects about complex social issues.

modern fuels, for cooking.[14] In the MENA region, this is often due to time-honoured traditions – for example, the customary role of women and children as firewood gatherers – that cause some communities to view cleaner, modern fuels as unnecessary. That families should intentionally expose themselves to the potentially devastating health effects of prolonged indoor cooking with poor-quality fuels demonstrates an interesting and important information deficit.[15] The decision to rely on traditional fuels while safer modern fuels are readily available is most often made by households with low levels of education and no access to a radio or other media – a deficit which is itself often the result of a lack of electricity.[16] Information campaigns, therefore, can be as successful as infrastructure projects or subsidies in reducing the use of potentially harmful cooking fuels.

One of the most endemic features of electricity supply in the MENA region, particularly in rural areas, is instability. Even in areas that are connected to the central grid, blackouts and power disruptions are common.[17] This instability has many causes. Central grid suppliers often lack adequate capacity to supply all consumers, and so ration power through rolling brownouts or blackouts. Widespread illegal access to the grid also exacerbates the problem by increasing the unpredictability of demand. Lebanon, for example, suffers from the region's highest rate of registered blackouts, which translates to daily power interruptions of three to 12 hours.[18] To avoid the annoyance – and danger – of frequent power failures, wealthier households invest in backup generators fueled by diesel or fuel-oil, at a substantially higher cost. Low-income households are of course the least able to pay for backup generation, and

14 Mekonnen, Alemu, and Gunnar Köhlin. "Determinants of Household Fuel Choice in Major Cities in Ethiopia," 2009. https://gupea.ub.gu.se/handle/2077/21490.

15 El-Katiri, 2014.

16 El-Katiri, 2014.

17 Ibid.

18 Ibid.

Discourse Media

460-425 Carrall St.
Vancouver, BC
V6B 6E3

discoursemedia.org
+1 604 688 0639
@Discourse_Media

Discourse Media is an independent company producing in-depth, collaborative, impact-focused journalism projects about complex social issues.

therefore are the ones hardest hit by power outages. In geographically remote rural areas, connection to the grid is often not feasible, and communities in these regions instead rely on self-generation and village-based mini grids. Although these mini grids allow for independent access to electricity, they are often designed for no more than a few hours of generation per day, depending on fuel availability. Thus, even where electricity is available in rural areas, it is often of poor and intermittent supply.[19] The impacts of intermittent power supply are felt most by rural communities, where it affects the health care sector in particular through the inability to: refrigerate spoilable medicines, generate the light needed during medical emergencies, and power basic electrical medical devices.[20]

The Water-Energy Nexus

Water and energy are tied closely together in every part of the world, but this relationship is particularly pertinent for countries in the MENA region. Water extraction, treatment, and distribution all use large amounts of energy. Reciprocally, most forms of energy generation use water for storage, cooling, or cleaning. This symbiotic relationship has been termed the "water-energy nexus," and it is becoming a critical area of research and planning as water resources around the planet are depleted.[21] Interested parties in the MENA region, where projected population growth will drop available per capita water resources by 30 to 70 per cent over the next few decades, are particularly intent on understanding this nexus.[22] One consequence of the nexus is that issues of energy poverty in the region cannot be understood or tackled in isolation; water access must also be taken into consideration.

19 Ibid.

20 Ibid.

21 Tabakovic, Aida, and Elisabeta Poci. "Water and Energy Nexus in Middle East, North Africa, and the United States." Transboundary Water Resources, March 29, 2012. http://www.caee.utexas.edu/prof/mckinney/ce397/Topics/Water-Energy/Water-Energy(2012).pdf.

22 Sowers, Jeannie. "Water, Energy and Human Insecurity in the Middle East." Middle East Research and Information Project, 2014. http://www.merip.org/mer/mer271/water-energy-human-insecurity-middle-east.

Discourse Media

460-425 Carrall St.
Vancouver, BC
V6B 6E3

discoursemedia.org
+1 604 688 0639
@Discourse_Media

Discourse Media is an independent company producing in-depth, collaborative, impact-focused journalism projects about complex social issues.

The MENA region has long lived with arid conditions and an extremely variable climate, but changes such as population growth, development, rapid urbanization, and environmental degradation are putting greater strains on water resources.[23] Also, climate change predictions forecast that the region will be harder hit than others, with droughts increasing in both frequency and intensity.[24] For the oil-rich Gulf countries, one solution to this challenge has been desalination plants. Saudi Arabia, for example, produces 70 per cent of municipal water from its 27 desalination plants, and recently announced plans to build the world's largest desalination plant.[25] While expensive, energy-intensive and technology-driven interventions are providing some success for rich states, many countries in the region have far fewer options. To deal with the challenges of the water-energy nexus, countries in the MENA region must invest in planning techniques that cut across sectoral boundaries, for example by combining wastewater treatment and reuse with energy production from sludge, or by investing in carbon-neutral solar-desalination.[26] Governments and international organizations are recognizing the synergistic nature of water and energy challenges, with initiatives such as Thirsty Energy from the World Bank, to quantify trade-offs between energy and water use, to pilot cross-sectoral planning, and to design assessment tools to help governments coordinate decision making.[27] The United Arab Emirates (UAE) has indicated that they will use seawater and treated wastewater to cool their currently under-construction nuclear power plants; in addition, wind power production – which requires no water once installed – increased 27 per cent between 2008 and 2011,

23 SEI. "Climate Change, Water and Energy in the MENA Region: Why a 'Nexus' Approach If Crucial for Mitigation and Adaptation." Stockholm Environment Institute, 2012. http://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-DB-2012-MENA-climate-nexus.pdf.

24 SEI, 2012.

25 Sowers, 2014.

26 SEI, 2012.

27 World Bank. "Water and Energy Security." Water, 2014. http://water.worldbank.org/WPP-Energy-Security.

Discourse Media

460-425 Carrall St.
Vancouver, BC
V6B 6E3

discoursemedia.org
+1 604 688 0639
@Discourse_Media

Discourse Media is an independent company producing in-depth, collaborative, impact-focused journalism projects about complex social issues.

led mainly by turbine arrays in Egypt, Tunisia, and Morocco.[28] As climate change intensifies, water supplies dwindle, and demand for energy increases in the coming decades, the greatest challenge for the MENA will be generating the political will to capitalize on these win-win "nexus" approaches to water and energy.[29]

28 Sowers, 2014.

29 SEI, 2012.